

# Richwing Exploration (Pty) Ltd

MEFT ECC APPLICATION REFERENCE No.: **APP-003858**

Final Updated Environmental Scoping and Environmental Management Plan (EMP) Report to Support the Application for the Renewal of the Environmental Clearance Certificate (ECC) for Ongoing and Proposed Exploration / Prospecting Activities in the Exclusive Prospecting License (EPL) No. 5533,  
**KARIBIB DISTRICT, ERONGO REGION**



# PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

## TYPE OF AUTHORISATIONS REQUIRING ECC

Exclusive Prospecting License (EPL) No. 5533  
MEFT ECC APPLICATION REFERENCE No: **APP-003858**

## NAME OF THE PROPONENT

Richwing Exploration (Pty) Ltd

## COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

## ADDRESS OF THE PROPONENT AND CONTACT PERSON

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## PROPOSED PROJECT

Proposed Minerals Exploration / Prospecting in the Exclusive  
Prospecting License (EPL) No. 5533

## PROJECT LOCATION

Karibib District, Erongo Region  
(Latitude: -21.924722, Longitude: 16.136111)

## ENVIRONMENTAL CONSULTANTS



### *Risk-Based Solutions (RBS) CC*

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## ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr. Sindila Mwiya  
*PhD, PG Cert, MPhil, BEng (Hons), Pr Eng*

## **Summary Profile and Qualifications of the Environmental Assessment Practitioner (EAP) / International Resources Consultant – Dr Sindila Mwiya**

Dr Sindila Mwiya has more than twenty (20) years of practical field-based technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, operation and utilisation, covering general and specialist technical exploration and recovery support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D, 3D and 4D Seismic, Gravity and Electromagnetic Surveys for mining, energy and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles. He continues to work internationally in the resources (mining and petroleum) and energy sectors, from permitting through to exploration and production. From the frontier regions (high risk hydrocarbons exploration zones) of South Africa and Namibia, to the prolific oil and gas fields of the Middle East, Angola and the West African Gulf of Guinea, Dr Mwiya has been directly involved in field-based aerial, ground and marine geophysical (gravity, magnetics and seismic) surveys, been onboard exploration drilling rigs, onboard production platforms, conducted public and stakeholder consultations and engagements, and worked with highly technical and well organised and committed clients and third-party teams from emerging and well established global resources and energy companies from many countries such as the UK, France, USA, Russia, Canada, Croatia, Norway, the Netherland, Spain, Brazil, China, South Africa, Equatorial Guinea, Angola and Nigeria. He is fully aware of all the competing interests and niche donation-based business environmental advocacy opportunism that exists in the resources sector from the local, regional, and international perspectives.

Through his companies, Risk-Based Solutions (RBS) and Sivieda Group Namibia (SGN) which he founded, he has undertaken more than 200 projects for Local (Namibian), Continental (Africa) and International (Global) based clients. He has worked and continues to work for Global, Continental and Namibian based reputable resources (petroleum and mining / minerals) and energy companies such as Shell Namibia B. V. Limited (Namibia/ the Netherlands), Reconnaissance Energy Africa Ltd (REN/ReconAfrica) (UK/Canada/Namibia), Debmarine (DBMN) (Namibia), Osino Resource Corporation (Canada/USA/Namibia), MEL (UK, Namibia), Dundee Precious Metals (Namibia / Canada), Headspring Investment (Namibia/ Russia), EMGS (UK/ Norway), Lepidico (Australia / UK), Best Sheer / Bohale (Namibia / China), CGG Services UK Limited (UK/ France/Namibia), BW Offshore (Norway/Singapore /Namibia), Tullow Oil (UK/Namibia), Petrobras Oil and Gas (Brazil) / BP (UK) / Namibia, REPSOL (Spain/ Namibia), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA/ Namibia), Chariot Oil and Gas Exploration (UK/ Namibia), NABIRM (USA/ Namibia), Serica Energy (UK/ Namibia), Eco (Atlantic) Oil and Gas (Canada / USA/ Namibia), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-NOPEC (UK), Maurel & Prom (France/ Namibia), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea/ Namibia), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia Ltd (Russia/ Namibia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia/ Namibia), Namibia Underwater Technologies (NUTAM) (South Africa/Namibia), InnoSun Holdings (Pty) Ltd and all its subsidiary renewable energy companies and projects in Namibia (Namibia / France), HopSol (Namibia/Switzerland), Momentous Solar One (Pty) Ltd (Namibia / Canada), OLC Northern Sun Energy (Pty) Ltd (Namibia) and more than 100 local companies. Dr Sindila Mwiya is highly qualified with extensive practical field-based experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non-Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management, and monitoring (Scoping, EIA, EMP, EMP, EMS) and overall industry specific HSE, cleaner production programmes, Geoenvironmental, geological and geotechnical engineering specialist fields.

Dr Sindila Mwiya has undertaken and continues to undertake and manage high value projects on behalf of global and local resources and energy companies. Currently, (2020-2023) Dr Sindila Mwiya is responsible for permitting planning through to operational and completion compliance monitoring, HSE and engineering technical support for multiple major upstream onshore and offshore petroleum, minerals, and mining projects, Solar and Wind Energy Projects, manufacturing and environmentally sustainable, automated / smart and Climate Change resilient homes developments in different parts of the World including Namibia. He continues to work as a National Technical Permitting Advisor, International Resources Consultant, Environmental Assessment Practitioner (EAP) / Environmentally Sustainable, automated / smart and Climate Change resilient homes developer, Engineering / Technical Consultant for RBS / Sivieda Group, Project Manager, Programme Advisor for the Department of Natural and Applied Sciences, Namibia University of Science and Technology (NUST) and has worked as a Lecturer, University of Namibia (UNAM), External Examiner/ Moderator, NUST, National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment, Forestry and Tourism / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetics, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continues to support several MScs and PhDs research programmes / projects and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development, pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence, management, development, recovery, utilisation and for development policies, plans, programmes and projects financed by governments, private investors, and Namibian development partners. Since 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment, Forestry and Tourism (MEFT) through GIZ in the preparation and amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), Strategic Environmental Assessment (SEA) Regulations, Environmental Impact Assessment (EIA) Regulations as well as the SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental assessment and management practices in Namibia. Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD within the broader fields of Engineering Geology/Geotechnical / Geoenvironmental / Environmental Engineering and Artificial Intelligence with a research thesis titled Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semi-arid Environments, MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics) qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr Sindila Mwiya is a life member of the Geological Society of Namibia, Consulting member of the Hydrogeological Society of Namibia and a Professional Engineer registered with the Engineering Council of Namibia.

**WINDHOEK JANUARY 2022**

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## NON-TECHNICAL SUMMARY

Richwing Exploration (Pty) Ltd (the **Proponent**) holds minerals rights under the Exclusive Prospecting License (EPL) No. 5533. The 17503.8219 Ha size EPL area is situated in the Karibib District of the Erongo Region and covers the commercial farmlands Okatjimukwu, Okakoara, Kalimbo, Johann Albrechtshohe, Vogelsang, Wilhelmstal, Clausthal and Ombujomaere north and south. The EPL 5533 was granted on the 04/02/2014 and will expire on the 17/10/2023. The Proponent intends to continue with minerals prospecting activities with special focus on base and rare metals (applied for), dimension stone, industrial minerals, and precious metals (applied for).

The proposed and ongoing exploration / prospecting activities as assessed in this updated Scoping and Environmental Management Plan (EMP) Report covers the following phases:

- (i) Initial desktop exploration activities (no field-work undertaken).
- (ii) Regional reconnaissance field-based mapping and sampling activities (Subject to the positive results of (i)).
- (iii) Initial local field-based mapping and sampling activities (Subject to the positive results of (ii) above).
- (iv) Detailed local field-based activities such as local geological mapping, geochemical mapping, and sampling, trenching, and drilling of closely spaced boreholes and bulk sampling (Subject to the positive results of (iii) above), and.
- (v) Prefeasibility and feasibility studies (Subject to the positive results of (iv) above).

The scope of the field-based support and logistical activities will be dependent on the scale of proposed exploration activities to be undertaken at any given phase / stage. The proposed / ongoing exploration activities will be supported by existing tracks and campsites / farmstead as well as existing accommodation in the local area as may be applicable. In the absences of existing tracks and depending on the scale of exploration activities being undertaken, the field team will create such new tracks with the permission of the land owner/s and in compliance with the provisions of the EMP and all applicable regulations and standards. In the absences of existing suitable campsite / farmstead, a temporary camp site will be setup at suitable location with the permission of the landowner and in line with the provisions of the EMP. The size of the exploration camp will be of very limited footprint during the initial and detailed field-based exploration phases. In an event of a discovery of economic minerals resources, the exploration campsite may be expanded for the subsequent exploration phases such as prefeasibility and feasibility studies.

The proposed exploration activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). An application for ECC together with the supporting updated Scoping and Environmental Management Plan (EMP) Report was prepared by the Risk-Based Solutions (RBS) CC on behalf of the Proponent and submitted to the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) in December 2018 and an ECC was granted on the 25<sup>th</sup> January 2019 and expired on 25<sup>th</sup> January 2022. This updated Environmental Scoping and EMP report has been prepared by Risk-Based Solutions on behalf of the Proponent to support the application for the renewal of the ECC granted on the 25<sup>th</sup> January 2022.

The general surrounding EPL area falls within the well-established commercial cattle farming area supported by game farming, tourism, and hospitality services as well as regional conservancies not necessary covering the EPL Area.

The population of Karibib Constituency is 13, 320 which accounts for 8.8 percent of the total Erongo Region population. The socioeconomic activities in and around the Town of Karibib are dependent on mining (the Navachab Gold Mine), farming (small stock and cattle), tourism and trading.



It is estimated that at least 86 species of reptile, 7 amphibian, 88 mammal, 216 birds, 79-109 larger trees and shrubs and up to 111 grass species occur in the general/immediate Karibib/Usakos/Omaruru areas surrounding the EPL 5533 of which a high proportion are known to be endemics species (e.g. reptiles 43%).

The environmental consequence that the proposed / ongoing exploration and associated infrastructure such as access and campsite would have on the receiving environment will depend on the extent of the proposed / ongoing activities over the development area, management of the area and how the Proponent eventually implements the proposed mitigation measures. Avoiding sensitive habitats such as Ephemeral River channels, rock heads, mountainous terrains, granite features that might hold archaeological resources as well as track discipline (including no killing/poaching of fauna and unnecessarily cutting down of trees) must be adhered to and/or always enforced. The following is the assessment summary of the likely environmental impacts that the proposed / ongoing exploration / prospecting activities will have on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) without mitigations:

- (i) Initial desktop exploration activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible and no field work will take place.
- (ii) Regional reconnaissance field-based activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible. Some field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations. Overall significant impacts will be negligible.
- (iii) Initial local field-based activities: Initial field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations. Overall significant impacts will be negligible. All desktop related activities and laboratory assessments will have negligible impacts with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible.
- (iv) Detailed local field-based activities: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised low impacts with mitigations. Overall significant impacts will be medium without mitigations and low with mitigations, and.
- (v) Prefeasibility and feasibility studies to be implemented on a site-specific area if the local field-based studies prove positive: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised medium impacts with mitigations. Overall significant impacts will be high without mitigations and low with mitigations for bulk sampling, and field coordination including exploration camp.

The overall severity of potential environmental impacts of the proposed / ongoing project activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will be of low magnitude, temporally duration, localised extent and low probability of occurrence. Mitigation measures as detailed in Section 6 of the Updated Scoping and EMP Report attached to this application must be implemented and monitored by the Proponent. The proponent shall obtain permission / consent from land owners (surface rights holders) before exercising their subsurface rights for all areas covered by the EPL 6953.

Based on the findings of this updated Scoping and EMP Report, it is hereby recommended that the proposed / ongoing exploration activities by the Proponent be issued with a renewed Environmental Clearance Certificate (ECC) with the following key conditions:

- (i) The Proponent shall negotiate Access Agreements with the land owners as may be applicable.

- (ii) In consultation with the land owners and where possible and if key and core conservation, tourism or archaeological resources areas are identified within the EPL area, such areas shall be excluded from the proposed minerals exploration activities.
- (iii) The Proponent shall adhere to all the provisions of the EMP and conditions of the Access Agreement to be entered between the Proponent and the land owner/s in line with all applicable national legislations and regulations.
- (iv) Before entering any private property such as private farms or communal areas, the Proponent shall give advance notices to the surface land rights holders and always obtain permission to access the land to undertake prospecting activities in any given area.
- (v) Mitigation measures shall be implemented as detailed in Section 6 (EMP) of this updated Scoping and EMP report, and.
- (vi) Where possible, and if good quality freshwater is found during the detailed exploration borehole drilling operations, the Proponent shall support other land users in the area in terms of access to good quality freshwater resources for both human consumption, wildlife management and agricultural uses as may be requested by the local community / land owner/s. With permission from the Department of Water Affairs in the Ministry of Agriculture, Water and Land Reform (MAWLR), the abstraction of the groundwater resources shall include water levels monitoring, sampling and quality testing on a bi-annual basis, and that the affected landowner/s must have access to the results of the water monitoring analyses as part of the ongoing stakeholder disclosure requirements on shared water resources as may be applicable.

Once economic resources are discovered for possible mining operations, a separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) shall be undertaken as part of the prefeasibility and feasibility studies. The site-specific EIA and EMP shall cover the area/s identified to have potential economic minerals resources and the assessment shall include the entire planned mine layout areas such as local land uses, pit / shaft, waste rock, tailings dump, access, office blocks, mechanical workshop, water, and energy infrastructure support areas (water, energy, and road / access).

In addition to the site-specific possible mining EIA and EMP Terms of Reference (ToR) to be developed during the prefeasibility study phase, the following field-based and site-specific specialist studies shall be undertaken in an event of a discovery of economic minerals resources that can support the development of a mining project within the EPL No. 5533 area:

- (i) Groundwater studies including modelling as may be applicable.
- (ii) Field-based flora and fauna assessments.
- (iii) Dusts, noise and sound assessments and modelling linked to engineering studies.
- (iv) Socioeconomic assessment, and.
- (v) Others as may be identified / recommended by the stakeholders/ land owners/ Environmental Commissioner or specialists during the prefeasibility and feasibility phases.

# 1. BACKGROUND

## 1.1 Introduction

**Richwing Exploration (Pty) Ltd** (the **Proponent**) hold minerals rights under the Exclusive Prospecting License (EPL) No. 5533. The following is the summary of the EPL 5533 (Annex 1):

- ❖ **Type of License:** Exclusive Prospecting License (EPL) No. 5533.
- ❖ **EPL Holder:** Richwing Exploration (Pty) Ltd.
- ❖ **Granted Date:** 04/02/2014.
- ❖ **Expiry Date:** 17/10/2023.
- ❖ **Commodities:** Base and rare metals (applied for), dimension stone, industrial minerals, and precious metals (applied for).
- ❖ **Size of the EPL:** 17503.8219 Ha, and.
- ❖ **Current Environmental Clearance Certificate (ECC):** Granted on the 25<sup>th</sup> January 2019 and will expire on 25<sup>th</sup> January 2022.

Richwing Exploration (Pty) Ltd intend to undertake exploration activities covering desktop studies, followed by field-based regional and detailed site-specific explorations activities using techniques such as desktop studies, geophysical surveys, geological mapping, trenching, drilling and bulk sampling.

## 1.2 Regulatory Requirements

The proposed minerals exploration / prospecting activities in the EPL 5533 falls under the activities that are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). To obtain the ECC for the listed activities, the Proponent is required to have undertaken Environmental Assessment comprising Environmental Scoping and Environmental Management Plan (EMP) for the proposed / ongoing minerals prospecting operations / activities.

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 undertake the Scoping and EMP to support the application for Environmental Clearance Certificate (ECC) (Annex 2).

An application for ECC together with the supporting updated Scoping and Environmental Management Plan (EMP) Report was prepared by the Risk-Based Solutions (RBS) CC on behalf of the Proponent and submitted to the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) in December 2018 and an ECC was granted on the 25<sup>th</sup> January 2019 and expired on 25<sup>th</sup> January 2022 (Fig. 1.1 and Annex 3).

This updated Environmental Scoping and EMP report has been prepared by Risk-Based Solutions on behalf of the Proponent to support the application for the renewal of the ECC granted on the 25<sup>th</sup> January 2022 as shown in Fig. 1.1.

The Environmental Assessment process for the previous and current processes have both been undertaken in accordance with the provisions of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007).



REPUBLIC OF NAMIBIA

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09 January 2019

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Manager  
Richwing Exploration (Pty) Ltd  
P O Box 3489  
Windhoek

Dear Sir/Madam

**SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED MINERALS EXPLORATION ACTIVITIES WITHIN EXCLUSIVE PROSPECTING LICENSES (EPL) NO. 5533, IN KARIBIB DISTRICT, ERONGO REGION**

The Environmental Scoping report and Environmental Management Plan submitted are sufficient as these have made an adequate provision of the environmental management for the proposed activities. From this perspective, regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

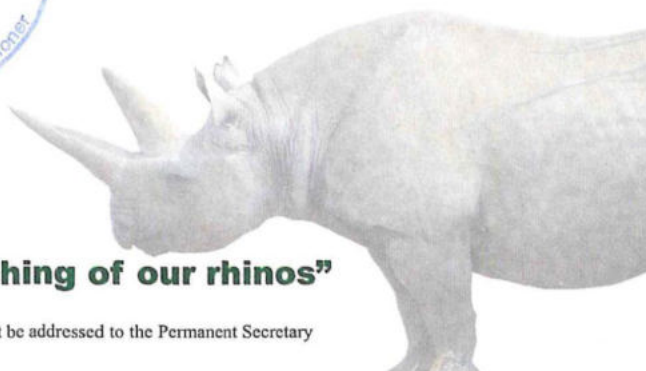
This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project. From this perspective, I issue this clearance with the following condition: All relevant permits are obtained prior to the commencement of the proposed activities.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Richwing Exploration (Pty) Ltd and their consultants.

This environmental clearance is valid for a period of (three) 3 years, from the date of issue unless withdrawn by this office.

Yours sincerely,

Teofilus Nghitila  
ENVIRONMENTAL COMMISSIONER



**“Stop the poaching of our rhinos”**

All official correspondence must be addressed to the Permanent Secretary

Figure 1.1: Copy of the ECC granted to the Proponent, on the 25<sup>th</sup> January 2019 and expired on the 25<sup>th</sup> January 2022 need to be renewed.

## **1.3 Location, Site Description, Land Use, and Infrastructure**

### **1.3.1 Location**

The Exclusive Prospecting License (EPL) No 5533 is located in the Karibib District, Erongo Region (Figs. 1.2-1.4). The EPL 5533 area totalling 17503.8219 Ha covers parts of Farms Okatjimukwu, Okakoara, Kalimbo, Johann Albrechtshohe, Vogelsang, Wilhelmstal, Clausthal and Ombujomaere north and south (Fig. 1.4).

### **1.3.2 Current Land Uses**

The general land use of the area is mainly dominated by agriculture (cattle and small stock farming) and game farming that support tourism and conservation in the local area and region (Fig. 1.5). Game farms are important conservation areas for endemic and protected flora and are key sanctuaries for endangered and problem faunal species.

Game farms offers visitors the opportunity to be close to nature with a variety of tailor-made tourism products such game viewing, trails, and hunting activities. The summary of other land uses activities found in the general areas includes: prospecting, small-scale mining operations and restricted national security infrastructure.

### **1.3.3 Supporting Infrastructure and Services**

The EPLs areas are well connected to the national supporting infrastructure (Figs. 1.1 and 1.2). The EPL 5533 is cut across in east-west direction by the B2 road linking Okahandja to Karibib (Figs. 1.1 and 1.2). The C36 to Omaruru provide access to a limited portion of the EPL area toward the north (Figs. 1.2 -1.5).

A number of minor gravel roads cut across these EPL area and will be used to access the area of interest within the EPL 5533.

There is limited mobile services with regional water and electricity infrastructure networks within the EPL area. However, the proposed exploration activities programme will not require major water and energy supplies.

Sources of water supply for minerals exploration will be obtained from local boreholes to be drilled based on the results of the groundwater exploration activities that will be undertaken as part of the geological mapping and drilling operations. Alternatively a water tanker collecting water from the Town of Karibib has been considered as another means of supply water for the proposed minerals exploration operations.

Electricity supply will be provided by diesel generators and solar as maybe required.

However, in an event of a discovery of economic minerals deposit that could be developed into a mining project, the sources of water supply will be provided by NamWater from possible limited local borehole to be drilled in the short-term and from pipeline from any nearby NamWater Scheme.

Electricity supply will be provided by NamPower from already existing infrastructure in the region in addition to use of renewable energies sources such as solar and possible wind.



Figure 1.2: Regional location of the EPL 5533.

