

# Osino Namibia Minerals Exploration (Pty) Ltd (the Proponent)

**MET ECC Application No.  
APP-001151**

Final Environmental Impact Assessment (EIA)  
Report to Support the Application for Environmental  
Clearance Certificate (ECC) for the Proposed  
Minerals Exploration / Prospecting in the Exclusive  
Prospecting License (EPL) No. (EPL) No. 7370  
OMARURU DISTRICT, ERONGO REGION,  
**NORTH CENTRAL NAMIBIA**

March 2020

13 Feld Street, P. O. Box 3489  
WINDHOEK, NAMIBIA

# PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

## TYPE OF AUTHORISATIONS REQUIRING ECC

Exclusive Prospecting License (EPL) No. 7370  
for ECC for Exploration

## NAME OF THE PROPONENT

Osino Namibia Minerals 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 activities in the Exclusive  
Prospecting License (EPL) No. 7370, Omaruru District,  
Erongo Region, North-Central Namibia

## PROJECT LOCATION

Omaruru District, Erongo Region, North-Central Namibia  
(Latitude: -20.774167, Longitude: 15.510000)

## ENVIRONMENTAL CONSULTANTS



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## ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

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*PhD, PG Cert, MPhil, BEng (Hons), Pr Eng*

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

Dr Sindila Mwiya has more than eighteen (18) 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 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. The great array of highly technical specialist knowledge and field-based practical experiences of Dr Sindila Mwiya has now been extended to supporting the development of Environmentally Sustainable, automated / smart and Climate Change resilient homes, towns and cities.

Through his companies, Risk-Based Solutions (RBS) CC and Foresight Group Namibia (FGN) (Pty) Ltd which he founded, he has undertaken more than 200 projects for Local (Namibian), Continental (Africa) and International (Global) based clients. He has worked and continue to work for Global, Continental and Namibian based reputable resources (petroleum and mining / minerals) and energy companies such as EMGS (UK/ Norway), CGG (UK/ France/Namibia), BW Offshore (Norway/Singapore /Namibia), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK/Namibia), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada/Namibia), Osino Resource Corporation (Canada/Germany/Namibia), Desert Lion Energy Corporation (Canada/ Australia/ 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), Sintezneftgaz 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 continue 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. Currently, Dr Sindila Mwiya is developing a 16 Ha commercial and residential Mwale Mwiya Park in the Town of Katima Mulilo, Zambezi Region, Namibia as one of first advanced Environmentally Sustainable, automated / smart and Climate Change resilient development in Namibia. He continue to worked as an International Resources Consultant, national Environmental Assessment Practitioner (EAP) / Environmentally Sustainable, automated / smart and Climate Change resilient homes developer, Engineering / Technical Consultant (RBS / FGN), 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 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 Magnetism, 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 continue to support a number of MScs and PhDs research programmes 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 donor organisations. Since 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment and Tourism (MET) through GIZ in the preparation and amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), new Strategic Environmental Assessment (SEA) Regulations, preparation of the updated Environmental Impact Assessment (EIA) Regulations as well as the preparation of the new 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 (Engineering Geology/Geotechnical / Geoenvironmental / Environmental Engineering and Artificial Intelligence) – Research Thesis: Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid 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, Namibia March 2020**

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## NON-TECHNICAL EXECUTIVE SUMMARY

Osino Namibia Minerals Exploration (Pty) Ltd (the Proponent) holds mineral rights under the Exclusive Prospecting License (EPL) No. 7370 for base, rare and precious metals groups. The EPL 7370 was granted 13/08/2019 and will expire 12/08/2022. Osino Namibia Minerals Exploration (Pty) Ltd is a subsidiary of Osino Resources Corporation, a Canadian Stock listed company (TSX.V: OSI, FSE: R2R1) focused on the acquisition and development of gold projects in Namibia.

The EPL No. 7370 is located in the Omaruru District of the Erongo Region, in the north-central Namibia. The EPL 7370 area totalling 5998.4045Ha over the following communal areas: Okemyenya, Ondundotjuapa, Otjotopera, Omutiwanduka and Okamaera.

The Proponent intends to conduct exploration / prospecting activities starting with desktop studies and aerial surveys, followed by regional field-based reconnaissance work and if the results are positive, implement detailed site-specific field-based activities over key site-specific localities using techniques such as geological mapping, geophysical surveys, trenching, drilling and sampling for laboratory tests.

The proposed / ongoing minerals exploration activities are listed in the Environmental Impact Assessment (EIA) Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC).

