Bohale Investment Two CC

Environmental Impact Assessment (EIA) Report to support the Application for Environmental Clearance Certificate (ECC) for the Proposed Mining and Ongoing Exploration Operations with Supporting Linear Infrastructures in the Mining License (ML) No. 253, Karibib District,
ERONGO REGION WEST-CENTRAL NAMIBIA

November 2023

Bohale Investment Two CC
P. O. Box 4676
WALVIS BAY, NAMIBIA

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

TYPE OF AUTHORISATIONS

Environmental Clearance Certificate (ECC) for Mining and Ongoing Exploration Activities with supporting Linear Infrastructures in No. 253

MEFT ECC REFERENCE APPLICATION No.

APP-002492

NAME AND ADDRESS OF THE PROPONENT

Bohale Investment Two CC
P. O. Box 4676
WALVIS BAY, NAMIBIA
Email: btnnamibia@gmail.com

COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

PROPOSED PROJECT

ECC for Mining License (ML) No. 253
Mining and Ongoing Exploration Activities,
Karibib District, Erongo Region, Namibia

PROJECT LOCATION

Karibib District, Erongo Region, West Central Namibia
Latitude: -22.093808, Longitude: 15.99173

ENVIRONMENTAL CONSULTANTS

Permitting / De-Risking Advisors / Environmental Consultants
Risk-Based Solutions (RBS) CC
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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

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CITATION: ***Risk-Based Solutions (RBS), 2023****. Environmental Impact Assessment (EIA) Report to support the application for Environmental Clearance Certificate (ECC) for the Proposed Mining and Ongoing Exploration Operations with supporting Linear Infrastructures in the Mining License (ML) No. 253, Karibib District, Erongo Region West-Central Namibia*

DR SINDILA MWIYA, TEAM LEADER / ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP), PERMITTING / DE-RISKING ADVISORS / ENVIRONMENTAL CONSULTANTS DECLARATION

I, Dr Sindila Mwiya, working for Risk-Based Solutions (RBS) CC, the Permitting / De-Risking Advisors / Environmental Consultants and being the Environmental Assessment process Team Leader and the Environmental Assessment Practitioner (EAP) for the preparation of this Environmental Impact Assessment (EIA) Report to support the application for an Environmental Clearance Certificate (ECC) for the proposed mining and ongoing exploration operations and supporting linear infrastructure by Bohale Investment Two CC (the Proponent) in the Mining License (ML) No. 253, Karibib District, Erongo Region west central Namibia, hereby declares that:

1. This Environmental Impact Assessment (EIA) Report has been prepared in accordance with the provisions of the Minerals (Prospecting and Mining) Act (No 33 of 1992), the Environmental Management Act, 2007, (Act No. 7 of 2007), all other applicable national laws, and Regulations and Good International Industry Practice (GIIP).

2. I am highly qualified and experienced in environmental assessments and management, marine seismic survey operations, offshore oil and gas exploration and production operations and hold a PhD with research interests, academic training, and technical knowledge in Engineering Geology, Geotechnical, Geoenvironmental and Environmental Engineering, Artificial Intelligence and Knowledge-Based Systems with special focus on EIAs, EMPs, EMSs, SEAs, SEMPs and ESG with respect to subsurface resources (minerals, petroleum, water) and energy in arid and semiarid environments.

3. I am an Engineering and Environmental Geologist with extensive technical knowledge and experience in conducting environmental assessments, management, and monitoring for offshore and onshore subsurface resources (petroleum, solid state minerals, water, geothermal), exploration and utilisation and have undertaken more than 300 projects since 2004 covering environmental assessments, management, and monitoring projects in different parts of the World.

4. I have performed the work relating to this project in an objective manner, even if the outcomes will result in views or Records of Decision that may not be favourable to the Stakeholders or the Proponent, and.

5. I am an independent consultant not related to the Proponent, I co-own and operate an independent company (Risk-Based Solutions CC) which is not related to the Proponent. Except for the fees payable for professional consulting services rendered to the Proponent, I have no shares, interests, or involvement in the license, financial or other affairs or business or operational decisions of either the Proponent or the decision-making structures of Government.

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Dr Sindila MWIYA
Environmental Assessment Practitioners (EAPs)\Team Leader
Permitting / De-Risking Advisors / Environmental Consultants
RISK-BASED SOLUTIONS (RBS) CC

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NON-TECHNICAL SUMMARY

1. Overview

Bohale Investment Two CC (the Proponent) has applied for the Mining License (ML) No. 253 to undertaken dimension stone (marble) mining and ongoing exploration activities. Bohale Investment Two CC is a sister company of BC Stone Products (Namibia) (Pty) Ltd and Best Cheer Investments Namibia (Pty) Ltd. The Group of companies, current operates a few quarries and two (2) stone processing plants in Karibib and Walvis Bay and has made significant investments in the Namibian economy and in particular the Erongo Region. The ML 253 area totalling 1397.8942 Ha, is situated to the south of the Town of Karibib, Karibib District, Erongo Region of Namibia. The license is accessible thorough the C32 and D1952 roads cutting across the ML area.

This Environmental Impact Assessment (EIA) Report covers the impact assessment for proposed mining operations and ongoing exploration activities covering the following proposed project developmental stages:

(i) Preconstruction and site clearing for quarry and supporting linear infrastructure area such as storage / yard area/ supporting containerised area/ access and all related services points for water and energy supplies as may be required.

(ii) Construction of the proposed quarry and supporting infrastructure.

(iii) Operation, ongoing monitoring and rehabilitation, and.

(iv) Decommissioning, closure, and aftercare.

This EIA excludes all the activities associated with the processing of the mined marble once it arrives at the processing plant in Karibib or Walvis Bay as well as the export of the finished product through the Port of Walvis Bay. All the mitigation measures for proposed project activities with significant impacts on the receiving environment as detailed in this EIA Report are presented in the Environmental Management Plan (EMP) Report.

2. Summary of the Proposed Project

The following is the summary of the key components of the proposed project:

- **Commodity Group**: Dimension stone with special focus marble and other economic rock rocks.
- **Size of Deposit**: More than 100 million cubic meters and will continuous ongoing exploration activities, this amount will increase by fourfold.
- **Estimated mine life**: 25 years and beyond.
- **Socioeconomic benefits** / **Project Motivation**: The Group has invested around N$ 600 million in the Namibian economy and in particular the Erongo Region. The proposed project will have employment opportunities, value addition, in-situ potential underground minerals resources and high beneficiation opportunities in Karibib / Walvis Bay and additional socioeconomic benefits in terms of capital investments, license rental fees, royalties payable to Government, export earnings, foreign direct investments, and various taxes payable to the Government.
- **Mining Technique:** Quarry, with a diamond wire saws and stone cutting machines used for cutting out the 5 m^3 and 7 m^3 rectangular blocks.

- **Processing**: Further processing of the mined-out marble blocks will take place either in Karibib or Walvis Bay. At the processing plant, a giant saw is used to cut up the marble into more manageable pieces.

- **Sources of water supply:** Groundwater from a local borehole to be drilled.

- **Sources of electricity supply**: Diesel generator and solar.

- **Mining and operational equipment**: Multiple excavators, wheel-loaders, forklift loaders, diesel generator sets, four-cylinder mining machines, wire saw machines, semi-automatic drilling machines, containers, trucks, 4 by 4 cars and air-compressors, and.

- **Waste Rock**: Waste rock will be used for mine rehabilitation. The effective capacity of the waste rock facility will vary but is likely to be in range of 120 × 90 m^3, calculated with 0.85 as capacity utilisation coefficient of waste rock.

3. Receiving Environment and Alternatives Project Development

The population of Karibib Constituency is 13, 320 and the socioeconomic activities in and around the nearest town of Karibib is dependent on mining (the Navachab Gold Mine and various quarries), farming (small stock and cattle), tourism and trading. It is estimated that at least 75 species of reptile, 7 amphibian, 87 mammal, 217 birds, 74-101 larger trees and shrubs and up to 80 grass species occur in the general/immediate ML No. 253 area of which a high proportion are endemics species. Project alternatives have been considered in this EIA Report covering location of the marble deposits/ proposed quarry, mining methods to be used, transport options, processing options, water resources, energy sources, the no-action alternative, other current and future alternative land uses, potential land use conflicts, and ecosystem function, services, use values, and non-use or passive use.

4. Methodology and Impact Assessment

The proposed mining activities in the ML 253 cannot be undertaken without an Environmental Clearance Certificate (ECC) because they are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007). To obtain the ECC the Proponent is required to have undertaken an Environmental Assessment (EA) comprising Environmental Scoping, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). The environmental assessment process adopted for this project covered the screening, preparation of background information reports (Scoping / BID Report), public consultation, implementation of the specialist assessments and preparation of drafts and Final EIA and EMP Reports. The assessment covered the proposed marble quarry and supporting infrastructures (roads and water supply services) for the proposed mine preconstruction, construction, mine operation, ongoing monitoring and rehabilitation and decommissioning, closure, and aftercare in the ML 253. The impact assessment methodology for this project adopted a two-dimensional matrix approach in predicting the potential impacts of the proposed Project on the receiving environment covering the following cross-referencing axis:

- The activities linked to the project that are supposed to have an impact on man and the environment, and.

- The existing environmental and socioeconomic conditions that could possibly be affected by the project.

The impact assessment considerations included land disturbance/land use impacts. potential impacts to specially designated areas. impacts to soil, water, and air resources. impacts to vegetation, wildlife, wildlife habitat, and sensitive species. visual, cultural, paleontological, climate change, socioeconomic and potential impacts from hazardous materials. The summary of key potential environmental concerns expected during site preparation and the construction of mine infrastructures including test mining operations are outlined in Table 1, while those associated with the proposed mine operation, ongoing monitoring and rehabilitation, closure and aftercare stages are outlined in Table 2.

Table 1: Summary of key potential environmental concerns during site preparation and the construction of mine infrastructures including test mining operations.

Potential Sources of Concern	Nature of Potential Concern	Assessment	Significance
Climate Change and Air Quality			
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of particulate matter, carbon monoxide, oxides of nitrogen, sulphur dioxide, and volatile organic compound	Negative Impacts	Localised Low Impacts
2. Fuel and chemical transportation, handling, and storage	❖ Potential releases of volatile organic compounds and other harmful substances		
3. Site preparation and construction activities	❖ Potential releases of particulate matter		
Surface (Local Ephemeral River) and Ground Water Vulnerability			
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of substances such as suspended solids, trace metals, oil, degreasers, and detergents and other harmful substances that could affect water quality and aquatic ecosystems	Negative Impacts	Localised Low Impacts
2. Fuel and chemical transportation, handling, and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect surface waters or groundwater as well as aquatic ecosystems		
3. Site preparation and construction activities	❖ Potential release of sediments, increasing concentrations of total suspended solids in receiving waters		
4. Sewage and wastewater disposal	❖ Potential releases of nutrients and other contaminants		
5. Construction of site access roads, water supply infrastructure and powerlines	❖ Potential release of sediments along the routes, increasing total suspended solids in receiving waters ❖ Potential for acidic drainage if sulphide-bearing minerals are exposed during construction. ❖ Stream crossings for access roads may affect aquatic ecosystems ❖ Increased road access in remote areas may lead to increased illegal hunting, poaching and collection of exotic fauna and flora species		
Soil Quality and Terrestrial Ecosystems			
1. Fuel and chemical transportation, handling, and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect soils, vegetation, and wildlife	Negative Impacts	Localised Low Impacts
2. Operation of vehicles	❖ Vehicle operations may result in collisions with wildlife ❖ Increased noise could disrupt wildlife		
3. Site preparation and construction activities associated with the proposed mining and exploration activities	❖ Clearing of vegetation around mining and exploration sites may have impacts on biodiversity, particularly if any rare, threatened or keystone species are present ❖ Activities may disrupt and dislocate local wildlife and any migratory wildlife in the area ❖ Some animals may be drawn to the site because of improper waste disposal or kitchen odours, which could lead to potential hazards for both workers and the animals		
4. Construction / upgrading of the main access,	❖ Construction activities may disrupt and dislocate wildlife and any migratory wildlife in the area ❖ Increased road access in remote areas may lead to increased hunting, stressing wildlife populations ❖ Vehicle operations may result in collisions with wildlife		
Noise and Visual Impact			
1. Noise from construction activities, including vehicle operations, drilling, and blasting	❖ Noise may affect local wildlife populations, and well as people living in communities near the exploration / mining activity	Negative Impacts	Localised Low Impacts
2. Preconstruction and construction quarry site selection	❖ The developer must make sure that the quarry face must be opened from the north and must not be visible to a road user along the C32 and D1952 Roads.	Negative Impacts	Localised Low Impacts

Table 2: Summary of key potential environmental concerns during mine operation, ongoing monitoring and rehabilitation, decommissioning, closure, and aftercare stages.

Potential Sources of Concern	Nature of Potential Concern	Assessment	Significance
All others Impacts			
Visual Impact	Scars on the mountain faces / topographic high areas likely to be visible along the D1992 Road cutting across the ML area if the quarry site is not selected carefully. **NOTE: The developer must make sure that the quarry faces MUST be opened from an area that is fully shielded and not visible to a road user along the C32 and D1952 Roads.**	Negative Impacts	Localised Low to Medium Impacts
Strain on Public Gravel Roads	The use of heavy trucks to move mine dimensions blocks from the mine to the processing plan in either Karibib or Walvis Bay may cause long-term damage to the local gravel roads and may be a source of tension with the local communities and other frequent road users such as tour operators.		
Land disturbance	Footprints of the mining and minerals processing facilities, exploration, and mine supporting infrastructures		
New waste management area	Can require large area. involves movement of materials, runoff and leachate management during the rainy season, dusting, and aesthetic considerations		
Reclamation	Both mine and waste rock area can represent major concerns due to the extent of the waste rock and pit areas and other mine supporting infrastructure footprints		
Slope Instability / Rock falls	Mining pits, waste management area and other excavations slope stability and potential failures are major challenges		
Noise and dust	Pits operations, haulage roads, waste rock / stock-piles and equipment, and vehicles movement around the mine site and between pit areas and waste rock dumps can be a source of dust and noise		
Blasting effects	Noise and vibration can be a concern requiring careful management		
Mine water	Mine water volume influenced by precipitation, surface, and groundwater ingress. Elevated metals levels from the operations are a concern. Mine water may contain high metals contents associated with mobilised metals from the local rocks.		

5. Summary of EIA Conclusions and Recommendations

The assessment has been undertaken in accordance with the requirements of the national applicable regulations. All key assessments with respect to the proposed development have been undertaken with the findings and recommendations incorporated and presented in this EIA report.

The proposed marble mine / quarry and supporting infrastructure in the ML 253 poses localised negative impacts to the receiving environment with great offset /trade-offs/ benefits in form of socioeconomic

benefits and investments. The extent of the proposed mining license is limited in area extent with respect to the marble ore body, the pit and supporting infrastructures areas. Focusing on developing and utilising the already disturbed areas from previous exploration and mining operations will greatly be beneficial to the future rehabilitation of the proposed mining and ongoing exploration operation. Due to the localised extent of the likely negative impacts, compared to the likely positive impacts, it is hereby recommended that a detailed EMP Report be prepared to address all the identified impacts.

It is hereby recommended that the proposed marble mine / quarry and supporting infrastructures in the ML 253 shall go ahead and shall be issued with an Environmental Clearance Certificate (ECC). The following is the summary of the key conditions that shall be implemented by the Proponent for the proposed project activities:

(i) The Proponent shall notify the local community through the Karibib Town Council / local Councillor/s on the implementation of the proposed project once the ECC has been granted. Such communications shall be maintained throughout the lifecycle of the proposed project.

(ii) The Proponent shall prepare a detailed EMP Report to address all the identified medium and high rated impacts.

(iii) The Proponent shall negotiate land access agreement with the owner/s / land rights holders covering the ML 253 area.

(iv) The Proponent must implement and adhere to all the provisions of the EMP report, and.

(v) Environmental monitoring shall be implemented as provided for the in EMP and Environmental Clearance Certificate (ECC).

1. PROJECT BACKGROUND

1.1 Introduction

Bohale Investment Two CC (**the Proponent**) is a Namibian registered company focused on the development of dimension stone projects in Namibia. The Proponent has applied for the Mining License (ML) No. 253 to undertaken dimension stone (marble) mining and ongoing exploration activities. Following the completion of the exploration programme, the company has delineated economic marble resources within the ML 253 area and intend to implement the development of a mining project supported by ongoing exploration activities.

The proposed mining and ongoing exploration activities will be implemented as soon as all the required regulatory permits such as the Mining License (ML) and the Environmental Clearance Certificate (ECC) have been granted by the Government. Following the completion of the feasibility exploration programme, the Proponent applied for a twenty (25) years Mining License (ML) from the Competent Authority, the Ministry of Mines and Energy (MME) in order mine / quarry /extract marble in the ML 253. The total delineated marble resources currently stand more than 100 million cubic meters and with the planned ongoing exploration activities to support the mining phase, this amount will increase.

1.2 National Legislation and Good International Industry Practice (GIIP)

1.2.1 National Regulatory Requirements

The national legislation governing minerals prospecting and mining activities in Namibia fall within the jurisdiction of the Competent Authority (Ministry of Mines and Energy (MME)) responsible for granting authorisations in form of Mining Claims (MCs), Reconnaissance Licenses, Exclusive Exploration Licences (EPLs) and Mining Licenses (MLs). The Minerals (Prospecting and Mining) Act (No. 33 of 1992) is the most important legal instrument governing minerals prospecting and mining activities in Namibia.

The proposed mining, minerals processing and ongoing exploration activities in the ML 253 are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulation, 2012 as among the activities with the potential to cause significance negative impact on the receiving physical, biological and socioeconomic environments. All listed activities cannot be undertaken without an Environmental Clearance Certificate (ECC). To obtain an ECC, the Proponent is required to have undertaken Environmental Assessment (EA) comprising Environmental Scoping, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed listed activities. The Environmental Assessment process shall be undertaken in accordance with the provisions of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007).

In fulfilment of the environmental requirements, the Proponent appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the EIA and EMP Reports as provided for in the national legislation to support the application for Environmental Clearance Certificate (ECC) for the listed activities.

1.2.2 Good International Industry Practice (GIIP)

In addition to the compliance to the provisions of the national mining and environmental legislations for in Namibia, the Proponent is committed to meeting Good International Industry Practice (GIIP) that defines leading industry best practices as provided for in the Equator Principles (www.equator-principles.com). According to the Equator Principles document effective July 2020 (www.equator-principles.com) the Equator Principles ("**EPs**") are a risk management framework, voluntarily adopted by Equator Principles Financial Institution (EPFI) for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making. The Equator Principles are intended to serve as a common baseline and framework for EPFI to identify, assess and manage environmental and social risks when financing Projects. The EPs have greatly increased the attention and focus on social/community standards

and responsibility, including robust standards for indigenous peoples, labour standards and consultation with locally affected communities (www.equator-principles.com).

In accordance with the Equator Principle 1: Review and Categorisation and Finance Corporation's (IFC) environmental and social categorisation process, the proposed project has the magnitude of potential environmental and social risks and impacts, including those related to biodiversity and hence falls in the categories A and B defined as follows:

- Category A – Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible, or unprecedented, and.

- Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures.

Based on the screening outcomes undertaken for this environmental assessment process, the proposed project can be classified as a Category B Project. This classification will however be reviewed based on the outcomes of the current process of preparing the environmental reports in support of the application for the ECC. There can be a range in the scale of potential environmental and social risks and impacts within Projects classified as Category B. In general terms, higher risk Category B Projects will be treated similarly to Category A Projects, and lower risk Category B Projects could be treated in a lighter regime. The EPFI that may finance the proposed project shall, at their own discretion, determine the appropriate level of Assessment Documentation, review, and/or monitoring required to address these risks and impacts in accordance with the EPs 1-10. The required Assessment Documentation shall be adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants, or external experts.

In accordance with Equator Principle 2: Environmental and Social Assessment, a Category A and, as appropriate, Category B Projects, the Assessment Documentation shall include an Environmental and Social Impact Assessment (ESIA) and Environmental Social Management Plan (ESMP). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process. In making a clear distinction with respect to the use of terminologies in this environmental assessment process, the term EIA is used to define the national (Namibian) EIA process, and the terms ESIA and ESMP are used when referring to the adoption of internationally compliant environmental and social assessments in line with the GIIP. This EIA Report has been prepared by Risk-Based Solution (RBS) CC to be followed by the EMP Report and both reports have been prepared in compliant with both the national legislation and the GIIP based on EPs 1-10.

1.3 Location, Infrastructure and Land Use

1.3.1 Location of the ML No. 253

The proposed 1397.8942 Ha ML No. 253 area is in central Namibia, approximately 180 km east of the Atlantic Ocean (Fig. 1.1). The proposed ML is located within the Karibib Constituency (or Karibib Magisterial District) in the Erongo Region of Namibia. Locally, the 1397.8942 Ha ML area falls within the privately owned commercial farms Habis 71/1, Habis 71 Rem, Abbabis 70 and Navachab (Figs. 1.3 and 1.4). The coordinates of the proposed ML area are shown in Table 1.1.

Karibib Constituency's district capital, and principal town, is the town of Karibib, which is and located to the north of the ML area, approximately 15 km from the centre of the ML (Fig. 1.2). Swakopmund, the regional centre of the Erongo Region and Walvis Bay the main Port, are situated about 180 km and 224 km to the west of the ML area via the B2 Road from the centre of the ML area. Namibia's capital city, Windhoek, is located approximately 200 km southeast of proposed ML Area via the B2 and B1 Roads from the centre of the ML area (Figs. 1.1).

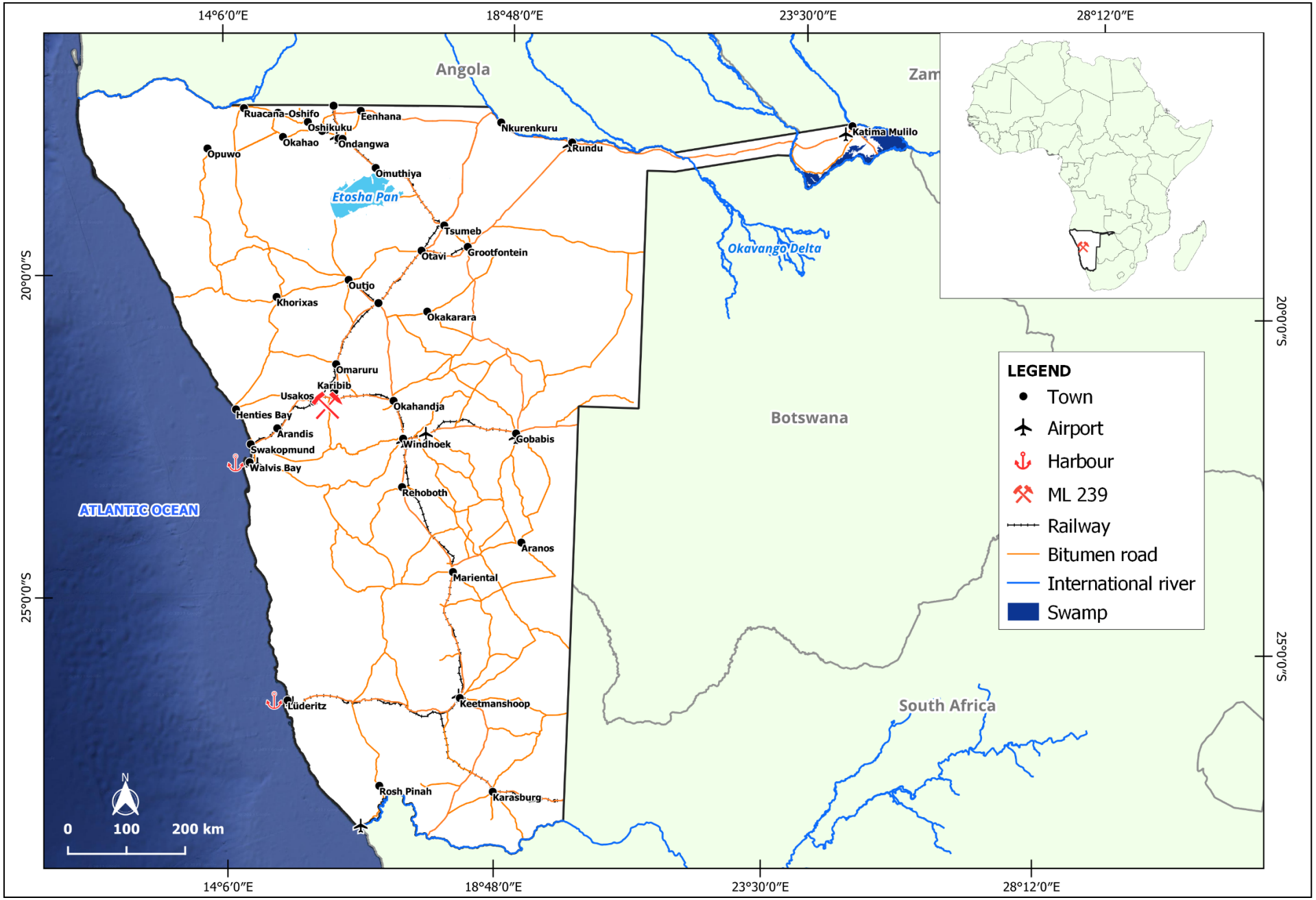


Figure 1.1: Regional location of the ML No. 253.

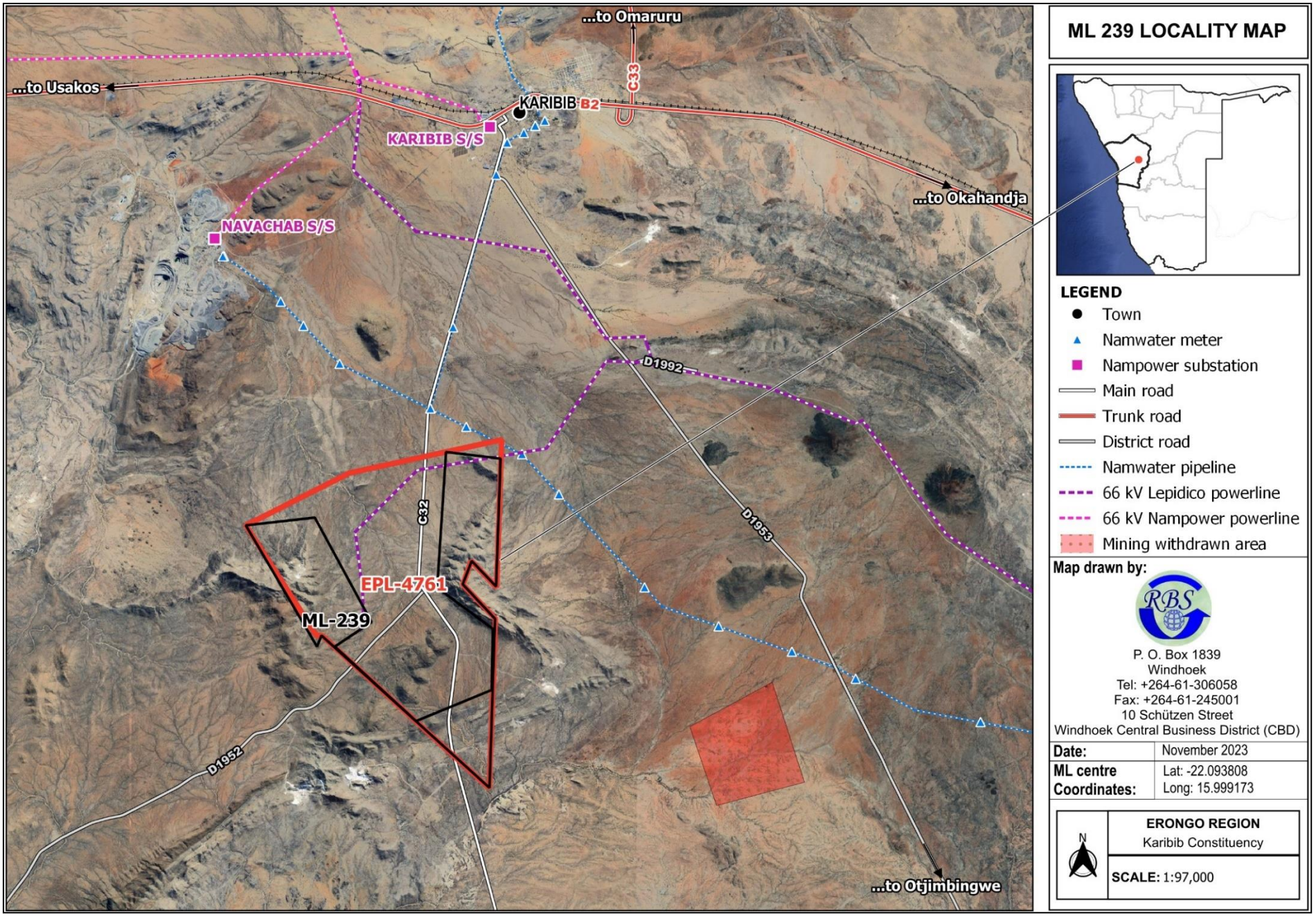


Figure 1.2: Detailed overview location the ML No. 253.