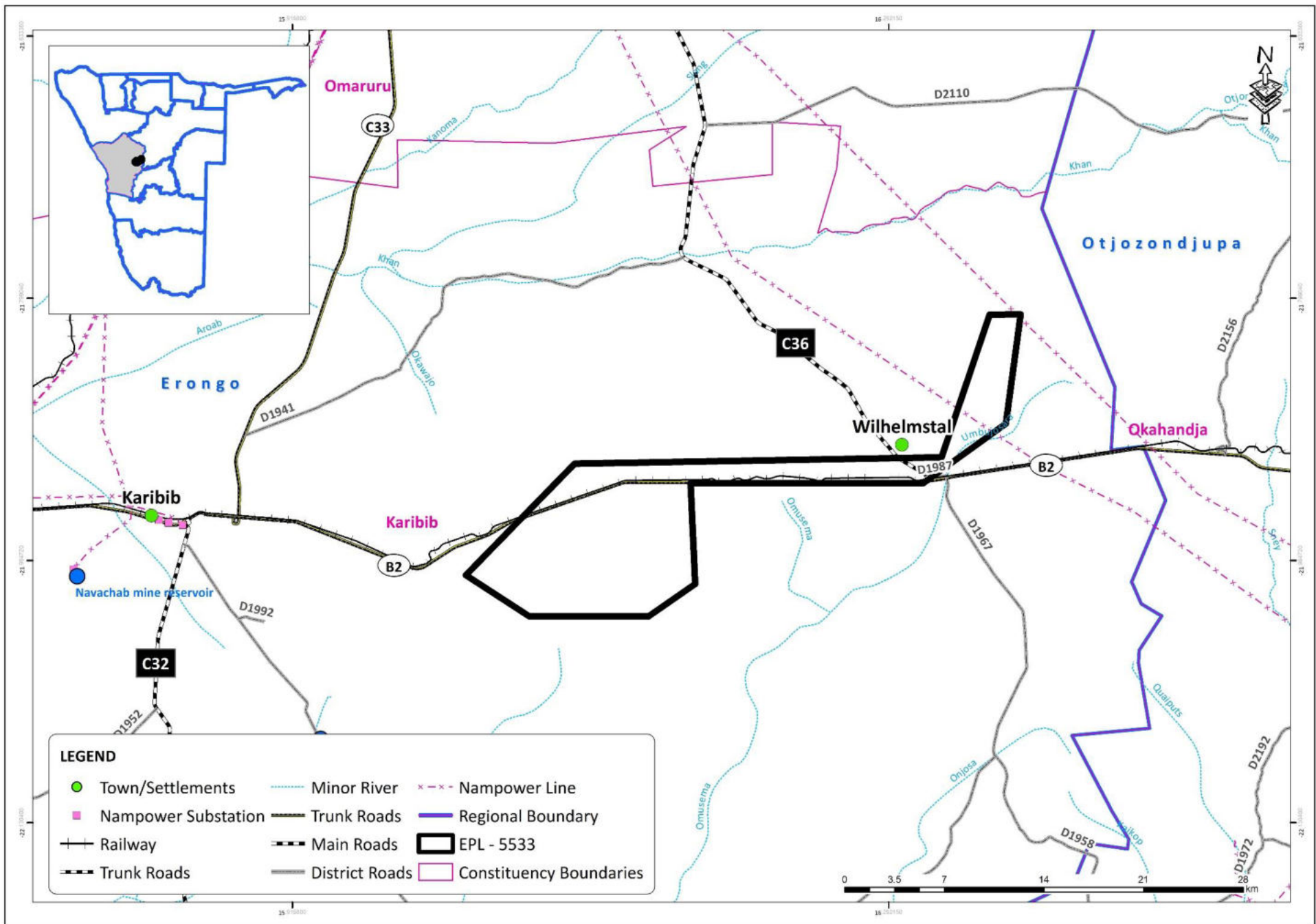


Figure 1.3: Detailed regional location of the EPL 5533.





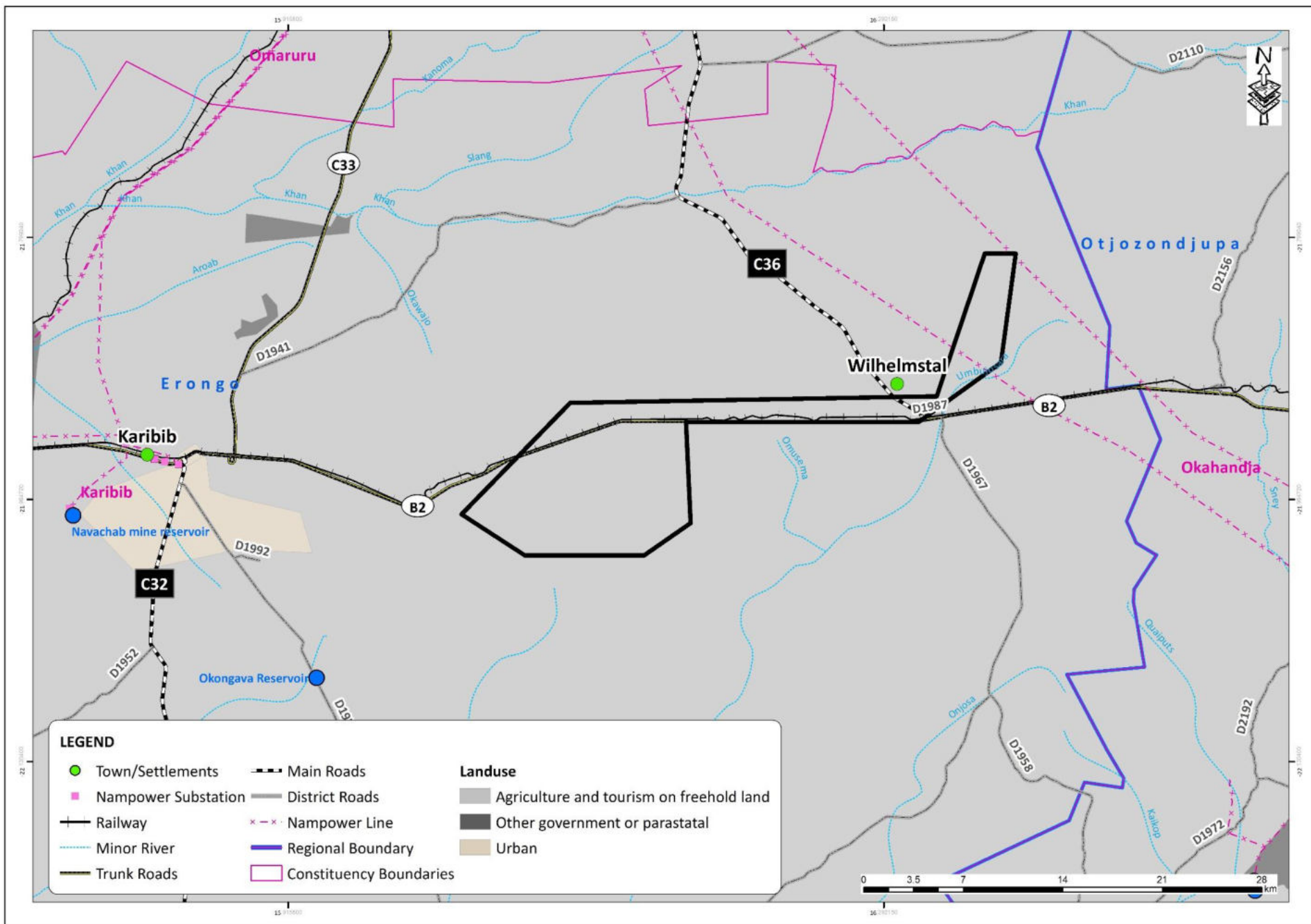


Figure 1.5: Land uses around the EPL 533.

## 1.4 Project Motivation and Benefits

The proposed exploration activities have limited to no local socioeconomic benefits for the local communities. The only tangible benefits of the proposed exploration activities are mainly centred around the payment of the annual license rental fees to the central Government through the Ministry of Mines and Energy (MME), payment for exploration support services and land access agreements as well as other related field-based disbursements such as meals, accommodation and fuel.

The following is the summary of other likely but limited potential project benefits:

- ❖ Provisional contractual employment opportunities for specialist services companies involved in minerals explorations during the minerals prospecting process that could take many years if potential minerals targets are discovered within the EPL area.
- ❖ Expansion of the subsurface knowledge-base: The exploration data to be generated will be highly useful in the search for other subsurface resources such as other minerals, water, geothermal and general geoscience research, and development interests.
- ❖ Contribution to the subsurface knowledge-base that will promote the coexistence of subsurface operations such as minerals exploration and possible mining with surface activities such as agriculture, tourism, and conservation where there is potential / opportunity for compatible coexistence, and.
- ❖ Contribution to the development of local infrastructures as may be applicable especially if potential minerals targets requiring field-based studies to be conducted are identified and there is the potential for the development of a mine.

## 1.5 Terms of Reference, Approach and Methodology

The Proponent appointed Risk-Based Solutions (RBS) to prepare this updated Environmental Scoping and Environmental Management Plan (EMP) report to support the application for renewal of the Environmental Clearance Certificate (ECC) for the EPL No. 5533 with respect to the proposed exploration activities. The following is summary of the key guiding principles and objectives of this updated Environmental Scoping and Environmental Management Plan (EMP)

- ❖ Inform the stakeholders about the proposed / ongoing exploration / prospecting programme.
- ❖ Update the main stakeholders and their concerns and values.
- ❖ Define the reasonable and practical alternatives to the proposed / ongoing project activities.
- ❖ Identify the important issues and significant impacts to be addressed in the EMP Section of the Report, and.
- ❖ Define the boundaries of the updated Scoping and EMP in time, space, and subject matter.

The scoping desktop study reviewed the receiving environmental settings (physical, biological, socioeconomic and ecosystem services, function, use values and non-use) and proposed / ongoing exploration activities and then assessed the likely impacts (positive and negative) on the receiving environment (Table 1.1). The key deliverable comprised this Environmental Scoping and Environmental Management Plan (EMP) detailing appropriate mitigation measures that will enhance the positive impacts and reduce the likely negative impacts identified.

The final Environmental Scoping and Environmental Management Plan (EMP) report and the completed Application for Environmental Clearance Certificate (ECC) shall be submitted to the client (Proponent) and the Office of the Environmental Commissioner, Department of Environmental Affairs (DEA), Ministry of Environment, Forestry and Tourism (MEFT) for review and the Record of Decision.

The Environmental Scoping and EMP has been 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 requirements, process and specifications in Namibia as required by Ministry of Mines and Energy (MME), Ministry of Environment, Forestry and Tourism (MEFT) and the client (Proponent) and as detailed in Fig. 1.6. The Scoping and EMP has been prepared in line with the January 2015 MET Environmental Assessment Reporting Guideline.

Table 1.1: Summary of the proposed / ongoing activities, alternatives and key issues considered during the Environmental Assessment (EA) process covering Scoping and Environmental Management Plan (EMP).

PROPOSED / ONGOING PROJECT ACTIVITIES	ALTERNATIVES CONSIDERED	KEY ISSUES EVALUATED AND ASSESSED WITH ENVIRONMENTAL MANAGEMENT PLAN (EMP) / MITIGATION MEASURES DEVELOPED		
(i) Initial desktop exploration activities (review of existing information and all previous activities in order identify any potential target/s)  (ii) Regional reconnaissance field-based activities such mapping and sampling to identify areas with potential targets based on the recommendations of the desktop work  (iii) Initial local field-based activities such as widely spaced mapping, sampling, surveying and possible drilling in order to determine the viability of any delineated local target  (iv) Detailed local field-based activities such very detailed mapping, sampling, surveying and possible drilling in order to determine the feasibility of any delineated local target  (v) Prefeasibility and feasibility studies to be implemented on a site-specific area if the local field-based studies prove positive	(i) Location for Minerals Occurrence: Several economic deposits are known to exist in different parts of Namibia and some have been explored by different companies over the years. The Proponent intends to explore / prospect for possible economic minerals occurrence in the EPL area.  (ii) Other Alternative Land Uses: Game Farming, Tourism and Agriculture  (iii) Ecosystem Function (What the Ecosystem Does.  (iv) Ecosystem Services.  (v) Use Values.  (vi) Non-Use, or Passive Use.  (vii) The No-Action Alternative	Potential land use conflicts / opportunities for coexistence between proposed / ongoing exploration and other existing land uses such as conservation, tourism, and agriculture		
			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
		Impacts on the Biological Environment	Socioeconomic, Archaeological and Cultural impacts on the local societies and communities	
			Flora	
			Fauna Habitat Ecosystem functions, services, use values and non-Use or passive use	
		Others to be identified during the exploration phase and various project implementation stages		

## 1.6 Assumptions and Limitations

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

- ❖ The proposed exploration activities as well as all the plans, maps, EPL 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.
- ❖ The impact assessment outcomes, mitigation measures and recommendations provided in this report are valid for the entire duration of the proposed exploration / prospecting activities.
- ❖ 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.

- ❖ 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 Environmental Commissioner.

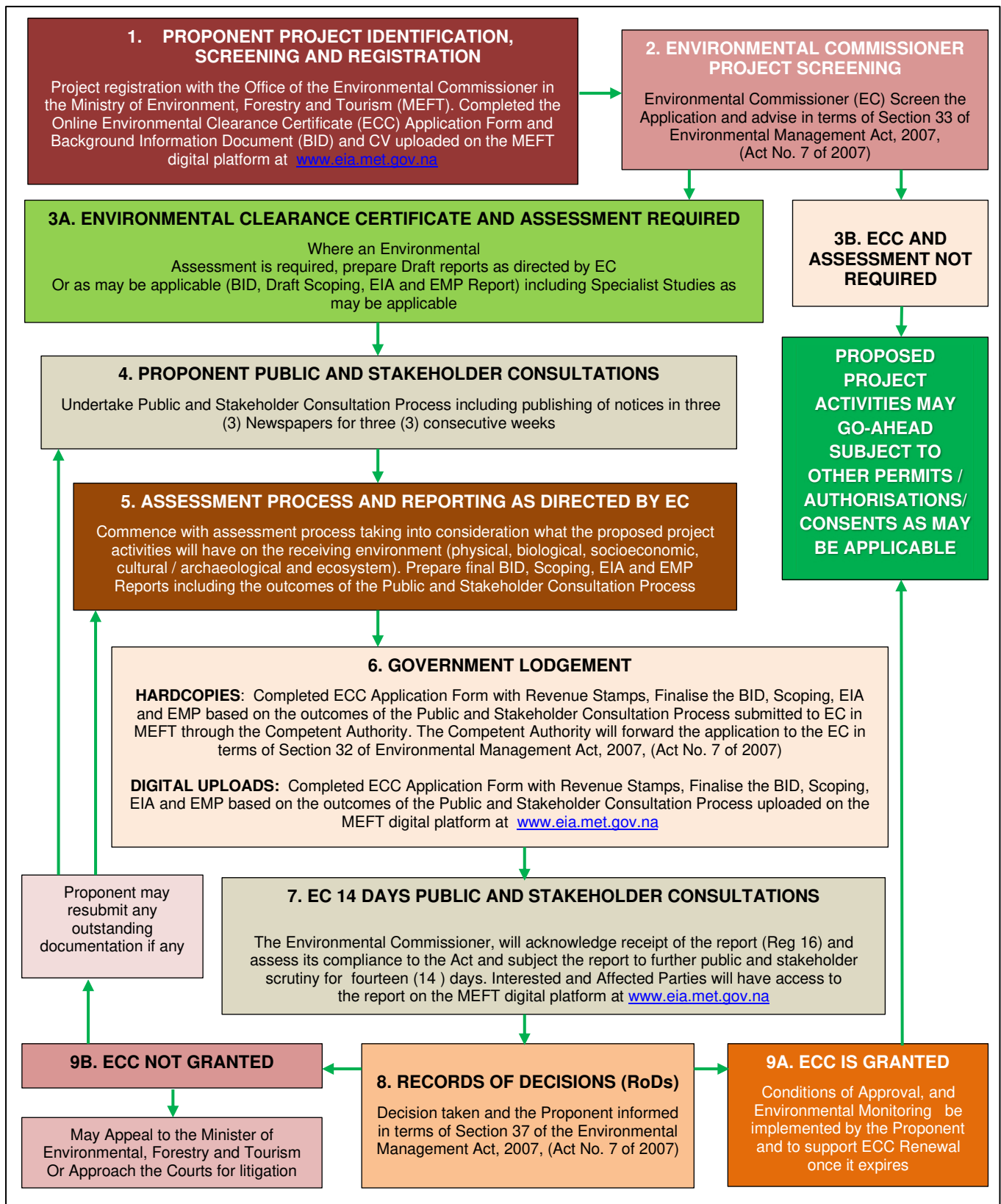


Figure 1.6: RBS Schematic presentation of Namibia's Environmental Assessment Procedure.

## 1.7 Structure of the Report

The following is the summary of the structure of this updated Scoping and EMP report prepared to support the application for the renewal of the exploration ECC for the EPL No. 5533:

1. **Section 1: Background** covering the proposed / ongoing project location with available infrastructure and services.
2. **Section 2: Project Description** covering the summary of the proposed / ongoing project exploration activities.
3. **Section 3: Regulatory Framework** covering the proposed / ongoing exploration with respect to relevant legislation, regulations and permitting requirements.
4. **Section 4: Receiving Environment** covering physical, biological, and socioeconomic environments of the proposed / ongoing project area.
5. **Section 5: Impact Assessment** covering the likely positive and negative impacts the proposed / ongoing project activities are likely to have on the receiving environment.
6. **Section 6: Environmental Management Plan (EMP)** describing the detailed mitigation measures with respect to the identified likely impacts.
7. **Section 7: Conclusions and Recommendations-** Summary of the findings and way forward.

## **2. DESCRIPTION OF THE PROPOSED PROSPECTING ACTIVITIES**

### **2.1 General Overview**

The overall aim of the proposed project activities (exploration / prospecting programme) is to search for potential economic minerals resources (base and rare metals (applied for), dimension stone, industrial minerals, and precious metals (applied for)) within the EPL area. The scope of the required field-based support and logistical activities will depend on the scale of proposed exploration activities to be undertaken.

The proposed exploration activities will be supported by existing tracks and campsites / farmstead as well as existing accommodation in the area. In the absence of existing tracks, the field team will create such new tracks with the permission of the land owner/s and depending on the scale of exploration. In the absence of existing suitable campsite / farmstead, temporary camp will be setup at suitable locations within the EPL area in line with the EMP provisions. The size of the exploration camp will be of very limited footprints during the exploration phase but may be expanded for the test mining and mine development phases in an event of a discovery of economic minerals resources.

### **2.2 Logistical Arrangements**

Before any site visit, permission will be requested from the land owner/s and an access agreement could be negotiated with the land owner/s if the Proponent want to continue with further field-based activities such as detailed mapping, trenching or drilling activities as may be required. It is the responsibility of the Proponent to negotiate access agreements with the land owners and to make sure that all security measures to protect the farmland and interests of the land owner/s are always observed and as may be agreed with the individual land owners.

Even if the mapping or drilling finds some indications of mineralisation, it takes many years (5 - 10 years or even more) to move an exploration / prospecting project to a mining stage and so many technical inputs including technology, markets, costs environmental liabilities and cost of services such water, roads and energy will need to form part of the project developmental stages, starting with the scoping, prefeasibility and then feasibility phases.

If a project is feasible, then the company will need to apply for a separate Mining License (ML) from the Government and a land owner agreement is required and mandatory before a Mining License is granted by Mining Commissioner. A Mining License application requires separate detailed site-specific studies of the local area of interest to have been conducted as part of the feasibility study. Environmental Impact Assessment (EIA), Environmental Management Plan (EMP) and specialist studies such as water, fauna, flora, dust, noise for mining operations as well as linear structures such as water, roads and powerline form part of the feasibility study to be conducted before such a project can even be considered for review by the Government.

### **2.3 Initial Exploration (Desktop Work)**

Initial desktop exploration activities (without field-work being conducted) lasting for up to six (6) months or more will include the following:

- (i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data.
- (ii) Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data.
- (iii) Purchase and analysis of existing Government aerial hyperspectral, and.
- (iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets.

## 2.4 Regional Reconnaissance Field-Based Exploration Activities

Regional reconnaissance field-based exploration activities lasting between six (6) months to year will involve the following:

- (i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis.
- (ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken.
- (iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken.
- (iv) Limited field-based support and logistical activities lasting between one (1) to two (2) days, and.
- (v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets.

## 2.5 Initial Local Field-Based Exploration Activities

Initial local field-based exploration activities lasting between 1 – 2 years will include the following:

- (i) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities.
- (ii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken.
- (iii) Ground geophysical survey (Subject to the positive outcomes of i and ii above).
- (iv) Possible Trenching (Subject to the outcomes of i - iii above).
- (v) Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days), and.
- (vi) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets.

## 2.6 Detailed Local Field-Based Exploration Activities

Detailed local field-based exploration activities that can take many years will include the following:

- (i) Access preparation and related logistics to support activities.
- (ii) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities.
- (iii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken.
- (iv) Ground geophysical survey, trenching, drilling, and sampling (Subject to the positive outcomes of i and ii above).

## 2.7 Prefeasibility and Feasibility Studies

The preparation of the prefeasibility and feasibility studies forms the final stages of the minerals exploration process and can take many years to complete and prove that a specific mineral deposit is viable for developing a mine. A positive feasibility study outcome is required to support an application for a Mining License (ML). The following is summary of the activities that will form part of a prefeasibility and or feasibility study:

- (i) Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping.
- (ii) Detailed drilling and bulk sampling and testing for ore reserve calculations.
- (iii) Geotechnical studies for mine design.
- (iv) Mine planning and designs including all supporting infrastructures (water, energy, and access) and test mining activities.
- (v) EIA and EMP to support the ECC for mining operations, and.
- (vi) Preparation of feasibility report and application for Mining License if the feasibility study proves positive and supportive to develop a mining project.



### 3. REGULATORY FRAMEWORK

#### 3.1 Minerals Exploration Legislation and Regulations

The Ministry of Mines and Energy (MME) is the competent authority with respect to minerals prospecting and mining activities in Namibia. The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing minerals prospecting / exploration and mining activities. Several explicit references to the environment and its protection are contained in the Minerals Act, which provides for environmental impact assessments, rehabilitation of prospecting and mining areas and minimising or preventing pollution.

#### 3.2 Environmental Regulations

##### 3.2.1 Environmental Assessment Requirements and Procedures

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). The proposed / ongoing field-based exploration activities fall within the categories of listed activities that cannot be undertaken without an Environmental Clearance.