This Environmental Impact Assessment (EIA) report has been prepared by Risk-Based Solutions (RBS) CC in order to support the application for ECC. Public consultation process was undertaken during the month of Months February and March 2020. In line with the provisions of the EIA Regulations, 2012 and in order to identify the key Interested and Affected Parties (I&APs), public notices were published in the following newspapers: New Era Daily Newspaper dated 18<sup>th</sup> February 2020, the Confidante Weekly Newspaper dated 27<sup>th</sup> February to 4<sup>th</sup> March 2020 and Windhoek Observer Weekly Newspapers dated 6<sup>th</sup> March 2020.

The closing date for registration and submission of written objections, comments or inputs to the environmental assessment process was Friday, 13<sup>th</sup> March 2020. During the public / stakeholder consultation period, a local community written objection to the proposed project activities was received by Environmental Assessment Practitioner (EAP). Additionally, a one to one meeting was also held on Tuesday 10<sup>th</sup> March 2020, at Risk-Based Solutions (RBS) CC Offices in Windhoek with the Chief Manasse Christian Zeraeua, the head of the Traditional Authority based at Omatjete with overall jurisdiction over the area covered by the EPL 7370.

Both in the statements made by the Chief Manasse Christian Zeraeua and in the submission made by the local community based on the meetings facilitated by Mr. Abuid Karongee, a Community Activist, there are major valid concerns and reservations about the proposed activities and especially mining activities on the fragile semiarid local environment and the socioeconomic settings of the surrounding communities especially, the eco-tourism activities and conservation efforts that are currently being implemented by the local communities. Nonetheless, in the community objection submission as attached to this report, very little addresses the issues of exploration. Almost the entire community submission is talking about the negative impacts of mining and lack of benefits from the current ongoing mining activities, whilst the Proponent intends to only undertake exploration activities with zero chance of advancing the exploration activities to mining stages (application for a Mining License).

Overall, however, the Chief Manasse Christian Zeraeua expressed support for the proposed exploration activities because he knew very well the difference between exploration and mining. The Chief recommended that the Traditional Authority shall be the key contact and focal point and shall be notified and permission obtained before any field-based activities are undertaken in the area and must be kept updated on progress of the proposed exploration activities in area.

The impacts that the proposed / ongoing exploration activities will have on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will depend on the extent of the proposed / ongoing activities over the development area, management of the area and how the mitigations as detailed in the EMP report are

eventually implemented and monitored by the Proponent to the satisfaction of the landowners and the Government regulators.

Based on the findings of this EIA Report, it's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). The Proponent shall take into consideration the following key requirements for implementing the proposed exploration programme:

- (i) The Proponent shall undertake thematic mapping in order to fully understand the land use plans of the local area and identify areas of possible coexistence and no-go zones;
- (ii) The Proponent shall notify and obtained permission from the Traditional Authority in Omatjete before any field-based activities are undertaken in the area and the Traditional Authority must be kept updated on progress and outcomes of the proposed exploration activities in order for the Traditional Authority to inform the local communities;
- (iii) Before a site-specific detailed exploration activity such as trenching or drilling are undertaken, an archaeological assessment of the shall be undertaken by an archaeologist. Precautionary principle / approach must always be exercised;
- (iv) 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 regulations;
- (v) The community tourism, wildlife breeding and transit areas shall be excluded from site-specific detailed exploration activity such as trenching or drilling or any furfure mining activities as requested by the local community;
- (vi) If resources allow, the Proponent shall consider Corporate Social Responsibilities by supporting broader community initiatives such as improving water supply, education or health related projects in the surrounding area;
- (vii) All exploration sites must be rehabilitated;
- (viii) Where possible, and if water is found during the detailed exploration boreholes drilling operations, the Proponent shall support other land uses in the area in terms of access to freshwater supply for both human consumption, wildlife and agricultural support as may be requested by the local community / land owner/s. The abstraction of fresh groundwater resources shall include water levels monitoring, sampling and quality testing on a bi-annual basis, and that the affected landowners 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, and;
- (ix) Based on the findings of this EIA Report, the Proponent shall prepare an EMP Report with key mitigations measures covering the lifecycle of the proposed exploration activities;

Once and if economic minerals resources are discovered, a separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports shall be prepared as part of the feasibility study with respect to the test mining or possible mining operations. The site-specific EIA and EMP shall cover the area identified to have potential economic minerals resources including the pit area/s, waste rock, access, office blocks and all infrastructure support areas (water, energy and road / access).

In addition to the Terms of Reference (ToR) to be developed during the Environmental Scoping study phase for the test mining / mining stages, the following field-based and site-specific specialist studies shall be considered in the TOR for the EIA and EMP for possible test mining or mining operations in an event of a discovery of economic minerals resources and possible development of a mining project within the EPL No. 7370:



- (i) Groundwater studies including modelling as maybe applicable;
- (ii) Field-based flora and fauna diversity;
- (iii) Dust, noise and sound 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.