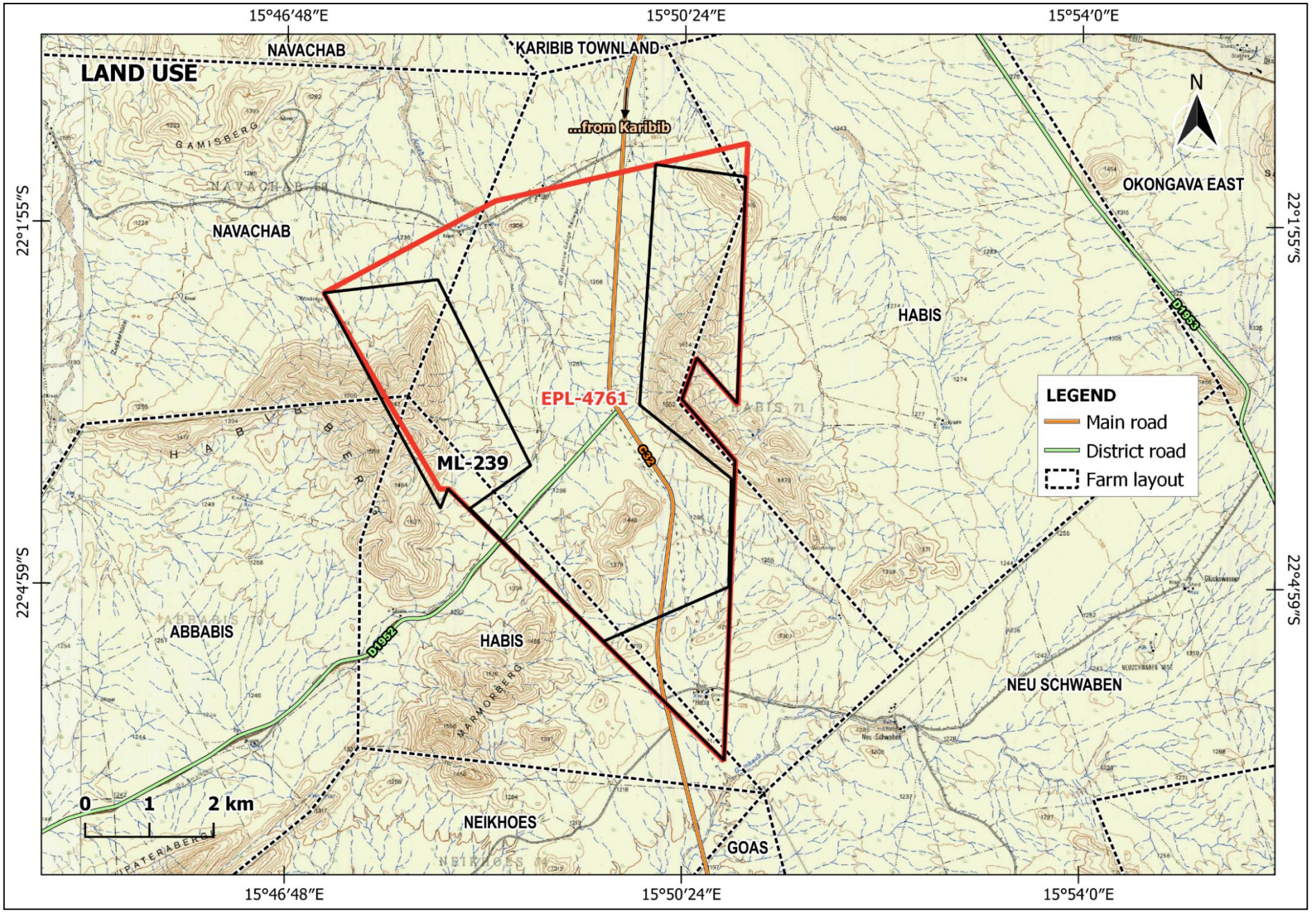


Figure 1.3: Geneal land use, commercial farmland covered by the ML No. 253 and existing access.

Table 1.1: Coordinates of the proposed 1397.8942 Ha ML No. 253 area as provided by Bohale Investment Two CC.

	Latitude				Longitude			
1	22°	01'	31"	S	15°	50'	57"	E
2	22°	03'	26"	S	15°	50'	53"	E
3	22°	03'	03"	S	15°	50'	31"	E
4	22°	03'	24"	S	15°	50'	23"	E
5	22°	03'	55"	S	15°	50'	52"	E
6	22°	06'	27"	S	15°	50'	47"	E
7	22°	04'	10"	S	15°	48'	16"	E
8	22°	04'	10"	S	15°	48'	12"	E
9	22°	02'	31"	S	15°	47'	08"	E
10	22°	02'	24"	S	15°	48'	10"	E
11	22°	03'	58"	S	15°	49'	01"	E
12	22°	04'	20"	S	15°	48'	28"	E
13	22°	05'	27"	S	15°	49'	41"	E
14	22°	04'	59"	S	15°	50'	49"	E
15	22°	04'	04"	S	15°	50'	50"	E
16	22°	03'	27"	S	15°	50'	00"	E
17	22°	01'	25"	S	15°	50'	08"	E

1.3.2 Supporting Infrastructure and Services

The project area is accessed via the well maintained C32 gravel road heading south out of Karibib and the local D1952 gravel road both cutting across the ML area (Figs. 1.2 and 1.3).

The ML 253 area is serviced by several internal local tracks and farm roads coming the D1952 and some of the minor roads require high clearance 4 x 4 vehicles that may need to be upgraded as maybe required. The following supporting infrastructures and services will be required:

(i) External and internal roads network: The Proponent will upgrade the already existing external and internal road networks and created additional new access road linking the quarries (mine) sites to the main access.

(ii) Water supply: Raw water will be sourced from local groundwater resources. The Proponent will utilise the existing boreholes and will also drill additional boreholes as any be require.

(iii) Energy: Proposed mining operations in ML 253 will use diesels and solar energy as may be required mining equipment and lighting, respectively.

(iv) Onsite administrations and offices (supporting infrastructure): The Proponent will utilise containerised systems.

(v) Staff transport arrangements from Karibib to the mine sites will be provided by the Proponent, and.

(vi) Karibib based staff accommodation services: Will use the already existing properties in the town of Karibib.

1.3.3 Project Desirability

The ML No. 253 is situated in a highly prospective area for dimension stone especially marble associated with the Darama Rocks. Bohale Investment Two CC is a sister company of BC Stone Products (Namibia) (Pty) Ltd and Best Cheer Investments Namibia (Pty) Ltd group of companies.

This Group of companies, current operates several quarries and two (2) stone processing plants in Karibib and Walvis Bay. The proposed project development will have great positive benefits at local (Karibib and Walvis Bay Areas), regional (Erongo Region) and national (Namibia) levels and these benefits include the following:

(i) Provide direct and many more indirect contracts and employment opportunities, to local Namibians especially in the Erongo Region where the quarries and the stones processing plants are all located. Around 386 people are directly employed by the Group.

(ii) Other direct and indirect socioeconomic benefits in terms of increased in local communities purchasing power and support to local businesses and services providers including the local authorities of Karibib and Walvis Bay.

(iii) Additional socioeconomic benefits will also be realised at regional and national levels in terms of capital investments, license rental fees, royalty taxes payable to Government, export earnings, foreign direct investments, and various taxes payable to the Government. The Group has invested around N$ 600 million in the Namibian economy and in particular the Erongo Region.

(iv) Support to the increase in local minerals resources value addition and beneficiation opportunities through the operations of the Karibib and Walvis Bay stone processing plants.

(v) Support to the local skills transfer and training of local Namibians in dimension stones mining and processing techniques and technological know-how.

(vi) Socioeconomic benefits including upgrading and maintenance of the local road and water infrastructures in the local areas for greater benefits of the local community, and.

(vii) Through ongoing exploration and the potential discovery of additional economic minerals resources and the expansion of the proposed mining and minerals processing operations will have much greater local (Karibib Area), regional (Erongo Region) and national (Namibia) socioeconomic benefits.

1.4 Methodology and Terms of Reference

1.4.1 Overview

Risk-Based Solutions (RBS) was appointed by the Proponent to prepare the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports to support the applications for Environmental Clearance Certificates (ECC) for the proposed mining operations within the ML 253.

The impact assessment process has been undertaken in accordance with the Terms of Reference (ToR) (Annex 1) and the requirements of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007).

The proposed project activities have all been assessed against the receiving environment covering the physical, biological, socioeconomic and ecosystem services (function, use values and non-use) (Table 1.1 and Annex 1).

1.4.2 Objectives of the EIA and EMP Phases

The aims and objectives of the Environmental Assessment (EA) covering Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to be prepared are:

(i) To assess all the likely positive and negative short- and long-term impacts on the receiving environment (physical, biological, and socioeconomic environments) at local (ML Area), regional (Erongo Region), national (Namibia) and Global levels using appropriate assessment guidelines, methods and techniques covering the complete project lifecycle.

(ii) The development of appropriate mitigation measures that will enhance the positive impacts and reduce the likely negative influences of the negative impacts identified or anticipated. Such mitigation measures shall be contained in a detailed EMP report covering the entire project lifecycle, and.

(iii) The EIA and EMP will be performed with reasonable skill, care and diligence in accordance with professional standards and practices existing at the date of performance of the assessment and that the guidelines, methods and techniques that have been applied are all in conformity to the national regulatory and GIIP requirements, process and specifications in Namibia as required by Ministry of Mines and Energy (MME), Ministry of Environment, Forestry and Tourism (MEFT). The EIA and EMP deliverables shall be prepared in line with the January 2015 MEFT Environmental Assessment Reporting Guidelines.

1.4.3 Assumptions and Limitations

The following assumptions and limitations underpin the approach adopted, overall outcomes and recommendations for this study:

(i) The proposed mining and ongoing exploration / prospecting activities activities as well as all the plans, maps, ML Boundary / coordinates and appropriate data sets received from the Proponent, project partners, regulators, Competent Authorities, and specialist assessments are assumed to be current and valid at the time of conducting the studies and compilation of this environmental report.

(ii) The impact assessment outcomes, mitigation measures and recommendations provided in this report are valid for the entire duration of the proposed mining and ongoing exploration / prospecting activities.

(iii) A precautionary approach has been adopted in instances where baseline information was insufficient or unavailable or site-specific locations of the proposed project activities is not yet available, and.

(iv) Mandatory timeframes as provided for in the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) have been observed and will apply to the review and decision of this report by the Competent Authority and the Environmental Commissioner.

1.4.4 Environmental Assessment Process and Steps

The processes and steps that have been followed in the preparation of this EIA Report took into considerations the provisions of the Environmental Impact Assessment Regulations, 2012, the Environmental Management Act, 2007, (Act No. 7 of 2007) and the GIIP (Figs. 1.5 and 1.6).

The complete lifecycle of the proposed mining and ongoing exploration activities in the ML 253 and inclusive of the supporting infrastructure such as access, energy and water supplies have all been assessed in this EIA Report. The key developmental stages that have been included are:

- Preconstruction,
- construction,
- operation with ongoing monitoring, and.
- Rehabilitation and decommissioning, closure, and aftercare.

The assessment processes and steps undertaken are summarised as follows (Fig. 1.4):

(i) Screened the project against the applicable legislation and regulations undertaken in September 2023.

(ii) Prepared the Draft BID / Scoping Report (Annex 1) for public and stakeholder consultations process and for registration of the proposed project on the MEFT digital platform undertaken in September 2023.

(iii) Prepared the public consultation materials including public notice for publication in the local newspapers undertaken in September 2023.

(iv) Opened a stakeholder register and published the public notice in the local newspapers Invited the public and stakeholders to participate in environmental assessment process undertaken in September 2023.

(v) Conducted public and stakeholder consultation process undertaken from Friday 27th October 2023 to Friday, 17th November 2023.

(vi) Prepared Draft EIA and EMP Reports for further stakeholder consultations / inputs undertaken in November 2023, and.

(vii) Based on the stakeholder inputs, finalised the EIA and EMP reports for submission to the Environmental Commissioner through the Mining Commissioner in the MME (Competent Authority) in support of the application for Environmental Clearance Certificate (ECC) for the proposed project undertaken in November 2023.

The complete lifecycle of the proposed mine development, inclusive of the supporting infrastructure such as onsite infrastructure, roads, energy, water and supply services have all been assessed in the environmental assessment process.

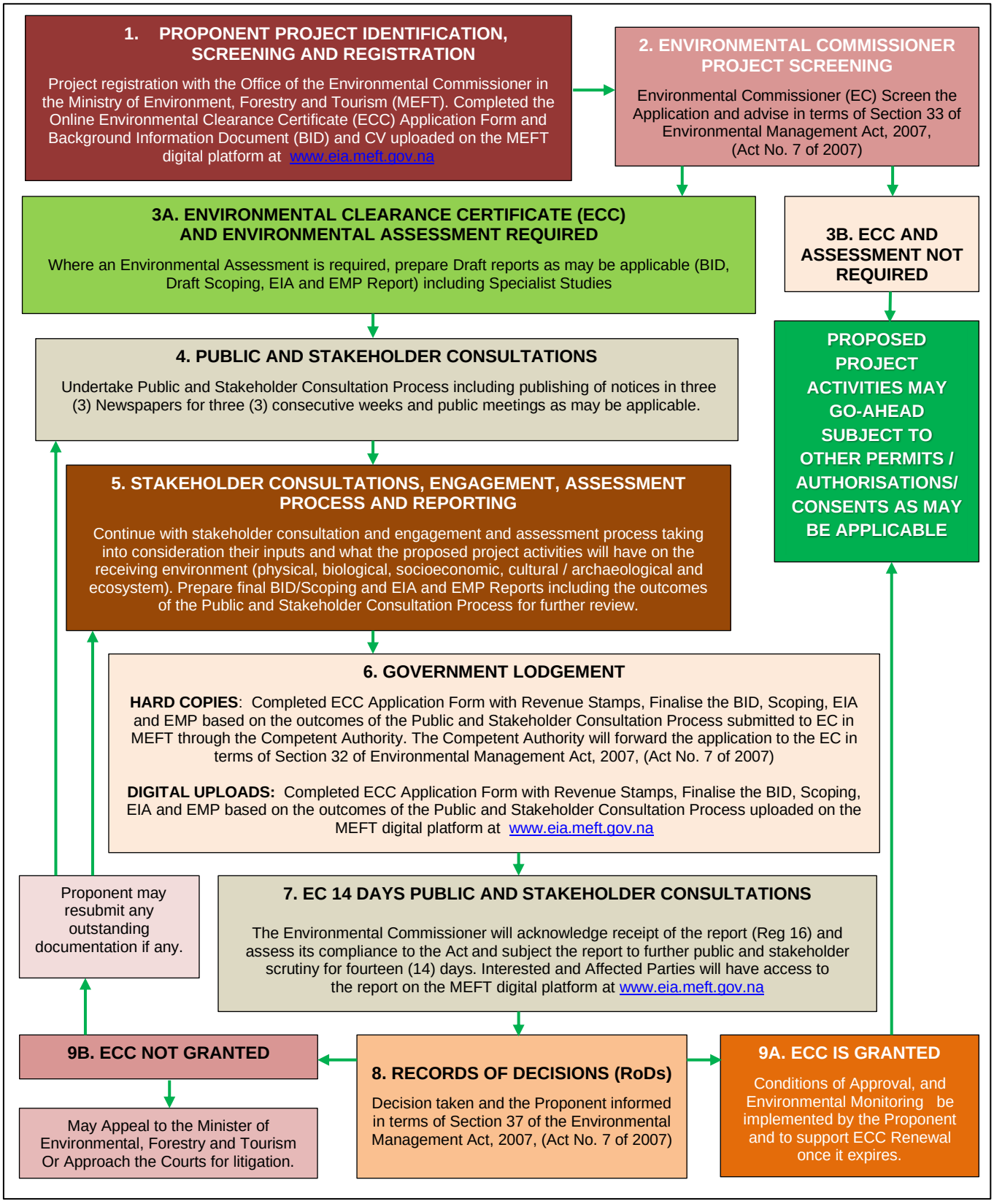


Figure 1.4: Schematic presentation of Namibia's Environmental Assessment Procedure in line with the provisions of the EIA Regulations No. 30 of 2012 and the EMA, 2007, (Act No. 7 of 2007).

1.4.5 Equator Principles (EPs) Considerations

In addition to the conformity with the national requirements, the preparation of this EIA has also incorporated the high level environmental and social aspects of EPs for implementation by the Proponent in the operation of the all the activities of the ML 253 throughout the project lifecycle and in complementing the national legislative framework (Figs. 1.5 and 1.6).

The following is the summary of the EPs 1-10 that have been taken into consideration the environmental assessment process:

- Principle 1: Review and categorisation.
- Principle 2: Environmental and Social Assessment.
- Principle 3: Applicable environmental and social standards.
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan.
- Principle 5: Stakeholder engagement.
- Principle 6: Grievance mechanism.
- Principle 7: Independent review.
- Principle 8: Covenants.
- Principle 9: Independent monitoring and reporting, and.
- Principle 10: Reporting and transparency.

The EPs 1 -10 are based on International Finance Corporation (IFC) performance standards on social and environmental sustainability and the World Bank Group's Environmental, health and safety general guidelines applied globally and across industry sectors by Equator Principle Financial Institution (EPFI) Banks.

The Equator Principles (EPs) are a sustainability risk management framework for projects financed by the financial institutions that have adopted the Equator Principles (EPFIs). The EP apply to certain financial products above specified value thresholds. EP4 decreases the threshold for in-scope Project-Related Corporate Loans from a total aggregate loan amount of US$100 million to US$50 million. Thus, both the total aggregate loan amount and the EPFI's commitment needs to be at least US$50 million.

There has also been an addition to the scope of applicability of the EPs in the form of project-related refinancing and project-related acquisition financing provided the following criteria are met (www.equator-principles.com):

- The underlying project was financed in accordance with the EPs framework.
- There has been no material change in the scale or scope of the project.
- The project has not yet occurred at the time of the signing of the facility or loan agreement.

The EP require the proposed mining and ongoing exploration activities in the ML 253 to address the following issues in meeting international finance corporation financing standards:

1. Assessment of the baseline environmental and social conditions.
2. Consideration of feasible environmentally and socially preferable alternatives.
3. Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris climate change agreement.

4. Protection and conservation of biodiversity (including endangered species and Sensitive ecosystems in modified, natural, and critical habitats) and identification of Legally protected areas.

5. Sustainable management and use of renewable natural resources (including Sustainable resource management through appropriate independent certification Systems).

6. Use and management of dangerous substances.

7. Major hazards assessment and management.

8. Efficient production: total energy consumed per output scaling factor, delivery and use of energy.

9. Pollution prevention and waste minimisation, pollution controls (liquid effluents and Air emissions), and waste management.

10. Greenhouse gas emissions level and emissions intensity.

11. Water usage, water intensity, water source.

12. Land cover, land use practices.

13. Consideration of physical climate risks and adaptation opportunities, and of viability of project operations under changing weather patterns/climatic conditions.

14. Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects.

15. Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if Present) were considered in their analysis.

16. Labour issues (including the four core labour standards), and occupational health and safety.

17. Consultation and participation of affected parties in the design, review, and implementation of the Project.

18. Socio-economic impacts.

19. Impacts on affected communities and disadvantaged or vulnerable groups.

20. Gender and disproportionate gender impacts.

21. Land acquisition and involuntary resettlement.

22. Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use.

23. Protection of cultural property and heritage.

24. Protection of community health, safety, and security (including risks, impacts and management of Project's use of security personnel), and.

25. Fire prevention and life safety.

The above potential EPs environmental and social issues have been linked to the national requirements and addressed as may be applicable to the proposed project in this EIA Report with mitigation measures provided in the EMP Report.

The Constitution of the Republic of Namibia, the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 as well as other associated laws with respect to exploration, mining water, land, energy, labour and health and safety all provides for the mechanism of assessing key issues associated with development projects in Namibia such as the proposed mining operations and ongoing exploration activities in the ML 253.

The only key missing components to the regulatory frameworks in Namibia are benchmarks, limits, standards, and guidelines with respect to gaseous, liquid, and solid emissions. In the absence of national gaseous, liquid, and solid emission limits for Namibia, this EIA Report has adopted the Multilateral Investment Guarantee Agency (MIGA) gaseous effluent emission level and liquid effluent emission levels. Noise abatement measures also adopted the MIGA guidelines.

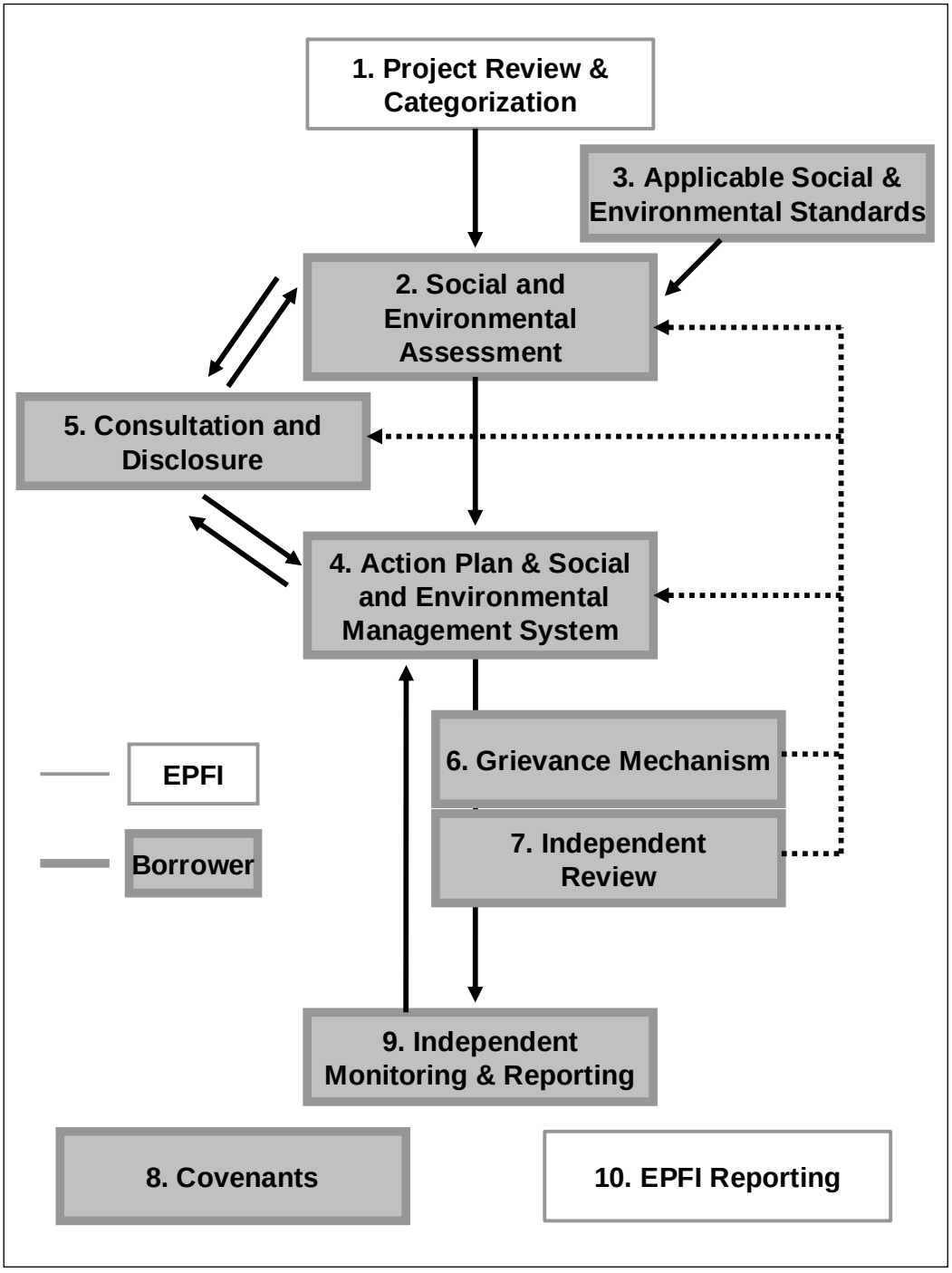


Figure 1.5: Schematic presentation of the Equator Principles.

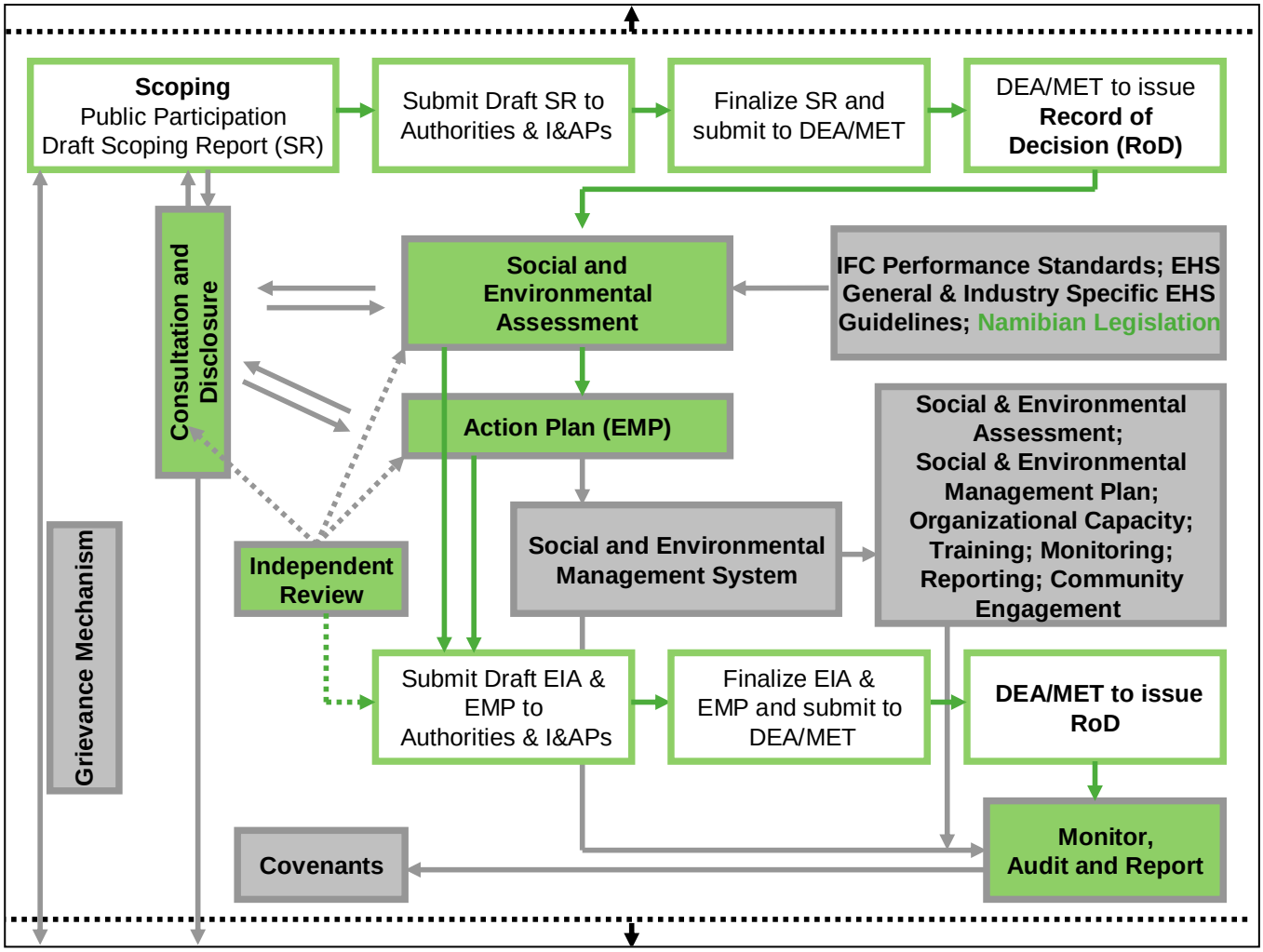


Figure 1.6: Schematic presentation of Namibia's Environmental Assessment Procedure, incorporating the Equator Principles and International Finance Corporation Performance Standards assessment procedures.

1.4.6 Impact Assessment Process

1.4.6.1 Overview

The overall impact assessment approach shall be undertaken in accordance with the provisions of the national EIA Regulations and EPs guidelines and will adopt the Leopold matrix framework which is one of the internationally best-known matrix assessment methodology available for predicting the impact of a project on the receiving environment.

The assessment process will take into considerations the proposed activities, trade-offs, alternatives, and issues to be considered as outlined in Table 1.2.

1.4.6.2 Evaluation of Project Activities Impacts

The impact assessment and evaluation process has been based on considering the proposed miming operations and ongoing exploration activities in the ML 253 as the source of impact. The receiving environment has been considered as the receptor / target that may be impacted positively or negatively by the activities of the proposed miming operations and ongoing exploration activities in the ML 253.

The components of the receiving environment encompassed the following:

- Physical Conditions / Natural Environment – Air, noise, water, green space, climate change,

built environment – houses, roads, transport systems, buildings, infrastructure, etc.

- ❖ Biological Conditions: fauna, flora, habitats, and ecosystem - services, function, use values and non-use etc., and.

- ❖ Socioeconomic Conditions: Social, economic, labour, gender, human rights, natural and social capital, archaeological, cultural resources, and cultural issues

In evaluating the degree of potential negative impacts, the following factors have been taken into consideration:

(i) Impact Severity: The severity of an impact is a function of a range of considerations, and.

(ii) Likelihood of Occurrence (Probability): How likely is the impact to occur?

In evaluating the severity of potential negative environmental impacts, the following factors have been taken into consideration:

- ❖ Receptor/ Resource Characteristics: The nature, importance, and sensitivity to change of the receptors / target or resources that could be affected.

- ❖ Impact Magnitude: The magnitude of the change that is induced.

- ❖ Impact Duration: The time over which the impact is expected to last.

- ❖ Impact Extent: The geographical extent of the induced change, and.

- ❖ Regulations, Standards and Guidelines: The status of the impact in relation to regulations (e.g., discharge limits), standards (e.g., environmental quality criteria) and guidelines.

The overall impact severity with respect to the impact duration, geographical extent and probability occurrence have been categorised using a semi quantitative approach as shown in Table 1.3.