##### 3.2.2 Regulatory Authorities

The environmental regulatory authorities responsible for environmental protection and management in relation to the proposed / ongoing project including their role in regulating environmental protection are listed in Table 3.1.

Table 3.1: Government agencies regulating environmental protection in Namibia.

AGENCY	RESPONSIBILITY
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, 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 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
Ministry of Agriculture, Water and Land Reform (MAWLR)	The Mission of the Ministry of Agriculture, Water and Land Reform (MAWLR) is to realize the potential of the Agricultural, Water and Forestry sectors towards the promotion of an efficient and sustainable socio-economic development for a prosperous Namibia. It has a mandate to promote, develop, manage, and utilise Agriculture, Water and Land resources. 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.

##### 3.2.3 Important National Legal Instruments

Important legislative instruments applicable to the proposed and ongoing exploration operations in the EPL No. 5533 are summarised in Table 3.2.

Table 3.2: Legislation relevant to the proposed and ongoing exploration operations in the EPL No. 5533.

LAW	SUMMARY DESCRIPTION
<p><b>Constitution of the Republic of Namibia, 1990</b></p>	<p>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."</p>
<p>Minerals (Prospecting and Mining) Act, 1992 <b>Ministry of Mines and Energy (MME)</b></p>	<p>The Minerals Act governs minerals prospecting and mining. The Act <i>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.</i></p>
<p>Environmental Management Act (2007) - <b>Ministry of Environment, Forestry and Tourism (MEFT)</b></p>	<p>The purpose of the Act is <i>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.</i> 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.</p>
<p>Water Act 54 of 1956 <b>Minister of Agriculture, Water and Land reform (MAWLR)</b></p>	<p>This Act provides for the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes. In terms of Section 6, there is no right 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 (as this is greater than 20,000m<sup>3</sup>), 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.</p> <p>Section 23 of the Act requires environment rehabilitation after closure of the Mine, particularly, in this instance to obviate groundwater pollution and potential pollution resulting from run-off. This Act is due to be replaced by the Water Resources Management Act 24 of 2004.</p>
<p><i>Forest Act 12 of 2001</i> - <b>Minister of Environment, Forestry and Tourism (MEFT)</b></p>	<p>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.</p> <p>Under Part IV Protection of the environment, Section 22(1) of the Act, it is unlawful for any person to: cut, destroy, or remove:</p> <p>(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</p> <p>(b) any living tree, bush or shrub growing within 100m of a river, stream, or watercourse.</p> <p>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.</p>
<p>Hazardous Substance Ordinance 14 of 1974 <b>Ministry of Health and Social Services</b></p>	<p>Provisions for hazardous waste are amended in this act as it provides <i>"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"</i></p>

Table 3.2: *Cont.*

<p>Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995 <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b></p>	<p>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.</p>
<p>Explosives Act 26 of 1956 (as amended in SA to April 1978) - <b>Ministry Home Affairs, Immigration, Safety and Security (MHAISS)</b></p>	<p>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.</p>
<p>Atmospheric Pollution Prevention Ordinance 11 of 1976. <b>Ministry of Health and Social Services (MHSS)</b></p>	<p>This regulation sets out principles for <i>the prevention of the pollution of the atmosphere and for matters incidental thereto</i>. 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.</p>
<p>The Nature Conservation Ordinance, Ordinance 4 of 1975, <b>Ministry of Environment, Forestry and Tourism (MEFT)</b></p>	<p>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 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.</p>
<p>Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007 <b>Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)</b></p>	<p>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 <i>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</i> under which provisions are made in chapter 4. Chapter 5 of the act improvises on the <i>protection of employees from unfair labour practice</i>.</p>
<p>Petroleum Products and Energy Act 13 of 1990 <b>Ministry of Mines and Energy (MME)</b></p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>National Heritage Act 27 of 2004 <b>Ministry of Education, Arts and Culture (MEAC)</b></p>	<p>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</p>

### 3.4 Standards and Guidelines

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). Industrial effluent likely to be generated by the proposed activities must comply with provisions of the Government Gazette No 217 dated 5 April 1962 (Table 3.5) while the drinking water quality comparative guideline values are shown in Table 3.6.

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)	
	Day time (07:00 – 22:00)	Night time (22:00 – 07:00)
Receptor		
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Table 3.5: R553 Regional Standards for Industrial Effluent, in Government Gazette No 217 dated 5 April 1962.

Colour, odour and taste	The effluent shall contain no substance in concentrations capable of producing colour, odour or taste	
pH	Between 5.5 and 9.5	
Dissolved oxygen	At least 75% saturation	
Typical faecal coli	No typical faecal coli per 100 ml	
Temperature	Not to exceed 35 °C	
Chemical demand oxygen	Not to exceed 75 mg/l after applying a correction for chloride in the method	
Oxygen absorbed	Not to exceed 10 mg/l	
Total dissolved solids (TDS)	The TDS shall not have been increased by more than 500 mg/l above that of the intake water	
Suspended solids	Not to exceed 25 mg/l	
Sodium (Na)	The Na level shall not have been increased by more than 50 mg/l above that of the intake water	
Soap, oil and grease	Not to exceed 2.5 mg/l	
Other constituents	Residual chlorine	0,1 mg/l as Cl
	Free & saline ammonia	10 mg/l as N
	Arsenic	0,5 mg/l as As
	Boron	1,0 mg/l as B
	Hexavalent Cr	0,05 mg/l as Cr
	Total chromium	0,5 mg/l as Cr
	Copper	1,0 mg/l as Cu
	Phenolic compounds	0,1 mg/l as phenol
	Lead	1,0 mg/l as Pb
	Cyanide and related compounds	0,5 mg/l as CN
	Sulphides	1,0 mg/l as S
	Fluorine	1,0 mg/l as F
	Zinc	5,0 mg/l as Zn

Table 3.6: Comparison of selected guideline values for drinking water quality (after Department of Water Affairs, 2001).

Parameter and Expression of the results			WHO Guidelines for Drinking-Water Quality 2 <sup>nd</sup> edition 1993		Proposed Council Directive of 28 April 1995 (95/C/13-1/03) EEC		Council Directive of 15 July 1980 relating to the quality intended for human consumption 80/778/EEC		U.S. EPA Drinking water Standards and Health Advisories Table December 1995		Namibia, Department of Water Affairs Guidelines for the evaluation of drinking-water for human consumption with reference to chemical, physical and bacteriological quality July 1991			
			Guideline Value (GV)	Proposed Parameter Value	Guideline Level (GL)	Maximum Admissible Concentration (MAC)	Maximum Contaminant Level (MCL)	Group A Excellent Quality	Group B Good Quality	Group C Low Health Risk	Group D Unsuitable			
Temperature	t	°C	-	-	12	25	-	-	-	-	-	-	-	
Hydrogen ion concentration	pH, 25° C	-	R <8.0	6.5 to 9.5	6.5 to 8.5	10	-	-	6.0 to 9.0	5.5 to 9.5	4.0 to 11.0	<4.0 to >11.0		
Electronic conductivity	EC, 25° C	mS/m	-	280	45	-	-	-	150	300	400	>400		
Total dissolved solids	TDS	mg/l	R 1000	-	-	1500	-	-	-	-	-	-		
Total Hardness	CaCO <sub>3</sub>	mg/l	-	-	-	-	-	-	300	650	1300	>1300		
Aluminium	Al	µ g/l	R 200	200	50	200	S	50-200	150	500	1000	>1000		
Ammonia	NH <sub>4</sub> <sup>+</sup>	mg/l	R 1.5	0.5	0.05	0.5	-	-	1.5	2.5	5.0	>5.0		
	N	mg/l	-	1.0	0.04	0.4	-	-	1.0	2.0	4.0	>4.0		
Antimony	Sb	µ g/l	P 5	3	-	10	C	6	50	100	200	>200		
Arsenic	As	µ g/l	10	10	-	50	C	50	100	300	600	>600		
Barium	Ba	µ g/l	P 700	-	100	-	C	2000	500	1000	2000	>2000		
Beryllium	Be	µ g/l	-	-	-	-	C	4	2	5	10	>10		
Bismuth	Bi	µ g/l	-	-	-	-	-	-	250	500	1000	>1000		
Boron	B	µ g/l	300	300	1000	-	-	-	500	2000	4000	>4000		
Bromate	BrO <sub>3</sub> <sup>-</sup>	µ g/l	-	10	-	-	P	10	-	-	-	-		
Bromine	Br	µ g/l	-	-	-	-	-	-	1000	3000	6000	>6000		
Cadmium	Cd	µ g/l	3	5	-	5	C	5	10	20	40	>40		
Calcium	Ca	mg/l	-	-	100	-	-	-	150	200	400	>400		
	CaCO <sub>3</sub>	mg/l	-	-	250	-	-	-	375	500	1000	>1000		
Cerium	Ce	µ g/l	-	-	-	-	-	-	1000	2000	4000	>4000		
Chloride	Cl <sup>-</sup>	mg/l	R 250	-	25	-	S	250	250	600	1200	>1200		
Chromium	Cr	µ g/l	P 50	50	-	50	C	100	100	200	400	>400		
Cobalt		µ g/l	-	-	-	-	-	-	250	500	1000	>1000		
Copper after 12 hours in pipe	Cu	µ g/l	P 2000	2	100	-	C	TT##	500	1000	2000	>2000		
		µ g/l	-	-	3000 <sup>1</sup>	-	S	1000	-	-	-	-		
Cyanide	CN <sup>-</sup>	µ g/l	70	50	-	50	C	200	200	300	600	>600		
Fluoride	F <sup>-</sup>	mg/l	1.5	1.5	-	at 8 to 12 °C: 1.5	C	4	1.5	2.0	3.0	>3.0		
		mg/l	-	-	-	at 25 to 30 °C: 0.7	P,S	2	-	-	-	-		
Gold	Au	µ g/l	-	-	-	-	-	-	2	5	10	>10		
Hydrogen sulphide	H <sub>2</sub> S	µ g/l	R 50	-	-	undetectable	-	-	100	300	600	>600		
Iodine	I	µ g/l	-	-	-	-	-	-	500	1000	2000	>2000		
Iron	Fe	µ g/l	R 300	200	50	200	S	300	100	1000	2000	>2000		
Lead	Pb	µ g/l	10	10	-	50	C	TT#	50	100	200	>200		
Lithium	Li	µ g/l	-	-	-	-	-	-	2500	5000	10000	>10000		
Magnesium	Mg	mg/l	-	-	30	50	-	-	70	100	200	>200		
	CaCO <sub>3</sub>	mg/l	-	-	7	12	-	-	290	420	840	>840		
Manganese	Mn	µ g/l	P 500	50	20	50	S	50	50	1000	2000	>2000		
Mercury	Hg	µ g/l	1	1	-	1	C	2	5	10	20	>20		
Molybdenum	Mo	µ g/l	70	-	-	-	-	-	50	100	200	>200		
Nickel	Ni	µ g/l	20	20	-	50	-	-	250	500	1000	>1000		
Nitrate*	NO <sub>3</sub> <sup>-</sup>	mg/l	P 50	50	25	50	-	45	45	90	180	>180		
	N	mg/l	-	-	5	11	C	10	10	20	40	>40		
Nitrite*	NO <sub>2</sub> <sup>-</sup>	mg/l	3	0.1	-	0.1	-	3	-	-	-	-		
	N	mg/l	-	-	-	-	C	1	-	-	-	-		
Oxygen, dissolved	O <sub>2</sub>	% sat.	-	50	-	-	-	-	-	-	-	-		
Phosphorus	P <sub>2</sub> O <sub>5</sub>	µ g/l	-	-	400	5000	-	-	-	-	-	-		
	PO <sub>4</sub> <sup>3-</sup>	µ g/l	-	-	300	3350	-	-	-	-	-	-		
Potassium	K	mg/l	-	-	10	12	-	-	200	400	800	>800		
Selenium	Se	µ g/l	10	10	-	10	C	50	20	50	100	>100		
Silver	Ag	µ g/l	-	-	-	10	S	100	20	50	100	>100		
Sodium	Na	mg/l	R 200	-	20	175	-	-	100	400	800	>800		
Sulphate	SO <sub>4</sub> <sup>2-</sup>	mg/l	R 250	250	25	250	S	250	200	600	1200	>1200		
Tellurium	Te	µ g/l	-	-	-	-	-	-	2	5	10	>10		
Thallium	Tl	µ g/l	-	-	-	-	C	2	5	10	20	>20		
Tin	Sn	µ g/l	-	-	-	-	-	-	100	200	400	>400		
Titanium	Ti	µ g/l	-	-	-	-	-	-	100	500	1000	>1000		
Tungsten	W	µ g/l	-	-	-	-	-	-	100	500	1000	>1000		
Uranium	U	µ g/l	-	-	-	-	P	20	1000	4000	8000	>8000		
Vanadium	V	µ g/l	-	-	-	-	-	-	250	500	1000	>1000		
Zinc after 12 hours in pipe	Zn	µ g/l	R 3000	-	100	-	S	5000	1000	5000	10000	>10000		
		µ g/l	-	-	5000	-	-	-	-	-	-	-		

P: Provisional  
R: May give reason to complaints from consumers  
C: Current. P: Proposed. S: Secondary.  
T#: Treatment technique in lieu of numeric MCL.  
TT##: treatment technique triggered at action level of 1300 µ g/l

### **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 shall follow the provisions of all relevant national regulatory during the implementation of the proposed / ongoing prospecting activities and shall obtain the following permits/ authorisations as may be applicable / required:

- (i) Valid Exclusive Prospecting Licenses (EPLs) as may be applicable from Department of Mines in the Ministry of Mines and Energy (MME).
- (ii) Valid Environmental Clearance Certificate (ECC) from the Department of Environmental Affairs in the Ministry of Environment, Forestry and Tourism (MEFT).
- (iii) Abstraction and waste water discharge permits from the Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Land Reform (MAWLR) for drilling of freshwater supply borehole and waste disposal requirements respectively, and.
- (iv) All other permits and consents as may be applicable during the proposed exploration operations.

## 4. SUMMARY OF NATURAL ENVIRONMENT

### 4.1 Climate

The EPL 5533 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 EPL Area. 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. 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 (<20 mm 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 >50 mm 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 due various influences including topographic effects.

### 4.2 Topography

The terrain around the EPL 5533 is rocky and rugged in nature with steep slopes characterising the mountainous sections whilst the foothills of the mountains are flat and gently undulating. The drainage of the area is dendritic in nature with ephemeral streams, often steeply incised, forming small early stage tributaries of the Khan Ephemeral River and a tributary of the Swakop River which one of the major ephemeral rivers of western Namibia.

### 4.3 Vertebrate Fauna and Flora Diversity

#### 4.3.1 Reptiles

According to Alexander and Marais (2007), Branch (1998), Branch (2008), Boycott and Bourquin 2000, Broadley (1983), Buys and Buys (1983), Cunningham (2006), Griffin (2003), Hebbard (n.d.), Marais (1992), Tolley and Burger (2007), endemic reptile species known and/or expected to occur in the general license area make up 35.1% of the reptiles from the general area and although not as high as endemism elsewhere for example the western escarpment areas of Namibia but still makes up a large portion of the reptiles. Reptiles of greatest concern are probably the tortoises – *Stigmochelys pardalis* and *Psammobates oculiferus* which are often consumed by humans. *Python anchietae* and *P. natalensis* which are indiscriminately killed throughout their range and *Varanus albigularis* as well as the various *Pachydactylus* species geckos of which 80% are viewed as endemic. Other important species would be the 3 Blind snakes (*Rhinotyphlops* species of which 2 species are endemic) and 2 Thread snakes (*Leptotyphlops* species of which 1 species is endemic) which could be associated with the sandier soils in the area.

#### 4.3.2 Amphibians

According to Carruthers (2001), Channing (2001), Channing and Griffin (1993), Du Preez and Carruthers (2009), Passmore and Carruthers (1995), of the 9 species of amphibians are likely to occur in the general license area, 33.3% (3 species) are of conservation value with 2 species being endemic (*Poyntonophrynus hoeschi* and *Phrynomantis annectens*) (Griffin 1998b) and 1 species (*Pyxicephalus adspersus*) viewed as near threatened (Du Preez and Carruthers 2009). However, the area does not

have unique amphibian habitat with potential habits being associated with the various ephemeral drainage lines within the license area.

### 4.3.3 Mammals

According to De Graaff (1981), Griffin and Coetzee (2005), Estes (1995), Joubert and Mostert (1975), Monadjem et al. (2010), Skinner and Smithers (1990), Skinner and Chimimba (2005), Stander and Hanssen (2003) and Taylor (2000), of the 84 species of mammals expected to occur in the general license area, 4.8% are endemic and 35.7% are classified under international conservation legislation. The most important groups are rodents (29.8% - 12% endemic), bats (26.2% - 4.5% endemic) and carnivores (20.2% - 5.9% endemic).

According to De Graaff (1981), Griffin and Coetzee (2005), Estes (1995), Joubert and Mostert (1975), Monadjem et al. (2010), Skinner and Smithers (1990), Skinner and Chimimba (2005), Stander and Hanssen (2003) and Taylor (2000), the most important species from the general area are probably all those classified as near threatened (*Eidolon helvum*, *Hipposideros vittatus*, *Rhinolophus blasii*, *Hyaena brunnea* and *Panthera pardus*) and vulnerable (*Acinonyx jubatus* and *Felis nigripes*) by the IUCN (2014) and rare (*Cistugo seabrai*, *Atelerix frontalis angolae* and *Felis nigripes*) under Namibian legislation.

### 4.3.4 Avifauna

The high proportion of endemics – 10 of the 14 endemics to Namibia (i.e. 71% of all endemics) – expected to occur in the general license area underscore the importance of this area. Furthermore 21.3% are classified as southern African endemics (or 6.3% of all the birds expected) and 78.7% are classified as southern African near-endemics (or 23.1% of all the birds expected).

According to Brown et al. (1998), Brown et al. (2006), Hockey et al. (2006), Komen (n.d.), Maclean (1985), Simmons and Brown (In press) and Tarboton (2001), the most important “endemic” species known/expected to occur in the general area are viewed as Monteiro’s Hornbill (*Tockus monteiri*), Damara Hornbill (*Tockus damarensis*), Ammomanopsis grayi (Gray’s Lark), Namibornis herero (Herero Chat), *Eupodotis rueppellii* (Rüppell’s Korhaan) and *Poicephalus rueppellii* (Rüppell’s Parrot). The species listed by the IUCN (2014) as endangered are: (Ludwig’s bustard and white-backed vulture), near threatened (kori bustard) and vulnerable (martial eagle and secretarybird) and are viewed as the most important.

### 4.3.5 Trees and Shrubs

It is estimated that at least 79-110 species of larger trees and shrubs (>1m) – Coats Palgrave 1983 [81 sp.], Curtis and Mannheimer 2005 [79 sp.], Mannheimer and Curtis 2009 [110 sp.], Van Wyk and Van Wyk 1997 [60 sp.]), are found in the general area. The most important tree/shrub species occurring in the general area are probably *Cyphostemma bainesii* (endemic, NC), *Cyphostemma currorii* (NC), *Cyphostemma juttiae* (endemic, NC), *Erythrina decora* (Forestry\*, endemic), *Heteromorpha papillosa* (endemic) and *Manuleopsis dinteri* (endemic species) (Craven, 1999. Curtis and Mannheimer, 2005 and Mannheimer and Curtis, 2009). The protected species are viewed as the most important tree/shrubs occurring in the area include: *Acacia erioloba* and *Boscia albitrunca* (Fig. 4.1). However, these species are widespread throughout large parts of Namibia and are not exclusively associated with the ongoing / proposed development area, which minimises the overall effect on trees/shrubs.

### 4.3.6 Grass Species

It is estimated that up to 111 grasses – 73 to 88 species – (Müller 2007 [88 sp.], Müller 1984 [73 sp.], Van Oudshoorn 1999 [73 sp.]) occur in the general area. The most important grass expected in the area is the endemic *Setaria finite* associated with ephemeral drainage lines. Although the season (end of dry and beginning of wet) made the identification of grasses difficult, none off the grasses are exclusively associated with the proposed / ongoing developments area nor protected species, which minimises the overall effect on grasses.



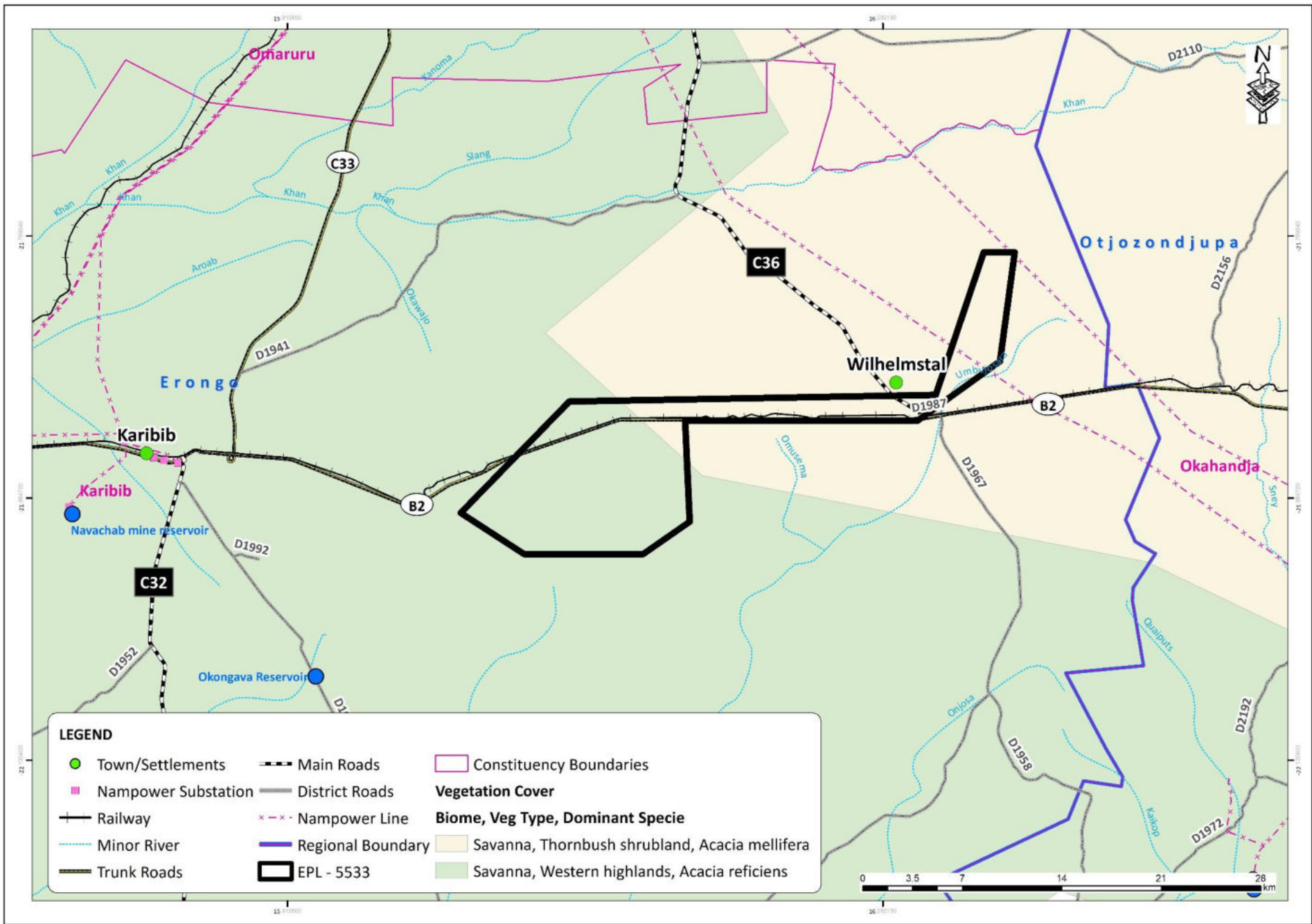


Figure 4.1: Vegetation diversity found within and around the EPL No. 5533 area.

### 4.3.7 Other Species

*Aloe littoralis* – scattered individuals – are viewed as another species of concern although occurs widespread throughout Namibia and not exclusively associated with the EPL area.

### 4.3.8 Fauna and Flora Conclusions / Sensitive Areas

Species most likely to be adversely affected by the proposed exploration within the EPL area would be the variety of reptiles and birds specifically associated with the proposed development site(s) as well as the potential effect such development may have on carnivores as well as the protected and unique flora. As all development have potential negative environmental consequences, identifying the most important fauna and flora 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 most important fauna and flora (habitat) areas within the EPL area:

- (i) Mountains [botanical richness and endemic vertebrates].
- (ii) Granite domes and other rocky outcrops [biotic richness and endemism], and.
- (iii) Local Ephemeral Rivers – Tributaries and the main Omaruru Ephemeral River [biotic richness, large desert-dwelling mammals, high value for human subsistence and tourism.

The following is summary of the key aspect of the proposed exploration programme likely to have some negative impacts on the receiving environment:

- (i) 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 because the proponent will utilise the already existing extensive access routes.
- (ii) Excavation, trenching/ drilling 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 and will depend on scale of the operations resulting in localised implications, and.
- (iii) Supporting Infrastructure including campsite - 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 (albeit ruins) infrastructure areas are used rather than affecting new sites – with localised implications.

## 4.4 Socioeconomic Setting

### 4.4.1 Overview

The nearest Town to the EPL 5533 is the mining Town of Karibib. The development of this project will have some socioeconomic contributions to the Town of Karibib which currently is dependent on the Navachab Gold Mine. There will be temporary employment opportunities and workers from the project area will be staying in the Town of Karibib. Potential for the development of a viable mining project will bring added local benefits and contribute to the national economy through taxes, royalty, and direct investment.

### 4.4.2 Agriculture

As an important cattle, game and small stock (goats and sheep) farming area (and consequently a source of employment) as well as renewed interest from a tourism point of view, the importance of the

western central Namibia to the GDP of Namibia is invaluable. The area surrounding EPL 5533 area falls within the long established private commercial farming communities.

The carrying capacity for the general area is 10-20kg/ha (Mendelsohn et al. 2002) or 12-15LAU/ha (van der Merwe 1983) and the risk of farming is viewed as relatively high. Small stock farming is the dominant farming activity in the Karibib area with between 70-80% of stock farmed with being sheep and 20-30% goats and cattle, respectively (van der Merwe 1983). The stock density is estimated at <3sheep/km<sup>2</sup> (1.5% of total sheep in Namibia) and <1cattle/km<sup>2</sup> (1.3% of total cattle in Namibia) (van der Merwe 1983). There are numerous existing tourism ventures in the area with the tourism potential viewed as relatively high (Mendelsohn et al. 2002).

#### **4.4.3 Conservation and Tourism**

The area does not fall within a Communal Conservancy with the closest being #Gaingu 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). The area is not well known for tourism and it does not have major tourism products such as unique natural landscapes, cultural resources or nature parks.

#### **4.4.4 Safety, Security and Obstructions**

Current safety issues include steep slopes / gullies / valleys, excavations, and minor scattered scrap metals. Generally, there will be a need to ensure that all employees and the public and visitors to the EPL area are safe. The entire proposed development will not cause any obstruction to human or fauna.

#### **4.4.5 Overall Socioeconomic Summary**

The population of Karibib Constituency is 13,320 which is 8.8 percent of the total Erongo Region population. The Karibib Project is in the sparsely populated freehold farming area. Karibib Constituency is among the least densely populated area in Erongo Region with a population density of approximately 0.9 persons per km<sup>2</sup>.

### **4.5 Ground Components**

#### **4.5.1 Geology**

The surficial geology is dominated by a variety of soils as shown in Fig. 4.2. The EPL 5533 falls within Swakop Group of the Central Zone of the Damara Sequence which underlies most of Namibia (Fig. 4.3). The oldest rocks within the Central Zone are the pre-Damara 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. The lithostratigraphy of the Damara Sequence in the Central Zone (CZ) in which the EPL 5533 falls has been reviewed and significantly revised by Badenhorst (1987), who has also correlated the stratigraphy across the Omaruru Lineament. The stratigraphy of the CZ taken from Steven (1993) as slightly modified after Badenhorst, (1987) and (1988) is given in Table 4.1.

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

GROUP	SUB-GROUP	FORMATION	THICKNES S (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.
		Chuoss	700	Diamictite, pebble- and boulder-bearing schist and minor quartzite
	<i>Discordance</i>			
	Ugab	Rössing	200	Very variable marble, quartzite, conglomerate, biotite schist, biotite cordierite schist and gneiss, aluminous gneiss, biotite-hornblende schist and calc-silicate schist.
<i>Unconformity or conformable transition</i>				
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.

#### 4.5.2 Geotechnical Engineering Consideration

Rocks of varying geotechnical characteristics are expected within the pegmatite zones and alternating bands within the banded dolomitic marble and biotite-quartz schist country rock and covered by a variety of sediments in some places.

No field and laboratory assessment of rock mass and detailed discontinuities survey were undertaken as part of this study.

Table 4.2 outlines an indicative classification of the various discontinuities that are likely to be found in the area. Both low and high order discontinuities are likely to be found around the EPL area.

It is highly recommended that a field-based geotechnical engineering assessment followed by laboratory assessments must be undertaken before the implementation deep excavation to have accurate figures of all the key geotechnical parameters.

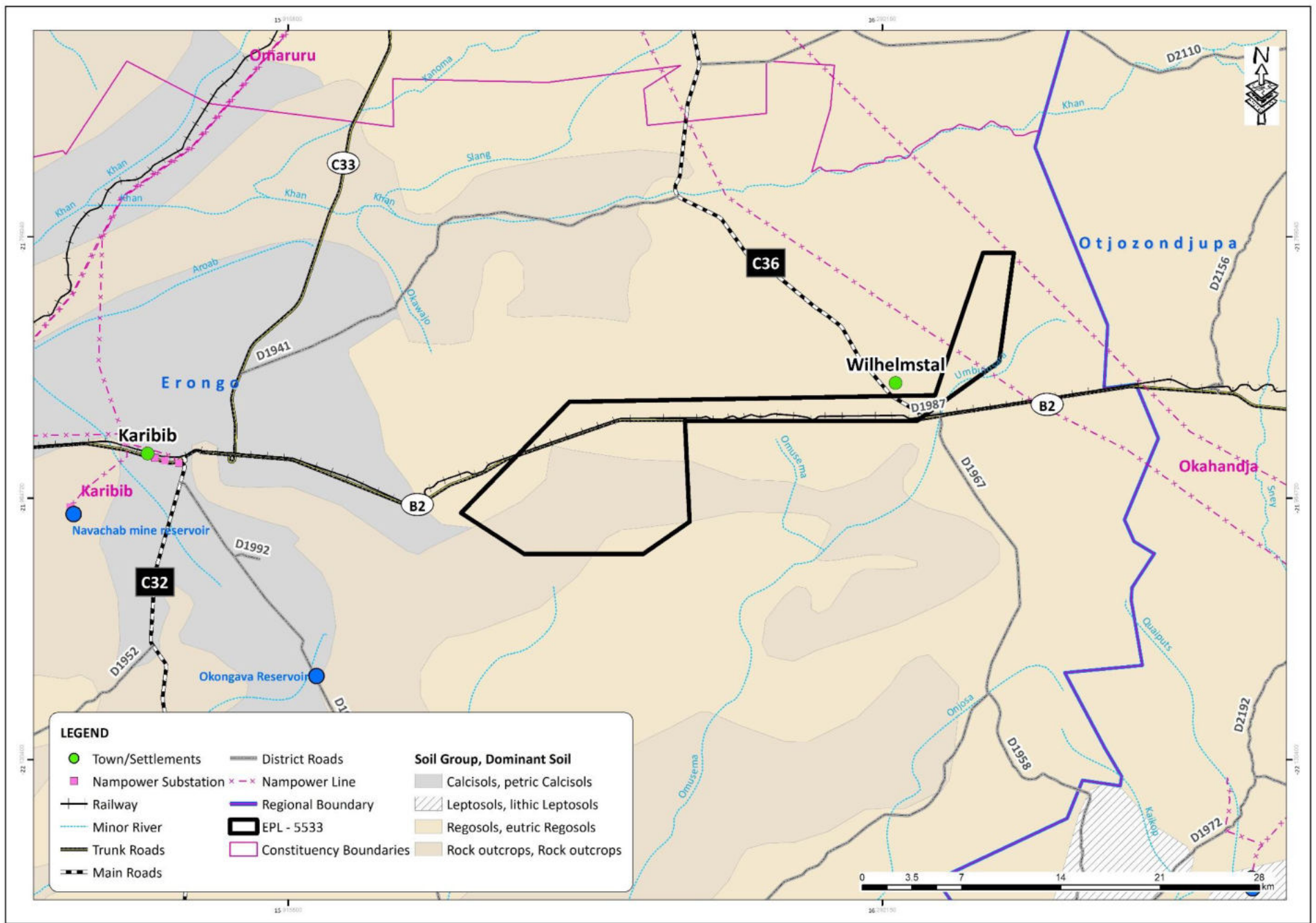


Figure 4.2: Soil types / surficial geology found within and around the EPL No. 5533 area.

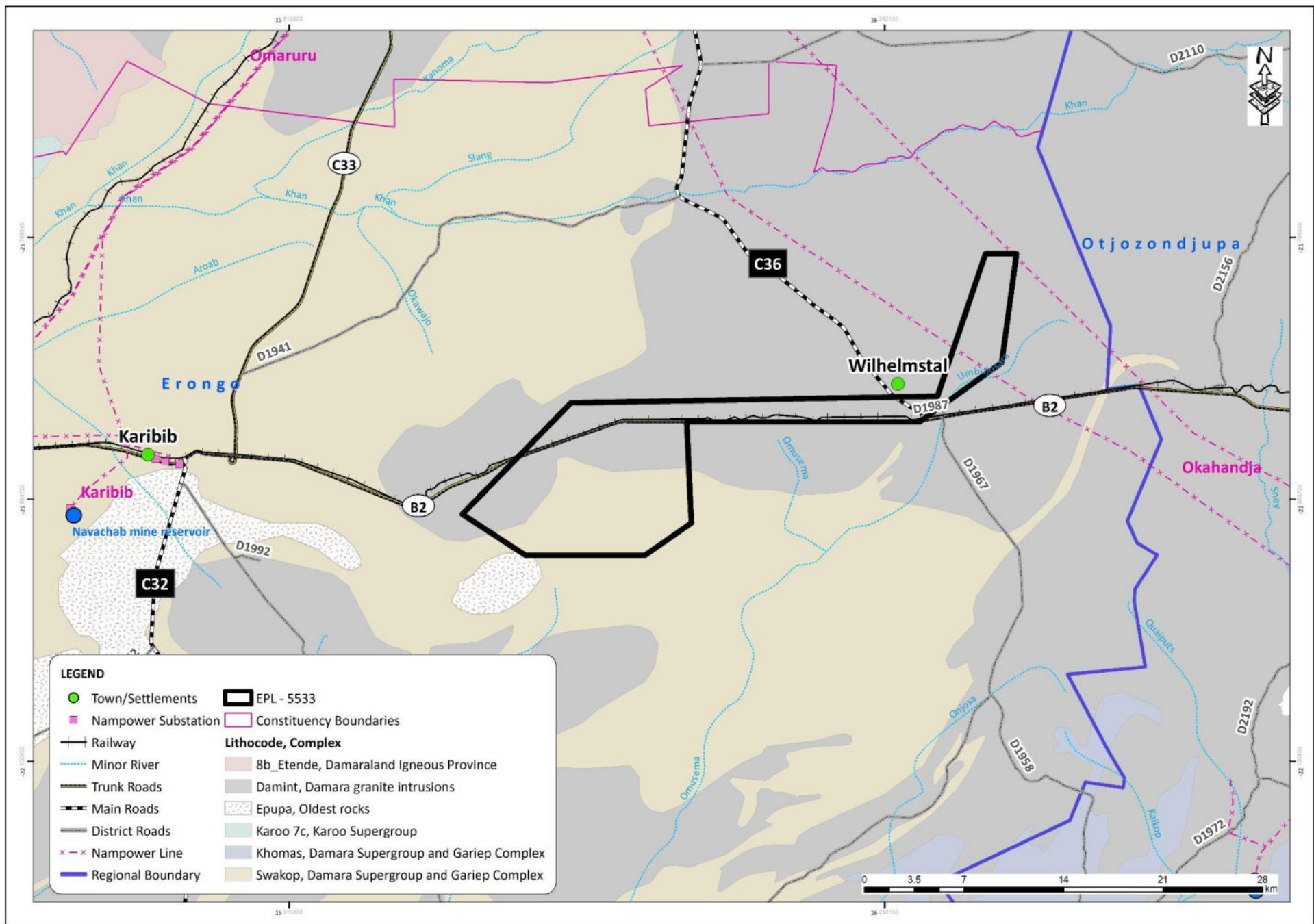


Figure 4.3: Rock types / solid geology found within and around the EPL No. 5533 area.

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

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

### 4.5.3 Water Sources

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. According to the Department of Water Affairs, (2001), the Erongo Region, Karibib and the EPL areas generally have low groundwater potential (Fig. 4.4). The area with aquifer potential, 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, but the degree of metamorphism affects the groundwater potential too. 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 and faults that outcrop on the surface without impermeable infillings. But the success rate and yields for these rock types are generally low. 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.

There is a NamWater Navachab mine water supply pipeline from the Swakoppoort Dam in the area, which dams the ephemeral Swakop River. The water supply pipeline dedicated for Navachab Gold Mine is located to south of the EPL area.

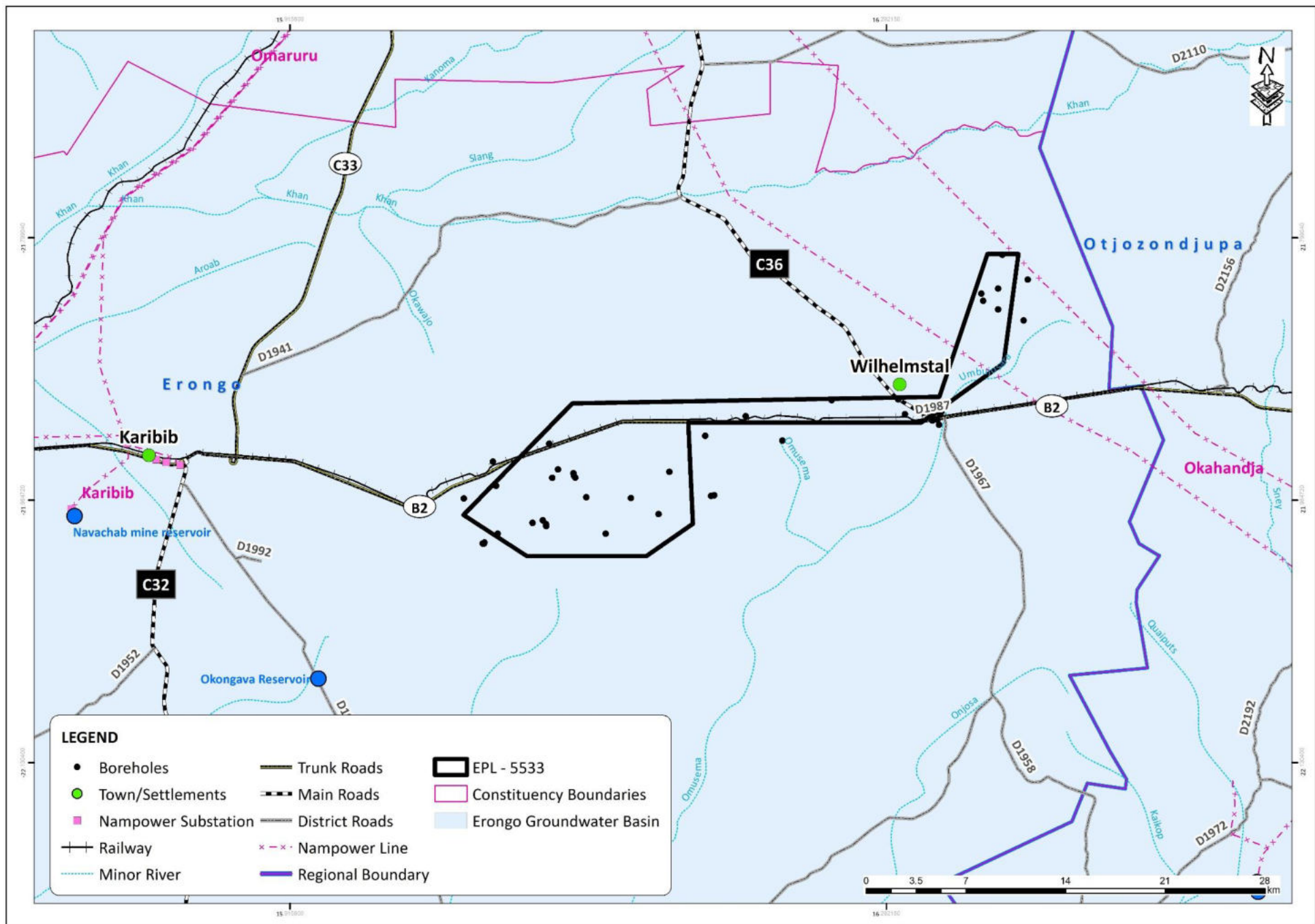


Figure 4.4: Groundwater and water supply schemes found within and around the EPL No. 5533 area.



#### **4.5.4 Evaluation of Water Vulnerability**

Vulnerability assessment of surface water covered possible runoff, the presence of source factors and major flow routes such as major high order discontinuities (Table 4.2), 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. The combined effects of unsaturated and saturated flow probabilities were used as indicator for groundwater vulnerability. However, groundwater or surface water will only be vulnerable to contamination if the following three (3) component are all present at the same time and at a site specific area within the EPL:

- (i) Contaminant sources resulting from proposed exploration programme.
- (ii) Potential pathways for contaminant migration such as major high order discontinuities (Table 4.2), ephemeral river channels, valleys and gullies, and.
- (iii) Targets (economic water resources) present within the project area.

Overall, the limited local groundwater resources found in the area form part of the poorly developed metamorphic rocks based confined and unconfined aquifer system that is moderately vulnerable to any sources of pollution. During the rainy season, surface water bodies can be found along the local ephemeral river system. This surface water often recharges the local groundwater resources along the faults, solutions holes, and other discontinuities along the ephemeral rivers in the general surrounding EPL area. Therefore, surface water in the local EPL area is more vulnerable to pollution sources associated with some of the proposed local field-based detailed prospecting / exploration activities such as drilling and trenching as well as supporting activities such as campsite and discharge of liquid and solid waste. It is important that all polluting activities must not be placed or undertaken in areas with high order discontinuities, valleys, or gullies systems in the area. Discharge of solid or liquid waste into a public stream is prohibited.

### **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 (Kinahan, 2017). 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. According to 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 considered to be of global importance.

#### **4.6.2 Local Archaeological Setting and Recommendation**

In the absence of field-based assessment being undertaken, it is likely that the general area around the EPL area may have archaeological resources that are protected by the National Heritage Act, 2004 (Act No. 27 of 2004) under the National Heritage Council of Namibia. The EPL area is likely to have evidence from the early colonial period related to a combination of mining, trade, missionary and indigenous tribes' activities. The expectation is therefore:

- (i) A high likelihood of Holocene age archaeological sites, including rock art, associated with outcropping granite in the EPL area, and.