Table 1.2: Summary ToR for the proposed project activities, alternatives, trade-offs, and key issues considered in the Environmental Assessment.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	KEY ISSUES EVALUATED AND ASSESSED IN THE EIA AND MITIGATION MEASURE PRESENTED IN THE EMP
PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout 2. Engineering design of the pit areas and the support facilities 3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure 4. Access roads upgrading of existing tracks / creation of new routes as may be required 5. Implementation of the human resources, community and social programs for the operational phase of the project 6. Top soil removal and storage for the pit areas and supporting infrastructure 7. Development of the temporary construction camp 8. Installation of containerised offices, workshops, storage facilities.	1. Potential land use conflicts / opportunities for coexistence between proposed miming operations and ongoing exploration activities in the ML 253 and other current and future land uses 2. Impacts on the Physical Environment ❖ Natural Environment such as air, noise, water, dust etc. ❖ Built Environment such as existing houses, roads, transport systems, buildings, energy and water and other supporting infrastructure ❖ Socioeconomic, Archaeological and Cultural impacts on the local societies and communities 3. Impacts on the Biological Environment ❖ Flora, Fauna, Habitat and Ecosystem functions, services, use values and non-Use or passive use 4. Applicable EPs key issues ❖ Assessment of the baseline environmental and social conditions ❖ Consideration of feasible environmentally and socially preferable alternatives ❖ Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris climate change agreement ❖ Protection and conservation of biodiversity (including endangered species and Sensitive ecosystems in modified, natural and critical habitats) and identification of Legally protected areas ❖ Sustainable management and use of renewable natural resources (including Sustainable resource management through appropriate independent certification Systems) ❖ Use and management of dangerous substances ❖ Major hazards assessment and management ❖ Efficient production: total energy consumed per output scaling factor, delivery and Use of energy ❖ Pollution prevention and waste minimisation, pollution controls (liquid effluents and Air emissions), and waste management ❖ Greenhouse gas emissions level and emissions intensity ❖ Water usage, water intensity, water source ❖ Land cover, land use practices ❖ Consideration of physical climate risks and adaptation opportunities, and of viability of project operations under changing weather patterns/climatic conditions ❖ Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects ❖ Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if Present) were considered in their analysis. ❖ Labour issues (including the four core labour standards), and occupational health and safety ❖ Consultation and participation of affected parties in the design, review, and implementation of the Project ❖ Socio-economic impacts ❖ Impacts on affected communities, and disadvantaged or vulnerable groups ❖ Gender and disproportionate gender impacts ❖ Land acquisition and involuntary resettlement ❖ Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use ❖ Protection of cultural property and heritage ❖ Protection of community health, safety and security (including risks, impacts and management of Project's use of security personnel), and ❖ Fire prevention and life safety.
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE: 1. Transportation facilities, including access roads to the site and on-site roads 2. Waste rock and mine blocks stockpiles 3. Water supply systems 4. Power infrastructure, including powerline and distribution systems (Generator and Solar) 5. Containerised administration blocks and warehouses 6. Fuel supply and storage 7. Workshop and equipment maintenance facilities 8. Wastewater treatment systems 9. Domestic solid waste disposal storage / transfer facility 10. Storm water management in the pit and supporting infrastructure PIT AREA: 1. Mining operations 2. Actual and stripping of the overburden to create direct access to the fresh marble 3. Ore production for test mining operations 4. Test mining and commissioning	
OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required) 2. Transportation of the mined blocks from pit to the sorting 3. Storage and transportation of marble blocks to Karibib or Walvis Bay for further processing 4. Waste rock management / reprocessing / recovery 5. Ongoing exploration support 6. Ongoing rehabilitation and maintenance 7. Waste water management 8. Municipal solid waste management / transfer to Karibib 9. Environmental performance monitoring	
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan 2. Closure of open pits 3. Closure of solid waste transfer station 4. Backfill all excavated areas 5. Closure of the mined blocks storage area 6. Decommissioning of water and electricity infrastructure 7. Overall land reclamation 8. Restoration of internal roads 9. Revegetation and aftercare as may be required	

Table 1.3: Impact assessment matrix used for assessing the overall likely impacts that the proposed project developmental stages and the associated activities on the receiving environment sensitivity (natural, built, socioeconomic, flora, fauna, habitat and ecosystem) with respect to duration, geographical extent and probability occurrence.

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout									
		2. Engineering design of the pit areas and the support facilities									
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure									
		4. Access roads upgrading of existing tracks / creation of new routes as may be required									
		5. Implementation of the human resources, community, and social programs for the operational phase of the project									
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads								
			2. Waste rock and mine blocks stockpiles								
			3. Water supply systems								
			4. Power infrastructure, including powerline and distribution systems (Generator and Solar)								
			5. Containerised administration blocks and warehouses								
			6. Fuel supply and storage								
			7. Workshop and equipment maintenance facilities								
			8. Wastewater treatment systems								
			9. Domestic solid waste disposal storage / transfer facility								
			10. Storm water management in the pit and supporting infrastructure								
		MINE WORKINGS	1. Mining operations								
			2. Actual and stripping of the overburden to create direct access to the fresh marble								
			3. Ore production for test mining operations								
			4. Test mining and commissioning								

Table 1.3: *Cont.*

SCALE		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic-Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g., HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Transportation facilities, including access roads to the site and on-site roads								
		2. Waste rock and mine blocks stockpiles								
		3. Water supply systems								
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)								
		5. Containerised administration blocks and warehouses								
		6. Fuel supply and storage								
		7. Workshop and equipment maintenance facilities								
		8. Wastewater treatment systems								
		9. Domestic solid waste disposal storage / transfer facility								
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Storm water management in the pit and supporting infrastructure								
		2. Mining operations								
		3. Actual and stripping of the overburden to create direct access to the fresh marble								
		4. Ore production for test mining operations								
		5. Test mining and commissioning								
		6. Transportation facilities, including access roads to the site and on-site roads								
		7. Transportation facilities, including access roads to the site and on-site roads								
		8. Waste rock and mine blocks stockpiles								
		9. Water supply systems								

1.4.7 Assessment of the Overall Significant Impacts

1.4.7.1 Overview

The determination of the significance of the negative impacts / key issues caused by the proposed miming operations and ongoing exploration activities in the ML 253 as key sources of such impact has been based on the environmental baseline results and the intensity of the likely negative impact. The assessment focused on the degree to which the proposed project activities are likely to results in unwanted consequences on the receptor covering the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem).

1.4.7.2 Summary of the Sources of Impacts

The main key sources of impacts that have been used in the determination of the significant impacts / key issues posed by the proposed miming operations and ongoing exploration activities in the ML 253 comprised the preconstruction, construction, operation with ongoing monitoring and rehabilitation and decommissioning, closure, and aftercare. Each of the main sources of impacts have been evaluated against the receiving environment as potential receptors with respect to potential pathways (Tables 1.2 and 1.3).

1.4.7.3 Determination of the Overall Likely Significant Impacts

To determine the overall significant impact for each individual source associated with the proposed miming operations and ongoing exploration activities in the ML 253, an impact identification and assessment process has been undertaken as part of this EIA.

The EIA impact identification and assessment processes focused on the environment interaction approach with respect to the proposed miming operations and ongoing exploration activities in the ML 253, alternatives and the likely targets or receptor / key issues (Table 1.2).

In this process, components of the project activities that are likely to impact the natural environment (physical, biological, and social) shall be broken down into individual development stages and activities as shown in Table 1.3.

The results of the overall significant impacts assessment associated with the proposed miming operations and ongoing exploration activities in the ML 253 / sources of potential impacts of significant impacts with respect to the receiving environment that could potentially be affected, resulting in key issues are presented in Chapter 5 of this EIA Report and as shown in Table 1.4.

Table 1.4: Assessment matrix used for assessing the likely significant impacts with respect to proposed project developmental stages and the associated activities on the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem).

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

				RECEPTORS / TARGETS THAT MAY BE IMPACTED							
				PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout									
		2. Engineering design of the pit areas and the support facilities									
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure									
		4. Access roads upgrading of existing tracks / creation of new routes as may be required									
		5. Implementation of the human resources, community, and social programs for the operational phase of the project									
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads								
			2. Waste rock and mine blocks stockpiles								
			3. Water supply systems								
			4. Power infrastructure, including powerline and distribution systems (Generator and Solar)								
			5. Containerised administration blocks and warehouses								
			6. Fuel supply and storage								
			7. Workshop and equipment maintenance facilities								
			8. Wastewater treatment systems								
			9. Domestic solid waste disposal storage / transfer facility								
			10. Storm water management in the pit and supporting infrastructure								
		MINE WORKINGS	1. Mining operations								
			2. Actual and stripping of the overburden to create direct access to the fresh marble								
			3. Ore production for test mining operations								
			4. Test mining and commissioning								

Table 1.4: *Cont.*

IMPACT SEVERITY	IMPACT LIKELIHOOD				
	Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

			RECEPTORS / TARGETS THAT MAY BE IMPACTED							
			PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g., HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required)								
		2. Transportation of the mined blocks from pit to the sorting								
		3. Storage and transportation of marble blocks to Karibib or Walvis Bay for further processing								
		4. Waste rock management / reprocessing / recovery								
		5. Ongoing exploration support								
		6. Ongoing rehabilitation and maintenance								
		7. Waste water management								
		8. Municipal solid waste management / transfer to Usakos or Karibib								
		9. Environmental performance monitoring								
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan								
		2. Closure of open pits								
		3. Closure of solid waste transfer station								
		4. Backfill all excavated areas								
		5. Closure of the mined blocks storage area								
		6. Decommissioning of water and electricity infrastructure								
		7. Overall land reclamation								
		8. Restoration of internal roads								
		9. Revegetation and aftercare as may be required								

1.4.8 Mitigation Measures for Significance Impacts

Based on the finding of this EIA Report, an EMP Report has been prepared detailing the mitigation measures that the Proponent shall implement in minimising and maximising the likely effects of negative and positive impacts, respectively.

The following is the summary of the guiding principles with respect to the mitigation measures as presented in the EMP Report in order of preference and in addressing the impacts assessed to have likely significant adverse effects on the receiving environment:

(i) Enhancement, e.g., provision of new habitats

(ii) Avoidance, e.g., sensitive design to avoid effects on ecological receptors.

(iii) Reduction, e.g., limitation of effects on receptors through design changes, and.

(iv) Compensation, e.g., community benefits.

1.4.9 Structure of the Report

The following is the summary structure outline of this scoping report.

- **Section 1: Project Background** covering Introductions, regulatory requirements, project motivation, site description, Terms of Reference summary, Environmental Assessment Process and Steps and Structure of report.

- **Section 2: Description of the Proposed Project** covering site description, project design and activities to be undertaken.

- **Section 3: Regulatory Framework providing** a summary of the applicable legislations and permitting requirements.

- **Section 4: Receiving Environment** covering physical environment (climate, water, air quality, and geology), Biological environment (flora, fauna and ecosystem services and functions) and socioeconomic environment.

- **Section 5: Assessment of Likely Impact** covering assessment procedure, summary of likely Impacts covered in the EIA and the method of assessment.

- **Section 6: EIA Conclusions and Recommendations** covering the key issues identified and summarised recommendations.

2. DESCRIPTION OF PROJECT

2.1 Overview

Bohale Investment Two CC (the Proponent) has applied for the Mining License (ML) No. 253 to undertake mining for dimension stone (marble) supported by ongoing exploration activities. The proposed dimension stone mining project will involve the extraction of between $5m^3$ to $7m^3$ size marble blocks, sorting, storage, transportation to a plant in Karibib or Walvis Bay for final processing. The processed stones will be sold locally and exported oversees. Bohale Investment Two CC has undertaken a detailed exploration programme and has successfully evaluated the technical and economic viability of mining dimension stones (marbles) within the ML 253. The following is a summary of the project developmental stages that will be implemented from construction of infrastructure to the closure and final rehabilitation of the mine and aftercare stages:

(i) Preconstruction of the supporting infrastructures to access the resources (Mine Preconstruction activities).

(ii) Construction of quarry (mine / pit/s) site/s area/s including the primary, screening, secondary, and cutting facilities (Quarry Construction and Development).

(iii) Construction of rock waste and generals waste disposal site (Mine Construction and Development).

(iv) Mining, loading, and transporting of the mined Blocks (Mine Operation).

(v) Ongoing exploration, rehabilitation, and environmental monitoring (Mine Operation), and.

(vi) Mine Closure, decommissioning, final rehabilitation / remediation / reclamation, post-closure, and aftercare including monitoring (Final mine closure and aftercare).

2.2 Application / Uses of Marble

2.2.1 Sculpture

Marble has been known for its use in sculptures since classical times. This preference has to do with the softness and relative isotropy and homogeneity, and a relative resistance to shattering. Also, the low index of refraction of calcite allows light to penetrate several millimeters into the stone before being scattered out, resulting in the characteristic "waxy" look which gives "life" to marble sculptures of the human body.

2.2.2 Construction Marble

Construction marble is a stone which is composed of calcite, dolomite or serpentine which can take a polish. More generally in construction, specifically the dimension stone trade, the term "marble" is used for any crystalline calcitic rock (and some non-calcitic rocks) useful as building stone. Marble is used in various applications including tabletops, kitchen tops, floor and wall titles, cladding, and tombstones.

2.2.3 Industrial use

Blocks of cut-off marble are a very pure source of calcium carbonate, which is used in a wide variety of industries. Ground calcium carbonate can be made from limestone, chalk, and marble. about three-quarters of the ground calcium carbonate worldwide is made from marble. Ground calcium carbonate is used as a coating pigment for paper because of its high brightness and as a paper filler because it strengthens the sheet and imparts high brightness. Ground calcium carbonate is also used in consumer products such as a food additive, in toothpaste, and as inert filler in pills. It is used in plastics because it imparts stiffness, impact strength, dimensional stability, and thermal conductivity. It is used in paints because it is good filler and extender, has high brightness, and is weather resistant. However, the

growth in demand for ground calcium carbonate in the last decade has mostly been for a coating pigment in paper. Calcium carbonate can also be reduced under high heat to calcium oxide (also known as "lime"), which has many applications including being a primary component of many forms of cement.

2.3 Mine Preconstruction

2.3.1 Overview

The following is the summary of the key activities to be undertaken as part of the preconstruction stage of the proposed mining and ongoing exploration activities the ML 253.

1. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure (Office blocks, storage, water, and electricity other site infrastructure).

2. Open pit geotechnical drilling and site investigations to inform the mine design and layout.

3. Engineering design of the pit areas and the support facilities including water and energy supplies, storage areas, workshops and containerised administration block.

4. Access roads upgrading of existing tracks / creation of new routes as may be required.

5. Human resources planning, development of community and social programs and development of environmental and social management programs for the operational phase of the project.

6. Top soil removal and storage.

7. Development of the temporary construction camp, and.

8. Installation of containerised offices, workshops, storage facilities.

The development and operation of a solid waste disposal site for municipal related solid waste is not allowed within the ML Area. The Proponent shall only operate a transfer faciality / station. All solid waste shall be stored in a closed container and disposed off at the Usakos / Karibib municipal waste disposal. All liquid waste such as sewage shall be managed through a French Drain System or chemical toilets / an onsite waste water treatment faciality to be approved by the Department of Water Affirms in the Ministry of Agriculture, Water and Land Reform (MAWLR). Discharge of waste water in public stream (dry Ephemeral River Channels) or in the natural environment without treatment is prohibited under the Water Act, 2536, (Act No.54 of 2536.

2.4 Mine Construction and Operations

2.4.1 Mine Design and Construction

The mining techniques to be employed for the proposed project will be an open pit mining method using conventional diesel-powered equipment and a drill and blast, load and haul operation.

1. Transportation facilities, including access roads to the site and on-site roads.

2. Waste rock and mine blocks stockpiles.

3. Water supply systems.

4. Power infrastructure, including powerline and distribution systems (Generator and Solar).

5. Containerised administration blocks and warehouses.

6. Fuel supply and storage.

7. Workshop and equipment maintenance facilities.

8. Wastewater treatment systems.

9. Domestic solid waste disposal storage / transfer facility, and.

10. Storm water management in the pit and supporting infrastructure.

2.4.2 Mine Operations (Extracting the Marble)

The mine operational phase will involve the extraction of the marble blocks from the quarry using special cutting saws. The cut-out blocks will be pulled from the quarry to the stockpiling and sorting area (Plates 2.1 and 2.2). A basic shape of a large rectangle is aimed for, so that it is easier to shape the marble into useful objects during further processing. The following is the overall summary of the activities to be undertaken during the mining stage:

1. Mining operations (actual mining operations as may be required).

2. Transportation of the mined blocks from pit to the sorting areas.

3. Storage and transportation of marble blocks to Karibib or Walvis Bay for further processing.

4. Waste rock management / reprocessing / recovery.

5. Ongoing exploration support.

6. Ongoing rehabilitation and maintenance.

7. Waste water management.

8. Municipal solid waste management / transfer to Usakos / Karibib, and.

9. Environmental performance monitoring.

The following is the indicative summary of the key equipment to be used for the proposed marble mining operations to be developed in the ML 253:

- Excavators, wheel-loaders, forklift loaders, diesel generator sets, four-cylinder mining machines, wire saw machines, semi-automatic drilling machines, containers, trucks, 4 by 4 vehicles, and air-compressors.

2.4.3 Transporting the Marble

Once the marble is removed from the quarry, the blocks will be examined for quality (Plates 2.3 and 2.4). All the marble of a particular colour will be placed together. Cracks and impurities will be eliminated from the marble (Plates 2.3 and 2.4). The marble blocks will then be transported to the processing plant in Karibib or Walvis Bay by truck.

2.4.4 Forming the Marble

Once the marble arrives at the processing plant, each block will be set up so that different pieces of marble can be cut out of the larger blocks. A giant saw will be used to cut up the marble into more manageable pieces. It can take up to a week to cut the marble enough to break into usable sections. The person running the giant saw has to be very skilled at his /her job because the different qualities of rock can change the way the saw cuts into the marble.

Plate 2.1: Marble mining involving sawing of blocks.

Plate 2.2: Mined blocks are stockpiled before sorting and transportation to the plant for final processing.

Plate 2.3: Impurities and discontinuities that must be removed from the marble blocks before transportation to the plant for final processing.

Plate 2.4: Colour sorting of marble blocks before transportation to the plant for final processing.

2.4.5 Processing the Marble

During the processing stage, the marble will be cut into more usable shapes. This may involve running through epoxy and other treatment processes followed by polishing processes to make it usable. The marble is cut into different shapes for different tasks. Some of the most common types of marble products include: sculpture marble, marble tiles, countertop marbles and others. Finally, the marble is shipped to different places where it can be sold locally and internationally (export).

2.4.6 Ongoing Rehabilitation

The ongoing rehabilitation will be undertaken during the operational phase of the mine and will be funded from the annual ongoing operational budget. The Proponent will undertake ongoing rehabilitation activities as soon as possible on land that is no longer needed for current or future operational requirements inclusive of all excavation and ongoing exploration footprints/ scars.

2.5 Mine Closure, Decommissioning, Rehabilitation and Aftercare

2.5.1 Overview

In line with the new regulatory requirements by the Ministry of Mines and Energy (MME), a Mine Closure Plan will be required to be submitted to the regulators. The Mine Closure will provide a detailed plan of actions and commitments including financial and human resources for effective management of the likely environmental liabilities at mine closure and aftercare stages of the proposed mining and ongoing activities in the ML 253. Regular assessments and evaluation of the environmental liabilities during the mining stage shall be undertaken to ensure that adequate provision of the necessary resources towards good environmental management at mine closure and aftercare stages. The following is the summary of the activities to be associated with the mine closure and aftercare stages

1. Implementation of sustainable socioeconomic plan.
2. Closure of open pits.
3. Closure of solid waste transfer station.
4. Backfill all excavated areas.
5. Closure of the mined blocks storage area.
6. Decommissioning of water and electricity infrastructure.
7. Overall land reclamation and restoration of internal roads, and.
8. Revegetation and aftercare as may be required.

2.5.2 Mine Closure Plan

The Mine Closure Plan activities consist of following five (5) steps that will be implemented by Proponent and where applicable in consultation with the key stakeholders:

(i) Ongoing rehabilitation: This will be implemented during the exploration phase and from day one (1) of the mine starting to produce coupled with the recruitment of a new workforce. Unwanted exploration and mine sites excavated or disturbed during the mine operation phase will not wait the final mine closure rehabilitation but will be attended to as ongoing activities and financed within an ongoing annual mine operational budget allocation to be detailed in the Mine Closure Plan Report.

(ii) Mine closure: Once production stops, the number of workers will be reduced and a small labour force will be retained to permanently shut down the mine. The mining company may have to

provide re-training or early retirement options to their workers before the mine is closed. The cost of the re-skilling, early retirement and retrenchments will be funded from the final Mine Closure Plan budget allocations to be detailed in the Mine Closure Plan Report.

(iii) Decommissioning: Will be undertaken by a small crews or contractors who will be responsible for decommissioning or taking apart the mining supporting infrastructure and equipment. Pipelines will be drained, equipment and valuable parts will be cleaned and may be sold, buildings will be repurposed or demolished, warehouse materials will be recovered, and waste will be disposed of. The cost of the decommissioning will be funded from the final Mine Closure Plan budget allocations to be detailed in the Mine Closure Plan Report.

(iv) Final rehabilitation\Remediation\reclamation: The objective of reclamation will be to return the Mining License (ML) area to an acceptable standard of socioeconomic use, ensuring that any landforms and structures are stable, and any watercourses are of acceptable water quality. Reclamation will involve a number of activities such as removal of any hazardous materials, reshaping the land, restoring topsoil, and planting native grasses, trees, or ground cover as may be applicable. The cost of the remediation/reclamation will be funded from the final Mine Closure Plan budget allocations to be detailed in the Mine Closure Plan Report, and.

(v) Post-closure and aftercare including monitoring: Monitoring programmes will be used to assess the effectiveness of the reclamation measures and to identify any corrective action that may be needed during the post closure and aftercare stage. In addition, the project area (ML 253) will also require long-term care and maintenance after mine closure such as periodic monitoring and maintenance of waste rock containment structures and secured hazardous areas, and monitoring any ongoing remediation technologies that have been implemented. The aftercare period will run for period of between two (2) to five (5) years or as may be agreed with the stakeholders especially the land owners and relevant Government regulators such as MME, MEFT and MAWLR. The cost for post-closure and aftercare will be funded from the final Mine Closure Plan budget allocations to be detailed in the Mine Closure Plan Report.

3. LEGISLATIVE FRAMEWORK

3.1 Overview

There are four sources of law in Namibia: (1) statutes (2) common law (3) customary law and (4) international law. These four kinds of law are explained in more detail in the other factsheets in this series. The constitution is the supreme law of Namibia. All other laws must be in line with it. The most important legislative instruments and associated permits\licenses\authorisations\concerts\ compliances applicable to the ongoing exploration activities and possible test mining include: Minerals exploration and mining, environmental management, land rights, water, atmospheric pollution prevention and labour as well as other indirect laws linked to the accessory services of exploration and possible test mining operations (Annex 2).

3.2 Key Applicable Legislation

3.2.1 Minerals Exploration and Mining Legislation

The national legislation governing minerals prospecting and mining activities in Namibia fall within the jurisdiction of the Ministry of Mines and Energy (MME) as the Competent Authority (CA) responsible for granting authorisations. The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing minerals prospecting and mining activities in Namibia. A new Bill, to replace the Minerals (Prospecting and Mining) Act (No 33 of 1992) is being prepared and puts more emphasis on good environmental management practices, local participation in the mining industry and promotes value addition as prescribed in the Minerals Policy of 2003.

The Minerals (Prospecting and Mining) Act (No 33 of 1992) regulates reconnaissance, prospecting (exploration) and mining activities. The Mining Commissioner, appointed by the Minister, is responsible for implementing the provisions of this Act including reporting requirements, environmental obligations as well as the associated regulations such as the Health and Safety Regulations.

3.2.2 Environmental Management Legislation

The Environmental Assessment (EA) process in Namibia is governed by the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) in the Ministry of Environment, Forestry and Tourism (MEFT). The objectives of the Act and the Regulations are, among others, to promote the sustainable management of the environment and the use of natural resources to provide for a process of assessment and control of activities which may have significant effects on the environment. The Minister of Environment, Forestry and Tourism (is authorised to list activities which may only be undertaken if an environmental clearance certificate has been issued by the environmental commissioner, which activities include those relating to exploration and mining operations.

In addition to the requirements for undertaking Environmental Assessment prior to the project implementation, the Environmental Management Act and the EIA Regulations also provide for obligations of a license holder to provide for project rehabilitation and closure plan. In the regulations, the definition of “rehabilitation and closure plan” is a plan which describes the process of rehabilitation of an activity at any stage of that activity up to and including closure stage.

3.2.3 Water Legislation

The Water Act 54 of 1956 has now been replaced by the Water Resources Management Act, 2013 (Act No. 11 of 2013), which commenced in August 2023 following the Gazetting of the Water Resources Management Regulations, 2023. The Water Resource Management Act 2013 and the Regulations provides for the management, development, protection, conservation, and use of water resources. The Water Resources Management Regulations, 2023, comprising the following fourteen (14) parts (Annex 2):

1. Preliminary.

2. Pricing policy for services in water sector.
3. Basin management committees.
4. Water management standards and licensed laboratories.
5. Water services, abstraction and use licenses.
6. Procedures and conditions for artificial recharge of aquifers.
7. Driller's licences.
8. Water pollution control.
9. Dams, dam safety and flood management.
10. Control of activities affecting wetlands, water resources and resource quality.
11. Removal of rocks, sand, or gravel from watercourse for sale or commercial exploitation.
12. Control of aquatic invasive species.
13. Protection of riparian zones, and.
14. Water services provided by State.

The Proponent shall take not of all the provisions of the Water Resources Management Regulations, 2023 including licensing requirements related to the proposed minerals explorations. In accordance with the Act, the ongoing exploration must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater as well as for "water works".

The broad definition of water works will include the reservoir on site, water treatment facilities and pipelines. Due to the water scarcity of the area, all water will be recycled (including domestic wastewater). The Act requires the license holder to have a wastewater discharge permit for discharge of effluent.

3.2.4 Atmospheric Pollution Prevention Legislation

The Atmospheric Pollution Prevention Ordinance, 11 of 1976 falling under the Ministry of Health and Social Services (MHSS) provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto. Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.

3.2.5 Labour, Health and Safety Legislations

The Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007), falling under the Ministry of Labour, Industrial Relations and Employment Creation (MLIREC) refers to severance allowances for employees on termination of a contract of employment in certain circumstances and health, safety, and welfare of employees.

In terms of the Health Safety and Environment (HSE), the Labour Act, 2007 protects employees and every employer shall, among other things: provide a working environment that is safe, without risk to the health of employees, and that has adequate facilities and arrangements for the welfare of employees, provide and maintain plant, machinery and systems of work, and work processes, that are

safe and without risk to the health of employees, and ensure that the use, handling, storage or transportation of hazardous materials or substances is safe and without risk to the health of employees.

All hazardous substances shall have clear exposure limits and the employer shall provide medical surveillance, first-aid and emergency arrangements as fit for the operation.

3.2.6 Other Applicable National Legislations

Other Important legislative instruments applicable to the proposed mining ongoing exploration operations in the ML 253 include the following (Table 3.1):

- Explosives Act 26 of 2536 (as amended in SA to April 1978) – Ministry of Home Affairs, Immigration, Safety and Security (MHAISS).
- National Heritage Act 27 of 2004 – Ministry of Education, Arts and Culture (MEAC).
- Petroleum Products and Energy Act 13 of 1990 – Ministry of Mines and Energy (MME).
- Nature Conservation Ordinance, No. 4 of 1975 – Ministry of Environment, Forestry and Tourism (MEFT).
- Forest Act 12 of 2001 – Ministry of Environment, Forestry and Tourism (MEFT).
- Hazardous Substances Ordinance 14 of 1974 – Ministry of Health and Social Services (MHSS), and.
- Public Health Act 36 of 1919 – Ministry of Health and Social Services (MHSS).

Table 3.1: Legislation relevant to the proposed mining and ongoing exploration operations.

LAW	SUMMARY DESCRIPTION
Constitution of the Republic of Namibia, 1990	The Constitution is the supreme law in Namibia, providing for the establishment of the main organs of state (the Executive, the Legislature, and the Judiciary) as well as guaranteeing various fundamental rights and freedoms. Provisions relating to the environment are contained in Chapter 11, article 95, which is entitled "promotion of the Welfare of the People". This article states that the Republic of Namibia shall – "Actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for all Namibians, both present and future. The Government shall provide measures against the dumping or recycling of foreign nuclear waste on Namibian territory."
Minerals (Prospecting and Mining) Act, 1992 ***Ministry of Mines and Energy (MME)***	The Minerals Act governs minerals prospecting and mining. The Act *provides for the reconnaissance, prospecting, and mining for, and disposal of, and the exercise of control over minerals in Namibia. and to provide for matters incidental thereto. A new Minerals Bills is currently under preparation.*
Environmental Management Act (2007) - ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	The purpose of the Act is *to give effect to Article 95(l) and 91(c) of the Namibian Constitution by establishing general principles for the management of the environment and natural resources. to promote the co-ordinated and integrated management of the environment. to give statutory effect to Namibia's Environmental Assessment Policy. to enable the Minister of Environment and Tourism to give effect to Namibia's obligations under international conventions*. In terms of the legislation, it will be possible to exercise control over certain listed development activities and activities within defined sensitive areas. The listed activities in sensitive areas require an Environmental Assessment to be completed before a decision to permit development can be taken. The legislation describes the circumstances requiring Environmental Assessments. Activities listed as per the provisions of the Act will require Environmental Assessment unless the Ministry of Environment, Forestry and Tourism, in consultation with the relevant Competent Authority, determines otherwise and approves the exception.
Water Resources Management Act, 2013 (Act No. 11 of 2013) and the Regulations, 2023 **Minister of Agriculture, Water and Land reform (MAWLR)**	This Act provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters. The Act provides for no rights of ownership in public water and its control and use is regulated and provided for in the Act. In accordance with the Act, the proposed project must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater (already obtained) as well as for "water works". The broad definition of water works will include the reservoir on site, water treatment facilities and pipelines. Due to the water scarcity of the area, all water will be recycled (including domestic wastewater) and the Mine will be operated on a zero-discharge philosophy. It will, therefore, not be necessary to obtain permits for discharge of effluent.
Forest Act 12 of 2001 - **Minister of Environment, Forestry and Tourism (MEFT)**	The Act provide for the establishment of a Forestry Council and the appointment of certain officials. to consolidate the laws relating to the management and use of forests and forest produce. to provide for the protection of the environment and the control and management of forest fires. Under Part IV Protection of the environment, Section 22(1) of the Act, it is unlawful for any person to: cut, destroy, or remove: (a) any vegetation which is on a sand dune or drifting sand or in a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully or (b) any living tree, bush or shrub growing within 100m of a river, stream, or watercourse. Should either of the above be unavoidable, it will be necessary to obtain a permit from the Ministry. Protected tree species as listed in the Regulations shall not be cut, destroyed, or removed.
Hazardous Substance Ordinance 14 of 1974 ***Ministry of Health and Social Services***	Provisions for hazardous waste are amended in this act as it 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".*

Table 3.1: *Cont.*

Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995 ***Ministry of Agriculture, Water and Land Reform*** **(MAWLR)**	This Act provide for the acquisition of agricultural land by the State for the purposes of land reform and for the allocation of such land to Namibian citizens who do not own or otherwise have the use of any or of adequate agricultural land, and foremost to those Namibian citizens who have been socially, economically, or educationally disadvantaged by past discriminatory laws or practices. to vest in the State a preferent right to purchase agricultural land for the purposes of the Act. to provide for the compulsory acquisition of certain agricultural land by the State for the purposes of the Act. to regulate the acquisition of agricultural land by foreign nationals. to establish a Lands Tribunal and determine its jurisdiction. and to provide for matters connected therewith.
Explosives Act 26 of 1956 (as amended in SA to April 1978) - ***Ministry Home Affairs, Immigration, Safety and Security (MHAISS)***	All explosive magazines are to be registered with the Ministry of Mines and Energy as accessory works. In addition, the magazines must be licensed as required by Section 22. The quantity of explosives and the way it is stored must be approved by an inspector. The inspector has powers to enter the premises at any time to conduct inspections regarding the nature of explosive, quantity, and the way it is stored. At closure, all explosives are to be disposed of accordingly.
Atmospheric Pollution Prevention Ordinance 11 of 1976. ***Ministry of Health and Social Services (MHSS)***	This regulation sets out principles for *the prevention of the pollution of the atmosphere and for matters incidental thereto.* Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.
The Nature Conservation Ordinance, Ordinance 4 of 1975, ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	During 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, Forestry and Tourism. Should the Proponent operate a nursery to propagate indigenous plant species for rehabilitation purposes, a permit will be required. At this stage, however, it is envisaged that this type of activity will be contracted out to encourage small business development.
Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007 **Ministry of Labour, Industrial Relations, and Employment Creation (MLIREC)**	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* under which provisions are made in chapter 4. *Chapter* 5 of the act improvises on the *protection of employees from unfair labour practice.*
Petroleum Products and Energy Act 13 of 1990 ***Ministry of Mines and Energy (MME)***	Any consumer installation as envisaged in this Act must be licensed. Appropriate consumer installation certificate will need to be obtained from the Ministry for each fuel installation. The construction of the installation must be designed in such a manner as to prevent environmental contamination. 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. General conditions apply to all certificates issued. These include conditions relating to petroleum spills and the abandonment of the Site. The regulation further provides that the Minister may impose special conditions relating to the preparation and assessment of environmental assessments and the safe disposal of petroleum products.
National Heritage Act 27 of 2004 ***Ministry of Education, Arts and Culture (MEAC)***	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 activities will ensure that if any archaeological or paleontological objects, as described in the Act, are found during the implementation of the activities, such a find shall be reported to the Ministry immediately. If necessary, the relevant permits must be obtained before disturbing or destroying any heritage.