- (ii) A high likelihood of late precolonial and colonial settlement sites.

The following are the key recommended actions related to archaeology in the EPL Area:

- (i) The exploration team should be made aware that under the National Heritage Act, 2004 (Act No. 27 of 2004) any items protected under the definition of heritage found in the course of the prospecting process should be reported to the National Heritage Council.
- (ii) The chance finds procedure as outlined in the EMP must be implemented at all times, and.
- (iii) Detailed field survey should be carried out if suspected archaeological resources or major natural cavities / shelters have been unearthed during the prospecting process.

#### 4.7 Public Consultations and Engagement

Public consultation and engagement must be part of the environmental assessment process for this project. According to the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007), a person conducting a public consultation process must give notice to all Interested and Affected Parties (I&AP) of the application which is subjected to public consultation.

The EIA Regulations clearly state that potential interested and affected parties must be provided with a reasonable opportunity (21 days) to comment on the application under Section 21(6) of the EIA Regulations. During the consultation process that was conducted from Tuesday 20<sup>th</sup> November 2018 to Monday 10<sup>th</sup> December 2018, the public and I&APs were invited to register and submit written comments / inputs / objections with respect to the proposed the proposed minerals exploration activities in the EPL No. 5533.

In line with the provisions of the regulations, the 1<sup>st</sup> advertisement has been published in the Namibian Newspaper dated **Tuesday 20<sup>th</sup> November 2018** informing all the I&AP about the proposed exploration (Fig. 4.1 and Annex 2).

Public notices continued to be published in the local newspapers as shown in Figs. 4.2 and 4.3 and Annex 2. The closing date for registration and submission of written objections, comments, inputs to the environmental assessment process was **Monday 10<sup>th</sup> December 2018**.

No written comments / inputs / objections with respect to the proposed the proposed minerals exploration activities in the EPL No. 5533 were received from the registered stakeholders during the public and stakeholder consultation period that ran from the from Tuesday 20<sup>th</sup> November 2018 to Monday 10<sup>th</sup> December 2018.

Table 4.3: Stakeholder register for the EPL 5533.

NAME	CONTACT DETAILS
Coleen Mannheimer (Botanist)	<a href="mailto:manfam@iafrica.com.na">manfam@iafrica.com.na</a> P.O. Box 193 Windhoek, Namibia Landline +264 61 233614 Mobile +264 (0) 811272820 Fax-email 0886552437
Jeano Foelscher (Kariongo Trading)	<a href="mailto:foelscher@yahoo.com">foelscher@yahoo.com</a> PO Box: 67 Karibib

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**PUBLIC NOTICE BY RICHWING EXPLORATION (Pty) Ltd (EPL 5533) AND JESAYA I. HAKOMUTO (EPL 6167) APPLICATIONS FOR ENVIRONMENTAL CLEARANCE CERTIFICATES (ECCs), KARIBIB DISTRICT, ERONGO REGION**

Richwing Exploration (Pty) Ltd and Jessaya Iyeleka Hakomuto holds mineral rights under the EPL 5533 for dimension stone and industrial minerals and EPL 6167 for base and rare metals, dimension stone, industrial minerals, precious metals and semi-precious stones, respectively. Both EPLs are being operated by Osino Gold Exploration (Pty) Ltd. The EPLs 5533 and 6167 were granted on the 04/02/2014 and 20/02/2017 and will expire on the 30/02/2019 and 22/02/2020 respectively. The EPL 5533 area totalling 28448 Ha covers parts of Farms Okajimikwu, Okakora, Kalimbo, Johann Albrechtshohe, Vogelsang, Wilhelmstal, Claudthal and Ombujomwene north and south. The EPL 6167 area totalling 1583 Ha covers parts of Farms Daham, Spasbona, and Okawayo. The proponents through Osino Gold Exploration (Pty) Ltd intend to continue with exploration activities in both EPLs covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting 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). In fulfillment of the environmental requirements, Osino Gold Exploration (Pty) Ltd has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindile Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the Scoping and Environmental Management Plan (EMP) Report in order to support the applications for ECCs. All interested and Affected Parties are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPLs 5533 and 6167. A combined Background Information Document (BID) is available on request and after registration.

**REGISTER BY EMAIL:** [tracedesk@rbs.com.na](mailto:tracedesk@rbs.com.na) or Contact Dr. Sindile Mwiya for more information: [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), Mobile: 0811413229  
**DEADLINE FOR WRITTEN SUBMISSIONS IS:**  
**MONDAY 10<sup>th</sup> DECEMBER 2018**



Risk-Based Solutions (RBS) CC  
For More Information Please Contact Dr. Sindile Mwiya  
Tel: 061-236056, 0811413229, [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), URL: [www.rbs.com.na](http://www.rbs.com.na)

Figure 4.5: Copy of the Public Notice 1<sup>st</sup> published in the Namibian Newspaper dated Tuesday 20<sup>th</sup> November 2018.

# Youth Corner

- Education
- Training

- Innovation
- Career guidance

## Zambezi adopts DREAMS for girls, young women

Confidante Reporter

THE Zambezi region has fully implemented the DREAMS program which is aimed at empowering adolescent girls and young women especially in the fight against HIV/AIDS.

The is the third Namibian region to implement the program has seen the enrolment of 1 300 adolescent girls consisting of 850 girls aged 9-14, 330 aged 15-19, and 125 aged 20-24 years old since July.

DREAMS is an ambitious partnership between the governments of Namibia and the United States to reduce HIV infections among adolescent girls and young women by helping them develop into Determined, Resilient, Empowered, Aids-free, Mentored, and Safe (DREAMS) women.

According to the Namibia Population-Based HIV Impact Assessment (NAMPHIA) released in July, the Zambezi region has the highest prevalence of HIV among adults aged 15-64 years. Despite this, the region is said to be doing well to maintain the viral load suppression of people on treatment.

"This means a person diagnosed with HIV in the Zambezi Region is quickly put on treatment and continues to take his or her medication. This is an important achievement for the region because once the



U.S. Ambassador Lisa Johnson with Governor of the Zambezi Region, Lawrence Sanyago

viral load is suppressed, the virus is cannot be transmitted, and the individual has every chance of living a long and healthy life," remarked U.S. Ambassador to Namibia Lisa Johnson. The DREAMS program in the

Zambezi region is implemented by I-TECH Namibia in collaboration with multi-sectoral Government involvement.

"Successful treatment of HIV in the Zambezi Region is an achievement that is



Ambassador Lisa Johnson

“ Successful treatment of HIV in the Zambezi Region is an achievement that is due to the commitment of the healthcare providers

due to the commitment of the healthcare providers, the partners, the supporting Ministries, and the communities - all tied together with strong leadership. That is what is helping the Zambezi Region change the course of the HIV epidemic in this region.”

**PUBLIC NOTICE BY ZHONGHE RESOURCES (NAMIBIA) DEVELOPMENT (Pty) Ltd APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATES (ECCs) FOR THE EPLs Nos. 3600 AND 3602, SWAKOPMUND / KARIBIB DISTRICTS, ERONGO REGION**

Zhonghe Resources (Namibia) Development (Pty) Ltd (the Proponent) holds mineral rights under the EPL 3600 for base and rare metals and nuclear fuels groups and EPL 3602 for nuclear fuels. The EPLs 3600 and 3602 were both granted on 24<sup>th</sup> July 2017 and will expire on the 23<sup>rd</sup> July 2019. The EPL No. 3600 area totalling 20932 Ha fall within the State land with the northern portion of the EPL area falling within the Namib Naukluft Park. The EPL No. 3602 area totalling 22000 Ha covers parts of Farm Vergehoeg 92 to the northeast, Farm Bloemhof 109 to the east with small portions in south falling within the Namib Naukluft Park. The proponent intend to continue with exploration activities in both EPLs covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations, 2012 and cannot be undertaken without Environmental Clearance Certificates (ECCs). In fulfillment of the 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 prepare the Scoping and Environmental Management Plan (EMP) Reports in order to support the applications for Environmental Clearance Certificates (ECCs). All interested and Affected Parties (I&APs) are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPLs Nos. 3600 and 3602. A combined Background Information Document (BID) is available on request and after registration.

**REGISTER BY EMAIL: [frontdesk@rbs.com.na](mailto:frontdesk@rbs.com.na) or Contact Dr. Sindila Mwiya for more information: [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), Mobile: 0811413229**  
**DEADLINE FOR WRITTEN SUBMISSIONS IS: MONDAY 10<sup>th</sup> DECEMBER 2018**

**Risk-Based Solutions (RBS) CC**  
 For More Information Please Contact Dr. Sindila Mwiya  
 Tel: 061-304056, 0811413229, [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), URL: [www.rbs.com.na](http://www.rbs.com.na)

**PUBLIC NOTICE BY RICHWING EXPLORATION (Pty) Ltd (EPL 5533) AND JESAYA I. HAKOMUTO (EPL 6167) APPLICATIONS FOR ENVIRONMENTAL CLEARANCE CERTIFICATES (ECCs), KARIBIB DISTRICT, ERONGO REGION**

Richwing Exploration (Pty) Ltd and Jesaya Iyeleka Hakomuto holds mineral rights under the EPL 5533 for dimension stone and industrial minerals and EPL 6167 for base and rare metals, dimension stone, industrial minerals, precious metals and semi-precious stones, respectively. Both EPLs are being operated by Osino Gold Exploration (Pty) Ltd. The EPLs 5533 and 6167 were granted on the 04/02/2014 and 23/02/2017 and will expire on the 3/02/2019 and 22/02/2020 respectively. The EPL 5533 area totalling 26446 Ha covers parts of Farms Okajimukwu, Okakara, Kalimbo, Johann Albrechtshöhe, Vogelsang, Wilhelmstal, Clausthal and Ombyuomaere north and south. The EPL 6167 area totalling 1583 Ha covers parts of Farms Daheim, Spesbona, and Okawayo. The proponents through Osino Gold Exploration (Pty) Ltd intend to continue with exploration activities in both EPLs covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting 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). In fulfillment of the environmental requirements, Osino Gold Exploration (Pty) Ltd has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the Scoping and Environmental Management Plan (EMP) Reports in order to support the applications for ECCs. All interested and Affected Parties are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPLs 5533 and 6167. A combined Background Information Document (BID) is available on request and after registration.

**REGISTER BY EMAIL: [frontdesk@rbs.com.na](mailto:frontdesk@rbs.com.na) or Contact Dr. Sindila Mwiya for more information: [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), Mobile: 0811413229**  
**DEADLINE FOR WRITTEN SUBMISSIONS IS: MONDAY 10<sup>th</sup> DECEMBER 2018**

**Risk-Based Solutions (RBS) CC**  
 For More Information Please Contact Dr. Sindila Mwiya  
 Tel: 061-304056, 0811413229, [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), URL: [www.rbs.com.na](http://www.rbs.com.na)

Figure 4.6: Copy of the Public Notice 2<sup>nd</sup> published in the Confidante newspaper dated 29<sup>th</sup> November – 5<sup>th</sup> December 2018.



**USAKOS TOWN COUNCIL**

Notice is hereby given in terms of Section 63(2) of the Local Authorities Act, (Act 23 of 1992) as amended, that the Usakos Town Council, vide Council Resolution No. OCM018.10.09.2018, resolved to sell the following immovable property by way of private treaty to the listed applicant.

Applicant	Property No	Size	Purchase Price	Zoning
Paragon Seafood Canning Factory (Pty) LTD	A portion of Portion 24 of the Farm Usakos Nord No. 40.	1.5ha	N\$200 000.00	"undetermined"

Anyone wishing to object against the intended transaction as set out above may do so in writing with the grounds thereof by submitting written objections to the Chief Executive officer of the Usakos Town Council, not later than 12h00 on the 21<sup>st</sup> December 2018

**ENVIRONMENTAL IMPACT ASSESSMENT**

APPLICATION FOR MINING LICENCE NUMBER: ML 148 – ERONGO REGION.

OUTRUN CONSULTANTS CC HEREBY GIVES NOTICE OF THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE APPLICATION OF MINING LICENCE NUMBER: ML 148 IN THE OMARURU AREA IN ERONGO REGION. The exact location of the project site is highlighted in the Background and Invitation to participate Document (BID). An EIA is being commissioned as required under the Environmental Management Act, 7 of 2007 and Regulations of 2012. Interested and Affected Parties are invited to register and attend meetings as detailed below.

PROPOSER(S): NAMIBIA QUARRIES (PTY) LTD  
 PROJECT ACTIVITIES: MINING OF DESERT CRYSTAL GRANITE  
 PROJECT LOCATION: OMARURU –ERONGO REGION – MAP IS PROVIDED IN THE BID.  
 PUBLIC PARTICIPATION: A FORMAL MEETING WILL BE HELD IN OMARURU ON AN AGREED DATE AND VENUE WITH REGISTERED IAPs.  
 Josiah – 0812 683 578,  
 E-Mail: [outruninvest@hotmail.com](mailto:outruninvest@hotmail.com)



**Philcor Shuttles**

For more information contact 085 355 1868

**NOTICE**

Take notice that HARMONIC TOWN PLANNING CONSULTANTS CC, TOWN AND REGIONAL PLANNERS, on behalf of the owner of Erf Rehoboth D 675, intends to apply to the Rehoboth Town Council and the Namibian Advisory Board for:

- CONSENT TO USE ERF REHOBOTH D 675, SINGLE RESIDENTIAL WITH A DENSITY OF 1:600 TO OPERATE A PLACE OF INSTRUCTION (CRECHE).

Erf Rehoboth D 675, measure 880m<sup>2</sup> in extent and is zoned 'Single Residential' with a density of 1.600. The owner(s) wish(es) the erf to remain zoned 'Single Residential' and wish(es) to apply for consent to use the erf as a place of instruction (creche). The application for consent use for a place of instruction would be made in terms of Table B of the Rehoboth Town Planning Scheme.

Parking to the development will be provided in accordance with the requirements of the Rehoboth Town Planning Scheme.

Further take notice that the plan of the Erf lies for inspection on the town planning notice board at the Rehoboth Town Council and at Harmonic Town Planning Offices, 76B Pasteur Street, Windhoek West.

Further take notice that any person objecting to the proposed use of the land as set out above may lodge such objection together with the grounds thereof, with the Rehoboth Town Council and with the Applicant (Harmonic Town Planning Consultants CC) in writing within 14 days of the last publication of this notice (final date for objections is Friday, 28<sup>th</sup> December 2018).



Contact: Harold Kisting  
 Harmonic Town Planning  
 Consultants CC  
 Town and Regional Planners  
 P.O. Box 3216 Windhoek  
 Cell 081 127 5879  
 Fax 088645401  
 Email: [hkisting@namibnet.com](mailto:hkisting@namibnet.com)



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 Windhoek, Namibia  
 3 Nguni Street  
 Northern Industrial Area



**ENVIRONMENTAL IMPACT ASSESSMENT**

APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE FOR A PIGGERY PROJECT ON STAMPRIED FARM IN HARDAP REGION.

OUTRUN CONSULTANTS CC HEREBY GIVES NOTICE OF THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PIGGERY PROJECT ON STAMPRIED FARM. The exact location of the project site is highlighted in the Background and Invitation to participate Document (BID). An EIA is being commissioned as required under the Environmental Management Act, 7 of 2007 and Regulations of 2012. Interested and Affected Parties are invited to register and attend meetings as detailed below.

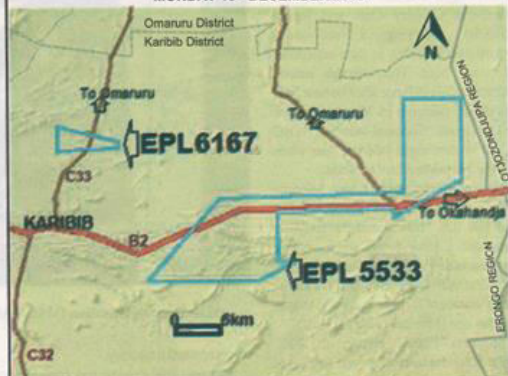
PROPOSER(S): STAMPRIED FARM (PTY) LTD  
 PROJECT ACTIVITIES: CONSTRUCTION AND MANAGEMENT OF A PIGGERY  
 PROJECT LOCATION: STAMPRIED – HARDAP REGION – MAP IS PROVIDED IN THE BID.  
 PUBLIC PARTICIPATION: A PUBLIC MEETING WILL BE HELD AT STAMPRIED FARM. REGISTERED IAPs WILL BE CONSULTED FOR A SUITABLE DATE AND TIME.  
 CONSULTANT: Josiah – 0812 683 578,  
 E-Mail: [outruninvest@hotmail.com](mailto:outruninvest@hotmail.com)



**PUBLIC NOTICE BY RICHWING EXPLORATION (Pty) Ltd (EPL 5533) AND JESAYA I. HAKOMUTO (EPL 6167) APPLICATIONS FOR ENVIRONMENTAL CLEARANCE CERTIFICATES (ECCs), KARIBIB DISTRICT, ERONGO REGION**

Richwing Exploration (Pty) Ltd and Jesaya Iyeleka Hakomuto holds mineral rights under the EPL 5533 for dimension stone and industrial minerals and EPL 6167 for base and rare metals, dimension stone, industrial minerals, precious metals and semi-precious stones, respectively. Both EPLs are being operated by Osino Gold Exploration (Pty) Ltd. The EPLs 5533 and 6167 were granted on the 04/02/2014 and 23/02/2017 and will expire on the 3/02/2019 and 22/02/2020 respectively. The EPL 5533 area totalling 26446 Ha covers parts of Farms Okatjimukwu, Okakoara, Kalimbo, Johann Albrechtshohe, Vogelsang, Wilhelmstal, Claussthal and Ombujomaere north and south. The EPL 6167 area totalling 1583 Ha covers parts of Farms Daheim, Spesbona, and Okawayo. The proponents through Osino Gold Exploration (Pty) Ltd intend to continue with exploration activities in both EPLs covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting 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 (ECCs). In fulfillment of the environmental requirements, Osino Gold Exploration (Pty) Ltd has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the Scoping and Environmental Management Plan (EMP) Reports in order to support the applications for ECCs. All Interested and Affected Parties are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPLs 5533 and 6167. A combined Background Information Document (BID) is available on request and after registration.

REGISTER BY EMAIL: [frontdesk@rbs.com.na](mailto:frontdesk@rbs.com.na) or Contact Dr. Sindila Mwiya for more Information: [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na), Mobile: 0811413229  
 DEADLINE FOR WRITTEN SUBMISSIONS IS:  
**MONDAY 10<sup>th</sup> DECEMBER 2018**



**Risk-Based Solutions (RBS) CC**

For More Information Please Contact Dr. Sindila Mwiya  
 Tel: 061-306058, 0811413229, [smwiya@rbs.com.na](mailto:smwiya@rbs.com.na) URL: [www.rbs.com.na](http://www.rbs.com.na)

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Figure 4.7: Copy of the Public Notice 3<sup>rd</sup> published in the Windhoek Observer newspaper dated Friday 7<sup>th</sup> December 2018.

## 5. IMPACT ASSESSMENT AND RESULTS

### 5.1 Impact Assessment Procedure

The Environmental Assessment process that has been undertaken with respect to the proposed exploration programme for the EPL No. 5533 has been conducted in accordance with the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007).

### 5.2 Assessment of Ecosystem Based Alternatives

The following alternatives have been considered:

- (i) **EPL Location:** A number of potential economic minerals deposits are known to exist in the general area and linked to the regional geology of the EPL area. The Proponent intend to explore / prospect for all the licensed minerals groups likely to be associated with the regional and local geology. The minerals occurrences are site-specific and related to the regional and local geology of a specific area to which there are no alternative sites to consider with respect to the license location. The only other alternative is the no-action option (no exploration activities are implemented in a specific area).
- (ii) **The No-Action Alternative** - A comparative assessment of the environmental impacts of the 'no-action' alternative (a future in which the proposed exploration activities do not take place) has been undertaken. An assessment of the environmental impacts of a future, in which the proposed exploration and possible discovery of economic minerals resources does not take place, may be good for the receiving environment because there will be no negative environmental impacts due to the proposed minerals exploration or possible mining operation that may take place in the EPL area.

The environmental benefits will include:

- ❖ No negative impacts as a result of no mineral exploration taking place, and.
- ❖ Potential future mining related negative environmental impact on the receiving environment.

However, it is important to understand that even if the proposed exploration activities do not take place, to which the likely negative environmental impacts are likely to be low and localised, the other current and future land uses such as agriculture and tourism will still have some negative impacts on the receiving environment. The likely negative environmental impacts of the other current and future land use that may still happen in the absence of the proposed minerals exploration activities includes:

- ❖ Land degradation due to drought.
- ❖ Overgrazing / over stocking beyond the land carrying capacity.
- ❖ Poor land management practices, and.
- ❖ Erosion and overgrazing.

Furthermore, it is important to understand what benefits might be lost if the proposed exploration activities do not take place. Key loses that may never be realised if the proposed project activities do not go-ahead include: Loss of potential added value to the unknown underground minerals resources that maybe found within the EPL No. 5533, socioeconomic benefits derived from current and future exploration, direct and indirect contracts and employment opportunities, export earnings, foreign direct investments, license rental fees, royalties, and various other taxes payable to the Government.

- (iii) **Other Alternative Land Uses:** The EPL area fall within the well-known commercial agricultural land uses area dominated by cattle, game, and small stock farming activities. The growing game farming is also making tourism a vital socioeconomic opportunity in the general area. Minerals exploration and mining activities are well known land use options in Namibia and the surrounding EPL area. Due to the limited scope of the proposed exploration and the implementation of the EMP, it is likely that the proposed exploration can coexist with the current and potential future land uses within the general area.
- (iv) **Potential Land Use Conflicts:** Considering the current land use practices (agriculture and tourism) as well as potential other land uses including minerals exploration, it is likely that potential economic derivatives from any positive exploration outcomes leading to the development of a mine in the general area can still co-exist with the existing and potential future land use options of the general area. However, much more detailed assessments of any likely visual and other socioeconomic impacts will need to be included in the EIA that must be undertaken as part of the prefeasibility and feasibility studies if economic minerals resources are discovered. The use of thematic mapping and delineation of various land use zones for specific uses such as agriculture, conservation, mining or tourism etc, within the EPL area will greatly improve the multiple land use practices and promote coexistence for all the possible land use options.
- (v) **Ecosystem Function (What the Ecosystem Does):** Ecosystem functions such as 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 are vital components of the receiving environment. However, the proposed exploration activities will not affect the ecosystem function due to the limited scope of the proposed activities because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.
- (vi) **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 EPL area. However, the proposed exploration activities will not affect the ecosystem services due to the limited scope and area of coverage of the proposed activities because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.
- (vii) **Use Values:** The EPL area has direct values for other land uses such as agriculture, conservation and tourism as well as indirect values which includes: 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 exploration activities will not destroy the current use values due to the limited scope of the proposed activities as well as the adherence to the provisions of the EMP as detailed in the EMP report, and.
- (viii) **Non-Use or Passive Use:** The EPL area has an existence value that is not linked to the direct use / benefits to current or future generations. The proposed exploration activities will not affect the ecosystem current or future none or passive uses due to the limited scope of the proposed activities that will leave much of the EPL area untouched because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.

## 5.3 Key Issues Considered in the Assessment Process

### 5.3.1 Sources of Impacts (Proposed Project Activities)

The proposed exploration activities covering initial desktop exploration activities (no field-work undertaken, regional reconnaissance, initial local field-based activities, detailed local field-based activities, prefeasibility and feasibility studies related activities are the key sources both negative and positive impacts on the receiving environment.

### 5.3.2 Summary of Receptors Likely to be Negative Impacted

Based on the findings of this EIA Report, the following is the summary of the key environmental receptors that are may be negatively impacted by the proposed activities:

- ❖ **Physical environment:** Water quality, physical infrastructure and resources, air quality, noise and dust, landscape and topography, soil quality and, Climate change influences.
- ❖ **Biological environment:** Habitat, protected areas and resources, flora, fauna, and ecosystem functions, services, use values and non-use or passive use, and.
- ❖ **Socioeconomic, cultural and archaeological environment:** Local, regional and national socioeconomic settings, commercial and subsistence agriculture, community protection areas tourism and recreation cultural, biological and archaeological resources.

## 5.4 Impact Assessment Methodology

### 5.4.1 Impact Definition

In this EIA Report, a natural and/or human environmental impact is defined as: “Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s environmental aspects.” (ISO 14001).

All proposed project activities (routine and non-routine) were considered during the Scoping, EIA and EMP Phases in terms of their potential to:

- ❖ Interact with the existing environment (physical, biological and social elements), and.
- ❖ Breach relevant national legislation, relevant international legislation, standards and guidelines, and corporate environmental policy and management systems.

Where a project activity and receptor were considered to have the potential to interact, the impact has been defined and ranked according to its significance. Table 5.1 provides the definition of different categories of impacts identified and used in this report.

This EIA Report has assessed the potential impacts resulting from routine Project activities, assuming that the Project activities that may cause an impact that will occur but the impact itself will be dependent on the likelihood (Probability) (Table 5.2).

Correct control measures through the implementation of the EMP and monitoring thereof, often reduce any negative significant impacts on the receiving environment as the results of the project activities. The assessment therefore, has focussed on the measures aimed at preventing the occurrence of an impact as well as mitigation measures that may be employed.



Table 5.1: Definition of impact categories used in this report.

<b>Nature of Impact</b>	Adverse	Considered to represent an adverse change from the baseline, or to introduce a new undesirable factor.
	Beneficial	Considered to represent an improvement to the baseline or to introduce a new desirable factor.
<b>Type of Impact</b>	Direct	Results from a direct interaction between a planned or unplanned Project activity and the receiving environment.
	Indirect	Results from the Project but at a later time or at a removed distance or which may occur as a secondary effect of a direct impact.
	Cumulative	Results from (i) interactions between separate Project-related residual impacts. and (ii) interactions between Project-related residual impacts in combination with impacts from other projects and their associated activities. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
<b>Duration of Impact</b>	Short-term	Predicted to last only for a limited period but will cease on completion of the activity, or as a result of mitigation/reinstatement measures and natural recovery typically within a year of the project completion.
	Medium-	Predicted to last only for a medium period after the Project finishing, typically one to five years.
	Long-term	Continues over an extended period, typically more than five years after the Project's completion.
	Permanent	Occurs during the development of the Project and causes a permanent change in the affected receptor or resource that endures substantially beyond the Project lifetime.
<b>Scale of Impact</b>	Local	Affects locally important environmental resources or is restricted to a single habitat/biotope, a single community.
	Regional	Affects nationally important environmental resources, or an area that is nationally important/protected or has macro-economic consequences.
	National	Affects nationally important environmental resources, or an area that is nationally important/protected or has macro-economic consequences.
	International	Affects internationally important resources such as areas protected by international Conventions
	Transboundary	Impacts experienced in one country as a result of activities in another.
<b>Probability</b>	Negligible	Possibility negligible
	Improbable	Possibility very low
	Probable	Distinct possibility
	Highly Probable	Most likely
	Definite	Impact will occur regardless of preventive measures

The overall impact severity has been categorised using a semi-quantitative subjective scale as shown in Table 5.2 for sensitivity of receptors, Table 5.3 for magnitude, Table 5.4 for duration, Table 5.5 for extent and Table 5.6 showing probability.

Table 5.2: Definitions used for determining the sensitivity of receptors.

SENSITIVITY RATING		CRITERIA
1	<b>Negligible</b>	The receptor or resource is resistant to change or is of little environmental value.
2	<b>Low</b>	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	<b>Medium</b>	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	<b>High</b>	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	<b>Very High</b>	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

Table 5.3: Scored on a scale from 0 to 5 for impact magnitude.

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

Table 5.4: Scored duration over which the impact is expected to last.

SCALE (-) or (+)	DESCRIPTION
T	Temporary
P	Permanent

Table 5.5: Scored geographical extent of the induced change.

SCALE (-) or (+)	DESCRIPTION
L	limited impact on location
O	impact of importance for municipality.
R	impact of regional character
N	impact of national character
M	impact of cross-border character

### 5.4.2 Likelihood (Probability) of Occurrence

The likelihood (probability) of the pre-identified events occurring has been ascribed using a qualitative scale of probability categories (in increasing order of likelihood) as shown in Table 5.6. Likelihood is estimated on the basis of experience and/ or evidence that such an outcome has previously occurred. Impacts resulting from routine/planned events under normal operations are classified under category (E).

Table 5.6: Summary of the qualitative scale of probability categories (in increasing order of likelihood).

SCALE (-) or (+)	DESCRIPTION
A	Extremely unlikely (e.g. never heard of in the industry)
B	Unlikely (e.g. heard of in the industry but considered unlikely)
C	Low likelihood (egg such incidents/impacts have occurred but are uncommon)
D	Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)
E	High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)

### 5.4.3 Project Activities Summary of Impacts Results

The results of the impacts assessment and evaluation has adopted a matrix framework similar to the Leopold matrix. Assessment results of the magnitude, duration, extent, and probability of the potential impacts due to the proposed project activities interacting with the receiving environment are presented in form of a matrix table as shown in Tables 5.7-5.10.

The overall severity of potential environmental impacts of the proposed project activities on the receiving environment will be of low magnitude (Table 5.7), temporally duration (Table 5.8), localised extent (Table 5.9) and low probability of occurrence (Table 5.10) due to the limited scope of the proposed activities and the use of step-by-step approach in advancing exploration activities and adopting of appropriate mitigation measures.

The Proponent shall continue to evaluate the results of exploration success and the implementation of the subsequent exploration stages will be subject to the positive outcomes of previous activities as graded (Tables 5.7-5.10).

It is important to note that the assessment of the likely impacts as shown in Tables 5.7 - 5.10, have been considered without the implementation of mitigation measures detailed in the EMP Report.

The need for implementation of the appropriate mitigation measures as presented in the EMP Report has been determined based on the results of the impact assessment (Tables 5.7 - 5.10) and the significant impacts as detailed in Tables 5.11 and 5.12.

Table 5.7: Results of the sensitivity assessment of the receptors (Physical, Socioeconomic and Biological environments) with respect to the proposed exploration / prospecting activities.

RECEPTOR SENSITIVITY			PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT					
SENSITIVITY RATING		CRITERIA	Water Quality	Physical Infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.																
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.																
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance.																
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.																
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.																
1. Initial Desktop Exploration Activities	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(ii) Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(iii) Purchase and analysis of existing Government aerial hyperspectral	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Regional Reconnaissance Field-Based Activities	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 5.7: Cont.

RECEPTOR SENSITIVITY			PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT					
SENSITIVITY RATING		CRITERIA	Water Quality	Physical Infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.																
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.																
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance																
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.																
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.																
3. Initial Local Field-Based Activities	(i)	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(ii)	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(iii)	Ground geophysical survey (Subject to the positive outcomes of i and ii above)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(iv)	Possible Trenching (Subject to the outcomes of i - iii above)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(v)	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(vi)	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4. Detailed Local Field-Based Activities	(i)	Access preparation and related logistics to support activities	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	(ii)	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(iii)	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	(iv)	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5. Prefeasibility and Feasibility Studies	(i)	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	(ii)	Detailed drilling and bulk sampling and testing for ore reserve calculations	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	(iii)	Geotechnical studies for mine design	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	(iv)	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(v)	EIA and EMP to support the ECC for mining operations	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	(vi)	Preparation of feasibility report and application for Mining License	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 5.8: Results of the scored time period (duration) over which the impact is expected to last.

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT										
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources						
<table border="1"> <thead> <tr> <th>SCALE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>T</td> <td>Temporary</td> </tr> <tr> <td>P</td> <td>Permanent</td> </tr> </tbody> </table>		SCALE	DESCRIPTION	T	Temporary	P	Permanent																
		SCALE	DESCRIPTION																				
		T	Temporary																				
P	Permanent																						
<b>1. Initial Desktop Exploration Activities</b>	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(ii) Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(iii) Purchase and analysis of existing Government aerial hyperspectral	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
<b>2. Regional Reconnaissance Field-Based Activities</b>	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T						

Table 5.8: Cont.

DURATION OF IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
SCALE		DESCRIPTION															
T		Temporary															
P		Permanent															
<b>3. Initial Local Field-Based Activities</b>	(i) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(ii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(iii) Ground geophysical survey (Subject to the positive outcomes of i and ii above)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(v) Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(vi) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
<b>4. Detailed Local Field-Based Activities</b>	(i) Access preparation and related logistics to support activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(ii) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(iii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(iv) Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
<b>5. Prefeasibility and Feasibility Studies</b>	(i) Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(iii) Geotechnical studies for mine design	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(iv) Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(v) EIA and EMP to support the ECC for mining operations	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	(vi) Preparation of feasibility report and application for Mining License	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	

Table 5.9: Results of the scored geographical extent of the induced change.

GEOGRAPHICAL EXTENT OF IMPACT		PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT																	
		Water Quality	Physical Infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources												
<table border="1"> <thead> <tr> <th>SCALE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>limited impact on location</td> </tr> <tr> <td>O</td> <td>impact of importance for municipality</td> </tr> <tr> <td>R</td> <td>impact of regional character</td> </tr> <tr> <td>N</td> <td>impact of national character</td> </tr> <tr> <td>M</td> <td>impact of cross-border character</td> </tr> </tbody> </table>		SCALE	DESCRIPTION	L	limited impact on location	O	impact of importance for municipality	R	impact of regional character	N	impact of national character	M	impact of cross-border character																
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L	limited impact on location																												
O	impact of importance for municipality																												
R	impact of regional character																												
N	impact of national character																												
M	impact of cross-border character																												
<b>1. Initial Desktop Exploration Activities</b>	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(ii) Purchase and analysis of existing Government high resolution magnetic and radiometric geophysical data	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iii) Purchase and analysis of existing Government aerial hyperspectral	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
<b>2. Regional Reconnaissance Field-Based Activities</b>	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												



Table 5.9: Conti.

GEOGRAPHICAL EXTENT OF IMPACT		PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT																		
		Water Quality	Physical Infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources													
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L	limited impact on location																													
O	impact of importance for municipality																													
R	impact of regional character																													
N	impact of national character																													
M	impact of cross-border character																													
<b>3. Initial Local Field-Based Activities</b>	(i) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(ii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iii) Ground geophysical survey (Subject to the positive outcomes of i and ii above)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(v) Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(vi) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
<b>4. Detailed Local Field-Based Activities</b>	(i) Access preparation and related logistics to support activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(ii) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iv) Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
<b>5. Prefeasibility and Feasibility Studies</b>	(i) Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iii) Geotechnical studies for mine design	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(iv) Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(v) EIA and EMP to support the ECC for mining operations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												
	(vi) Preparation of feasibility report and application for Mining License	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L												

Table 5.10: Results of the qualitative scale of probability occurrence.

IMPACT PROBABILITY OCCURRENCE		PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT																	
		Water Quality	Physical Infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources												
<table border="1"> <thead> <tr> <th>SCALE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Extremely unlikely (e.g. never heard of in the industry)</td> </tr> <tr> <td>B</td> <td>Unlikely (e.g. heard of in the industry but considered unlikely)</td> </tr> <tr> <td>C</td> <td>Low likelihood (egg such incidents/impacts have occurred but are uncommon)</td> </tr> <tr> <td>D</td> <td>Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)</td> </tr> <tr> <td>E</td> <td>High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)</td> </tr> </tbody> </table>		SCALE	DESCRIPTION	A	Extremely unlikely (e.g. never heard of in the industry)	B	Unlikely (e.g. heard of in the industry but considered unlikely)	C	Low likelihood (egg such incidents/impacts have occurred but are uncommon)	D	Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)	E	High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)																
SCALE	DESCRIPTION																												
A	Extremely unlikely (e.g. never heard of in the industry)																												
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E	High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)																												
<b>1. Initial Desktop Exploration Activities</b>	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(ii) Purchase and analysis of existing Government high resolution magnetic and radiometric geophysical data	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(iii) Purchase and analysis of existing Government aerial hyperspectral	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
<b>2. Regional Reconnaissance Field-Based Activities</b>	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A												

Table 5.10: Cont.

IMPACT PROBABILITY OCCURRENCE		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
SCALE		DESCRIPTION															
A		Extremely unlikely (e.g. never heard of in the industry)															
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D		Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)															
E		High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)															
3. Initial Local Field-Based Activities	(i)	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities															
	(ii)	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken															
	(iii)	Ground geophysical survey (Subject to the positive outcomes of i and ii above)															
	(iv)	Possible Trenching (Subject to the outcomes of i - iii above)															
	(v)	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)															
	(vi)	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets															
4. Detailed Local Field-Based Activities	(i)	Access preparation and related logistics to support activities															
	(ii)	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities															
	(iii)	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken															
	(iv)	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).															
5. Prefeasibility and Feasibility Studies	(i)	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping															
	(ii)	Detailed drilling and bulk sampling and testing for ore reserve calculations															
	(iii)	Geotechnical studies for mine design															
	(iv)	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities															
	(v)	EIA and EMP to support the ECC for mining operations															
	(vi)	Preparation of feasibility report and application for Mining License															

## 5.5 Evaluation of Significant Impacts

### 5.5.1 Overview

The significance of each impact has been determined by assessing the impact severity against the likelihood (probability) of the impact occurring as summarised in the impact significance assessment matrix provided in Table 5.11.

### 5.5.2 Significance Criteria

Significance criteria for negative/adverse impacts (i.e., relative ranking of importance) are defined in Table 5.11. It is important to note that impacts have been considered without the implementation of mitigation measures. The need for appropriate mitigation measures as presented in the EMP report has been determined based on the impact assessment results presented in this report.

Table 5.11: Scored impact significance criteria.

<b>IMPACT SEVERITY</b> Magnitude, Duration, Extent, Probability	<b>RECEPTOR CHARACTERISTICS (SENSITIVITY)</b>				
	<b>Very High (5)</b>	<b>High (4)</b>	<b>Medium (3)</b>	<b>Low (2)</b>	<b>Negligible (1)</b>
<b>Very High (5)</b>	Major [5/5]	Major [4/5]	Moderate [3/5]	Moderate [2 /5]	Minor 1/5
<b>High (4)</b>	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor [1/4]
<b>Medium (3)</b>	Major [5/3]	Moderate [4/3]	Moderate [3/3]	Minor [2/3]	None [1/3]
<b>Low (2)</b>	Moderate [5/2]	Moderate [4/2]	Minor [3/2]	None [2/2]	None [1/2]
<b>Negligible (1)</b>	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]

### 5.5.3 Assessment Likely Significant Impacts

The assessment of significant impacts depended upon the degree to which the proposed project activities are likely to result in unwanted consequences on the receptor covering physical and biological environments (Table 5.12). Overall, the assessment of significant impacts has focused on the ecosystem-based approach that considers potential impacts to the ecosystem. The main key sources of impacts that have been used in the determination of significant impacts posed by the proposed minerals exploration comprised activities. Each of the main areas of impact have been identified and assessed as follows:

- ❖ Positive Impacts are classified under a single category. they are then evaluated qualitatively with a view to their enhancement, if practical.
- ❖ Negligible or Low Impacts will require little or no additional management or mitigation measures (on the basis that the magnitude of the impact is sufficiently small, or that the receptor is of low sensitivity).
- ❖ Medium or High Impacts require the adoption of management or mitigation measures.
- ❖ High Impacts always require further management or mitigation measures to limit or reduce the impact to an acceptable level.

Overall, the results of the significant impact assessment matrix for the proposed minerals exploration activities on the physical and biological environments are shown in Tables 5.12.

Table 5.12: Significant impact assessment matrix for the proposed exploration activities.

SIGNIFICANT IMPACT						PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT				SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT							
IMPACT SEVERITY <small>Magnitude, Duration, Extent, Probability</small>	RECEPTOR CHARACTERISTICS (SENSITIVITY)					Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources	
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)																	
Very High (5)	Major [5/5]	Major [4/5]	Moderate [3/5]	Moderate [2 /5]	Minor 1/5																	
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]																	
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]																	
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]																	
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]																	
<b>1. Initial Desktop Exploration Activities</b>	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1		
	(ii) Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1		
	(iii) Purchase and analysis of existing Government aerial hyperspectral					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1		
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
<b>2. Regional Reconnaissance Field-Based Activities</b>	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1		
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets					1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Table 5.12: Cont.

SENSITIVITY						PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT				SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT						
IMPACT SEVERITY <small>Magnitude, Duration, Extent, Probability</small>	RECEPTOR CHARACTERISTICS (SENSITIVITY)					Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)																
Very High (5)	Major [5/5]	Major [4/5]	Moderate [3/5]	Moderate [2 /5]	Minor 1/5																
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]																
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]																
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]																
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]																
<b>3. Initial Local Field-Based Activities</b>	(i) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
	(ii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
	(iii) Ground geophysical survey (Subject to the positive outcomes of i and ii above)	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(v) Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(vi) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
<b>4. Detailed Local Field-Based Activities</b>	(i) Access preparation and related logistics to support activities	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	3/2	2/2	2/2	2/2	2/2	2/2	
	(ii) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	3/2	2/2	2/2	2/2	2/2	2/2	
	(iii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(iv) Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	3/2	2/2	2/2	2/2	2/2	2/2
<b>5. Prefeasibility and Feasibility Studies</b>	(i) Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	
	(iii) Geotechnical studies for mine design	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	
	(iv) Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3
	(v) EIA and EMP to support the ECC for mining operations	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(vi) Preparation of feasibility report and application for Mining License	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

## 5.6 Assessment of Overall Impacts

### 5.6.1 Summary of the Results of the Impact Assessment

In accordance with Tables 5.7 - 5.12, the following is a summary of the overall likely negative and significant impacts of the proposed exploration activities on the receiving environment (physical, biological and socioeconomic environments) without and with mitigations:

- (i) Initial desktop exploration activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible **[1/1]** (Table 5.12). Except for the socioeconomic components which carry a **(+)**, the rest of the likely impacts are negative **(-)**.
- (ii) Regional reconnaissance field-based activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible **[1/1]**. Some field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations. Overall significant impacts will be negligible **[1/1]** (Table 5.12). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**.
- (iii) Initial local field-based activities: Initial field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations. Overall significant impacts will be negligible **[2/2]**. All desktop related activities and laboratory assessments will have negligible impacts with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible **[2/2]** (Table 5.12). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**.
- (iv) Detailed local field-based activities: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised low impacts with mitigations. Overall significant impacts will be medium **[2/2]** without mitigations and low with mitigations (Table 5.12). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**, and.
- (v) Prefeasibility and feasibility studies to be implemented on a site-specific area if the local field-based studies prove positive: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised medium impacts with mitigations. Overall significant impacts will be medium **[3/3]** without mitigations and low with mitigations for bulk sampling, test mining and field logistics (Table 5.12). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**.

## 6. THE EMP

### 6.1 Summary of the EMP Objectives

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts, respectively. The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration. Regular assessments and evaluation of the environmental liabilities during the exploration will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project development.

### 6.2 Implementation of the EMP

#### 6.2.1 Roles and Responsibilities

Management of the environmental elements that may be affected by the different activities of the proposed / ongoing exploration is an important element of the proposed / ongoing exploration activities. The EMP also identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major impacts that the different exploration activities may have on the receiving environment (physical and biological environments).