3.3 Key Regulators / Competent Authorities

The environmental regulatory authorities responsible for environmental protection and management in relation to the proposed project including their role in regulating environmental protection are listed in Table 3.2.

Table 3.2: Government agencies regulating environmental protection in Namibia.

AGENCY	RESPONSIBILITY
Ministry of Mines and Energy (MME)	The competent authority for minerals prospecting and mining activities in Namibia. Issues Exclusive prospecting License (EPL), Mining Licenses (ML) and Mining Claims (license) as well as all other minerals related permits for processing, trading and export of minerals resources. In accordance with the provisions of the Petroleum Products and Energy Act 13 of 1990 ("the Petroleum Products Act") and the regulations thereof, only 210 L of diesel can be stored onsite without a license for own use. In order to store more than 210L of diesel for own use a site-specific Consumer Installation License is required. The application of a Consumer Installation License requires the applicant to have undertaken Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in order to apply for Environmental Clearance Certificate (ECC) in accordance with the provisions of the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations 30 of 2012.
Ministry of Environment, Forestry and Tourism (MEFT)	Issue of Environmental Clearance Certificate (ECC) based on the review and approval of the Environmental Assessments (EA) reports comprising Environmental Scoping, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) prepared in accordance with the Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012. The National Botanical Research Institute's (NBRI) mandate is to study the flora and vegetation of Namibia, in order to promote the understanding, conservation and sustainable use of Namibia's plants for the benefit of all. The Directorate of Forestry (DOF) is responsible for issuing of forestry permits with respect to harvest, transport, and export or market forest resources.
Ministry of Agriculture, Water and Land Reform (MAWLR)	The Directorate of Resource Management within the Department of Water Affairs (DWA) at the MAWLR is currently the lead agency responsible for management of surface and groundwater utilisation through the issuing of abstraction permits and waste water disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting.
Ministry of Home Affairs, Immigration, Safety and Security (MHAISS)	The Explosive Department within the Namibian Police are responsible for licensing to purchase, store and use of explosive magazines for exploration or mining related blasting that may be undertaken in the ML 253

3.4 Standards and Guidelines

Industrial effluent likely to be generated by the proposed activities must comply with provisions of the provisions of the Water Resources Management Regulations, 2023 (Annex 2). The only key missing components to the regulatory frameworks in Namibia are the standards, and guidelines with respect to gaseous, liquid, and solid emissions.

However, in the absence of national gaseous, liquid, and solid emission limits for Namibia, the proposed project shall target the Multilateral Investment Guarantee Agency (MIGA) gaseous effluent emission level and liquid effluent emission levels (Table 3.3).

Noise abatement measures must target to achieve either the levels shown in Table 3.4 or a maximum increase in background levels of 3 dB (A) at the nearest receptor location off-site (MIGA guidelines).

Table 3.3: Liquid effluent emission levels (MIGA /IFC).

Pollutant	**Max. Value**
pH	6-9
Total suspended solids	50 mg/l
Total metals	10 mg/l
Phosphorous (P)	5 mg/l
Fluoride (F)	20 mg/l
Cadmium (Cd)	0.1 mg/l

Table 3.4: Noise emission levels (MIGA /IFC).

	Maximum Allowable Leq (hourly), in dB(A)	
Receptor	Day time (07:00 – 22:00)	Nighttime (22:00 – 07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

3.5 International and Regional Treaties and Protocols

Article 144 of the Namibian Constitution provides for the enabling mechanism to ensure that all international treaties and protocols are ratified. All ratified treaties and protocols are enforceable within Namibia by the Namibian courts, and these include the following:

- The Paris Agreement, 2016.
- Convention on Biological Diversity, 1992.
- Vienna Convention for the Protection of the Ozone Layer, 1985.
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987.
- United Nations Framework Convention on Climate Change, 1992.
- Kyoto Protocol on the Framework Convention on Climate Change, 1998.
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, 1989.
- World Heritage Convention, 1972.
- Convention to Combat Desertification, 1994. and

- ❖ Stockholm Convention of Persistent Organic Pollutants, 2001.
- ❖ Southern Africa Development Community (SADC) Protocol on Mining, and.
- ❖ Southern Africa Development Community (SADC) Protocol on Energy.

3.6 Recommendations on Permitting Requirements

It is hereby recommended that the Proponent must follow the provisions of all relevant national regulatory throughout the proposed project lifecycle and must obtain the following permits/ authorisations as maybe applicable / required as the proposed project develops:

(i) Valid ML as may be applicable from Department of Mines in the MME.

(ii) Valid ECC for mining operations from the Department of Environmental Affairs in the MEFT.

(iii) The Proponent shall apply for all the applicable permits as provided in the Water Resources Management Regulations, 2023 including freshwater abstraction and wastewater discharge permits from the Department of Water Affairs (DWA) in the MAWLR before drilling a water borehole and discharge wastewater into the environment respectively (Annex 2), and.

(iv) All other permits as may be applicable for the proposed exploration operations and test mining activities.

4. RECEIVING ENVIRONMENT

4.1 Regional Physical Geography

The proposed project area falls within the Erongo Region in the central western part of Namibia. On the Western part of the region is the Atlantic Ocean with Ugab River in the North and Kuiseb River as the southern boundary (Ministry of Mines and Energy (MME), 2010). The Namib Desert borders the Namibian coastline with Atlantic Ocean and stretching inwards to about 120-150 km. The Topography of land rises steadily from sea level to about 1000m across the Namib Desert. Most of the land within Namib Desert is flat to undulating gravel plains, with occasional ridges and isolated inselberg hills and mountains. In the far north of the Erongo Region lies the Brandberg at a highest peak of 2579 m, making it the country's highest mountain.

The ML area falls within the western edge Great Escarpment. The area is characterised by relatively flat topography, with the exception of local ridges and hills where more competent rocks occur, forming conspicuous topographic elevated surface expressions. Small, ephemeral rivers that flow only when it rains and dry most of the year dominate the general drainage. The elevation above mean sea level (amsl) ranges from 1350m for most parts of the ML area to 1600m and 1700m for the Sargdeckel and Jungfrau Mountain summits respectively (Fig. 4.1).

Ephemeral rivers in Erongo region run through from their inland catchment to seawards direction. These rivers include the Swakop River with its main tributary the Khan River, the Omaruru River, Kuiseb and Ugab River (Fig. 4.2). The surface flows of the ephemeral rivers in the region are short-lived and only their alluvial aquifers provide a source of groundwater. Palaeochannels in the Omaruru River form the underground Omaruru delta also providing a significant source of surface water for the central Namib. There are two water supply schemes in the Kuiseb (Gobabeb) namely, Swartbank and Rooibank.

4.2 Climatic Settings

4.2.1 Overview

The proposed mining project area is located in the Karibib District, Erongo Region in central Namibia with daytime warm to hot temperatures throughout the year, while the nights are mild to cool in winter. The mean annual rainfall is highly variable and may range between 200 - 300 mm in some parts of the ML Area (Fig. 4.2).

The distribution of rainfall is extremely seasonal with almost all the rain falling in summer - from November to April with occasional with mean annual gross evaporation of about 3300 mm (Fig. 4.2). The local project area has the following three distinct seasons:

- A dry and relatively cool season from April to August with average daytime highs of 23°C and virtually no rainfall during this period.

- A hot and dry season from September to December with minimal and variable rainfall falling (<20mm per month) and average daytime highs of 30°C, which regularly exceed 40°C, and.

- A hot and rainy season from January through to March with >50mm per month falling during this period (although this is extremely variable) and average high temperatures of 29°C.

The project area does not have a weather station with reliable wind records. However, based on the regional wind patterns, the prevailing wind in the area seems to be dominated by winds from the north eastern and southwest quadrants.

Locally, the situation may be different dues various influences including topographic effects.

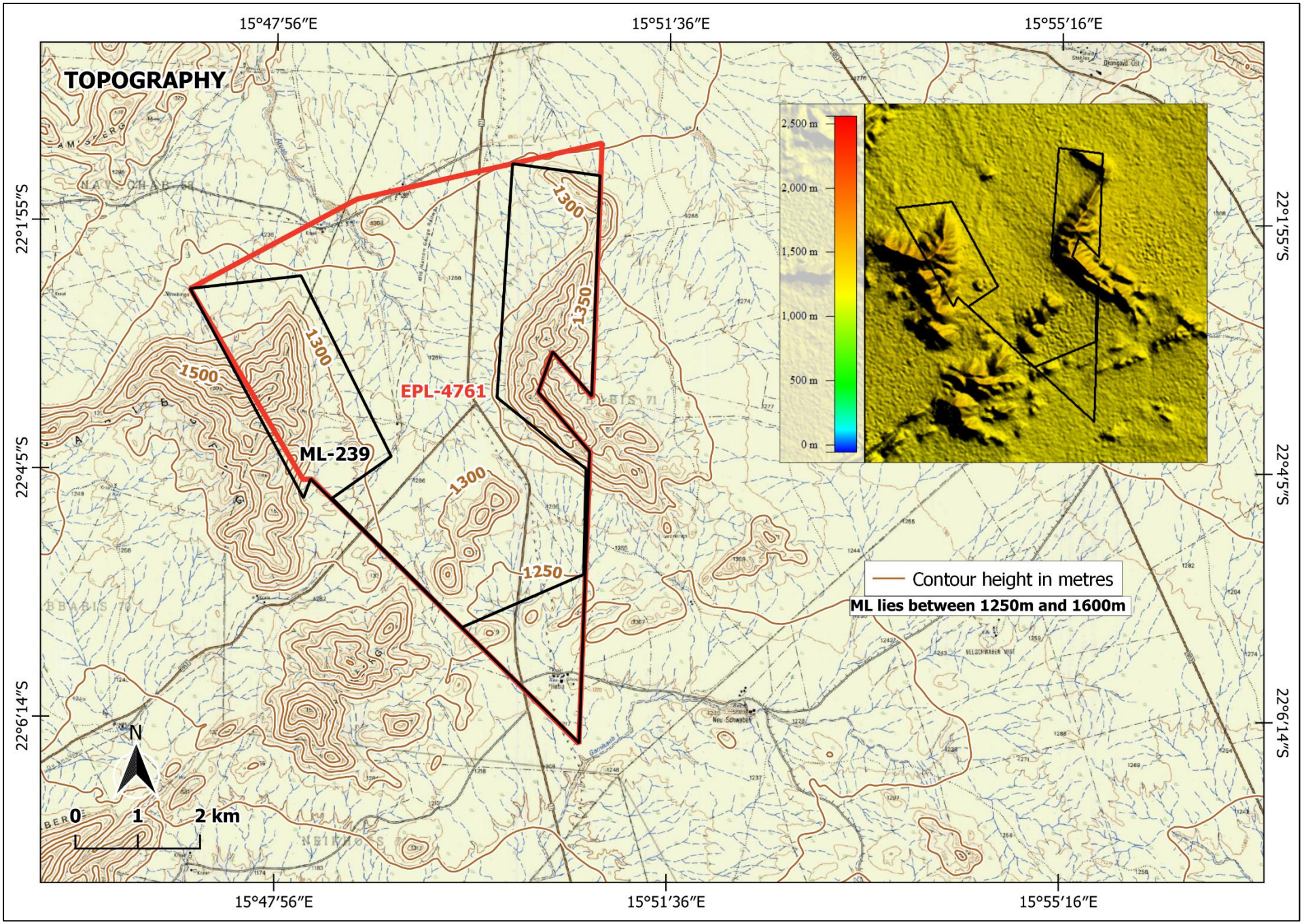


Figure 4.1: Detailed topographic map of the ML 253 and surrounding areas.

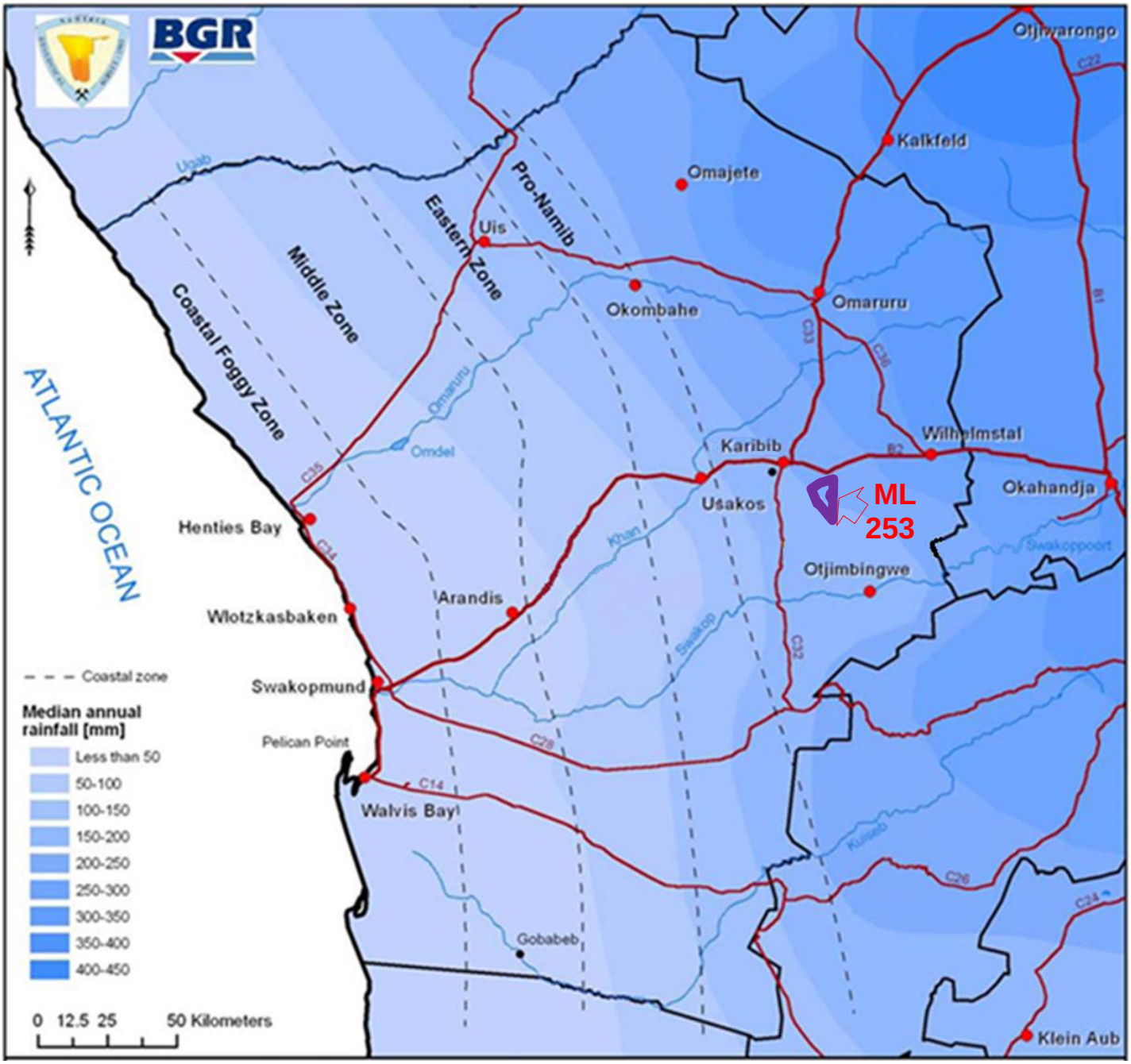


Figure 4.2: Median annual rainfall of central Namib Desert showing the location of the project area, ML 253 (Source: Ministry of Mines and Energy (MME), 2010).

4.2.2 Wind Patterns

The Namib Desert is heavily influenced by high pressure systems, the sub continental high and the South Atlantic high. The coastal winds are driven by the South Atlantic high-pressure systems, resulting in strong winds prevailing from the south or south-west (Fig. 4.3). The cold Benguela Current on the Namibian coastline influences the South-westerly winds.

The Stronger winds experienced in the coastal towns and surroundings are mainly north-easterly or east winds. These winds are usually dry and hot with a wind speed of about 27 km /hour. This influence is experience to up to 50 days annually between the months of April to September. Within the project area, stronger winds are dominated by the south-westerly or a north-easterly component (Fig. 4.3). The wind is stronger in winter due to high pressure system of inland regions.

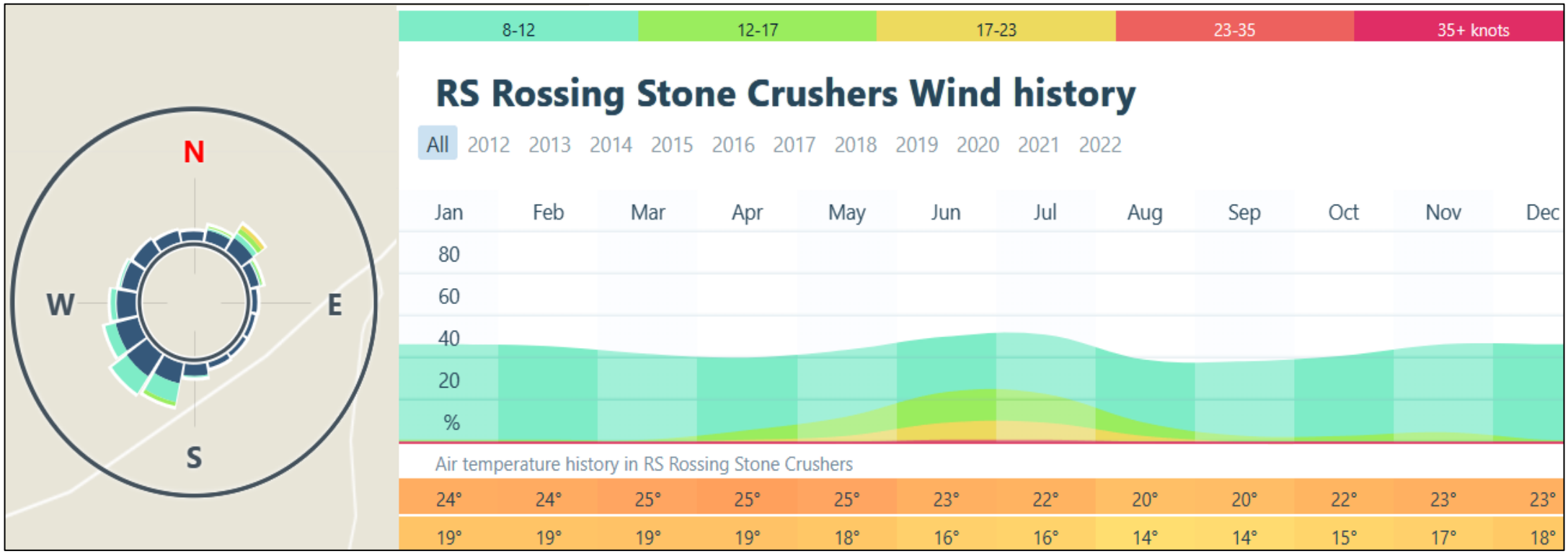


Figure 4.3: Prevailing wind direction, average wind speed and air temperature around Arandis situated to the west of the proposed ML No. 253 (Source: https://windy.app).

4.2.3 Regional and Local Air Quality Assessment

The need for air quality monitoring is important and must be focused on evaluating the likely influence of any pollutant that may be associated with the proposed project activities. Ambient air quality monitoring for suspended particulate matter, sulphur dioxide, and nitrogen oxides should be carried out over a longer period during the operation of the mine. The aim should be to study diurnal and seasonal variation and spatial distribution of said pollutants. Dust fall rate measurements should also be carried out for a period of one month out of each season and for all the four seasons of the year. Mining and associated activities may raise the background levels of particulate pollution in the local area. Movement of mined blocks as well as general vehicles movements and poorly maintained roads are potential sources of particulate pollution in mining operations. Burning of fuel and transportation activities could be among the major sources of SO_2 and NO_x in mining operations.

4.2.4 Noise and Air Emissions

Assessment of baseline and future noise and air emission trends were undertaken as part of the environmental assessment. The main aim of the air quality assessment of the likely impact of the proposed project in the ML 253 determined the likely contaminant sources, possible pathways and targets with respect to the likely noise and air quality impacts. The general air quality ranged from 16.61 to 101.88 (mg/m^{2}day) while the noise levels ranged from 59.8 - 76.2 (dBA). The study has found that the existing air quality and noise pollution are below acceptable limit hence following or adopting the proposed recommendations will help to improve compliance during mining.

4.2.5 Recommendations on the Climatic Components

Based on the regional climatic data sets and the results of the specialist study, it's likely that a proportion of windblown dust will be generated during the proposed project lifecycle covering exploration, preconstruction, construction, operation, rehabilitation, closure and aftercare stages. Due to the proximity of other mines and quarries in the area, there will be potential for cumulative impacts on the air quality occurring. This is likely to occur when the threshold wind speed of 4.5 m/s is exceeded. The threshold wind speed is dependent on the erosion potential of the exposed surface, which is expressed in terms of availability of erodible material per unit area. Any factor that binds the erodible material will significantly reduce the availability of erodible material on the surface, thus reducing the erosion potential of the surface. Namibia does not have air quality standards. Nonetheless, the Proponent, must aim at reducing hazardous air pollutant (HAPs) emissions to levels that comply with long-term regional (SADC) and international standards air quality guidelines.

4.3 Habitat and Ecosystem

4.3.1 Overview

Locally, the ML area falls within the edge of the central western highlands of Namibia (Figs. 4.4 and 4.5). Central western Namibia in general is regarded as "relatively low to moderate" in overall (all terrestrial species) diversity (Mendelsohn *et al.* 2002). Overall terrestrial endemism in the area on the other hand is "moderate to high" (Mendelsohn *et al.* 2002). The overall diversity and abundance of large herbivorous mammals (big game) is viewed as "moderate" with 3-4 species while overall diversity and density of large carnivorous mammals (large predators) is determined as "moderate" with 4 species expected – e.g., leopard, cheetah, spotted & brown hyena (Mendelsohn *et al.* 2002).

The generally Karibib area is viewed as an area of importance for local endemic plant species, especially the Erongo Mountains with between 26-35 endemic species (Mendelsohn *et al.* 2002). The overall plant diversity (all species) in the general Karibib area is estimated at between 150-299 species and the Erongo Mountain area between 400-499 species (Mendelsohn *et al.* 2002). These estimates are limited to "higher" plants as information regarding "lower" plants is sparse. The greatest variants affecting the diversity of plants are habitat and climate with the highest plant diversity generally associated with high rainfall areas.

Pockets of high diversity are found throughout Namibia in “unique” habitat – often transition zones – e.g., mountains, inselbergs, etc. Plant endemism, other than the Erongo Mountains, is viewed as “medium to high” – with between 6-15 endemics expected from the general area (Mendelsohn *et al.* 2002). Furthermore, Mendelsohn *et al.* (2002) views the overall plant production as medium to low in the general Karibib area and high in the Erongo Mountains, the availability of hardwoods as medium and the grazing and browse as average in the general area. Bush thickening (encroachment) is viewed as problematic between Karibib and Omaruru with *Acacia reficiens* the problem species and patchy between Karibib and Okahandja with *A. mellifera* dominating (Bester 1996, Cunningham 1998, Mendelsohn *et al.* 2002).

The area does not fall within a Communal Conservancy with the closest being ǂGaingu located in the Spitskoppe area to the west of Karibib, neither within a Freehold (i.e., commercial) Conservancy with Okawi being the closest, east of Karibib (Mendelsohn *et al.* 2002, NACSO 2006, 2010). According to Cunningham (2020), it is estimated that at least 75 species of reptile, 7 amphibian, 87 mammal, 217 birds, 74-101 larger trees and shrubs and up to 80 grass species occur in the general/immediate Karibib area of which a high proportion are endemics (e.g., reptiles – 45.3%).

4.3.2 Important Fauna Species

4.3.2.1 Reptiles

The high percentage of endemic reptile species (45.3%) associated with the rocky escarpment region of central western Namibia underscores the importance of this area without formal state protection. The most important species expected to occur in the general area are viewed as the tortoises Stigmochelys pardalis and Psammobates oculiferus. pythons – P. anchietae and P. natalensis. Namibian wolf snake (Lycophidion namibianum) – Varanus albigularis and some of the endemic and little-known gecko species – e.g., Pachydactylus species. Tortoises, snakes and monitor lizards are routinely killed for food or as perceived threats. Other important species are those viewed as “rare” – i.e., Rhinotyphlops lalandei, Mehelya vernayi & Afroedura africana – although very little is known about these species

4.3.2.2 Amphibians

Of the seven species of amphibians that potentially could occur in the general area of which 2 species are endemic (Poyntonophrynus hoeschi and Phrynomantis annectens) (Griffin 1998b) and 1 species is classified as “near threatened” (Pyxicephalus adspersus) (Du Preez and Carruthers 2009) – i.e., high level (42.9%) of amphibians of conservation value from the general area. With the exception of these important species and due to the fact that there is no open permanent surface water in the area, amphibians are not viewed as very important in the general area.

4.3.2.3 Mammals

Of the 87 species of mammals known and/or expected to occur in the general Karibib area, 9 species (10.3%) are classified as endemic. Rodents (of which 6 species – 23.1% – are endemic) and bats (of which 1 species is classified as “rare”) are the groups least studied. Species of greatest concern in the general area are those viewed as “rare” in Namibia – i.e., Namibian wing-gland bat and Southern African hedgehog – and species classified as “near threatened” – i.e., Commerson’s roundleaf bat, striped leaf-nosed bat & brown hyena, leopard – and “vulnerable” by the IUCN (2016) – i.e., cheetah and Hartmann’s Mountain zebra.

4.3.2.4 Birds

At least 217 bird species [mainly terrestrial “breeding residents”] occur and/or could occur in the general Karibib area at any time and include 12 of the 14 Namibian endemics (85.7% of all Namibian endemic species or 5.6% of all the species expected to occur in the area). The most important bird species from the general area are those classified as endemic to Namibia of which the Damara hornbill and Herero chat are viewed as the most important due to the overall lack of knowledge of these species. Although also viewed as important, Rüppels korhaan is migratory throughout its range while the rockrunner inhabits inaccessible terrain and is widespread throughout mountainous areas in Namibia. Other

species of concern are those classified as endangered (violet wood-hoopoe, Ludwig's bustard, white-backed vulture, black harrier, tawny eagle, booted eagle, martial eagle, black stork), vulnerable (lappet-faced vulture, secretarybird) and near threatened (Rűppel's parrot, kori bustard, Verreaux's eagle, peregrine falcon, marabou stork) (Simmons et al. 2015).

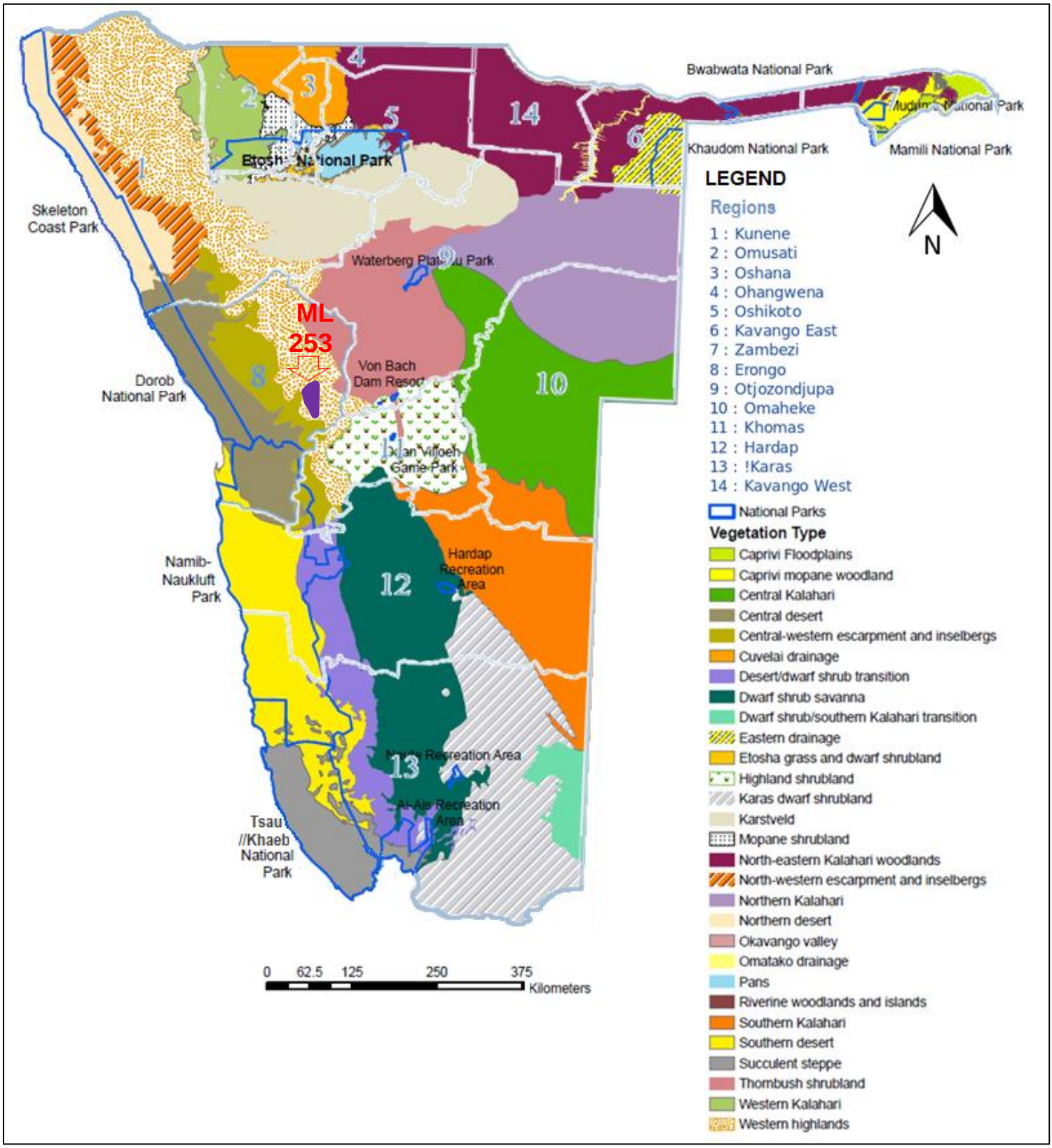


Figure 4.4: Regional vegetation map of Namibia showing the location of the ML 253 falling at the edge of the central western escarpment and inselbergs and west highlands boundary (Directorate of Environmental Affairs, 2002).

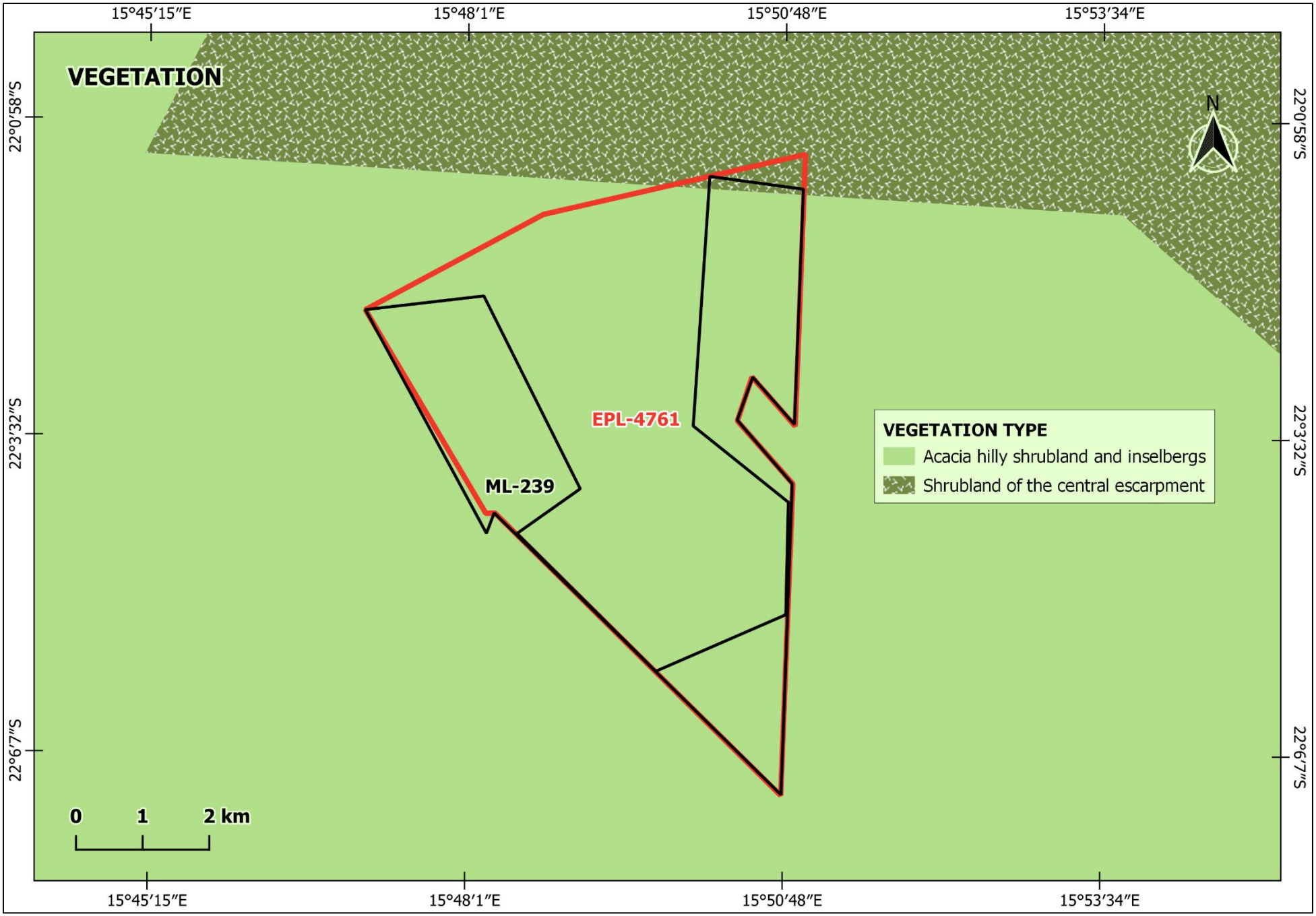


Figure 4.5: Vegetation map showing the location of the ML 253.

4.3.3 Important Flora Species

4.3.3.1 Trees/Shrubs and Grasses

At least 91 to 101 larger species of trees and shrubs are known and/or expected to occur in the general area of which 8 species (7.9%) expected to occur in the general Karibib area are classified as endemics, 4 species as near endemics, 23 species (22.8%) are protected by the Forest Act No 12. of 2001 and another 2 species by various other Forestry laws (Curtis and Mannheimer 2005 and Mannheimer and Curtis 2009), 5 species (4.9%) are protected under the Nature Conservation Ordinance No. 4 of 1975 while 6 species (5.9%) are classified as CITES Appendix 2 species.

All the trees with some kind of conservation and/or protected status are viewed as important in the general Karibib area. The endemic grass – Eragrostis omahekensis – is viewed as the most important species potentially occurring in the general area.

4.3.3.2 Other Species

Other species of great importance likely to occur in and around the ML 253 are:

(i) **Aloes**: Aloes are protected throughout Namibia and those expected to potentially occur in the general area, and also viewed as important are Aloe asperifolia, A. hereroensis and A. zebrina (Rothmann 2004).

(ii) **Commiphora**: Many endemic Commiphora species are found throughout Namibia with Steyn (2003) indicating that Commiphora crenato-serrata (not included in the Table 6) potentially also occurring in the general area.

(iii) **Ferns**: At least 64 species of ferns, of which 13 species being endemic, occur throughout Namibia. Ferns in the general Karibib area include at least 15 indigenous species (Actiniopteris radiata, Asplenium cordatum, Cheilanthes dinteri, C. eckloniana, C. marlothii, C. parviloba, Marselia aegyptiaca, M. ephippiocarpa, M. farinosa, M. macrocarpa, M. nubica, M. unicornis, M. vera, Ophioglossum polyphyllum & Pellaea calomelanos) (Crouch et al. 2011). The general area is undercollected with more species probably occurring in the general area.

(iv) **Lithop**: Are known to occur in the general area and often difficult to observed, especially during the dry season when their aboveground structures wither. Lithop species known to occur in the general ML area include *Lithops ruschiorum* var. *ruschiorum* and *L. gracilidelineata* var. *gracilidelineata* (Cole and Cole 2005, Loots 2005).

(v) **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. Lichens are known to occur on rocky terrain in the mountainous terrain in the general area, and.

(vi) **Other species**: Other species with commercial potential that could occur in the general Karibib 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).

4.3.4 Important Habitat Areas and Conclusions

All developments have potential negative environmental consequences, identifying the most important faunal species including high risk habitats beforehand, coupled with environmentally acceptable mitigating factors, lessens the overall impact of such development. The following is the summary of the key habitats that have been identified:

- **Hills / topographically high areas**: Rocky areas generally have high biodiversity and consequently viewed as important habitat for all vertebrate fauna and flora. A hills area in the ML has a high density of Aloe litoralis (protected) as well as Ficus cordata (protected), Sterculia africana (protected) and Commiphora glaucescens (near endemic) individuals.

- **Ephemeral drainage lines**: The various ephemeral drainage lines are important habitat to larger trees, especially Acacia erioloba (protected), Euclea pseudebenus (protected), Faidherbia albida (protected) and Ziziphus mucronata (protected).

- **Plains / Topographically low area**: Topographically low areas are also important habitats with *Acacia erioloba*, *Albizia anthelmintica* and *Boscia albitrunca* being found in these areas.

Vertebrate fauna species most likely to be adversely affected by the proposed mining and ongoing exploration activities in the ML 253 would be sedentary reptile species associated with specific geology marble ridges/hills/outcrop targeted for mining– e.g., Pedioplanis husabensis and various *Pachydactylus* and *Rhoptropus* species. Important flora potentially adversely affected would be *Aloe asperifolia*, *A. namibensis*, various *Commiphora* species and *Lithops ruschiorum* var. *ruschiorum* and *L. gracilidelineata* var. *gracilidelineata*.

There are various anthropomorphic activities throughout the general ML area such as existing roads and tracks, farm infrastructure and previous exploration activities, etc., and the proposed developments would have a limited footprint and not be expected to affect the whole ML 253 area and associated unique amphibians, mammals, reptiles and flora species negatively. The implementation and monitoring of the mitigation measures as detailed in the EMP Report is likely to lessen the extent of the likely negative impacts.

4.4 Ground Component

4.4.1 Regional Geology

The ML area falls within the Central Zone of the Damara Sequence which underlies most of Namibia (Miller, 1992). The oldest rocks within the Central Zone are the pre-Damaran basement that consists of gneiss and granite lithologies found in different parts of the zone (Miller, 1992).

According to Miller, (1983a), the sequence was deposited during successive phases of rifting, spreading, subduction and continental collision. Much of the basal succession (Nosib Group), laid down in or marginal to intracontinental rifts, consists of quartzite, arkose, conglomerate, phyllite, calc-silicate, subordinate, limestone and evaporitic rocks. Local alkaline ignimbrites with associated subvolcanic intrusions ranging from 840 to 720 million years in age also form part of the regional geology (Miller, 1992).

According to Miller, (1992), widespread carbonate deposition followed and overlapped far beyond early rift shoulders (Kudis, Ugab and basal Khomas Subgroups). interbedded mica and graphitic schist, quartzite (some ferruginous), massflow deposits, iron-formation and local within-plate basic lava point to fairly variable depositional conditions south of a stable platform where only carbonates with very minor clastics occur (Otavi Group).

Near the southern margin of the orogen, deep-water fans, facies equivalents of the carbonates were deposited on either side of a Southern Zone Ocean separating Kalahari and Congo Cratons (Auas and Tinkas Formations). Thick schistose metagreywacke and metapelite (Kuiseb Formation) overlie the above rocks.

4.4.2 Local Geology

The targeted marble horizon in the ML 253 belong to the Karibib Marble Formation (Figs. 4.6-4.8 and Table 4.1).

The marble-dominated Karibib Formation exhibits considerable thickness variations and conformably over-lies the Arandis Formation.

The local geology comprises the following lithologies (Figs. 4.6- 4.8):

- Quaternary (Qs) sediments comprising unconsolidated surficial deposits.
- Etendeka basalts and lions Head arkose, shale, mudrock and sandstone covering the Sargdeckel and Jungfpau mountain peaks in the central parts of the ML area.
- Metamorphic Complex augen gneiss, biotite silimatite gneiss covers a small part of the ML in the far northern corner.
- Diorite (NdOv) dominating the southwestern half of the ML area.
- Pegmatites (N/Epe) belonging to the Namibia to Cambrian age cover the far south-eastern boundary of the ML area, and.
- Marble (Nkb) with cal-silicate rocks and mica schists belonging to the Swakop Group – Karibib Formation dominating the north-eastern half of the ML area. The marble is the main targeted geological horizon for dimensions stone mining operations.

Table 4.1: Partial Lithostratigraphy of the Damara Sequence in Central Namibia (Karibib-Swakopmund Area) (Source: Venmyn Deloitte, 2014).

GROUP	SUB-GROUP	FORMATION	THICKNESS (m)	LITHOLOGICAL DESCRIPTION
Swakop	Khomas	Kuiseb	3,000	Biotite-rich quartzo-feldspathic schist, biotite-garnet-cordierite schist, minor amphibolite schist, quartzite, calc-silicate rock and marble.
		Karibib	700	Marble, biotite schist, quartz schist and calc-silicate rock.
		Chuos	700	Diamictite, pebble- and boulder-bearing schist and minor quartzite
	Discordance			
	Ugab	Rössing	200	Very variable marble, quartzite, conglomerate, biotite schist, biotite cordierite schist and gneiss, aluminous gneiss, biotite-hornblende schist and calc-silicate schist.
Unconformity or conformable transition				
Nosib		Khan	1,100	Various gneisses, quartzite, schist, conglomerate, minor marble, amphibolite and calc-silicate rock.
		Etusis	3,500	Layered light-red to greyish-brown quartzites with high feldspar content. In-between para-gneisses, biotite schists and conglomerates occur.

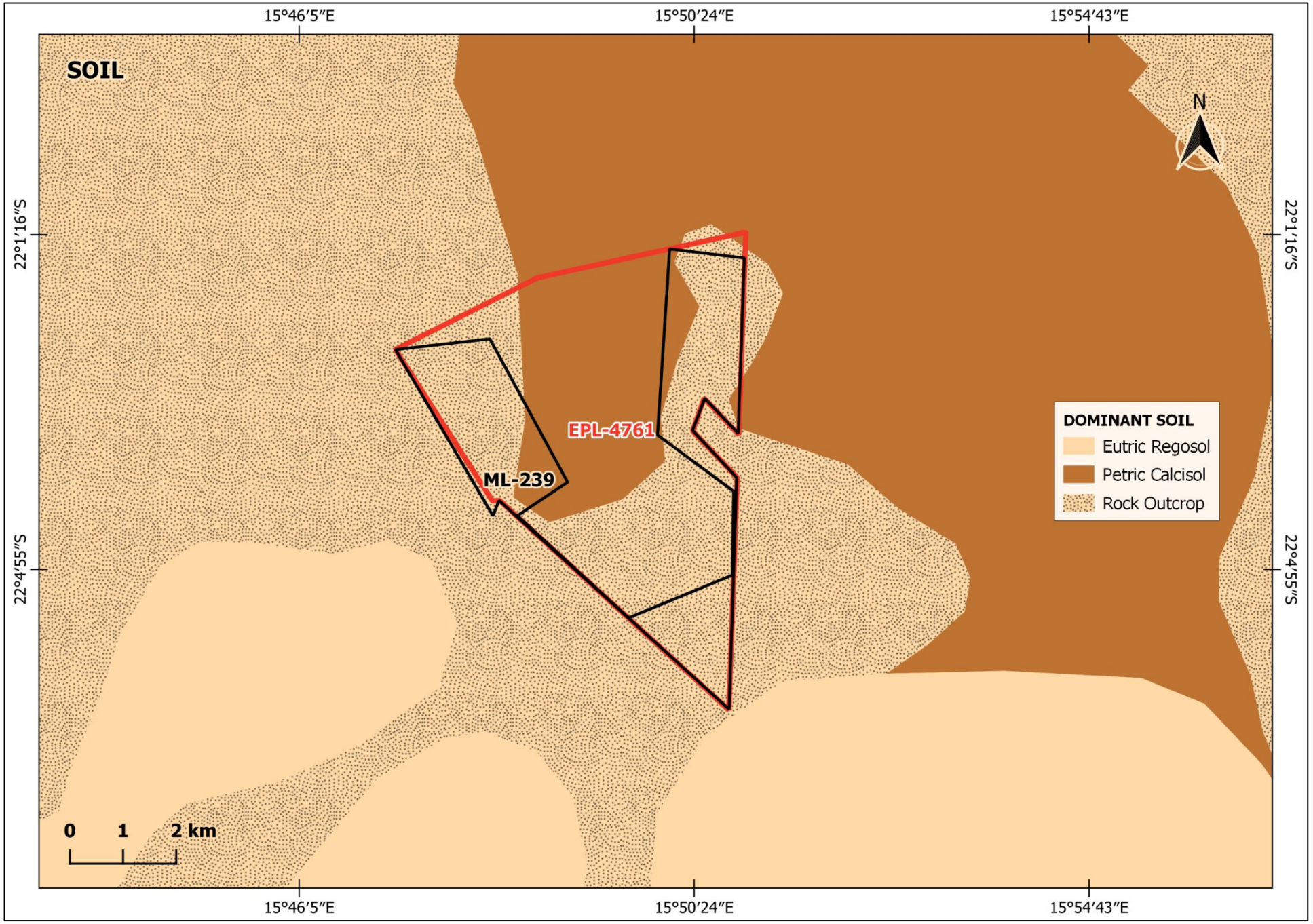


Figure 4.6: Simplified surficial geological map of the ML 253 showing surface geology (soil types).

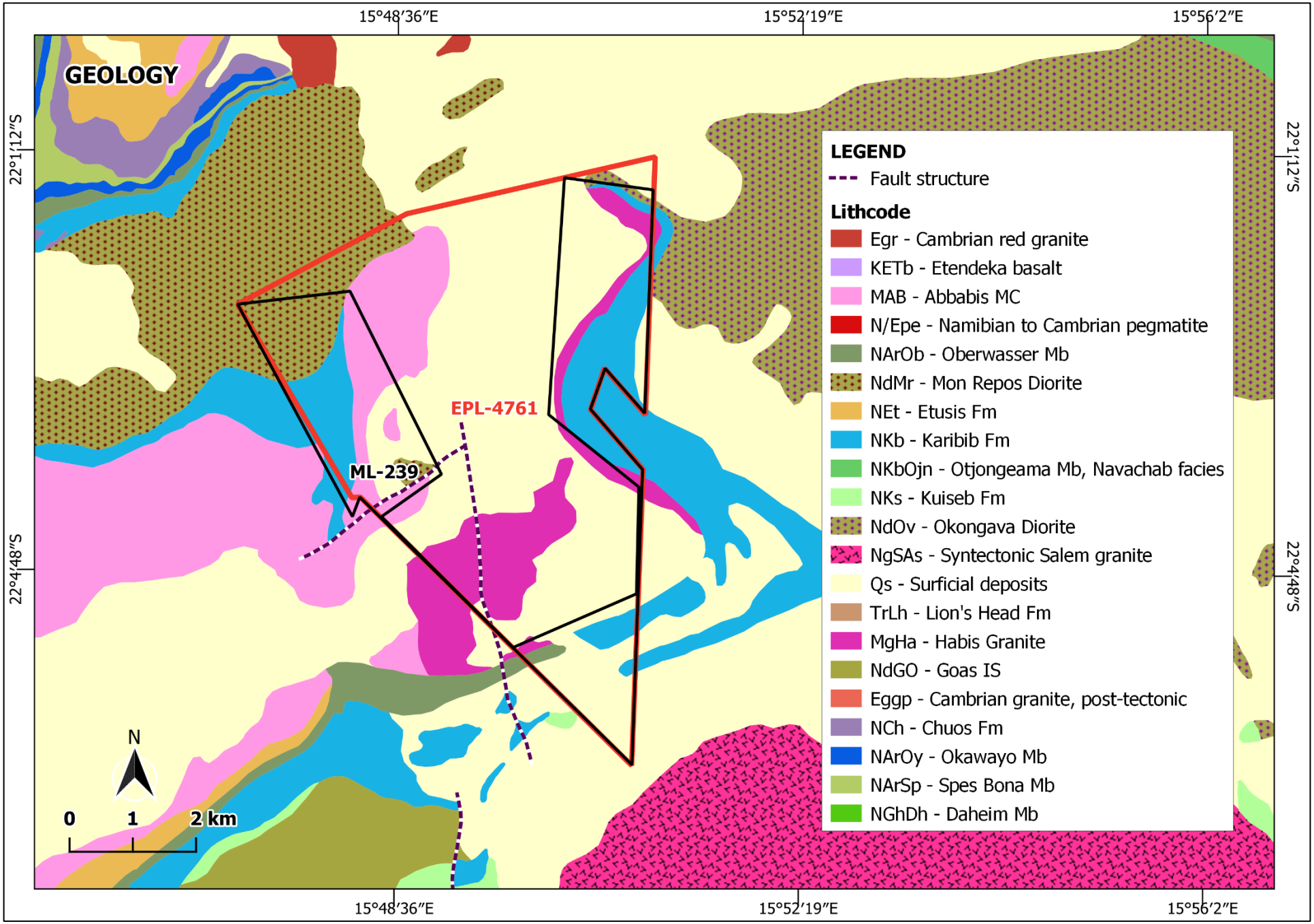


Figure 4.7: Simplified solid geological map of the ML 253 showing regional mapped geological Formations.

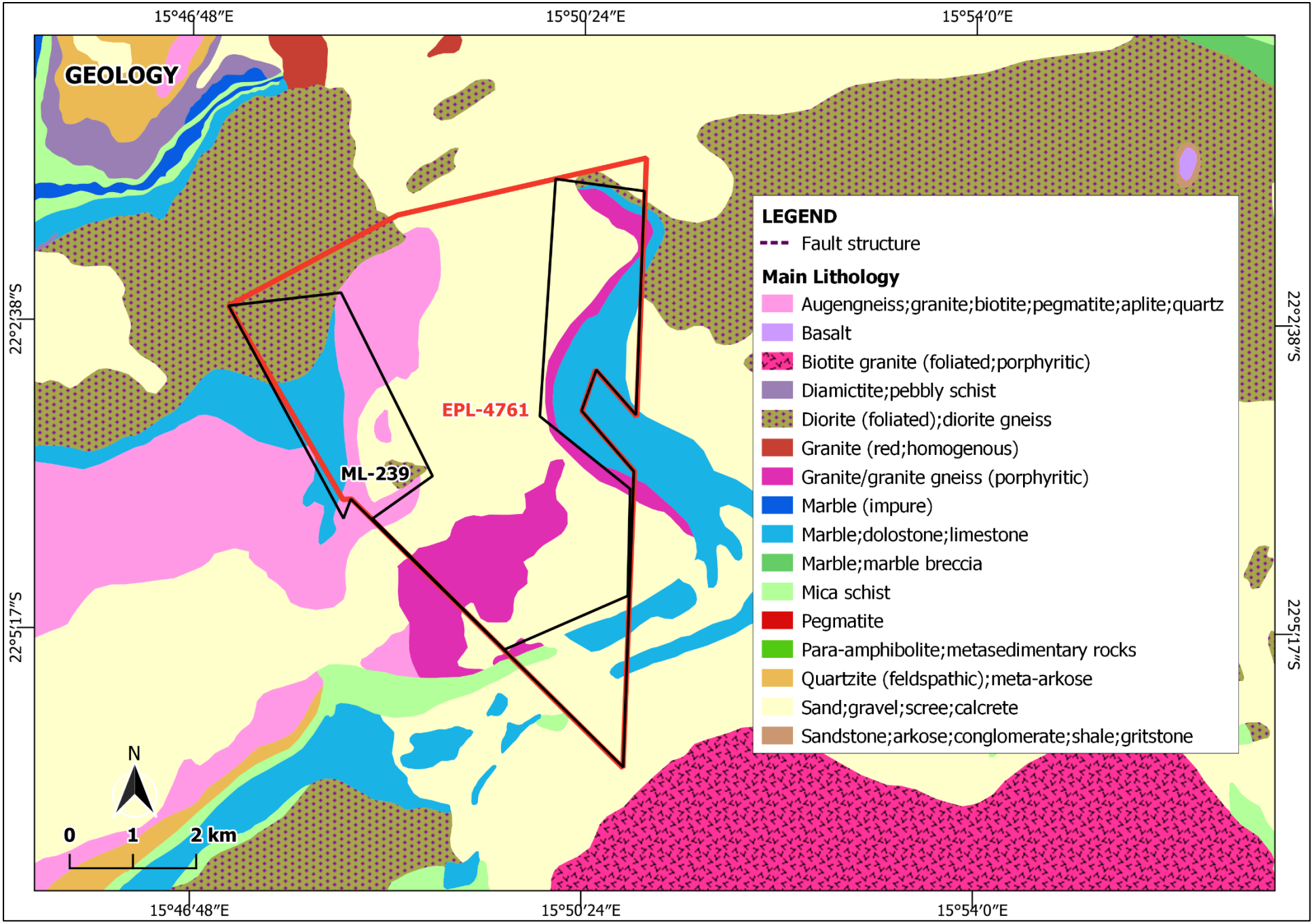


Figure 4.8: Simplified solid geological map of the ML 253 showing lithologies / rock types.

4.4.3 Geotechnical Engineering Considerations

Rocks of varying geotechnical characteristics are expected within the ML area. Table 4.2 outlines an indicative classification of the various discontinuities that are likely to be found in the area including the targeted marble outcrop. Both low and high order discontinuities are likely to be found around the targeted ML area. Based on results of the fieldwork and laboratory assessment undertaken by Bohale Investment Two CC, the marble found within the ML 253 area is good for dimension stone mining and depending on the dip and intersections of the various discontinuities, can withstand near vertical steep slopes required for mining operations.

Table 4.2: General rock structure scheme (Source: Mwiya *at el.,*2004).

GEOMETRY				CHARACTERISTIC				
DISCONTINUITY	LENGTH m	SPACING m	WIDTH m	TRANSMISSIVITY m^2/s	HYDRAULIC CONDUCTIVITY m/s	INFILLING THICKNESS m	EXAMPLE	INFLUENCE INDICATOR
LOW ORDER DISCONTINUITIES. ZONES OUTCROPS								
1^{ST} ORDER	$>10^4$	$>10^3$	$>10^2$	10^{-5} - 10^{-2}	10^{-7}- 10^{-5} AV. [10^{-6}]	10^0	Regional major fault systems	4 V. High
2^{ND} ORDER	10^3 - 10^4	10^2- 10^3	10^1 – 10^2	10^{-7} - 10^{-4}	10^{-8} – 10^{-6} AV. [10^{-7}]	10^{-1}	Local major fault zones	
3^{RD} ORDER	10^2 – 10^3	10^1 – 10^2	10^0 - 10^1	10^{-9} – 10^{-6}	10^{-9} – 10^{-7} AV. [10^{-8}]	$\leq 10^{-2}$	Local minor fault zones	
HIGH ORDER DISCONTINUITIES: INDEPENDENT OUTCROPS								
4^{TH} ORDER	10^1 – 10^2	10^0- 10^1	-	-	10^{-11}-10^{-9} AV.[10^{-10}]	-	Local major joint set or bedding	3 High
5^{TH} ORDER	10^0 - 10^1	10^{-1} - 10^0	-	-	10^{-12}-10^{-10} AV. [10^{-11}]	-	Local minor joints/ fractures	
6^{TH} ORDER	10^{-1} - 10^0	10^{-2} – 10^{-1}	-	-	10^{-13}-10^{-11} AV. [10^{-12}]	-	Local minor fissures / schistosity	2 Low
7^{TH} ORDER	$<10^{-1}$	$<10^{-2}$	-	-	$<10^{-13}$	-	Crystalline voids	1 V. Low

4.4.4 Sources of Water Supply

Groundwater as well as surface water (only during the rainy season) from ephemeral river channels is the sources of water supply in the area as well as much of the Erongo Region (Department of Water Affairs, 2001). The ML Area has moderate groundwater potential in the northeaster half of the licenses covering the targeted marble horizon and low groundwater potential in southwestern half of the licenses area (Figs. 4.6- 4.9). The area with aquifer potential, more or less reflects the rainfall distribution, decreasing westwards. Knowledge of the aquifers in this area is sparse, due to the low number of boreholes and few on groundwater. Recharge from rainfall is an important parameter determining the groundwater potential as well as the degree of metamorphism of local rocks. The groundwater potential of rocks decreases, as the degree of metamorphism increases. Crystalline rocks normally exhibit a very low tendency to store water, typical of the pegmatite zones and the alternating bands within the banded dolomitic marble and biotite-quartz schist found within the project area. The groundwater potential of these rock units is generally low, to locally moderate. Possible targets for water resources in this area are mainly fractured zones, karsts, solution holes and faults associated for the carbonate terrain.

The area along major ephemeral rivers may be more promising due to well developed fractures and faults that give rise to good recharge potential during the rainy season, typical of the local ephemeral spring found within the ML Area. The possible water sources for the proposed mining operations will be from groundwater sources within the marble. The hard-rock aquifer can supply sustainably at yields of up to 5 m^3/h per borehole as seen from past drilling records.