#### 6.2.2 Proponent's Representative (PR) / Project Manager (PM)

The Proponent is to appoint a **Proponent's Representative (PR) / Project Manager (PM)** with the following responsibilities with respect to the EMP implementation:

- ❖ Act as the site project manager and implementing agent.
- ❖ Ensure that the Proponent's responsibilities are executed in compliance with the relevant legislation.
- ❖ Ensure that all the necessary environmental authorisations and permits have been obtained.
- ❖ Assist the exploration contractor/s in finding environmentally responsible solutions to challenges that may arise.
- ❖ Should the PR be of the opinion that a serious threat to, or impact on the environment may be caused by the exploration activities, he/she may stop work. The Proponent must be informed of the reasons for the work stoppage as soon as possible.
- ❖ The PR or as may be contractually delegated, has the authority to institute disciplinary proceedings in accordance with the provisions of the national laws for transgressions of basic conduct rules and/or contravention of the EMP.
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the PR can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied.
- ❖ Maintain open and direct lines of communication between the landowners and Proponent, as well as any other identified Interested and Affected Parties (I&APs) with regards to environmental matters. and
- ❖ Attend regular site meetings and inspections as may be required for the proposed / ongoing exploration programme.



### 6.2.3 Project Health, Safety and Environment (Project HSE)

The Proponent is to appoint a Project Health, Safety and Environment (Project HSE) with the following responsibilities with respect to the EMP implementation:

- ❖ Assist the PR in ensuring that the necessary environmental authorizations and permits have been obtained.
- ❖ Assist the PR and Contractor in finding environmentally responsible solutions to challenges that may arise.
- ❖ Conduct environmental monitoring as per EMP requirements.
- ❖ Carry out regular site inspections (on average once per week) of all exploration areas with regards to compliance with the EMP report any non-compliance(s) to the PR as soon as possible.
- ❖ Organise for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through each field-based exploration activity audit reports to be submitted to the PR.
- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document.
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site.
- ❖ Keep records of all activities related to environmental control and monitoring the latter to include photographic records of the exploration activities, rehabilitation process, and a register of all major incidents, and.
- ❖ Attend regular site meetings.

### 6.2.4 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** that may be appointed by the Proponent to undertake certain field-based activities of the proposed / ongoing exploration programme include:

- ❖ Comply with the relevant legislation and the EMP provision.
- ❖ Preparation and submission to the Proponent through the Project HSE of the following Management Plans:
  - Environmental Awareness Training and Inductions.
  - Emergency Preparedness and Response.
  - Waste Management. and.
  - Health and Safety.
- ❖ Ensure adequate environmental awareness training for senior site personnel.
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement. the Project HSE is to provide the course content and the following topics, at least but not limited to, should be covered:
  - The importance of complying with the EMP provisions.

- Roles and Responsibilities, including emergency preparedness.
- Basic Rules of Conduct (Do's and Don'ts).
- EMP: aspects, impacts and mitigation.
- Fines for Failure to Adhere to the EMP.
- Health and Safety Requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations. and
- ❖ Attend regular site meetings and environmental inspections.

## **6.3 Specific Mitigation Measures**

### **6.3.1 Hierarchy of Mitigation Measures Implementation**

A hierarchy of methods for mitigating significant adverse negative impacts of the ongoing / proposed exploration activities on the receiving environment has been adopted in order of preference and as follows:

- (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.

### **6.3.2 Mitigation Measures Implementation**

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts, respectively. The EMP also provides the management actions with roles and responsibilities requirements for implementation of environmental management strategies by the Proponent through the Contractors and Subcontractors who will be undertaking the exploration activities. The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the implementation of the proposed / ongoing exploration programme.

Based on the findings of the Scoping work, Table 6.1 – 6.18 provides the detailed specific mitigation measures to be implemented by the Proponent with respect to the proposed / ongoing exploration programme activities and in particular for the field-based exploration activities. The following is a summary of the key areas of the migration measures provided in Tables 6.1-6.18:

1. Project planning and implementation.
2. Implementation of the EMP.
3. Public and stakeholders relations.
4. Measures to enhance positive socioeconomic impacts.
5. Environmental awareness briefing and training.

6. Erection of supporting exploration infrastructure.
7. Use of existing access roads, tracks, and general vehicle movements.
8. Mitigation measures for preventing flora destruction.
9. Mitigation measures for preventing faunal destruction.
10. Mitigation measures to be implemented with respect to the exploration camps and exploration sites.
11. Mitigation measures for surface and groundwater protection as well as general water usage.
12. Mitigation measures to minimise negative socioeconomic impacts.
13. Mitigation measures to minimise health and safety impacts.
14. Mitigation measures to minimise visual impacts.
15. Mitigation measures to minimise vibration, noise, and air quality.
16. Mitigation measures for waste (solid and liquid) management.
17. Rehabilitation plan, and.
18. Environmental data collection.

Table 6.1: Project planning and implementation.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
1. Establish a strong environmental awareness protocol from project implementation to final closure in order to ensure the least possible impact to the environment.	2. Resources (Human and Financial) are provided for the Environmental Awareness and Training, Regular Safety, Health and Environment meetings and for internal and external Environmental Monitoring Costs as well as for any rehabilitation costs that may arise. 3. Appointment of senior and experienced persons as Proponent's Representative (PR), Project Manager (PM) and Project HSE to assume responsibility for environmental issues. 4. All individuals including sub-contractors who work on, or visit, the sites are aware of the contents of the Environmental Policy and the EMP. 5. The EMP and Environmental Policy will be included in Tender Documents. 6. Field visit will take place during which main access tracks will be discussed in cooperation with the land owner/s	1. Regional reconnaissance field-based mapping and sampling activities. 2. Initial local field-based mapping and sampling activities. 3. Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. 4. Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 6.2: Implementation of the EMP.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
1. Define roles and responsibilities in terms of the EMP. To make sure all personnel, contractors and subcontractors aware of these roles and responsibilities to ensure compliance with the EMP provisions. 2. Implement environmental management that is preventative and proactive. 3. Establish the resources, skills, etc. required for effective environmental management.	1. Senior staff and senior contractors are aware of, and practice the EMP requirements. These persons shall be expected to know and understand the objectives of the EMP and will, by example, encourage suitable environmentally friendly behaviour to be adopted during the exploration process. 2. Recognition will be given to appropriate environmentally acceptable behaviour. 3. Inappropriate behaviour will be corrected. An explanation to why the behaviour is unacceptable must be given, and, if necessary, the person will be disciplined. e.g. fees set out for non-compliance	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 6.3: Public and stakeholders relations.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
1. Maintain sound relationships with the Other land users/ land owner/s and another stakeholders / public	<ol style="list-style-type: none"> <li>1. No littering or any other activity prohibited</li> <li>2. Permission to utilise water as well as all applicable permits are obtained.</li> </ol>	<ol style="list-style-type: none"> <li>1. Regional reconnaissance field-based mapping and sampling activities.</li> <li>2. Initial local field-based mapping and sampling activities.</li> <li>3. Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>4. Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.4: Measures to enhance positive socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Measures to enhance positive socioeconomic impacts in order to:</p> <ol style="list-style-type: none"> <li>1. Avoid exacerbating the influx of unemployed people to the area.</li> <li>2. Develop a standardised recruitment method for sub-contractor and field workers.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stipulate a preference for local contractors in its tender policy. Preference to local contractors should be based on competitive business principles and salaries and payment to local service providers should be competitive.</li> <li>2. Develop a database of local businesses that qualify as potential service providers and invite them for each tender process.</li> <li>3. Scrutinise tender proposals to ensure that minimum wages are included in the costing.</li> <li>4. Stipulate that local residents should be employed for temporary unskilled/skilled positions and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy.</li> <li>5. Must ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years.</li> <li>6. Must ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. This could be accomplished with a contractual requirement stipulating that monthly proof should be submitted indicating payment of minimum wages to workers, against their ID numbers, payment of social security and submission of affirmative action data.</li> <li>7. Encouraged to cater for the needs of employees to increase the spending of wages locally.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.5: Environmental awareness briefing and training.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
1. Implement environmental awareness briefing / training for individuals who visit, or work, on site.	<ol style="list-style-type: none"> <li>1. Every senior/supervisory member of the team shall familiarise themselves with the contents of the EMP. They shall understand their roles and responsibilities with regard to personnel and project compliance with the EMP.</li> <li>2. Subject to agreement of the parties, the Environmental Coordinator will hold an Environmental Awareness Briefing meeting, which shall be attended by all contractors before the start of the mineral exploration activities.</li> <li>3. Briefings on the EMP and Environmental Policy shall discuss the potential dangers to the environment of the following activities: public relations, littering, off-road driving, waste management, poaching and plant theft etc. The need to preserve soil, conserve water and implement water saving measures shall be presented.</li> <li>4. Individuals can be questioned on the Environmental Philosophy and EMP and can recall contents.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.6: Erection of supporting exploration infrastructure.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<ol style="list-style-type: none"> <li>1. Get Environmental Clearance before implementation.</li> <li>2. Establishment of the supporting exploration infrastructure done on an area with the least disturbance to the environment and within the non-sensitive areas.</li> </ol>	<ol style="list-style-type: none"> <li>1. Documented Environmental Clearance from MET.</li> <li>2. All on site exploration infrastructure (e.g. water tanks, sewage tanks, waste disposal) are not situated on environmental sensitive area and have disturbed as less as possible.</li> <li>3. No littering.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.7: Use of existing access roads, tracks, and general vehicle movements.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Plan a road/track network that considers the environmental sensitivity of the area and a long-term tourism potential, and which is constructed in a technically and environmentally sound manner.</p> <p>2. Stick to the recommended track and sensitivity management zones.</p>	<p>1. Avoid unnecessarily affecting areas viewed as important habitat – i.e. Ephemeral River and its network of tributaries of ephemeral rivers. rocky outcrops. clumps of protected tree species.</p> <p>2. Make use of existing tracks/roads as much as possible throughout the area.</p> <p>3. Do not drive randomly throughout the area (could cause mortalities to vertebrate fauna and unique flora. accidental fires. erosion related problems, etc.).</p> <p>4. Avoid off-road driving at night as this increase's mortalities of nocturnal species.</p> <p>5. Implement and maintain off-road track discipline with maximum speed limits (e.g.30km/h) as this would result in fewer faunal mortalities and limit dust pollution.</p> <p>6. Use of "3-point-turns" rather than "U-turns".</p> <p>7. Where tracks have to be made to potential exploration sites off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks. cross drainage lines at right angles. avoid placing tracks within drainage lines. avoid collateral damage (i.e. select routes that do not require the removal of trees/shrubs, especially protected species).</p> <p>8. Leave vehicles on tracks and walk to point of interest, when possible.</p> <p>9. Rehabilitate all new tracks created.</p>	<p>(i) Regional reconnaissance field-based mapping and sampling activities.</p> <p>(ii) Initial local field-based mapping and sampling activities.</p> <p>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</p> <p>(iv) Prefeasibility and feasibility studies.</p>	<p>(i) Proponent's Representative (PR)</p> <p>(ii) Project Manager (PM)</p> <p>(iii) Project HSE</p> <p>(iv) Contractor</p> <p>(v) Subcontractors</p>

Table 6.8: Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Prevent flora and ecosystem destruction and promote conservation</p>	<ol style="list-style-type: none"> <li>1. Limit the development and avoid rocky outcrops throughout the entire area.</li> <li>2. Avoid development and associated infrastructure in sensitive areas – e.g. Ephemeral River, in/close to drainage lines, cliffs, boulder and rocky outcrops in the area, etc. This would minimise the negative effect on the local environment especially unique features serving as habitat to various species.</li> <li>3. Avoid placing access routes (roads and tracks) through sensitive areas – e.g. over rocky outcrops/ridges and along drainage lines. This would minimise the effect on localised potentially sensitive habitats in the area.</li> <li>4. Avoid driving randomly through the area (i.e. “track discipline”), but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive habitats in the area.</li> <li>5. Stick to speed limits of maximum 30km/h as this would result in less dust pollution which could affect certain flora – e.g. lichen species. Speed humps could also be used to ensure the speed limit.</li> <li>6. Remove unique and sensitive flora (e.g. all Aloe sp.) before commencing with the development activities and relocate to a less sensitive/disturbed site if possible.</li> <li>7. Prevent and discourage the collecting of firewood as dead wood has an important ecological role – especially during the development phase(s). Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g. chopping down of live and/or protected tree species such as <i>Acacia erioloba</i> which is a good quality wood.</li> <li>8. Attempt to avoid the removal of bigger trees during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna.</li> <li>9. Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires causing problems (e.g. loss of grazing and domestic stock mortalities, etc.) for the neighbouring farmers.</li> <li>10. Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks as well as temporary accommodation sites. Preferably workers should be transported in/out to the construction sites on a daily basis to avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company’s environmental integrity, but also show true local commitment to the environment.</li> <li>11. Implement erosion control. The area(s) towards and adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid construction within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated fauna.</li> <li>12. Conduct a thorough investigation on the flora associated with the proposed / ongoing exploration site(s).</li> <li>13. Prevent the introduction of potentially invasive alien plant species (e.g. <i>Tecoma stans</i>, <i>Pennisetum setaceum</i>, etc.) for ornamental purposes as part of the landscaping should mining activities eventually commence. Alien species often “escape” and become invasive causing further ecological damage.</li> <li>14. A thorough investigation of water use and ground water extraction should take place before actual mining activities commence as this would affect the local flora, especially the ephemeral riparian vegetation, not only locally, but downstream as well.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent’s Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>



Table 6.9: Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Prevent faunal and ecosystem destruction and promote conservation</p>	<ol style="list-style-type: none"> <li>1. Limit the development and avoid rocky outcrops throughout the entire area.</li> <li>2. Avoid development &amp; associated infrastructure in sensitive areas – e.g. in/close to drainage lines, cliffs, boulder and rocky outcrops in the area, etc. This would minimise the negative effect on the local environment especially unique features serving as habitat to various species.</li> <li>3. Avoid placing access routes (roads &amp; tracks) through sensitive areas – e.g. over rocky outcrops/ridges and along drainage lines. This would minimise the effect on localised potentially sensitive habitats in the area.</li> <li>4. Avoid driving randomly through the area (i.e. “track discipline”), but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive habitats in the area.</li> <li>5. Stick to speed limits of maximum 30km/h as this would result in fewer faunal road mortalities. Speed humps could also be used to ensure the speed limit.</li> <li>6. Remove (e.g. capture) unique fauna and sensitive fauna before commencing with the development activities and relocate to a less sensitive/disturbed site if possible.</li> <li>7. Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) and collecting of wood as this would diminish and negatively affect the local fauna – especially during the development phase(s).</li> <li>8. Attempt to avoid the removal of bigger trees during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna.</li> <li>9. Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires affecting the local fauna, but also causing problems (e.g. loss of grazing &amp; domestic stock mortalities, etc.) for the neighbouring farmers.</li> <li>10. Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks as well as temporary accommodation sites. Preferably workers should be transported in/out to the construction sites on a daily basis to avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company’s environmental integrity, but also show true local commitment to the environment.</li> <li>11. Implement erosion control. The area(s) towards &amp; adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid construction within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated fauna.</li> <li>12. Conduct a thorough investigation on the fauna associated with the proposed / ongoing exploration site(s).</li> <li>13. Prevent the number of domestic pets – e.g. cats &amp; dogs – accompanying the workers during the construction phase as cats decimate the local fauna and interbreed &amp; transmit diseases to the indigenous African Wildcat found in the area. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent’s Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.10: Mitigation measures to be implemented with respect to the exploration camps and exploration sites.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Promotion of conservation through preservation of flora, fauna and ecosystem around the exploration camps and exploration sites</p>	<ol style="list-style-type: none"> <li>1. Select camp sites and other temporary lay over sites with care – i.e. avoid important habitats.</li> <li>2. Use portable toilets to avoid faecal pollution around camp and exploration sites.</li> <li>3. Initiate a suitable and appropriate refuse removal policy as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios – e.g. baboon, black-backed jackal, etc..</li> <li>4. Avoid and/or limit the use of lights during nocturnal exploration activities as this could influence and/or affect various nocturnal species – e.g. bats and owls, etc. Use focused lighting for least effect.</li> <li>5. Prevent the killing of species viewed as dangerous – e.g. various snakes – when on site.</li> <li>6. Prevent the setting of snares for ungulates (i.e. poaching) or collection of veld foods (e.g. tortoises) and unique plants (e.g. various Aloe and Lithop) or any form of illegal hunting activities.</li> <li>7. Avoid introducing dogs and cats as pets to camp sites as these can cause significant mortalities to local fauna (cats) and even stock losses (dogs).</li> <li>8. Remove and relocate slow moving vertebrate fauna (e.g. tortoises, chameleon, snakes, etc.) to suitable habitat elsewhere on property.</li> <li>9. Avoid the removal and/or damaging of protected flora potentially occurring in the general area – e.g. various Aloe, Commiphora and Lithop species.</li> <li>10. Avoid introducing ornamental plants, especially potential invasive alien species, as part of the landscaping of the camp site, etc., but rather use localised indigenous species, should landscaping be attempted, which would also require less maintenance (e.g. water).</li> <li>11. Remove all invasive alien species on site, especially Prosopis sp., which is already becoming a major ecological problem along various water courses throughout Central Namibia. This would not only indicate environmental commitment, but actively contribute to a better landscape.</li> <li>12. Inform contractors/workers regarding the above-mentioned issues prior to exploration activities and monitor for compliance thereof throughout.</li> <li>13. Rehabilitate all areas disturbed by the exploration activities – i.e. camp sites, exploration sites, etc..</li> <li>14. Implement a policy of replacing 2 tree species (preferably the same species) for every 1 protected tree species having to be removed (if necessary).</li> <li>15. Although fires are not expected to be a major issue in the general area due to the overall lack of grass cover, some years it may be necessary to consider fire prevention. Ensure that adequate firefighting equipment (e.g. fire beaters, extinguishers, etc.) is available at camp sites and clear kitchen areas to avoid accidental fires.</li> <li>16. Employ an independent environmental auditor to ensure compliance, especially of the rehabilitation of all the affected areas.</li> </ol>	<p>(i) Regional reconnaissance field-based mapping and sampling activities.</p> <p>(ii) Initial local field-based mapping and sampling activities.</p> <p>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</p> <p>(iv) Prefeasibility and feasibility studies.</p>	<p>(i) Proponent's Representative (PR)</p> <p>(ii) Project Manager (PM)</p> <p>(iii) Project HSE</p> <p>(iv) Contractor</p> <p>(v) Subcontractors</p>