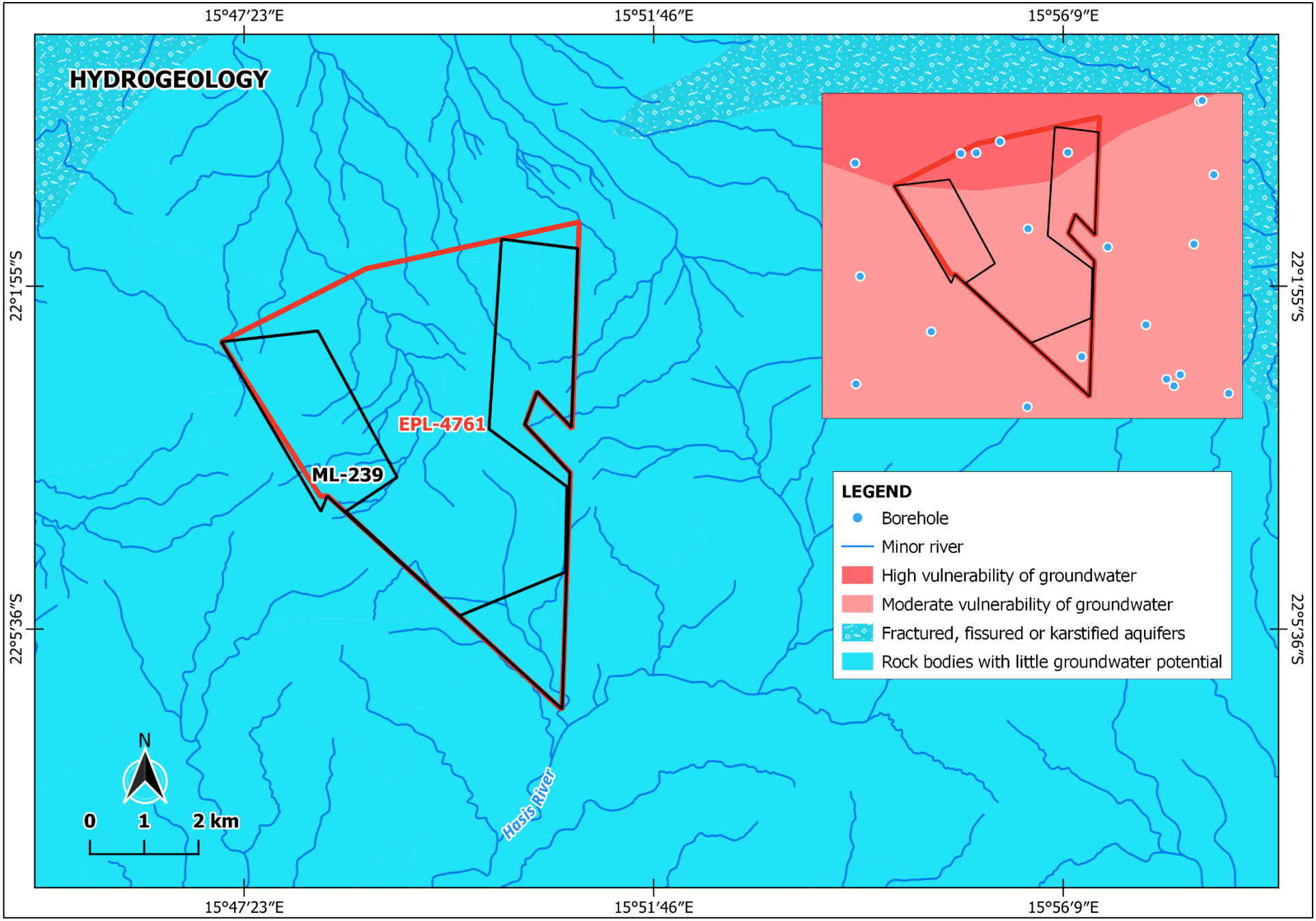


Figure 4.9: Simplified local hydrogeological map of the ML 253.

4.4.5 Evaluation of Water Vulnerability

Vulnerability assessment of surface water covered possible runoff, the presence of source factors and major flow routes such as Ephemeral River Channels, valleys and gullies as pathways and the presence of surface water body as a target.

The groundwater assessments covered hydraulic properties and thickness of the unsaturated and saturated zones derived from geological and hydrogeological data. The assessment of the unsaturated characteristics was based on the ability for source factors to influence the system through known pathway factors such as discontinuities.

However, groundwater or surface water will only be vulnerable to contamination if there are contaminant sources, if there are pathways for contaminant migration and there are targets (surface water or groundwater) present within the project area.

Overall, the limited local groundwater resources found in the area form part of the unconfined aquifer system that is highly vulnerable to any sources of pollution that may be associated with the proposed mining operations (Figs. 4.6 -4.9).

During the rainy season, surface water bodies can be found along the major ephemeral river systems in the area with an active local spring. This surface water often recharges the local groundwater resources along the faults, solutions holes and other discontinuities along the ephemeral rivers in the area. Therefore, surface water in the area could be vulnerable to pollution sources from the proposed mining activities.

It is important that all polluting activities such as waste rock stockpile, dirty water pond and ore stockpile must not be placed or undertaken within the carbonates horizons with high discontinuities such solution holes or other areas with valleys or gullies connected to the major ephemeral rivers systems in the area. Management of wastewater from the onsite administration blocks and related infrastructures will utilise French Drains.

Effective monitoring will need to be put in place to avoid under designing of the facilities that may results in overflow of waste water into the surrounding receiving environment.

4.5 Socioeconomic Environment of ML Area

4.5.1 Socioeconomic Baseline Summary

The ML 253 falls within the Karibib Constituency, Erongo Region in Namibia (Fig. 4.10). The total area of Karibib Constituency covers 14 535.8 km² amounting to 22.8 percent of the total area of Erongo Region (National Planning Commission, 2006, 2007 and 2012).

Karibib Constituency is among the least densely populated area in Erongo Region with a population density of approximately 0.9 persons per km^2. Karibib Constituency is bordered by the Omaruru Constituency in the north, Daures Constituency in the northwest, Arandis Constituency in the southwest and Otjozondjupa and Khomas Regions to the east.

Figure 4.10: Map of the Erongo Region (Source: www.erc.com.na).

The following is the summary of the key socioeconomic information associated with the ML 253 (National Planning Commission, 2006, 2007 and 2012):

(i) Household socio-demographic characteristic:

- The study revealed a diverse socio-economic profile of inhabitants in the study area while portraying similarities in social setups and lifestyle characteristics.

- In terms of gender of head of household, the study indicated that across target communities 55.3% and 44.7% of households interviewed were headed by males and females, respectively.

- Households in Usakos (43%) and Otjimbingwe (40.6%) were headed by relatively older people (>56 years of age) whereas the majority of heads of households in Karibib (42%) and Namdeb (30%) were in the age group of 31–40 years.

- In line with the observation that majority (59.4%) of residents in the study area were relatively younger people in the age groups of 18–35 years (accounting for 26.1%) and 36–60 years (33.2%), it turned out that majority of the households (57.9%) were headed by unmarried (single) persons.

- Across target communities, the average size of the household was 5.15, and ranged between 3.6 and 6.3 persons – being slightly higher than the national average. Otjimbingwe had larger household sizes, the largest being 26 members in one household.

- In terms of household composition, Usakos and Otjimbingwe had relatively more female than male adults, accounting for 19.6% vs. 17.1% and 15.3% vs. 12.7%, respectively. In contrast, Karibib and Namdeb had more male than female adults in the ratio of 19.6% vs. 17.2% and 19.6% vs. 11.8%, respectively

- The same trend was noticed for male and female youths across the study areas, except for Karibib where male youths accounted for 10.7% and female youths 15.7%.

- Children accounted for 30.7% (Usakos) to 38.1% (Otjimbingwe), whereas pensioners accounted for 1.3% (Namdeb) to 9.2% (Otjimbingwe) of households.

- Notably, overall, the larger segment of persons in households consisted of able-bodied persons (59.4%) than children (35.5%) – indicating availability of the critical mass that could be relied upon as labour for various household or community development activities and/or to be tapped into by potential employers, subject to skill-to-job matching.

- The study revealed that out of a total of 767 children, 89 (11.6%) were orphans. Within the study area, Usakos (with 20.5% of children in the household being orphans) had the highest orphans, followed by Namdeb (10.3%), Otjimbingwe (10.2%) and Karibib (4.8%).

- As for disability, the study showed that 3% (65 persons) of the sampled population (n = 2,188) had some form of disability. This figure is slightly lower than the national average of 4.7%.

- In terms of education level of heads of households, one quarter of household heads in Otjimbingwe did not attend any formal education, followed by Usakos (21%), Namdeb (16%) and Karibib (2%). On the same trend, a further 24.4%, 19.5%, 18% and 9.3% of household heads in Otjimbingwe, Usakos, Namdeb and Karibib respectively, ended their academic careers at primary school level.

- Attendance of secondary/high school by unemployed youth in target communities shows statistics that are higher than the national average. For example, on average 40.8% and 46.1% of unemployed female youth (UFY) and unemployed male youth (UMY) respectively, reached Grade 10. A further 34.8% and 34% of UFY and UMY respectively, reached Grade 12.

- In light of education levels as well as the diverse skills and experiences possessed by members of the target community, the study revealed that the target communities would have an abundance of low-skilled and unskilled labour – some of whom can be trained through e.g., on-the-job training, short-courses, and adult learning to assume various roles in different sectors and industries.

- Of relevance to Proponent is the proportion of residents (Karibib – 28%. Namdeb – 18%. and Usakos – 17%) who indicated possession of key experience in mining and/or related fields.

- For convenience and ease of access, over 90% of pre-primary and primary school learners attended schools in their respective towns/places. However, for Namdeb most pre-primary (61.5%) and primary school (92.3%) learners attended pre-primary and primary schools in Karibib because education institutions are non-existent at that settlement.

- As regards to Junior and Senior Secondary (High) School, a similar trend in which town-based (local) schools were generally preferred over schools in other places was observed.

- Of the children (all being in the school-going age) segment within households, 96.8% were enrolled in formal education system, being in concurrence with national average for that age group.

- On average 14.0%, 34.4%, 21.2%, 24.8% and 2.4% were in pre-primary, primary, junior secondary and senior secondary (high) schools respectively, mainly across the study area.

- The study revealed that income sources were diverse, with a strong bias on social grants which sustained 27.8% of the households.

- Further, study noted that a relatively high number of heads of household in Namdeb (72%), Karibib (38%) and Otjimbingwe (18.9%) had no income. Similarly, majority of other household members did not have incomes – Namdeb (86%), Otjimbingwe (63.9%), Karibib (63.3%) and Usakos (46%).

- The only notable exception was 15% of households who had own businesses for additional income in Usakos. 15% in Otjimbingwe who had members employed as civil servants. and 14.7% who had own businesses in Karibib.

- Social grants were relied upon as the main income source by 52.8%, 41% and 15.3% of households in Otjimbingwe, Usakos and Karibib, respectively. Interestingly, despite having no reliable income, households in Namdeb also do not draw much from social grants, with only 2% drawing benefits from this grant mechanism of the state.

- Formal employment accounted for incomes of only 10.7%, 6.5%, 4.0% and 0.6% of household heads in Karibib, Usakos, Namdeb and Otjimbingwe, respectively.

- Reliable farming income was recorded by only 8.3%, 2.5% and 2.0% of households in Otjimbingwe, Usakos and Namdeb, respectively.

- Nearly half (48.3%) of the sampled households had a combined monthly income in the range of NAD 0 to 999. This was followed by the income bracket of NAD 1,000 to 2,999 which represented the average of income of 34% of households.

- Notably, nearly all income-earners (84.0%) residing at Namdeb are in the lowest income category. On the same trend, 93.9% of income-earners in Otjimbingwe were in the bottom two income categories.

- These observations, coupled with other findings pertaining to the socio-economic situation of residents, clearly confirm Namdeb and Otjimbingwe (and Usakos, to some extent) as multiple deprivation hotspots requiring massive investments and programs in the social development space to effectively address the plight of those in need.

(ii) Service provision and community needs

- Majority households and key informants are unsatisfied with municipal services due to a magnitude of reasons. At present, the town/village councils in the target communities do

not have the financial resources or the professional and administrative capabilities to fulfil their mandate as perceived by communities.

- Based on survey findings, 52.5%, 40.0%, 12.0% and 36.7% of households in Usakos, Karibib, Namdeb and Otjimbingwe respectively, had access to formal credit facilities and/or financial services (mainly reputable commercial banks, Nampost and a few micro-lenders).

- Despite the importance of roads, it was evident that the maintenance of roads within the towns of Usakos and Karibib as well as the gravel road between Karibib and Otjimbingwe was sub-standard as per respondent's assertions.

- About 28.1% of households across the study area owned transport assets.

- In line with the aspirations of the government – which is to ensure that all Namibians have access to basic services especially water – none of the households confirmed total deprivation from water services.

- In Usakos, the main water source was piped water connected to dwellings (74.5%) and centralized public taps (24.5%). In Karibib, majority (76.0%) of residents obtained water from public taps and only 22.7% had piped water (22.7%). Namdeb households largely depended on water provided through water tankers (58.0%) and natural open water sources e.g., ponds and rivers (28.0%). In Otjimbingwe, 82.8% obtained water from a public tap, and only 11.1% had water piped into their dwellings.

- The LAs of Karibib and Usakos as well as the settlement administration in Otjimbingwe try their best to ensure adequate public health conditions, including clean drinking water and acceptable treatment and disposal of human excreta and sewage. However, the LAs have been facing financial challenges which cripple effective service delivery – a key concern being ablution facilities.

- Considering that a significantly high number of households (Namdeb – 96.0%. Karibib – 72.0% and Otjimbingwe – 64.4%) did not have access/own ablution facilities and the fact that most households in the target communities resorted to 'bush/veld toilet' when nature calls, there is a looming danger which may see a repeat of outbreaks (e.g., Hepatitis E) such as those experienced in Windhoek and a few other towns in the recent years.

- As part of taking early action including associated preventative measures, the above calls for collection action and expedited investments in servicing new townships and settlements while managing rural-urban migration issues – the root cause of the mushrooming of these settlements or "shanty towns".

- A lot needs to be done in the health domain, with staffing, ambulance, mortuary, pharmacies, availability of drugs/vaccines, general health care service (which was reported as poor by some respondents as poor) being among the list of key issues requiring urgent attention.

- Overall, the main key issues with respect to LAs, are:

  (i) Economic aspects (unemployment, poverty).

  (ii) Insufficient or lack of basic infrastructure (potable water, agro-marketing, irrigation, roads, ablution and sewage, electricity).

  (iii) Amenities (sports and playgrounds, public green areas).

  (iv) Law and order (police station, vehicles).

  (v) Education (teachers, classrooms, equipment, transportation), and.

(vi) Health (staffing, ambulance, mortuary, pharmacies).

(iii) Prioritised needs of target communities:

- Target communities had very diverse opinions on development priorities – most of which discern from the perspective of service delivery and general destitution. Below are the top 3 broad categories of prioritized needs:

  (i) Mega projects/investments with high employment creation potential – to be aligned to the relatively abundant and diverse local labour.

  (ii) Well-equipped vocational centres for tailor-made trainings/skills enhancement, targeting unemployed youth, women or any interested community member(s), and.

  (iii) Diversification and value addition initiatives for food security enhancement and poverty alleviation, targeting vulnerable groups and farmers.

4.5.2 Conclusions and Recommendation on the Socioeconomic Assessment

The proposed mining and ongoing exploration action in the ML 253 will have a positive contribution to economic development and employment opportunities of the Karibib Constituency and the Erongo Region. The Proponent has already invested more than N$600 million in Namibian economy and especially in the Erongo Region. Apart from the planned mining operations in the ML 253, the Proponent has interests in several other licenses and owns both the Karibib and Walvis Bay stone processing factories. The proposed development will coexist with the other current and future land uses in area including conservation, tourism, farming and other planned minerals exploration and mining projects in the general area. The following is the summary of the key actions that the Proponent shall implement as part of enhancing the socioeconomic impacts of the proposed project:

- Stipulate that local residents should be employed for temporary unskilled/skilled and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy. However, due to low skills levels of the local population, it is likely that the majority of skilled positions would be filled with people from outside the area.

- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

- Ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws.

- The local authorities, community organisations and community leaders shall be informed on final decisions regarding the project and the potential job opportunities for local people.

- Stipulate a preference for local contractors in the tender policy. The procurement of services and goods from local entrepreneurs and the engagement of local businesses people should be favoured and promoted provided that it is financially and practically feasible.

- Undertake a skills audit, develop a database of local businesses that qualify as potential service providers and invite them to the tender process.

- Scrutinise tender proposals to ensure that minimum wages were included in the costing.

- Project offers experience and on job skills development, particularly for low or semi-skilled workers. This would raise the workers experience and skills to secure jobs in future.

- ❖ Promising employees could be identified and training and skills development programme could be initiated.
- ❖ The project could organise business partnerships with local entrepreneurs or small SMEs.
- ❖ Service providers to provide opportunities for skills transfer, and.
- ❖ Provide opportunities for employee re-skilling beyond mine closure.

4.6 Archaeology

4.6.1 Regional Archaeological Setting

Modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch. Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and Namib Desert (Kinahan, 2017).

The Recent Holocene archaeological sequence in Namibia, i.e., the last 5 000 years, is of particular importance because it provides the background evidence for the development and recent history of the indigenous peoples of Namibia before the advent of written historical records during the colonial era. Many archaeological sites from this period are of great significance to the understanding of Namibian history, and some are of global importance.

4.6.2 Local Archaeological Setting

In summary, the three area surveys previously undertaken in the vicinity of the ML 253 provide new evidence relating to the last one thousand years, with little indication of earlier occupation. The pre-colonial evidence points to impermanent settlement by groups of probably Khoe pastoralists (Kinahan, 2017). These people formed part of a regional-scale network with links to the Atlantic coast and inland sites where copper was produced.

According to Kinahan, (2017) the large assemblage of ceramic vessels from Habis represents an important addition to the regional archaeological picture. Evidence from the early colonial period relates to mining in the Karibib area and a combination of trade, missionary activity, and wagon repair in the Otjimbingwe area. Both Karibib and Otjimbingwe are centres of historical importance and have several National Monument sites recognized under the National Heritage Act.

4.6.3 Archaeological Desk Assessment

Based on the previous field surveys conducted in the general area (Kinahan, 2017), it is safe to assume that ML 253 will have some sites of archaeological significance and that these will probably date to the late pre-colonial and early colonial periods.

Early colonial remains are expected to be relatively abundant on ML 253, although it is likely that if these are related to historical mining activity, they will form part of the general area of mining interest in the vicinity.

It is expected that the area of mining interest will be extensively disturbed and that little might remain of either pre-colonial or early colonial sites in the near vicinity. However, the targeted marble rocky outcrop areas in the ML 253 will not have rock shelters containing stratified archaeological deposits.

The Proponent must not disturb major natural cavities that may be unearthed because they could hold some highly significant historical or cultural sites that would require detailed documentation and possibly mitigation measures to be adopted in the event of encroachment by mining activity.

4.6.4 Archaeological Conclusions and Recommendations

According to the archaeological assessment that was undertaken in the general area, the ML 253 area probably has archaeological potential, although no archaeological sites have been recorded so far from within the ML 253 area itself. The following is the summary of the expectations:

(i) A high likelihood of Holocene age archaeological sites.

(ii) A high likelihood of late precolonial settlement sites throughout the entire tenement, especially in the vicinity of springs and seepages, and.

(iii) A high likelihood of early colonial settlement remains relating to the historical occupation of Karibib and Otjimbingwe.

The following are the key recommended actions related to archelogy in the ML 253 area:

(i) Contractors working on the site should be made aware that under the National Heritage Act any items protected under the definition of heritage found during development should be reported to the National Heritage Council.

(ii) The Chance Finds procedure as outlined in the EMP must always be implemented, and.

(iii) Detailed field survey should be carried out when the licence holder has identified specific targets for exploration, and before invasive exploration commences.

4.7 Stakeholder Consultations and Engagement

4.7.1 Overview

Public consultation and engagement process have been part of the environmental assessment process for this project. Opportunity for stakeholders and the public to submit written comments / inputs / objections with respect to the proposed mining operations and ongoing minerals exploration activities in the ML 253 were provided from Friday 27th October 2023 to Friday 17th November 2023 (Figs. 4.11-4.11).

4.7.2 Public Consultation Process

Public consultation process was undertaken through emails contact and the newspaper advertisements as shown in Figs. 4.11- 4.14 and Annex 3. The project was extensively advertised as follows:

- Copy of the Public Notice published in the New Era English Daily Newspaper dated Friday 27th October 2023.
- Copy of the Public Notice published in the Market Watch insert in the Republikein Afrikaans Daily Newspaper dated Tuesday 31st October 2023.
- Copy of the Public Notice published in the Market Watch insert in the Namibian Sun English Daily Newspaper dated Tuesday 31st October 2023, and.
- Copy of the Public Notice published in the Market Watch insert in the Allgemeine Zeitung (German Language) Daily Newspaper dated Tuesday 31st October 2023.

Public notices were published in the local newspapers from the Friday 27th October 2023 to Friday 17th November 2023 (Figs. 4.11 - 4.14). A stakeholder register was opened and despite telephonic inquiries with respect to contracts and employment opportunities, no written objection was received. A Stakeholder register is shown Table 4.3. The two (2) registered stakeholders were provided with the BID document but no further written inputs were received during the consultation period.

Table 4.3: Stakeholders register.

Name	Contact Details
1. Dr H Schneider (Owner of Farm Habis 71 (Part 1)) / Interested & Affected Party)	herbert@farmhabis.com
2. Ingo SCHNEIDER (Owner of Farm Habis 71 (Part 1)) / Interested & Affected Party)	ingo.h.schneider@gmail.com
3. Ilme Schneider (Owner of Farm Habis 71 (Part 1)) / Interested & Affected Party)	ilme@farmhabis.com
4. Bianca Foelscher (Small Scale Mining)/ Interested & Affected Party	P O Box 67, KARIBIB Tel. (064) 550109, Email address: leandre.jf@gmail.com

4.7.3 Stakeholders and Public Discussions

The following are the responses to the relevant inputs that were provided by Bianca Foelscher (Small Scale Mining):

(i) Request for public consultation and holding of public meeting: Lack of interest in terms of the number of stakeholders who have registered (Table 4.3) and despite the extensive advertisement drive that was conducted between the Friday 27th October 2023 to Friday 17th November 2023 (Figs. 4.11 - 4.11), it did not make any sense to organise a public meeting for four (4) registered stakeholders.

4.7.4 Stakeholders and Public Consolations Recommendations

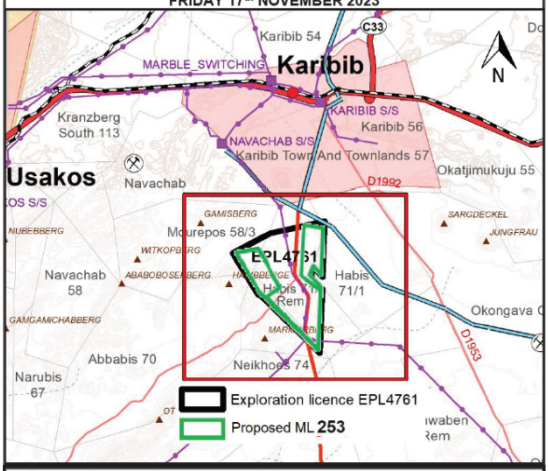
Overall, in meeting the need for continuous stakeholder consultation process, this EIA has recommended that the Proponent shall notify the land owners directly and local community through the Karibib Town Council / local Councillor/s on the implementation of the proposed project once the ECC has been granted. Such communications shall be maintained throughout the lifecycle of the proposed project. This recommendation may be included as condition on the ECC to be issued.

PUBLIC NOTICE

APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) BY BOHALE INVESTMENT TWO CC FOR THE MINING LICENSE (ML) No. 253 IN THE EXCLUSIVE PROSPECTING LICENSE (EPL) No. 4761, KARIBIB DISTRICT, ERONGO REGION

BOHALE INVESTMENT CC (the **PROPONENT**) has applied for the Mining License (ML) No. 253 totalling 13.822 km² with respect to mining and prospecting activities for dimension stones and industrial minerals groups. The ML No. 253 falls within the Exclusive Prospecting License (EPL) No. 4761. The ML area covers commercial farmland portions of Farms Habis Rem 71, Abbabis 70 and Mourepos 58/3 in Karibib District, Erongo Region. The Proponent is part of the Group of companies owned by the same shareholders and has made significant investments in the dimension stone mining and processing / value addition industries in Namibia and owns multiple stone processing factories in the Erongo Region. The Proponent intends to undertake mining of marble in the ML No. 253, supported by ongoing exploration activities. The proposed mining and ongoing exploration activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations 2012 and cannot be undertaken without an Environmental Clearance Certificate (ECC). The Proponent is required to have undertaken Environmental Assessment for the ML No. 253 comprising EIA and EMP to support the application for ECC with respect to the proposed mining and ongoing exploration activities. In fulfilment of these environmental requirements, the Proponent has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to undertake the required Environmental Assessment studies to support the application for ECC. Interested and Affected Parties (I&APS) are hereby invited to register and submit written comments / objections / inputs with respect to the proposed mining operations and ongoing prospecting activities in the ML No. 253. A Background Information Document (BID) is available on request upon registration.

REGISTER BY EMAIL: frontdesk@rbs.com.na
Dr Sindila Mwiya (EAP/Technical Permitting Advisor/Consultant
CONSULTATION DURATION AND DEADLINE FOR WRITTEN SUBMISSIONS IS: FRIDAY 17th NOVEMBER 2023



Risk-Based Solutions (RBS) CC- (URL: www.rbs.com.na)
Your Technical Specialist Consultants, Permitting & De-Risking Advisors in Natural Resources in Petroleum Exploration & Production/ Minerals Exploration & Mining / Energy / Water / Environmental Assessments & Management (ESG, SEA, EIA, EMP, EMS)

REPUBLIC OF NAMIBIA

MINISTRY OF AGRICULTURE, WATER AND LAND REFORM

CALL FOR EXPRESSION OF INTERESTS

FOR THE CONSULTANCY SERVICES FOR THE FENCING AUDIT IN OTJOZONDJUPA REGION; PROCUREMENT REFERENCE NUMBER: SC/RP/37-10/2023

The Ministry of Agriculture, Water and Land Reform is hereby inviting competent legally registered companies, close-cooperation or individuals to express interest to the fencing audit in Otjozondjupa's communal areas.

The objective of the Audit is not to investigate illegal fences for removal purposes, but to identify all fences in communal areas of Otjozondjupa Region, map them and identify their owners and document historical background regarding the erection of fences in the region. All kinds of fences, legal or illegal, shall be identified and mapped for the purpose of controlling the erection of fences in future

CREDENTIALS REQUIRED:

1. **Qualification and experience of Expert (team)**
   - Qualifications (Minimum of Diploma) in Land Administration or Economics or Development Studies or related field.
   - Experience (minimum of 2 year's experience) in conducting land related studies, research or investigations.

Interested companies should submit their company profiles, proof of Namibian registered companies, SME status and a motivation that they meet the requirements required.

NB: Envelopes should be clearly marked: Expression of Interest – Provision of Consultancy Services for the Resettlement Audit in Otjozondjupa Region. All Companies which meet requirements shall be provided with Terms of Reference (ToR) for the preparation and submission of Technical and Financial Offers.

CLOSING DATE: 11 DECEMBER 2023
CLOSING TIME: 11H00

DELIVERY ADDRESS: TENDER BOX, MINISTRY OF AGRICULTURE, WATER AND LAND REFORM, HEAD OFFICE, 55 ROBERT MUGABE AVENUE, GROUND FLOOR, WINDHOEK

ENQUIRIES: MRS. NDAPANDULA TALINYANGE OR / MRS. C. ESTERNHUIZEN (ADMINISTRATION) TEL: +264(61) – 2965156
MR. ALFRED MWALA SIKOPO OF CELL NO 0811410556 (TECHNICAL)

MWALA LUTAKA
HEAD OF PROCUREMENT MANAGEMENT UNIT

Procurement Management Unit
Ministry of Agriculture, Water & Land Reform
24 OCT 2023
Private Bag 13184
Windhoek

KAMANJAB VILLAGE COUNCIL

INVITATION OF BIDS

Kamanjab Village Council is hereby inviting qualified, competent and experienced and registered Namibian Electrical Companies to submit their offers for the Bid below:

BID NUMBER:	**W/ONB/KVC-026/2023**
BID DESCRIPTION:	The supply, delivery and installation, testing and commissioning of medium & low voltage reticulation and Street lighting for Kamanjab, extension 2, Rotsvesting
DOCUMENT PRICE:	N$ 300.00 (Non-refundable)

DOCUMENTS AVAILABLE: The document will be available as from **Friday, 27th October 2023** at Kamanjab Village Council offices.

BID SUBMISSION: Bids must be submitted in a sealed envelope, clearlyMarked with the appropriate Bid number and name, addressed to the Procurement Management Unit to be, deposited in the Bid box at Kamanjab Village Council offices, Erenst Gurirab Street, Kamanjab, Namibia.

CLOSING TIME AND DATE: THURSDAY, 30TH NOVEMBER 2023 AT 12h00

FOR ENQUIRIES:

Procurement management Unit:
Kamanjab Village Council
Ms. Beauty E. Aebes
Tel: 067 330 051 / 081 953 0951
Mobile: 081 143 7237
Email: led@kamanjabcouncil.com
Alternate **(eveaebes@gmail.com)**

Technical:
CENORED
Mr. Meudafano Shakela
Tel: 067 314 100
email: MShakela@Cenored.com.na

REPUBLIC OF NAMIBIA

MINISTRY OF WORKS AND TRANSPORT

DIRECTORATE AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATIONS DIVISION INVESTIGATIONS

Post Designation	:	Deputy Director Grade 4
1 x Post	:	Windhoek
Scale of Salary	:	N$ 478 220 – 502 753
Housing Benefit	:	N$ 68 188 per annum
Motor Vehicle Allowance	:	Capital Costs: N$ 76 950 per annum
	:	Running Costs: N$ 25 751 per annum
Total Allowance	:	N$ 102 701 per annum

MINIMUM REQUIREMENTS: An Appropriate B-Degree on NQF Level 7 and/or equivalent qualifications as listed below plus nine (9) years' experience in aviation.

Aircraft Engineer: A BSc. Degree in Aeronautical Engineering (or equivalent)

OR

An appropriate National Diploma in Aviation Maintenance for Technicians (or equivalent qualification); Completed apprenticeship plus ten (10) years appropriate experience in aviation maintenance; Registration as Engineering Technician plus a Diploma or Certificate in Aircraft Accident Investigations plus three (3) years' experience with an Airplane maintenance licence endorsed under categories A and C, or B or D.

OR

Pilot: A Commercial Pilot License with Instrument Rating, Multi-Engine rating and Night rating plus a total of minimum 2000 hours flying experience.

OR

Airline Transport Pilot Licence (ATPL) and a total of minimum 2000 hours flying experience.

Air Traffic Controller: with Aerodrome control, approach procedural control, area procedural control, approach radar control and area radar control.

ADDITIONAL REQUIREMENTS:
- Certificate in Aircraft Accident Investigations Management
- Certificate in Aircraft Accident Investigations Techniques
- Certificate in Safety Management Systems
- A valid Driver's License

Enquiries: Mr. Magnus Abraham +264 61–208 8411/Ms. L T Moelenyane Tel: +264 61 -208 8133

Women and persons with disabilities who meet the appointment requirements are encouraged to apply. Applications (on form 156043 and health questionnaire form 156094) obtainable at all government offices) together with a comprehensive Curriculum Vitae and certified copies of educational qualifications. Staff members in the Public Service must have completed their probation successfully and may only compete for vacancies, which are on the next higher grade/post level. Applications must be submitted to the following address:

The Executive Director
Ministry of Works and Transport
Private Bag 13341
Ausspannplatz
Windhoek

OR hand delivered to:

The Human Resource Office
Ministry of Works and Transport
Registry Office - Room 101
First floor

NB! Only shortlisted candidates will be contacted and documents will not be returned back. All supporting documents (ID's, Qualifications, and References) must be originally certified by the Namibian Police. Foreign qualifications must be accompanied by NQA evaluation. Failure to complete all items on the application form for employment and not attaching all the required documents will disqualify the application.

CLOSING DATE: 24 DECEMBER 2023

Figure 4.11: Copy of the Public Notice published in the New Era English Daily Newspaper dated Friday 27th October 2023.

035 Regskennisgewings Legal Notices

REZONING NOTICE DUNAMIS CONSULTING TOWN, REGIONAL PLANNERS AND DEVELOPERS on behalf of the owner of Erf 1976 corner of Goshawk and Sunbird Streets, Hochlandpark intends to apply to the Municipal Council of Windhoek for the following:
* Subdivision of Goshawk Road Hochlandpark into Portion 1 and Remainder;
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DM0202300412699

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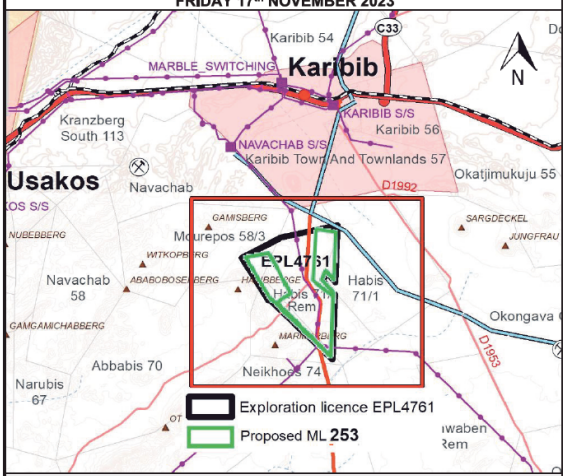

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Figure 4.12: Copy of the Public Notice published in the Market Watch insert in the Republikein Afrikaans Daily Newspaper dated Tuesday 31st October 2023.

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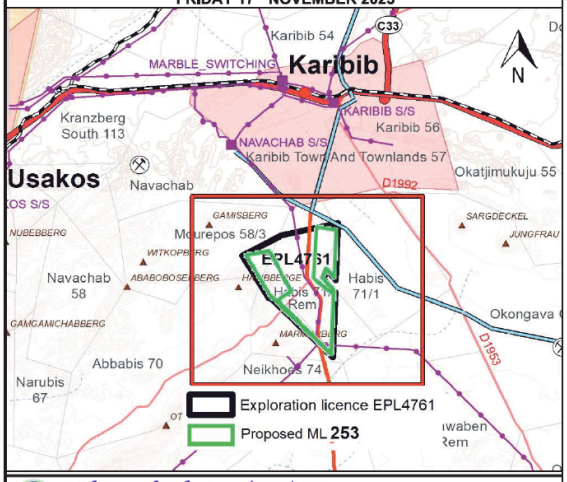

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Figure 4.13: Copy of the Public Notice published in the Market Watch insert in the Namibian Sun English Daily Newspaper dated Tuesday 31st October 2023.

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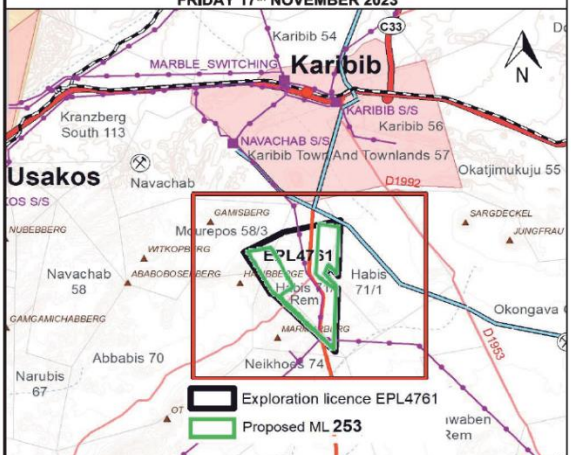

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Figure 4.14: Copy of the Public Notice published in the Market Watch insert in the Allgemeine Zeitung (German Language) Daily Newspaper dated Tuesday 31st October 2023.

5. ASSESSMENT OF LIKELY IMPACTS

5.1 Overview

The impact assessment results detailed in this section of this EIA Report is based on the review of the baseline conditions and has taken into account both the positive and negative impacts on the receiving environment associated with the proposed mining and ongoing exploration activities in the ML 253 activities. The purpose of this EIA report has been to identify and assess the potential environmental and social impacts assessment that could be a consequence of the proposed activities covering the complete project lifecycle from preconstruction to aftercare stages. Through such identification, potentially significant adverse impacts can be avoided, reduced, offset, or managed to the extent feasible, as part of the project design and with mitigation measures as detailed in EMP Report.

The impact assessment process has been an iterative process that has taken place during the project design phase and has required close collaborations of the geological, engineering, mining, environmental and social specialists involved in the proposed mining and ongoing exploration activities in the ML 253. Throughout the preparation of this EIA Report as well as the EMP Report, the layout of the proposed mining operations and supporting infrastructures has undergone review and refinement.

5.2 Evaluation of Impacts

5.2.1 Impact Assessment Objectives

The overall objective of the impact assessment undertaken for this project focused attention specifically on the proposed mining and ongoing exploration activities in the ML 253 impacts of potentially significant risk. The following approach has been undertaken regarding the concept of whether assessed key issues need to be actively addressed in the EMP Report:

- If environmental aspects are evaluated to be of low significance, they do not require specific management plans, and need not be actively addressed in the EMP (although they may still be listed and reported on).

- A decision on the need to actively address any issue with a "Medium" significance ranking will require consideration of other relevant factors, such as the nature of the impact, risks associated with possible cumulative aspects, and the degree of concern of stakeholders, and.

- If environmental aspects receive a "High" significance ranking, they must be addressed by means of active management, mitigation, or rehabilitation measures.

For each negative impact of high or medium significance, mitigation objectives are set (i.e. ways of reducing negative impacts), and attainable management actions are subsequently addressed in the EMP for the proposed mining and ongoing exploration activities in the ML 253. Without management, these impacts would either breach statutory limits or be unacceptable to statutory authorities or to stakeholders, as they would result in a significant deterioration of one or more environmental resources.

The overall impact assessment approach has adopted the Leopold matrix framework which is one of the internationally best-known matrix assessment methodology available for predicting the impact of a project on the receiving environment.

5.2.2 Environmental Impact Assessment Rankings

To ensure consistency in the evaluation of environmental impacts associated with proposed mining and ongoing exploration activities in the ML 253, the rating criteria for the impact assessment have been standardised to include set definitions applied in the risk assessment (Table 5.1).

To the extent possible, allocation to rank categories is based on quantifiable criteria which can be measured as detailed in Table 5.1. Furthermore, when evaluating impacts, the allocated ranks refer to

the resultant *impact* (e.g., area affected, or time that the result of the impact will last), and not of the *cause* thereof (e.g., area actually mined, or time of active impact). Each activity has been assessed with respect to the type of effect that the aspect will have on the relevant component of the environment and includes, "what will be affected and how?" The criteria used to determine the significance rating of the impact(s) is detailed in Table 5.2.

Table 5.1: The criteria used in the evaluation of environmental impacts.

Rating	Definition of Rating
Status of the Impact – in terms of meeting the objective of maintaining a healthy environment.	
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect
Probability – the likelihood of the impact occurring	
Negligible	Possibility negligible
Improbable	Possibility very low
Probable	Distinct possibility
Highly Probable	Most likely
Definite	Impact will occur regardless of preventive measures
Degree of confidence in predictions – in terms of basing the assessment on available information	
Low	Assessment based on extrapolated data
Medium	Information base available but lacking
High	Information base comparatively reliable
Extent – the area over which the impact will be experienced	
Site specific	Confined to within < 1 km of the project
Local	Confined to the study area or within 5 km of the project
Regional	Confined to the region, i.e., > 5 km but < National
National	Nationally
International	Beyond the borders of Namibia
Duration – the time frame for which the impact will be experienced	
Very short	Less than 2 years
Short-term	2 to 5 years
Medium-term	6 to 15 years
Long-term	More than 15 years
Permanent	Generations
Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment	
Negligible	Natural functions and processes are negligibly altered due to adaptation by the receptor(s) to high natural environmental variability
Mild	Natural functions and processes continue albeit in a modified way that **does not** appear to have a significant disruptive effect (i.e. changes are temporary)
Moderate	Natural functions and processes continue albeit in a modified way that **does** appear to have a noticeable disruptive effect (i.e. changes are permanent)
Severe	Natural functions or processes are altered to the extent that they temporarily cease resulting in severe deterioration of the impacted environment
Very Severe	Natural functions or processes permanently cease or are completely disrupted

Table 5.2: The criteria used to determine the significance rating of the impact(s).

Low:	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given project 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 project design and/or alternative mitigation. This would be allocated to impacts of moderate severity, 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(ies) causing it should not be permitted without substantial mitigation and management, and pro-active rehabilitation commitments (i.e. there could be a 'no-go' implication for the project). This would be allocated to impacts of severe magnitude, locally over the medium-term, and/or of severe magnitude regionally and beyond.

5.2.3 Assessment of Alternatives

The various project alternative has been assessed for the proposed marble quarry in the ML 253 and will need to be continuously reviewed at various stages of the project development process. The

following alternatives have been considered and evaluated with respect to the proposed project preconstruction, construction, operation and monitoring, rehabilitation and closure as well as the aftercare stages:

(i) **Location of the Marble Deposits/ Proposed Operations:** A number of the different marble deposits are known to exist in different parts of Namibia and some have been explored and mined by different companies over the years. The deposits found around the proposed ML 253 area have been explored and still being mined by different companies in the area. Based on the historical records available as well as the results of the comprehensive work covering desktop studies, field-base data collection process, including a field surface, drilling and sampling programmes undertaken, there is potential to develop a mining project in this area compared to other known deposits. More so, however, is that the deposit is located in an area with very good infrastructure required for development a dimension stone mining project including close to the town of Karibib where the processing plant is situated with good road network connecting the proposed mining (ML No. 253) to Karibib.

(ii) **Exploration Methods:** In general, an exploration programme covers four stages namely: desk study, scoping, pre-feasibility and feasibility. The type of exploration methods applied at each stage may be different and will depend on the various issues such as the type of the hosting rocks, depth, as well as the level of detail required. All different variables and alternatives have been considered in the evaluation of the influences likely to be posed by the ongoing exploration activities. Due to the availability of sufficient historical data sets, much of the exploration activities undertaken at each of the four stages (scoping, pre-feasibility and feasibility) comprised desk studies, surface field mapping, sampling, trenching in selected areas, sampling in selected areas, test mining and ore reserve assessments and evaluations. Other exploration techniques such as geophysical surveys have also been considered.

(iii) **Mining Methods**: The mining techniques will use open cast mining in the extraction of the marble blocks as the only safe and practical mining method for dimension stone. The blocks will be cut using a diamond wire and removed by a frontend loader for sorting and stockpiling.

(iv) **Transport:** Assessment of the transport alternatives are more of a major issue to the mining phase compared the exploration. During the exploration much of the transport mechanisms will utilise light 4x4 vehicles. Transport of marble blocks from the mining face to the stockpile will be done by the front-end loader and from the mine stockpile / storage to Karibib / Walvis Bay processing plant will be done by trucks.

(v) **Processing:** A dimension stone ore body comprise block of rock from which certain shape and size block can be taken out by sawing with a diamond cutter. These blocks will be cut, trimmed and processed into a variety of products. All the marble blocks produced will be inspected and classified in terms of size, dimension colour, texture, fractures, veins and spots etc.

(vi) **Water Resources:** Groundwater is available in the area. Permission for the extraction of water (drilling of borehole to support the proposed mining operations) and the disposal of waste water will need to be obtained from the Ministry of Agriculture, Water and Land Reform. The main source of water in the area is the groundwater associated with the good secondary hydraulic properties with limited surficial covers and extensive carbonate deposits in the area. The strategies for the recycling and reuse of water will need to be implemented.

(vii) **Energy Sources:** The available sources of energy include solar, diesel, Liquid Petroleum Gas (LPG) and petrol have been considered and subject to availability. Various alternative combinations will need to be considered as part of the development of this proposed marble project.

(viii) **The No-Action Alternative** - A comparative assessment of the environmental impacts of the 'no-action' alternative (a future in which the proposed mining and ongoing exploration activities in the ML No. 253 do not take place) has been undertake. An assessment of the environmental impacts of a future, in which the proposed mining and ongoing exploration activities do not

take place, may be good for the receiving environment because there will be no negative environmental impacts due to the proposed mining and exploration operation that may take place in the ML No. 253 area. The environmental benefits will include: No negative environmental impact on the receiving environment. However, it is important to understand that even if the proposed mining and ongoing exploration activities do not take place, to which the likely negative environmental impacts is likely to be low and localised (subject to the outcomes of the EIA and EMP Phases), the current and other future land uses such as agriculture will still have some negative impacts on the receiving environment. The likely negative environmental impacts of other current and future land use that may still happen in the absence of the proposed mining and ongoing minerals exploration activities includes: Land degradation due to natural Climate Change, drought, poor land management practices, erosion and overgrazing. Furthermore, it is also important to understand what benefits might be lost if the proposed mining and ongoing exploration activities do not take place. Key loses that may never be realised if the proposed mining and ongoing project activities do not go-ahead include: Loess of more than N$600 million investment that has been made in Namibia, loss of more than 384 direct jobs that have been created, loss of potential added value to the unknown marble resources, loss of direct and indirect socioeconomic benefits derived from current and future mining and exploration activities, contracts, export earnings, future foreign direct investments, license rental fees, royalties and various other taxes payable to the Government during the mining operational stage.

(ix) **Other Alternative Land Uses:** The proposed mining area fall within Karibib Townlands and commercial agricultural land uses area dominated by cattle and small stock farming as well as quarrying. The growing game farming is also making tourism a vital socioeconomic opportunity in the general area but not necessary within the ML No. 253. Minerals exploration and mining activities are well known land uses options in Namibia and the surrounding ML area. Due to the limited and localised scope of the proposed mining and ongoing exploration within the ML No. 253 and the implementation of the EMP, it's likely that the proposed mining and ongoing exploration activities can coexist with the current and future land uses within the ML No. 253.

(x) **Potential Land Use Conflicts:** Considering the current land use practices (Townlands, agriculture and mining) it is likely that the development of a mine in the ML No. 253 area can still co-exist with the existing and potential future land uses of the area. However, much more detail assessment of any likely visual and other socioeconomic impacts will need to be undertaken as part of the EIA. The use of thematic mapping thereby delineating zones for specific uses such as conservation, mining or tourism etc, within the ML area will greatly improve the multiple land use practices and promote coexistence.

(xi) **Ecosystem Function** (**What the Ecosystem Does**)**:** There are wildlife habitats, carbon cycling or the trapping of nutrients and characterised by the physical, chemical, and biological processes or attributes that contribute to the self-maintenance of an ecosystem in this area. The proposed mining and ongoing exploration activities will not affect the ecosystem function due to the limited and localised scope and the ecosystem of ML area is part of the larger local and regional ecosystems which are all interlinked.

(xii) **Ecosystem Services:** Food chain, harvesting of animals or plants, and the provision of clean water or scenic views are some of the local ecosystem services associated with the ML area. However, the proposed mining and ongoing exploration activities will not affect the ecosystem services due to the limited scope, area of coverage and the ecosystem of ML area is part of the larger local and regional ecosystems which are all interlinked.

(xiii) **Use Values**: The ML area has direct use for other land uses such as townlands, agriculture, conservation and tourism as well as indirect include watching a television show about the general area and its wildlife, food chain linkages that sustains the complex life within this area and bequest value for future generations to enjoy. The proposed mining and ongoing exploration activities will not destroy the current use values due to the limited and localised scope of the proposed mining and ongoing activities as well as the adherence to the provisions of the EMP, and.

(xiv) **Non-Use or Passive Use**: The proposed ML area has an existence value that is not linked to the direct use / benefits to current or future generations. The proposed mining and ongoing exploration activities will not affect ecosystem current or future none or passive uses due to the limited and localised scope that will leave much of the ML area untouched and the ecosystem of the ML area is part of the larger local and regional ecosystems which are all interlinked.

5.2.4 Likely Sources Positive Impacts

Not all activities of proposed mining and ongoing exploration operations have negative impacts on the receiving environment. The following is summary of the positive socioeconomic impacts identified associated with the proposed project development:

- The contribution of taxes, royalties and dividends- These will contribute to the national economy. Namibian Government will benefit in the form of taxes, royalties and dividends. This also includes property and company income taxes to the Namibian Government.

- Employment – provision of work provides an income, with boosting the quality of life for employees and their families. which will also reduce unemployment and sustain the Namibian economy.

- Transfer of knowledge, skills and technology associated with different aspects of the Development – the use of new technologies will call for a new skills base which has to be transferred to employees.

- Investments in community development –The Company is committed in community development of the local infrastructure such roads and water supply. Furthermore, once in full operation, the company is also committed to support education (particularly in the area of science and technology), health, welfare and sustainable income-generating community projects in Namibia, and.

- Secondary economic boost – the development will aid in sustaining secondary industries in Karibib, Erongo Region and elsewhere in Namibia.

5.2.5 Likely Sources of Negative Impacts

Table 5.3 summarise the key sources of likely negative impacts associated with the proposed mining and ongoing exploration operations in the ML 253 and it's inclusive of the supporting infrastructure such as roads and water supply services.

The impact assessment covering this EIA Report and the preparation of the EMP reports has been undertaken in line with the following envisaged proposed mine and supporting infrastructures (roads and water supply) developmental stages:

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

Table 5.3: Summary sources of negative impacts associated with the proposed mining and exploration activities in the ML 253.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	
PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout	
	2. Engineering design of the pit areas and the support facilities	
	3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure	
	4. Access roads upgrading of existing tracks / creation of new routes as may be required	
	5. Implementation of the human resources, community and social programs for the operational phase of the project	
	6. Top soil removal and storage for the pit areas and supporting infrastructure	
	7. Development of the temporary construction camp	
	8. Installation of containerised offices, workshops, storage facilities.	
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Waste rock and mine blocks stockpiles
		3. Water supply systems
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)
		5. Containerised administration blocks and warehouses
		6. Fuel supply and storage
		7. Workshop and equipment maintenance facilities
		8. Wastewater treatment systems
		9. Domestic solid waste disposal storage / transfer facility
		10. Storm water management in the pit and supporting infrastructure
	PIT AREA	1. Mining operations
		2. Actual and stripping of the overburden to create direct access to the fresh marble
		3. Ore production for test mining operations
		4. Test mining and commissioning
OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required)	
	2. Transportation of the mined blocks from pit to the sorting	
	3. Storage and transportation of marble blocks to Karibib or Walvis Bay for further processing	
	4. Waste rock management / reprocessing / recovery	
	5. Ongoing exploration support	
	6. Ongoing rehabilitation and maintenance	
	7. Waste water management	
	8. Municipal solid waste management / transfer to Karibib	
	9. Environmental performance monitoring	
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	
	2. Closure of open pits	
	3. Closure of solid waste transfer station	
	4. Backfill all excavated areas	
	5. Closure of the mined blocks storage area	
	6. Decommissioning of water and electricity infrastructure	
	7. Overall land reclamation	
	8. Restoration of internal roads	
	9. Revegetation and aftercare as may be required	

5.3 Impact Assessment Results

5.3.1 Positive Impact Assessment Results

Tables 5.4 - 5.10 summarises the impact assessment results associated with positive impacts which are mainly linked socioeconomic issues covering payment of taxes / royalties, employment, improved local infrastructure, training and skills transfer, boost to local economies, development of technology and technological advancement.

Table 5.4: Payment of Taxes / royalties.

Contribution to national economy through payment of taxes and royalties	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	National: The Proponent may use international contractors are maybe required but the bulk of the support services will be reserved for Namibian companies / services providers
	Duration	Medium-term
	Intensity	Moderate
	Significance	High. The Proponent will make a marked contribution to the Namibian economy through payment of taxes and royalties throughout the life of the proposed mine

Table 5.5: Employment.

Provision of employment opportunities boosting the local economy	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	National: Employees are mostly from Namibia
	Duration	Medium-term
	Intensity	High
	Significance	High. a significant number of especially Namibian families will be supported financially over the life of the proposed mining operations

Table 5.6: Improved local infrastructure.

Upgrade of the local infrastructure such as access road linking the mine to main national B2 Road	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Local
	Duration	Medium-term
	Intensity	Moderate
	Significance	Medium

Table 5.7: Training and skills transfer

Provision of employee training and development of skills including high value beneficiation support in Karibib and Walvis Bay	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Long-term
	Intensity	High (=Severe)
	Significance	High

Table 5.8: Boost to local and reginal economies.

Use of Usakos or Karibib to house the mine workers and Walvis Bay as the logistics base and facilities, purchasing of local goods and services, use of local vendors, local employment and local economic boost.	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Local to Regional
	Duration	Long-term
	Intensity	High (=Severe)
	Significance	High

Table 5.9: Development of technology and technological advancement.

Research and design associated with minerals exploration, mining and processing techniques including high value beneficiation	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Permanent
	Intensity	Moderate
	Significance	High

Table 5.10: Sponsorships of research, education and community projects.

Creation of opportunities for research and education Improved environmental knowledge/awareness with links to institutions of higher learning	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Medium-term
	Intensity	Moderate
	Significance	Medium

5.3.2 Negative Impact Assessment Results

5.3.2.1 Preconstruction

The preconstruction is very important from an environmental perspective. The preconstruction phase will cover site preparation (clearing, stripping and grading) and construction of the supporting infrastructure.

The following is the summary of the key activities that have been assessed in the EIA with respect to the site preparation and construction of mine infrastructure phase:

(i) Site investigations to inform the mine design and layout.

(ii) Engineering design of the pit areas and the support facilities.

(iii) General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure

(iv) Access roads upgrading of existing tracks / creation of new routes as may be required

(v) Implementation of the human resources, community and social programs for the operational phase of the project.

(vi) Top soil removal and storage for the pit areas and supporting infrastructure, and.

(vii) Development of the temporary construction camp, and installation of campsites, offices, workshops, storage facilities.

All the above activities are likely to have potentially important environmental implications. Potential concerns are related to highly localised negative impacts on natural environment (air quality, noise, water, soil), built environment (roads, transport systems, buildings, infrastructure), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem (services, function, use values and non-use) (Tables 5.11 - 5.13).

Detailed mitigation measures are provided in the EMP Report. The preconstruction related activities are also associated with the air quality, risk of spills and accidents, which could result in the release of

contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

Table 5.11: General site clearing of the pit area, administration block, waste rock and supporting infrastructure.

Preconstruction activities associated exploration, mining and supporting infrastructure	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.12: Access roads clearing and upgrading the existing and creation of new road networks.

Preconstruction activities associated with the access road linking the ML area	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.13: Development of the temporary construction facilities.

Preconstruction activities associated with the development of the temporary construction facilities	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.14: Installation of campsites, offices, workshops, storage facilities

Preconstruction activities associated with the installation of campsites, offices, workshops, storage facilities by upgrading the existing and creation of new structures	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.15: Air quality and noise related potential environmental concerns during site preparation and the construction of mine infrastructure.

Potential Sources of Concern	Nature of Potential Concern	Assessment of Impacts
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of particulate matter, carbon monoxide, oxides of nitrogen, sulphur dioxide, and volatile organic compounds	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: Highly probably and can be reduced low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Fuel and chemical transportation, handling and storage	❖ Potential releases of volatile organic compounds and other harmful substances	
3. Site preparation and construction activities	❖ Potential releases of particulate matter	
4. Noise from preconstruction activities, including vehicle operations and drilling	❖ Noise may affect local wildlife populations, and well as workers	

Table 5.16: Water quality and aquatic ecosystems related potential environmental concerns during site preparation.

Potential Sources of Concern	Nature of Potential Concern	Assessment of Impacts
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of substances such as suspended solids, trace metals, oil, degreasers, and detergents and other harmful substances that could affect water quality and aquatic ecosystems	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: Highly probably and can be reduced low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Fuel and chemical transportation, handling and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect surface waters or groundwater as well as aquatic ecosystems	
3. Site preparation and construction activities	❖ Potential release of sediments, increasing concentrations of total suspended solids in receiving waters	
4. Sewage and wastewater disposal	❖ Potential releases of nutrients and other contaminants	
5. Construction of site access roads and power lines	❖ Potential release of sediments along the routes, increasing total suspended solids in receiving waters ❖ Potential for acidic drainage if sulphide-bearing minerals are exposed during construction ❖ Stream crossings for access roads may affect aquatic ecosystems ❖ Increased road access in remote areas may lead to increased land degradation	

Table 5.17: Soil quality and terrestrial ecosystems related potential environmental concerns during site preparation.

Potential Sources of Concern	Nature of Potential Concern	Assessment of Impacts
1. Fuel and chemical transportation, handling and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect soils, vegetation and wildlife	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: Highly probably and can be reduced low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Operation of vehicles	❖ Vehicle operations may result in collisions with wildlife	
3. Site preparation and construction activities	❖ Clearing of vegetation on site may have impacts on biodiversity, particularly if any rare, threatened or keystone species are present ❖ Activities on site may disrupt and dislocate local wildlife and any migratory wildlife in the area ❖ Some animals may be drawn to the site as a result of improper waste disposal or kitchen odours, which could lead to potential hazards for both workers and the animals	
4. Construction of site access roads and power lines	❖ Construction activities may disrupt and dislocate wildlife and any migratory wildlife in the area ❖ Increased road access in remote areas may lead to increased hunting, stressing wildlife populations ❖ Vehicle operations may result in collisions with wildlife	

5.3.2.2 Construction Stage

The construction stage of the proposed mining development and ongoing exploration activities in the ML 253 will cover the mine supporting infrastructure and the actual mine workings. These activities will last for periods ranging from six (6) months and one (1) year. The following are the key activities that have been assessed:

1. **Mine Supporting Infrastructure:**

   (i) Transportation facilities, including access roads to the site and on-site roads.

   (ii) Supporting site infrastructure including foundations and fencing.

   (iii) Waste rock stockpiles.

   (iv) Groundwater water supply systems.

   (v) Local generator areas for power infrastructure.

   (vi) Administration blocks.

   (vii) Fuel supply and storage / yard.

   (viii) Workshop and equipment maintenance facilities.

(ix) Wastewater treatment system.

(x) Solid waste transfer facility (No Municipal Waste disposal shall be developed on Site), and.

(xi) Storm water management around the pit, waste rock and supporting infrastructure.

2. Mine workings:

(i) Excavation as maybe required to create direct access to the marble.

(ii) Actual pit excavation and stripping of the overburden to create direct access to fresh marble.

(iii) Marble production for test mining operations, and.

(iv) Test mining and commissioning.

Tables 5.18 – 5.28 summarises impacts of the proposed construction of the mine supporting infrastructure and workings with respect to the natural environment (air quality, noise, water, soil), built environment (houses, roads, transport systems, buildings, infrastructure), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem (services, function, use values and non-use). The construction related activities are also associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

Table 5.18: Transportation facilities, including access road linking the mine site to the main national road network and on-site roads linking various operational areas.

Construction of the transportation facilities, including access roads to the site and on-site roads	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Will involve upgrading of existing roads)

Table 5.19: Supporting site infrastructure including foundations and fencing.

Construction of supporting site infrastructure including foundations and fencing	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas)

Table 5.20: Waste rock stockpiles.

Construction of waste rock stockpiles	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium (Use already disturbed areas)

Table 5.21: Water supply systems.

Construction of water supply systems	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas)

Table 5.22: Local generator areas for power infrastructure.

Construction / preparation of areas for generator / power infrastructure	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate to High

Table 5.23: Administration blocks and warehouses.

Construction of new administration blocks and warehouses	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.24: Fuel supply and storage / yard.

Construction of fuel supply and storage	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.25: Workshop and equipment maintenance facilities.

Construction of workshop and equipment maintenance facilities	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.26: Solid waste transfer facility.

Construction of new solid waste disposal storage / transfer facility. No burial of municipal / hazardous waste is allowed to be buried within the ML Area	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas / old mine compound)

Table 5.27: Wastewater treatment systems.

Construction of wastewater treatment system (French Drains Systems to be used)	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.28: Storm water management around the pit, waste rock and supporting infrastructure.

Construction of peripheral storm water management around the quarry, waste rock and supporting infrastructure such yard and workshop in order to prevent leachate from entering the local ephemeral rivers	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

5.3.2.3 Mine Operations and Ongoing Exploration

5.3.2.3.1 Overview

The following is the summary of the key component of the proposed mining operations stage that has been assessed with respect to the natural environment (air quality, noise, water, soil), built environment (houses and roads,), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem services, function, use values and non-use:

(i) Mining operations (actual mining operations including excavation as maybe required).

(ii) Transportation of the mined materials from pit to the yard for sorting.

(iii) Transportation of the $5m^3$ mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay.

(iv) Operations of the waste rock.

(v) Ongoing exploration support.

(vi) Ongoing rehabilitation and maintenance.

(vii) Waste water and sludge management, and.

(viii) Environmental Monitoring on the overall receiving environment.