Table 6.11: Mitigation measures for surface and groundwater protection as well as general water usage.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Effective management / protection of surface and groundwater resources and general water resources usage</p>	<ol style="list-style-type: none"> <li>1. Always use as little water as possible. Reduce, reuse and re-cycle water where possible.</li> <li>2. All leaking pipes / taps must be repaired immediately when they are noticed.</li> <li>3. Never leave taps running. Close taps after you have finished using them.</li> <li>4. Never allow any hazardous substance to soak into the soil.</li> <li>5. Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the solar park areas.</li> <li>6. Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip.</li> <li>7. Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities.</li> <li>8. No washing of vehicles, equipment and machinery, containers and other surfaces.</li> <li>9. Limit the operation to a specific site and avoid sensitive areas and in particular the Ephemeral River Channel. This would sacrifice the actual area for other adjacent Ephemeral River areas and thus minimise any likely negative effect on water resources.</li> <li>10. Disposal of wastewater into any public stream is prohibited.</li> <li>11. The Proponent must obtain permission of the land owners before utilising any water resources or any associated infrastructure.</li> <li>12. If there is a need to drilling a water borehole to support the exploration programme the Proponent (Proponent) must obtain permission from the land owner and Department of Water Affairs in the Ministry of Agriculture and Forestry. In an event of discovery of economic minerals resources, the sources of water supply for the mining related operations will be supplied by NamWater.</li> <li>13. If there are any further (larger scale) exploration/drilling activities and/or mining activities to follow from the initial planned drill holes, groundwater monitoring must be implemented to include water level monitoring and also water sampling on a bi-annual basis. In order to have greater transparency on the water monitoring activities, the affected landowners / farmers must be given full access to the results of the water monitoring analyses.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.12: Mitigation measures to minimise negative socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Effective management of socioeconomic benefits of the proposed / ongoing project activities</p>	<ol style="list-style-type: none"> <li>1. The employment of local residents and local companies should be a priority. To ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years.</li> <li>2. Providing information such as the number and types of jobs available, availability of accommodation facilities and rental costs and living expenses, could make potential job seekers wary of moving to the area.</li> <li>3. Addressing unrealistic expectations about large number of jobs would be created.</li> <li>4. Exploration camp if required should be established in close consultation with the land owners.</li> <li>5. Exploration camp should consider provision of basic services.</li> <li>6. When employees' contracts are terminated or not renewed, contractors should transport the employees out of the area to their hometowns within two days of their contracts coming to an end.</li> <li>7. Tender documents could stipulate that contractors have HIV/AIDS workplace policies and programmes in place and proof of implementation should be submitted with invoicing.</li> <li>8. Develop strategies in coordination with local health officers and NGO's to protect the local communities, especially young girls.</li> <li>9. Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the EPL. Disciplinary actions should be in accordance with Namibian legislation.</li> <li>10. Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyser test upon reporting for duty daily.</li> <li>11. Request that the Roads Authority erect warning signs of heavy exploration vehicles on affected public roads.</li> <li>12. Ensure that drivers adhere to speed limits and that speed limits are strictly enforced.</li> <li>13. Ensure that vehicles are road worthy and drivers are qualified.</li> <li>14. Train drivers in potential safety issues.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.13: Mitigation measures to minimise health and safety impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Promotion of health and safe working environment in line with national Labour Laws</p>	<ol style="list-style-type: none"> <li>1. Physical hazards: Follow national and international regulatory and guidelines provisions, always make use of correct Personal Proactive Clothing, training programme, as well as the implementation of a fall protection program in accordance with the Labour Act.</li> <li>2. Some of the public access management measures that may be considered in an event of vandalism occurring are: <ul style="list-style-type: none"> <li>• All exploration equipment must be in good working condition and serviced accordingly.</li> <li>• Control access to the exploration site through using gates on the access road(s) if required.</li> <li>• The entire site, must be fenced off. the type of fencing to be used would, however, be dependent on the impact on the visual resources and/or cost. and.</li> <li>• Notice or information boards relating to public safety hazards and emergency contact details to be put up at the gate(s) to the exploration area.</li> </ul> </li> <li>3. There is a comprehensive First Aid Kit on site and that suitable anti-histamine for bee stings / snake bites should be available.</li> <li>4. Rubber gloves are used in case of an accident to reduce the risk of contracting HIV/AIDS.</li> <li>5. All individuals have received instructions concerning the dangers of dehydration or hyperthermia. Encourage all to drink plenty of clean water not directly from the surface water bodies.</li> <li>6. No person under the influence of alcohol or drugs is allowed to work on site.</li> <li>7. The Exploration Manager ensures compliance with the requirements of the relevant Namibian Labour, Mining and Health and Safety Regulations.</li> <li>8. Dangerous or protected / sensitive areas are clearly marked and access to these areas is controlled or restricted.</li> <li>9. Due care must be taken when driving any vehicles on any roads particularly the gravel roads. ALL Drivers must drive with their headlights switched on when travelling on the gravel roads (day and night).</li> <li>10. Persons driving a vehicle must be in possession of a valid driver's license</li> <li>11. Awareness on HIV/AIDS among workers is raised</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.14: Mitigation measures to minimise visual impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Preserve the landscape character in the development of supporting infrastructure and choice of visual screening</p>	<ol style="list-style-type: none"> <li>1. Consider the landscape character and the visual impacts of the exploration area including camp site from all relevant viewing angles, particularly from public roads.</li> <li>2. Use vegetation screening where applicable. Do not cut down vegetation unnecessarily around an exploration / supporting site such as a sampling, drilling, access, or campsite location.</li> <li>3. Always consider using local vegetation for site screening.</li> <li>4. Avoid the use of very high fencing.</li> <li>5. Minimise access roads and no off-road that could result in land scarring is allowed.</li> <li>6. Minimise the presence of secondary structures: remove inoperative support structures.</li> <li>7. Remove all infrastructure and reclaim, or rehabilitate the project site after exploration activities are completed.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.15: Mitigation measures to minimise vibration, noise, and air quality.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Promote of effective management of vehicle movement, drilling and blasting operations and use of Personal Protective Equipment (PPE) in mitigating air quality and vibrations impacts in line with national laws</p>	<ol style="list-style-type: none"> <li>1. Limit vehicle movements and adhere to the speed of 60 km/h.</li> <li>2. Vehicles and all equipment must be properly serviced to minimise noise pollution.</li> <li>3. Use Personal Protective Equipment (PPE) to minimise Occupational Health Safety impacts dues to noise pollution around the site.</li> <li>4. National or international acoustic design standards must be followed.</li> <li>5. Drilling and blasting operations can major sources of vibration, noise and dust and where required the following mitigation measure shall be implemented.               <ul style="list-style-type: none"> <li>• Drilling and blasting operations shall only be done by a qualified person who must at all times adhere to the required blasting protocol.</li> <li>• Prior warning shall be given to all persons, neighbour and visitors before the blasting takes place.</li> <li>• Careful planning and timing of the blast program to minimise the size of the charge.</li> <li>• Where practicable, use of explosive products with lower detonation velocities, but noting that this would require more explosives to achieve the same blast result.</li> <li>• Use of detonating caps with built-in time delays, as this effectively reduces each detonation into a series of small explosions.</li> <li>• Use of a procedure ("decking the charge") which subdivides the charge in one blast hole into a series of smaller explosions, with drill patterns restricted to a minimum separation from any other loaded hole.</li> <li>• Over-drilling the holes to ensure fracturing of the rock.</li> <li>• Staggering the detonation for each blast hole in order to spread the explosive's total overpressure over time.</li> <li>• Matching, to the extent possible, the energy needed in the "work effort" of the borehole to the rock mass to minimise excess energy vented into the receiving environment.</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>

Table 6.16: Mitigation measures for waste (solid and liquid) management.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Promotion of effective waste (solid and liquid) management through the adoption of sound and hierarchical approach to waste management, which would include waste minimisation, re-use, recovery, recycling, treatment, and proper disposal.</p>	<ol style="list-style-type: none"> <li>1. Burial of waste on anywhere within the EPL area is not allowed and all generated solid waste must be disposed at the at an approved municipal waste disposal site.</li> <li>2. Toilet and ablution facilities must be provided on site and should not be located close to Ephemeral Rivers or visible discontinuities (fractures, joints, or faults).</li> <li>3. Provide site information on the difference between the two main types of waste, namely:               <ul style="list-style-type: none"> <li>• General Waste. and</li> <li>• Hazardous Waste.</li> </ul> </li> <li>4. Sealed containers, bins, drums, or bags for the different types of wastes must be provided. Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble.</li> <li>5. All solid and liquid wastes generated from the proposed / ongoing project activities shall be reduced, reused, or recycled to the maximum extent practicable.</li> <li>6. Trash may not be burned or buried, except at approved sites under controlled conditions in accordance with the municipal regulations.</li> <li>7. Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full.</li> <li>8. Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping.</li> <li>9. Littering is prohibited.</li> <li>10. Latrines and French drains built &gt;100m from watercourses or pans to avoid pollution of primary and secondary aquifers.</li> <li>11. Chemical toilets or suitable waste water management system shall be provided on site and around the camp as may be required.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Regional reconnaissance field-based mapping and sampling activities.</li> <li>(ii) Initial local field-based mapping and sampling activities.</li> <li>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</li> <li>(iv) Prefeasibility and feasibility studies.</li> </ol>	<ol style="list-style-type: none"> <li>(i) Proponent's Representative (PR)</li> <li>(ii) Project Manager (PM)</li> <li>(iii) Project HSE</li> <li>(iv) Contractor</li> <li>(v) Subcontractors</li> </ol>



Table 6.17: Rehabilitation plan.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Contributions toward environmental preservation and sustainability through rehabilitation of disturbed areas such as exploration sites and remove all unwanted parts of the fixtures and restore the sites to as close an approximation of the pristine state as is technically, financially and reasonably possible.</p>	<p>1. The following rehabilitation actions are practiced:</p> <ul style="list-style-type: none"> <li>• Small samples are preferably removed from site to avoid additional scars in the landscape.</li> <li>• Litter from the site has been taken to the appropriate disposal site.</li> <li>• Debris, scrap metal, etc is removed before moving to a new site or closure of the mine.</li> <li>• Water tanks are dismantled and removed if not needed for after use.</li> <li>• Tracks on site and the access road are rehabilitated by smoothing the 'middle mannetjie'(middle ridge between the tracks) and raking the surface.</li> </ul> <p>2. The following should be undertaken at all disturbed areas that require further rehabilitation:</p> <ul style="list-style-type: none"> <li>• if applicable the stockpiled subsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns.</li> <li>• Replace the stored topsoil seed bank layer.</li> <li>• Five (5) years after rehabilitation the sites are not visible from 500 m away.</li> </ul>	<p>(i) Regional reconnaissance field-based mapping and sampling activities.</p> <p>(ii) Initial local field-based mapping and sampling activities.</p> <p>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</p> <p>(iv) Prefeasibility and feasibility studies.</p>	<p>(i) Proponent's Representative (PR)</p> <p>(ii) Project Manager (PM)</p> <p>(iii) Project HSE</p> <p>(iv) Contractor</p> <p>(v) Subcontractors</p>

Table 6.18: Environmental data collection.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Collect data that will add value to environmental monitoring and reporting to the regulators</p> <p>2. Collect data that will add to the general scientific and geographic knowledge of the environment in which the exploration process takes place.</p> <p>3. Acknowledge that the required skills and knowledge to collect all the suggested data may not be available within the mine /exploration team, however, as much data as is practical should be collected.</p>	<p>1. Environmental Monitoring Report Compiled and submitted by the Environmental Coordinator to the regulators</p> <p>2. The following types of information should be gathered:</p> <ul style="list-style-type: none"> <li>• Fauna. What tracks or signs of animal activity have been seen? (photographs and GPS recording) What animals, birds etc were identified? Alternatively provide a description and/ or photo if unidentified.</li> <li>• Unusual weather conditions, e.g. records of the prevailing wind direction and the direction from which storm events come. Was there fog or rain, frost overnight or intense heat? Preferably have a thermometer and rain gauge on site.</li> <li>• Vegetation. Record trees, shrubs, grass, etc. that are found in the vicinity along each of the profiles. Some plants do only occur after rainfall and might not have been seen for decades.</li> <li>• Any archaeological, cultural or historical sites that may be found. GPS coordinates, photograph and plot the position on a 1: 50 000 maps.</li> <li>• Other data sets, including surface water, spring, large scale geological features etc</li> </ul>	<p>(i) Regional reconnaissance field-based mapping and sampling activities.</p> <p>(ii) Initial local field-based mapping and sampling activities.</p> <p>(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.</p> <p>(iv) Prefeasibility and feasibility studies.</p>	<p>(i) Proponent's Representative (PR)</p> <p>(ii) Project Manager (PM)</p> <p>(iii) Project HSE</p> <p>(iv) Contractor</p> <p>(v) Subcontractors</p>

## 6.4 Rehabilitation and Closure Plan

### 6.4.1 Rehabilitation Process

The following is the summary of the key rehabilitation processes to be implemented by the proponent:

❖ **Step 1: Backfilling excavated or disturbed areas:**

- Transporting all stockpiled overburden back to the excavated voids.
- Backfilling the trenches, pits and quarries using original excavated and stockpiled materials.
- If applicable, backfill the various layers of overburden in the reverse order in which they were removed, i.e. Last out should be first in as far as possible, and.
- When backfilling, bear in mind that some space must be left for the backfilling of the soil on top of the overburden.

❖ **Step 2: Remove all waste and unwanted materials:**

- Once the drilling slimes ponds have dried sufficiently, scrape out the slimes and transporting back to an exploration excavated voids during the overburden backfilling stage.
- Allow the pollution control dam to evaporate completely, scrape all waste that has collected in the pond and dispose of these and the pond lining at a suitable site.
- Bulldoze the walls of the pollution control pond over and contour.
- Collect remaining domestic waste on site and transport to an approved municipal waste disposal site.
- Clean out the oil traps, collect the waste material in drums and transport to a suitable site for disposal, and.
- Manually remove all weedy species that are present at the site (the entire plant can easily be removed because the plants tend not to root deeply).

❖ **Step 3: Remove all structures:**

- Remove all building materials from the exploration / test mining site and either:
  - Transporting to a new site if it is to be used or stored elsewhere. or
  - Disposing at a suitable approved municipal waste disposal site. or
  - Making them available to the farmer or local persons, or,
  - Selling at an auction.
- Remove all machinery from the site and transport to a new site where it is to be used or stored or sell at an auction.
- Remove all fences that have been constructed and either make the material available to the local persons/farmer, dispose at a suitable site or sell at an auction.
- Remove the generators from the site and either transport to a new site for storage or sell it to the farmer or an Auction.

- Seal all petrol, diesel, oil and grease containers and remove from the site to a storage facility or make it available to the farmer.
- Collect all scrap metal and dispose at a suitable site or sell at an auction, and.
- Break up all concrete slabs and structures on site and transport the fragments to a suitable site for disposal.

❖ **Step 4: Rehabilitate the excavated voids:**

- Replace the subsoil layer by backfilling the soil on top of the overburden and contour cap the subsoil with a topsoil layer about 10cm deep, and.
- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

❖ **Step 5: Rehabilitate site-specific storm-water channel:**

- Remove all the site structures created.
- Dispose of the plastic/wire and use the fill material to backfill the storm-water channel.
- Cap with a layer of topsoil to a depth of about 10cm, and.
- Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

❖ **Step 6: Rehabilitate all adjacent exploration / test mining sites affected:**

- Rip the surfaces to a depth of 40 cm to 50 cm using a multi-toothed ripper and tractor.
- Cover with a layer of topsoil to a depth of about 10 cm, and.
- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

❖ **Step 7: Rehabilitate all unwanted access roads created:**

- Rip the road surface to a depth of at least 50 cm using a multi-toothed ripper and tractor.
- Disk the ripped surface to break up the lumps.
- Cover with a layer of topsoil to a depth of about 10 cm, and.
- Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

## **6.5 Monitoring of the Environmental Performance**

### **6.5.1 Rehabilitation Evaluation and Performance Monitoring**

The following is the summary of key rehabilitation evaluation and performance monitoring to be implemented by the proponent:

- ❖ **Monitoring:** Monitoring program is instituted to ensure that the requirements of the mining site rehabilitation program are met. Rehabilitation program may be subjected to various natural or man-made forces that can hinder the progress and lead to problems or failure or

the rehabilitation program. Regular monitoring will ensure that these factors are identified early so they may be resolved through appropriate recommendations.

- ❖ Frequency: All rehabilitated areas should be monitored over a three (3) years period from the onset of the rehabilitation procedures. The frequency of monitoring suggested above is dependent on satisfactory performance. If, however, the requirements are not being met, the frequency of monitoring can be increased. It is suggested that the monitoring be conducted once a year around September when the grasses and forbs are flowering.
- ❖ Methods: The rehabilitated areas might be monitored by the sampling randomly located 1m<sup>2</sup> quadrates. Approximately 10 quadrates per hectare (or a minimum of 3) should be sampled per plant community. The factors that will be examined in each quadrate include:
  - Percentage basal cover.
  - Percentage aerial cover.
  - Species composition and diversity.
  - Vigor and health of plants.
  - Presence of and evidence of fauna, and.
  - Nature of the substrate.
- ❖ Controls: To enable a comparison, control plots located within the surrounding un-mining areas should also be monitored. This will give an indication of the progress of rehabilitated areas versus the natural vegetation and will set the goals, which ultimately should be achieved. By monitoring the natural vegetation annually, it will also be possible to assess the natural changes that are taking place. These findings can then be applied to the rehabilitated areas so as to account for the changes, which may have resulted from natural events. Approximately 5 to 10 quadrates of 1m<sup>2</sup> should be sampled per community type to set the controls.
- ❖ Maintenance: Maintenance requirements may include seeding (if there is poor germination of the seedbank), fertiliser applications, correcting erosion problems, removing weeds, etc. Maintenance of the rehabilitated areas will be necessary periodically. The need for and extent of maintenance activities will be determined during the regular monitoring of the site, and.
- ❖ Qualified Personnel: The rehabilitation procedures from implementation to monitoring should be overseen by qualified personnel. Any persons involved in the rehabilitation of the mining site should be trained in the techniques involved.

#### **6.4.2 Overall Environmental Performance Monitoring and Reporting**

The monitoring of the environmental performances for the proposed / ongoing exploration project can be divided into two (2) parts and these are:

- (i) Routine / ongoing daily monitoring activities to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required, and.
- (ii) Preparation of annual Environmental Monitoring Report and Environmental Closure covering all activities related to the Environmental Management Plan during exploration / prospecting stages and at closure of the proposed / ongoing exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required.

Environmental Commissioner in the Ministry of Environment and Tourism (MET), the environmental performances as part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performance assessments and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of undertaking appropriate monitoring as per specific topic (such as fauna and flora) and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Project HSE Officer.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the planned mineral exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as may be required. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation.

The report shall outline the status of the environment and any likely environmental liability after the completion of the proposed / ongoing project activities. The report shall be submitted to the Environmental Commissioner in the Ministry of Environment and Tourism and will represent the final closure and fulfilment of the conditions of the Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner and the conditions of the Pro-Forma Environmental Contract signed by the Proponent, Environmental Commissioner and the Mining Commissioner.

## 7. CONCLUSION AND RECOMMENDATION

### 7.1 Conclusions

Richwing Exploration (Pty) Ltd (**the Proponent**) intends to undertake exploration activities in the Exclusive Prospecting Licence (EPL) No. 5533, with special focus on base and rare metals (applied for), dimension stone, industrial minerals, and precious metals (applied for). The exploration activities to be undertaken as assessed in this environmental assessment are as follows:

- (i) Initial desktop exploration activities.
- (ii) Regional reconnaissance field-based activities.
- (iii) Initial local field-based activities including detailed mapping, sampling, and drilling operations.
- (iv) Detailed local field-based activities including detailed mapping, sampling, and drilling operations, and.
- (v) Prefeasibility and feasibility studies including possible test mining.

The overall severity of potential environmental impacts of the proposed / ongoing prospecting activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will be of low magnitude, temporally duration, localised extent, and low probability of occurrence. Mitigation measures must be implemented as detailed in Section 6 (EMP) of this report. The Proponent must obtain permission of the land owners (surface rights holders) before exercising their subsurface rights in all the farms covered by the EPL 5533.

### 7.2 Recommendations

It is hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC) with the following key conditions:

- (i) The Proponent shall negotiate Access Agreements with the land owners as may be applicable.
- (ii) In consultation with the land owners and where possible and if key and core conservation, tourism or archaeological resources areas are identified within the EPL area, such areas shall be excluded from the proposed minerals exploration activities.
- (iii) The Proponent shall adhere to all the provisions of the EMP and conditions of the Access Agreement to be entered between the Proponent and the land owner/s in line with all applicable national legislations and regulations.
- (iv) Before entering any private property such as private farms or communal areas, the Proponent shall give advance notices to the surface land rights holders and always obtain permission to access the land to undertake prospecting activities in any given area.
- (v) Mitigation measures shall be implemented as detailed in Section 6 (EMP) of this Scoping and EMP report, and.
- (i) Where possible, and if good quality freshwater is found during the detailed exploration borehole drilling operations, the Proponent shall support other land users in the area in terms of access to good quality freshwater resources for both human consumption, wildlife and agricultural uses as may be requested by the local community / land owner/s. With permission from the Department of Water Affairs in the Ministry of Agriculture,

Water and Land Reform (MAWLR), the abstraction of the groundwater resources shall include water levels monitoring, sampling and quality testing on a bi-annual basis, and that the affected landowner/s must have access to the results of the water monitoring analyses as part of the ongoing stakeholder disclosure requirements on shared water resources as may be applicable.

The Proponent must take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed / ongoing exploration programme covering the EPL 5533. Recommended actions to be implemented by the Proponent as part of the management of the likely impacts through implementations of the EMP are:

- (i) The Proponent shall obtain permission from the land owners to enter the EPL area to undertake field-based exploration / prospecting activities.
- (i) The Proponent shall implement precautionary measures / approach to environmental management. Once a viable and potential economic resource have been identified, the Proponent shall develop and implement a separate EIA and EMP inclusive of the specialist studies such as fauna and flora to be undertaken by specialist consultants as part of the feasibility study stage.
- (ii) Before detailed site-specific exploration activities such as extensive drilling operations and access routes are selected, the Project HSE Officer with the support of the external specialist consultants as maybe required, should consider the flora, fauna and archaeological sensitivity of the area and commission a field survey in advance of any site development as may be required based on the assessment undertaken.
- (iii) The Project HSE Officer shall lead, implement, and promote environmental culture through awareness raising of the workforce, contractors, and sub-contractors in the field during the whole duration of the proposed / ongoing exploration period.
- (iv) The Proponent to provide all the necessary support including human and financial resources, for the implementation of the proposed / ongoing mitigations and effective environmental management during the planned exploration activities for the EPL 5533.
- (v) Project HSE Officer with the support of the external specialist consultants as maybe required to develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors.
- (vi) Where contracted service providers are likely to cause environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities.
- (vii) Implement internal and external monitoring of the actions and management strategies developed during the mineral exploration process. Final Environmental Monitoring report shall be prepared by the Project HSE Officer with the support of the external specialist consultants as maybe required to be submitted to the regulators and to mark the closure of the proposed / ongoing mineral exploration.
- (viii) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for possible mining projects.

### **7.3 Summary ToR for Test Mining and Mining Stages**

Once economic resources are discovered for possible mining operations, a separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) shall be undertaken as part of the prefeasibility and feasibility studies. The site-specific EIA and EMP shall cover the area/s identified to have potential economic minerals resources and the assessment



shall include the entire planned mine layout areas such as the pit / shaft, waste rock, tailings dump, access, office blocks, mechanical workshop, water, and energy infrastructure support areas (water, energy, and road / access).

In addition to the site-specific possible mining EIA and EMP Terms of Reference (ToR) to be developed during the prefeasibility study phase, the following field-based and site-specific specialist studies shall be undertaken in an event that economic minerals resources are discovered for possible development of a mining project within the EPL 5533 area:

- (i) Groundwater studies including modelling as may be applicable.
- (ii) Field-based flora and fauna assessments.
- (iii) Dusts, noise and sound assessments and modelling linked to engineering studies.
- (iv) Socioeconomic assessment, and.
- (v) Others as may be identified / recommended by the stakeholders/ land owners/ Environmental Commissioner or specialists during the prefeasibility and feasibility phases.

The aims and objectives of the Environmental Assessment (EA) covering Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to be implemented as part of the feasibility study if a variable resource is discovered 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 (EPL Area), regional, national (Namibia) and Global levels using appropriate assessment guidelines, methods and techniques covering the complete project lifecycle. The EIA and EMP to be undertaken shall 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 shall conform to the national regulatory requirements, process and specifications in Namibia and in particular as required by the Ministry of Mines and Energy, Ministry of Environment, Forestry and Tourism and Ministry of Agriculture, Water Affairs and Land Reform, and.
- (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.

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