Mining operations and ongoing explorations activities are also associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

5.3.2.3.2 Actual Mining Operations

The primary environmental concerns associated with marble extraction activities are the disposal of waste rock and the release of mine water. Waste rock disposal and water management and treatment are further discussed below. Ore extraction activities can also affect the environment as a result of dust, noise and vibration. The impact assessment of the proposed mining operation with respect to the receiving environment is shown in Table 5.29.

Table 5.29: Actual mining operations.

Mining operations (actual mining operations including excavation as maybe required	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.3 Transportation of the Mined / Recovered Marble 5m^3 Blocks

The primary environmental concerns associated with the transportation of the mined / recovered marble 5m^3 blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay relates to the air quality, disposal of waste rock / offcuts and the management and treatment of wastewater as well as all other associated components of the receiving environment.

The impact assessments for all forms of ore transportation activities and storage with respect to the receiving environment are shown in Tables 5.30 and 5.31.

Table 5.30: Transportation of the mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay.

Transportation of the 5m^3 mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low

Table 5.31: Storage and transportation of recovered minerals for further high value addition beneficiation and export through the Port of Walvis Bay.

Storage and transportation of recovered minerals for further high value addition beneficiation and export through the Port of Walvis Bay	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low

5.3.2.3.4 Operations of a New Waste Rock

The production of marble blocks will always result in unwanted poor-quality materials as well as offcuts from the operations. The poor quality and offcuts will be deposited on the waste rock dump. The key concern in the management of mine waste is the prevention or control of the release of contaminants that could have significant environmental impacts.

Groundwater seepage is also a concern for waste rock facilities, in that seepage into the groundwater could result in the release of contaminants through a permeable foundation layer or other instability. The impact assessment results for operating a new waste rock dump as part of the mining operations with respect to the receiving environment are shown in Table 5.32.

Table 5.32: Operations of the waste rock.

Operation of new waste rock	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.5 Ongoing Exploration Ongoing Rehabilitation and Maintenance

In order to extend the life of the proposed mining operations, there will be a need to continue undertaking exploration activities. At the same time, there will be a need to continuously undertake ongoing rehabilitation and maintenance of the mined-out areas in order to make sure that the overall environmental liabilities for final rehabilitation are minimised during the mine closure. The environmental impacts assessment for the ongoing exploration, rehabilitation and maintenance activities in support mining operations are shown in Tables 5.33 and 5.34.

Table 5.33: Ongoing exploration.

Ongoing exploration to support the mining operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

Table 5.34: Ongoing rehabilitation and maintenance.

Ongoing rehabilitation and maintenance to support for the mining operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.6 Waste Water and Sludge Management

The management of waste water from the proposed mining operations is key potential source of pollution. According to the preliminary design of the proposed mining operations precautionary measures have been incorporated in the management of waste water and sludge from the proposed operations. The composition of waste water and sludge varies, and sludge may contain a wide range of metals.

The volumes of waste water and sludge likely to be produced from the proposed mining operations will be limited and will not exceed the designs over the life of the proposed operations mine. Any produced waste water and sludge will be disposed on site. Although there may be some uncertainties about the long-term chemical stability of waste water and sludge there are however, minor risks that they are likely to become sources metals beyond the final mine closure stage of the proposed mining operations.

Waste water and sludge disposal for both the mining operations impact assessment results with respect to the receiving environment covering the complete lifecycle of the proposed project are shown in Table 5.35.

Table 5.35: Waste water and sludge disposal.

Waste water and sludge and sludge management	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Less volumes and dry conditions)

5.3.2.3.7 Exploration, Mining, Supporting Infrastructure and Impacts on Water

Freshwater management constitute the primary environmental concern for the proposed mine. An effective water management program must incorporate the following cleaner production measures to:

- Segregate clean and contaminated water flows in order to help reduce the requirement for the treatment of effluent.
- Control and address seepage losses, and.
- Reduce water usage by recycling water for further process use.

Measures that can be used in water management include drainage ditches to divert off-site water and drainage ditches and diversions to control the flow of on-site water and prevent contamination in order to prevent contaminated waters from leaving the site before treatment.

The impact assessment results of exploration and mining inclusive of all the supporting infrastructure activities on the receiving environment, covering the complete lifecycle of the proposed project are shown in Table 5.36.

Table 5.36: Exploration, mining, supporting infrastructure and Impacts on water.

Overall likely impacts of mining and exploration operations including supporting infrastructure activities on water	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.8 Exploration, Mining, Supporting Infrastructure and Impacts on Air Quality

Air quality impacts from exploration, mining, supporting infrastructure are mainly associated with the releases of airborne particulate matter.

Operation of vehicles and generators can also lead to releases of greenhouse gases and various air contaminants, including sulphur oxides, nitrogen oxides, carbon monoxide and particulate matter. Releases of airborne particulate matter can result from various activities.

Climatic components have a direct linkage to the air quality. Overall, the proposed project activities will have low significant impacts on the air quality. The impact assessment results of the exploration, mining, supporting infrastructure on the receiving environment, covering the complete lifecycle of the proposed project are shown in Table 5.37.

Table 5.37: Mining, processing and minerals recovery impacts on air quality.

Overall likely impacts on air quality during mining and exploration operations including excavation, drilling, blasting as maybe required for all activities	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low

5.3.2.3.9 Exploration, Mining, Supporting infrastructure and Impacts on Flora

The stripping of outcrops during mine construction and operation thereof, can have significant local effects on resident plant communities. These communities also represent wildlife habitat, and destroying habitat can lead to the loss of local breeding grounds and wildlife movement corridors or other locally important features.

Mining activity may also contaminate terrestrial plants. Metals may be transported into terrestrial ecosystems adjacent to mine sites as a result of releases of airborne particulate matter and seepage of groundwater or surface water. In some cases, the uptake of contaminants from the soil in mining areas can lead to stressed vegetation. In such cases, the vegetation could be stunted or dwarfed.

Overall, the proposed mining project will have flora disturbance that will be localised. Table 5.38 indicates the potential/envisaged impacts expected regarding floral disturbance (which is obviously closely linked to habitat destruction. Detailed information about the type of flora found in and around the proposed mining area and the protection status are available have been provided in this report.

Table 5.38: Summary of the potential/envisaged impacts expected regarding floral disturbance as a result of the proposed activities linked to habitat destruction.

Description	Floral disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure.
Extent	**1.** Access routes - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual routes. This however, would be a relatively small area(s) with localised implications. **2.** Mining / Prospecting sites - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual sites. This however, would be relatively small area(s) – depending on scale of operations – with localised implications. **3.** Infrastructure - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual sites. This however, would be relatively small area(s) – especially if the existing infrastructure areas are used rather than affecting new sites – with localised implications.
Duration	**1.** Access route(s) - The duration of the impact is expected to be permanent along the route(s). This however, would be relatively small area(s) with localised implications. **2.** Mining / Prospecting sites - The duration of the impact is expected to be permanent at the site(s). This however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The duration of the impact is expected to be permanent at the site(s). This however, would be relatively small area(s) with localised implications.
Intensity	**1.** Access route(s) - The actual sites where construction of the route(s) would be located would be permanently altered. This however, would be relatively small area(s) with localised implications. **2.** Mining / Prospecting sites - The actual mining/prospecting site(s) would be permanently altered. This however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The actual construction sites associated with the various mining infrastructures would be permanently altered. This however, would be relatively small area(s) with localised implications. The areas adjacent the mining/prospecting site(s) and other associated infrastructure should not be significantly affected. This however, would depend on control over the contractors during the road building, construction phase(s) & mining/prospecting phase(s), but should be limited to localised implications. Areas not directly affected by the mining/prospecting and associated infrastructure although within the immediate area would be affected minimally. This would include dust & other associated disturbances in the area, but is limited to the mining/prospecting & construction periods.
Frequency of occurrence	Expected to be a "once off" issue affecting the selected site(s). Further prospecting & associated road construction (should this become necessary/evident during the mining operations) throughout the area would however increase the frequency of occurrence.
Probability	Definite (100%) negative impact on flora is expected in the actual mining/prospecting area(s) as well as the access route(s) and infrastructure development sites. This however, would be much localised and cover only a small area and should avoid sensitive areas. Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts. Highly Probable (75%) negative impact on flora is expected in the general areas especially with large scale extraction of groundwater for prospecting/mining activities. Probable (50%) negative impact on flora is expected from the infrastructure (roads/tracks/buildings, etc.). Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts.
Significance	Before mitigation: **High** and After mitigation: **Medium** to **Low**
Status of the impact	Negative: Localised unique habitats. mountainous areas & drainage lines) with associated flora would bear the brunt of this proposed development, but be limited in extent and only permanent at the actual mining site and access routes and infrastructure sites.
Legal requirements	Flora related: Forest Act No. 12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES, IUCN
Degree of confidence in predictions	As an ecologist I am sure of the above-mentioned predictions made and would suggest that the mitigation measures be implemented to minimise potentially negative aspects regarding the local flora in the area.

5.3.2.3.11 Exploration, Mining, Supporting infrastructure and Impacts on Fauna

Mining and exploration activities can affect fauna as a result of habitat loss and habitat degradation. For example, mining activity may affect migration routes, breeding grounds, or nesting areas. Conversely, some wildlife species may be attracted to mine sites, particularly if food wastes and other wastes that may attract wildlife are not properly managed. Food sources for animals may become contaminated and some contaminants, particularly metals, can magnify up the food chain. This may

lead to increased interactions between humans and wildlife and it could result in animals that pose a risk to persons on site having to be relocated or destroyed. Table 5.39 indicates the potential / envisaged impacts expected regarding fauna disturbance which is obviously closely linked to habitat destruction. Detailed information about the type of fauna found around the proposed mining area and the protection status are provided in this report.

Table 5.39: Summary of the potential/envisaged impacts expected regarding fauna disturbance as a result of the proposed mining project to habitat destruction.

Description	Faunal disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure.
Extent	**1.** Access routes - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual routes. This however, would be a relatively small area with localised implications. **2.** Mining/Prospecting sites - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual sites. This however, would be a relatively small area – depending on scale of operations – with localised implications. **3.** Infrastructure - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual sites. This however, would be a relatively small area – especially if the existing infrastructure areas are used rather than affecting new sites – with localised implications.
Duration	**1.** Access route(s) - The duration of the impact is expected to be permanent along the route(s). This however, would be a relatively small area(s) with localised implications. **2.** Mining/Prospecting sites - The duration of the impact is expected to be permanent at the site. This however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The duration of the impact is expected to be permanent at the site(s). This however, would be relatively small area(s) with localised implications.
Intensity	**1.** Access route(s) - The actual sites where construction of the route(s) would be located would be permanently altered. This however, would be relatively small area(s) with localised implications. **2.** Mining/Prospecting - The actual prospecting/mining site(s) would be permanently altered. This however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The actual construction sites associated with the various mining infrastructures would be permanently altered. This however, would be relatively small area(s) with localised implications. The areas adjacent the mining site(s) and other associated infrastructure should not be significantly affected. This however, would depend on control over the contractors during the road building, construction phase(s) & prospecting/mining phase(s), but should be limited to localised implications. Areas not directly affected by the prospecting/mining and associated infrastructure although within the immediate area would be affected minimally. This would include dust, noise, light & other associated disturbances in the area, but be limited to the prospecting/mining & construction periods.
Frequency of occurrence	Expected to be a “once off” issue affecting the selected site(s). Further prospecting & associated road construction (should this become necessary/evident during the mining operations) throughout the area would however increase the frequency of occurrence.
Probability	Definite (100%) negative impact on fauna is expected in the actual mining areas as well as the access route(s) and infrastructure development sites. This however, would be much localised and cover only a small area(s) and should avoid sensitive areas. Highly Probable (75%) negative impact on fauna is expected in the general areas especially during the construction and mining phase(s) as a result of noise, increased activities, etc. Probable (50%) negative impact on fauna is expected from the infrastructure (roads/tracks/buildings, etc.). Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts.
Significance	Before mitigation: **High** and After mitigation: **Medium** to **Low**
Status of the impact	Negative: Localised unique habitats (e.g. hills, mountainous areas & drainage lines) with associated fauna would bear the brunt of this proposed development, but be limited in extent and only permanent at the actual mining site(s) and access routes and infrastructure sites.
Legal requirements	Fauna related: Nature Conservation Ordinance No. 4 of 1975, CITES, IUCN and SARDB Habitat – Flora related: Forest Act No. 12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES
Degree of confidence in predictions	As an ecologist I am sure of the above-mentioned predictions made and would suggest that the mitigation measures be implemented to minimise potentially negative aspects regarding the local fauna in the area.

5.3.2.3.12 Exploration, Mining, Supporting infrastructure and Archaeology

The likely type of archaeological resources will comprise pre-colonial sites that are likely to be small and widely scattered, probably comprising the remains of hutted encampments and including some burial sites. The impact assessment results of the mining and exploration operations inclusive of all the supporting infrastructure activities on the receiving archaeological resource, covering the complete lifecycle of the proposed project are shown in Table 5.40.

Table 5.40: Exploration, mining, supporting infrastructure and impacts likely impacts on archaeology.

Likely impacts on archaeological resource during the mining and exploration operations including excavation as may be required for all activities	*Status*	Negative
	Probability	Probable (already disturbed areas)
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low

5.3.2.3.13 Exploration, Mining, Supporting Infrastructure on Socioeconomic

The proposed mining, minerals processing and recovery activities are likely to be associated with negative socioeconomic impacts including the increase in prevalence of HIV / Aids. The impact assessment results of the proposed mining and exploration operations inclusive of all the supporting infrastructure activities on the overall socioeconomic environment including any likely increase on the HIV / AIDs prevalence, covering the complete lifecycle of the proposed project are shown in Table 5.41.

Table 5.41: Mining and exploration likely impact on socioeconomic environment.

Likely impacts on socioeconomic environment including HIV/AIDs during the mining and exploration operations including excavation, drilling, blasting as maybe required for all activities	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low

5.3.2.4 Progressive and Final Mine Closure

5.3.2.4.1 Progressive Mine Closure Activities During Mine Operations

In additional to the currently already disturbed land targeted for mining and exploration operations, additional disturbed areas of land may be disturbed during the proposed mining and ongoing exploration activities. Disturbed areas that are not stabilised can be susceptible to erosion caused by both wind and water. Erosion can lead to problems with dust as well as water quality problems related to sedimentation.

During the mine operations phase, it's important for the operator to start with ongoing landscape rehabilitation which may include the reshaping and restructuring of the landscape and erosion control measures. In addition to reshaping or recontouring, landscape restructuring activities can include the use of stockpiled soils to reconstruct soil structure in preparation for revegetation during the final restoration and closure stages. These activities are also associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and

Safety (OHS). Assessment of the overall likely negative impacts associated with the progressive mine closure activities during mine operations are shown in Table 5.42.

Table 5.42: Progressive mine closure activities during mine operations.

Assessment of likely negative impacts associated with the progressive mine closure activities during mine operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate - High

5.3.2.4.2 Final Mine Closure Activities

The objectives of final mine closure are to:

- Ensure public and wildlife safety and preventing inadvertent access to mine openings and other infrastructure.
- Provide for the stable, long-term storage of waste rock.
- Ensure that the site is self-sustaining and to prevent or minimise environmental impacts, and.
- Rehabilitate disturbed areas for a specified land use (e.g., return of disturbed areas to a natural state or other acceptable land use).

The final closure of all the activities of the proposed mine operations will results in both negative socioeconomic impacts such as loss of jobs and positive impacts. Tables 5.43 – 5.45 summarises the impact assessment results associated with the final closure of the proposed mining operations. Table 5.46 provided a summary of components to be addressed in the final mine closure phase linked to the ongoing mine closure activities undertaken during mine operational stage.

Table 5.43: Implementation of sustainable socioeconomic closure plan.

Use of non-renewable resources, closure company operations and the termination of all contributions to the economy including taxes, employment, support to secondary industries	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Long-term
	Intensity	Moderate
	Significance	Medium to High

Table 5.44: Closure of mining and exploration operations and removal of all infrastructure.

Closure of mining and exploration operations and removal of all supporting infrastructure covering: 1. Closure of open pits 2. Closure of solid waste piles at transfer facility 3. Backfill waste dump sites 4. Closure of storage sites	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Long-term
	Intensity	Moderate
	Significance	Medium

Table 5.45: Overall land reclamation and revegetation and aftercare as may be required.

Land reclamation and revegetation of mined out and disturbed areas as part of the implementation of the final mine closure and aftercare stage	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Permanent
	Intensity	Low
	Significance	Low

Table 5.46: Mine components to be addressed in the ongoing and final mine closure plan.

Components	Aspects to be Addressed
Open Pit Mines	○ Slope and bench stability ○ Groundwater and rainwater management ○ Security and unauthorized access ○ Wildlife entrapment ○ Effects of drainage into and from the pit
Yard, Storage / workshop / Sorting Facilities	○ Removal of buildings and foundations ○ Clean-up of workshops, fuel and reagent ○ Disposal of scrap and waste materials ○ Re-profiling and revegetation of site
Waste Rock Piles	○ Slope stability ○ Effects of leaching and seepage on surface and groundwater ○ Dust generation ○ Visual impact ○ Special considerations for some types of mines such as uranium mines
Water Management Facilities	○ Restoration or removal of dams, reservoirs, settling ponds, culverts, pipelines, spillways or culverts which are no longer needed ○ Surface drainage of the site and discharge of drainage waters ○ Maintenance of water management facilities
Solid Waste Transfer Station / and Waste Water Management Facilities	○ Disposal or removal from site of hazardous wastes ○ Disposal and stability of treatment sludge ○ Removal of sewage treatment plant ○ Prevention of groundwater contamination ○ Prevention of illegal dumping ○ Security and unauthorized access
Infrastructure	○ Removal of power and water supply ○ Removal of haul and access roads ○ Reuse of transportation and supply depots

5.3.2.5 Accidents and Emergencies

All the developmental activities of the proposed mine operations in the ML 253 covering the preconstruction, construction, operation, ongoing monitoring and rehabilitation and decommissioning, closure and aftercare stages are associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

Tables 5.47 – 5.51 summarizes the impact assessment results associated with fire, hydraulic fluid spills, re-fuelling, accidents and related operational emergencies.

Table 5.47: Fire.

Fire emergency associated with the mining, processing, minerals recovery, exploration or use of any supporting infrastructure such in any area	*Status*	Negative
	Probability	Improbable. based on standards and procedures implemented and long track record
	Confidence	Medium
	Extent	Site specific (<1 km)
	Duration	Very Short. fires likely to be rapidly extinguished
	Intensity	Mild
	Significance	Low

Table 5.48: Hydraulic fluid spills.

Leakage of hydraulic fluid spill due to rupture of pipes /failure of hydraulic sampling / mining equipment which cannot be contained easily	*Status*	Negative
	Probability	Improbable. based on standards and procedures implemented and long track record
	Confidence	High
	Extent	Site specific (<1 km)
	Duration	Very Short. dispersal of low volume spills will be rapid
	Intensity	Mild
	Significance	Low

Table 5.49: Re-fuelling accidents.

Accidental spillage of fuel during refuelling operations due to rupture of pipes or valve failure	*Status*	Negative
	Probability	Improbable. based on standards and procedures implemented and long track record.
	Confidence	Medium
	Extent	Local
	Duration	Very Short to Short-term
	Intensity	Mild
	Significance	Low

Table 5.50: Mining and exploration or use of any supporting infrastructure emergency including car crush.

Emergency caused by mining and exploration or use of any supporting infrastructure including car crush	*Status*	Negative
	Probability	Improbable, based on strict operational standard and speed limits at all times
	Confidence	High
	Extent	Local
	Duration	Very Short
	Intensity	Moderate
	Significance	Low

Table 5.51: Exposure to potential radioactive sources.

Detrimental effects on the health of personnel as a result of exposure to high natural radiation from the country rocks or radiation related to the operational equipment	*Status*	Negative
	Probability	Improbable (Country rocks will be analysed as part of the exploration programme and no mining and processing equipment will use radiation sources).
	Confidence	High
	Extent	Site specific.
	Duration	Very Short
	Intensity	Very low
	Significance	Very Low

5.4 Overall Impact Assessment Results

5.4.1 Overview

The overall impact assessment methodology adapted for this EIA Report and the development of the EMP Report is in line with the ToR as well as the matrix criteria widely used internationally. The overall matrix framework used for this project is the Leopold matrix which is one of the internationally best-known matrix methodologies available for predicting the impact of a project on the receiving environment.

The Leopold matrix is a two-dimensional matrix cross-referencing the following:

- The activities linked to the project that are supposed to have an impact on man and the environment.
- The existing environmental and socioeconomic conditions that could possibly be affected by the project.

The activities linked to the proposed mine development are listed on one axis, while the environmental and socioeconomic conditions are listed on the other axis, and divided in following three (3) major groups:

- Physical conditions: receiving environment, air, etc..
- Biological conditions: fauna, flora, ecosystems etc., and.
- Social and cultural conditions: Socioeconomic setting, historical and cultural issues, populations, economy…

The activities of the proposed mine development have the potential to affect the environment in many different ways. The first step in the impact identification has been to identify the various types of activities associated with the proposed mine development, together with their associated emissions and land discharges where appropriate. At a high level, the main sources of impact of the proposed mine development are:

- Physical disturbance to the local environment.
- Emissions, discharges and wastes.
- Accidental events.

Accidental events are clearly not a part of the intended activity and their potential occurrence has a low probability of occurrence associated with it. Such impacts have therefor been treated differently.

5.4.2 Assessment of the Proposed Activities and the Key Issues

The results of the overall impacts and key issues associated with the proposed activities / sources (mining, exploration and supporting infrastructure activities) of potential impacts with respect to the receiving environment that could potentially be affected, resulting in key issues are presented in Table 5.52.

Table 5.52: Matrix impact assessment results of the proposed mining, exploration and supporting infrastructure activities.

SCALE		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		RECEPTORS / TARGETS THAT MAY BE IMPACTED							
				PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
				Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout		3 (-)	1 (-)	3 (+)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		2. Engineering design of the pit areas and the support facilities		3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure		3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		4. Access roads upgrading of existing tracks / creation of new routes as may be required		3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		5. Implementation of the human resources, community and social programs for the operational phase of the project		3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Waste rock and mine blocks stockpiles	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Water supply systems	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Power infrastructure, including powerline and distribution systems (Generator and Solar)	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			5. Containerised administration blocks and warehouses	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			6. Fuel supply and storage	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			7. Workshop and equipment maintenance facilities	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			8. Wastewater treatment systems	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			9. Domestic solid waste disposal storage / transfer facility	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			10. Storm water management in the pit and supporting infrastructure	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		MINE WORKINGS	1. Mining operations	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Actual and stripping of the overburden to create direct access to the fresh marble	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Ore production for test mining operations	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			4. Test mining and commissioning	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 5.52: *Cont.*

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Transportation facilities, including access roads to the site and on-site roads	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		2. Waste rock and mine blocks stockpiles	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		3. Water supply systems	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		5. Containerised administration blocks and warehouses	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		6. Fuel supply and storage	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		7. Workshop and equipment maintenance facilities	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		8. Wastewater treatment systems	1(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		9. Domestic solid waste disposal storage / transfer facility	1(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Storm water management in the pit and supporting infrastructure	0(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		2. Mining operations	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		3. Actual and stripping of the overburden to create direct access to the fresh marble	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		4. Ore production for test mining operations	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		5. Test mining and commissioning	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		6. Transportation facilities, including access roads to the site and on-site roads	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		7. Transportation facilities, including access roads to the site and on-site roads	2(+)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		8. Waste rock and mine blocks stockpiles	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		9. Water supply systems	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)

5.4.3 Assessment of the Overall Significant Impacts

5.4.3.1 Overview

The determination of the significance of the negative impacts of the sources was undertaken based on the environmental baseline results and the intensity of the likely negative impact. The assessment was depending upon the degree to which the proposed development activities are likely to results in unwanted consequences on the receptor covering the natural environment such as the physical and biological environments. Overall, the assessment of significant impacts was focused on the ecosystem-based approach that considers potential impacts to the ecosystem as part of the receiving environment.

5.4.3.2 Summary of the Sources of Impacts

The main key sources of impacts that have been used to determine significant impact posed by the proposed mine comprised all the activities associated with the preconstruction, construction, operation and decommissioning stages. Each of the main sources of impacts have been evaluated against the receiving environment (receptor / pathways).

5.4.3.3 Determination of the Overall Likely Significant Impacts

In order to determine the overall significant impact of individual sources associated with the proposed mine development, an impact identification and assessment process was undertaken as part of the EIA. The results of the overall likely significant impacts and key issues associated with the proposed activities / sources (mining, exploration and supporting infrastructure related activities) of potential impacts with respect to the receiving environment that could potentially be affected, resulting in key issues.

The EIA impact identification and assessment processes has focused on the receiving environment (Physical, Biological and Socioeconomic) interaction approach with respect to the proposed project activities, the pathways and the likely targets or receptor. In this process, components of the project activities that are likely to impact the receiving environment were broken down into individual development stages and activities (Table 5.53).

Table 5.53: Significant matrix impact assessment results for mining, exploration and supporting infrastructure activities.

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

				RECEPTORS / TARGETS THAT MAY BE IMPACTED							
				PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic-Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		2. Engineering design of the pit areas and the support facilities		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		4. Access roads upgrading of existing tracks / creation of new routes as may be required		B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		5. Implementation of the human resources, community and social programs for the operational phase of the project		B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2. Waste rock and mine blocks stockpiles	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3. Water supply systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4. Power infrastructure, including powerline and distribution systems (Generator and Solar)	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5. Containerised administration blocks and warehouses	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			6. Fuel supply and storage	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			7. Workshop and equipment maintenance facilities	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			8. Wastewater treatment systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			9. Domestic solid waste disposal storage / transfer facility	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			10. Storm water management in the pit and supporting infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		MINE WORKINGS	1. Mining operations	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			2. Actual and stripping of the overburden to create direct access to the fresh marble	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			3. Ore production for test mining operations	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			4. Test mining and commissioning	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)

Table 5.52: *Cont.*

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

			RECEPTORS / TARGETS THAT MAY BE IMPACTED							
			PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required)	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Transportation of the mined blocks from pit to the sorting	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Storage and transportation of marble blocks to Karibib or Walvis Bay for further processing	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Waste rock management / reprocessing / recovery	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Ongoing exploration support	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Ongoing rehabilitation and maintenance	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Waste water management	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Municipal solid waste management / transfer to Usakos or Karibib	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		9. Environmental performance monitoring	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Closure of open pits	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Closure of solid waste transfer station	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Backfill all excavated areas	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Closure of the mined blocks storage area	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Decommissioning of water and electricity infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Overall land reclamation	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Restoration of internal roads	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		9. Revegetation and aftercare as may be required	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)

6. EIA CONCLUSIONS AND RECOMMENDATIONS

6.1 Development Opportunities

This EIA Report forms a part of the comprehensive feasibility work programme that has been implemented in accordance with the environmental requirements with respect to the proposed marble mine and ongoing exploration activities in the ML 253. With high regard to good environmental performances, the overall objective of the proposed development is to develop a medium to large size marble quarry / mine in the ML 253.

Based on all the data collected and analysed at different stages of this Environmental Assessment process, including all the findings and recommendations of the specialist assessments, there are opportunities to implement the proposed mine with higher considerations to good environmental performances. The proposed marble mine and ongoing exploration operations within the ML 253 will greatly support the socioeconomic development of the area and Erongo Region and will coexist with the other current and future land uses within the local and surrounding areas.

6.2 Summary of EIA Conclusions

This EIA Report for the development of dimension stone (marble) mine and ongoing exploration operations in the ML 253 has been undertaken in accordance with the Terms of Reference (ToR), provisions of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007). All key specialist assessments with respect to the proposed development have been undertaken with the findings and recommendations incorporated and presented in this EIA report. The impact assessment covering this EIA and the preparation of the EMP reports has been undertaken in line with the following envisaged proposed mine and supporting infrastructures (roads and water supply) developmental stages (proposed project lifecycle): Preconstruction, construction, operation, ongoing monitoring and rehabilitation, and decommissioning, closure and aftercare.

Based on the results of the impact assessment undertaken in this EIA report, the following is summary of the key issues that have been assessed to have likely significance impacts on the receiving environment throughout the proposed project lifecycle:

1. Pollution from routine operations and accidental incidences.
2. Waste management.
3. Stripping and stockpiling soils.
4. Tracks and roads management.
5. Water abstraction and supply.
6. Flora, habitat and ecosystem.
7. Fauna habitat and ecosystem
8. Noise.
9. Dust.
10. Visual.
11. Neighbouring communities and or the general public.
12. Archaeological, historical, and cultural heritage resources.

13. Office, workshop and all related sanitation.

14. Final mine, exploration and supporting infrastructure rehabilitation, closure and aftercare, and.

15. Mine components to be addressed in the ongoing and final mine closure plan.

Mitigation measures for each of the above (1) to 15) key issues have been prepared and presented in the EMP Report (Tables 3.1-3.15) for implementation by the Proponent.

6.3 Summary of EIA Recommendations

The development of the proposed marble quarry / mining and ongoing exploration operations in the ML 253 must always focus on utilising disturbed areas first as maybe required for all the supporting infrastructures, pit area, storage / stockpile areas in order to protect pristine / undisturbed area. Focusing on developing and utilising the already disturbed and contaminated areas from previous exploration or / and mining operations will greatly be beneficial to the future rehabilitation process of the proposed mining, minerals and ongoing exploration operations in the ML 253.

It is hereby recommended that the proposed marble mining and ongoing exploration project in the ML 253 with all the supporting infrastructure be issued with an Environmental Clearance Certificate (ECC) with the following key conditions:

(i) The Proponent shall negotiate land access agreement with the owner/s / land rights holders covering the ML 253 area.

(ii) The Proponent shall notify the local community through the Karibib Town Council / local Councillor/s on the implementation of the proposed project once the ECC has been granted. Such communications shall be maintained throughout the lifecycle of the proposed project.

(iii) The Proponent shall prepare a detailed EMP Report in order to address all the identified medium and high rated impacts.

(iv) The Proponent must implement and adhere to all the provisions of the EMP report, and.

(v) Environmental monitoring shall be implemented as provided for the in EMP and Environmental Clearance Certificate (ECC).

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8. ANNEXES

Annex 1 – Final BID / Scoping Report

Annex 2 – Legal Register

Annex 3 – Public and Stakeholder Consultation Materials