# 1. BACKGROUND

## 1.1 Introduction

Osino Namibia Minerals Exploration (Pty) Ltd (the **Proponent**) hold mineral rights under the Exclusive Prospecting License (EPL) No. 7370. The following is the summary of the EPL 7370:

- ❖ **Type of License:** Exclusive Prospecting License (EPL) No. 7370;
- ❖ **EPL Holder:** Osino Namibia Minerals Exploration (Pty) Ltd;
- ❖ **Granted Date:** 13/08/2019;
- ❖ **Expiry Date:** 12/08/2022;
- ❖ **Commodities:** base, rare and precious metals groups, and;
- ❖ **Size of the EPL:** 5998.4045Ha.

Osino Namibia Minerals Exploration (Pty) Ltd is a subsidiary of Osino Resources Corporation, a Canadian Stock listed company (TSX.V: OSI, FSE: R2R1) focused on the acquisition and development of gold projects in Namibia.

The Proponent intends to undertake exploration activities covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and bulk sampling.

## 1.2 Regulatory Requirements

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).

The Proponent is required to have undertaken Environmental Assessment comprising this Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports for the proposed minerals prospecting activities in order to support the application for ECC.

In fulfilment of the environmental requirements, the Proponent appointed Risk-Based Solutions (RBS) CC as the Environmental Consultants led by Dr Sindila Mwiya as the Environmental Assessment Practitioner in the preparation of the EIA and EMP Reports in order to support the application for ECC.

## 1.3 Location, Land Use, Infrastructure and Services

### 1.3.1 Location and Land Use

The EPL No. 7370 is located in the Omaruru District of the Erongo Region, in the north-central Namibia (Figs 1.1 -1.3). The EPL 7370 area totalling 5998.4045Ha over the following communal areas: Okemyenya, Ondundotjiuapa, Otjotopera, Omutiwanduka and Okamaera (Fig. 1.3).

The general land use of the area is mainly dominated by subsistence agriculture (cattle and small stock), community tourism, hospitality and conservation initiatives by local communities, minerals prospecting and mining operations especially dimension stone (granite quarrying) and small-scale mining of gemstones.

### 1.3.2 Supporting Infrastructure and Services

The EPL area is accessible through the D3713, D3712 and 3718 gravel roads (Fig. 1.3). The D3712 gravel road connects the project area to national road network either via the D2344 gravel road to

Omaruru or the C36 road connect Omaruru to Okombahe (Fig. 1.3). The project area is located approximately 325 km from Windhoek, with the deep-water port of Walvis Bay located approximately 340 km to the south west of the EPL 7370 (Figs. 1.1-1.3).

A number of minor local community tracks cut across the EPL Area and with permissions from the local community may be used to access exploration area/s of interest that may be delineated within the areas of interest within the EPL area (Fig. 1.3). The construction of any new access if really required shall only be done with strict permission from the local community and shall be undertaken in accordance with the provisions of the EMP in terms of environmental protection.

The EPL Area has no mobile services, national or local water and electricity infrastructure networks. However, the proposed minerals exploration activities will not require major water and energy supplies. Sources of water supply for exploration especially drilling will be obtained from local boreholes if available or supplied by a water tanker truck collecting water from nearby reliable supply. The local area has very low and limited groundwater resources due to the presence of non-porous granitic terrains. Electricity supply will be provided by diesel generators and solar as may be required.

## **1.4 Project Motivation**

A number of minerals occurrences are known to exist in the general area linked to the regional geology of the EPL area. The proponent intends to explore / prospect for all licensed minerals groups with special focus on gold likely to be associated with the regional, local geology and geological structures. If economic minerals resources are discovered and can led to the development of mine, this will be of great benefits to the sustainability of the mining industry and growth of the economic landscape of Namibia.

Minerals exploration is a key driver of the mining industry and without the discovery of new resources and research, the mining industry will eventually cease to exist in Namibia and by so doing will go with a big slice of the national economy and leave a major gap in State financing, export goods, forex earnings, employment and overall contribution to the Gross Domestic Products (GDP). It is highly important to support each and every exploration effort.

Minerals exploration is a long-term and high-risk process and to advance a mineral exploration project from exploration to the application of a ML can take up to ten (10) years or more and costing millions of dollars of high-risk capital with zero guarantee for recovering the cost of exploration or discovering a mineable and profitable minerals deposit.

The chance or probability for discovering economic minerals that can become a mine in any EPL is as low as 0.001% while the cost of undertaking exploration can run into millions of Namibia Dollars. The high-risk capital nature of exploration with zero guarantee for recovering the cost of exploration makes it a no-go zone for Governments globally. It is for this reason that minerals exploration is mainly driven by few investors such as wealthy individuals with interest in resources and high appetite for risk financing as well as international corporations and public listed companies.



Figure 1.1: Regional location of the EPL No 7370 Area.

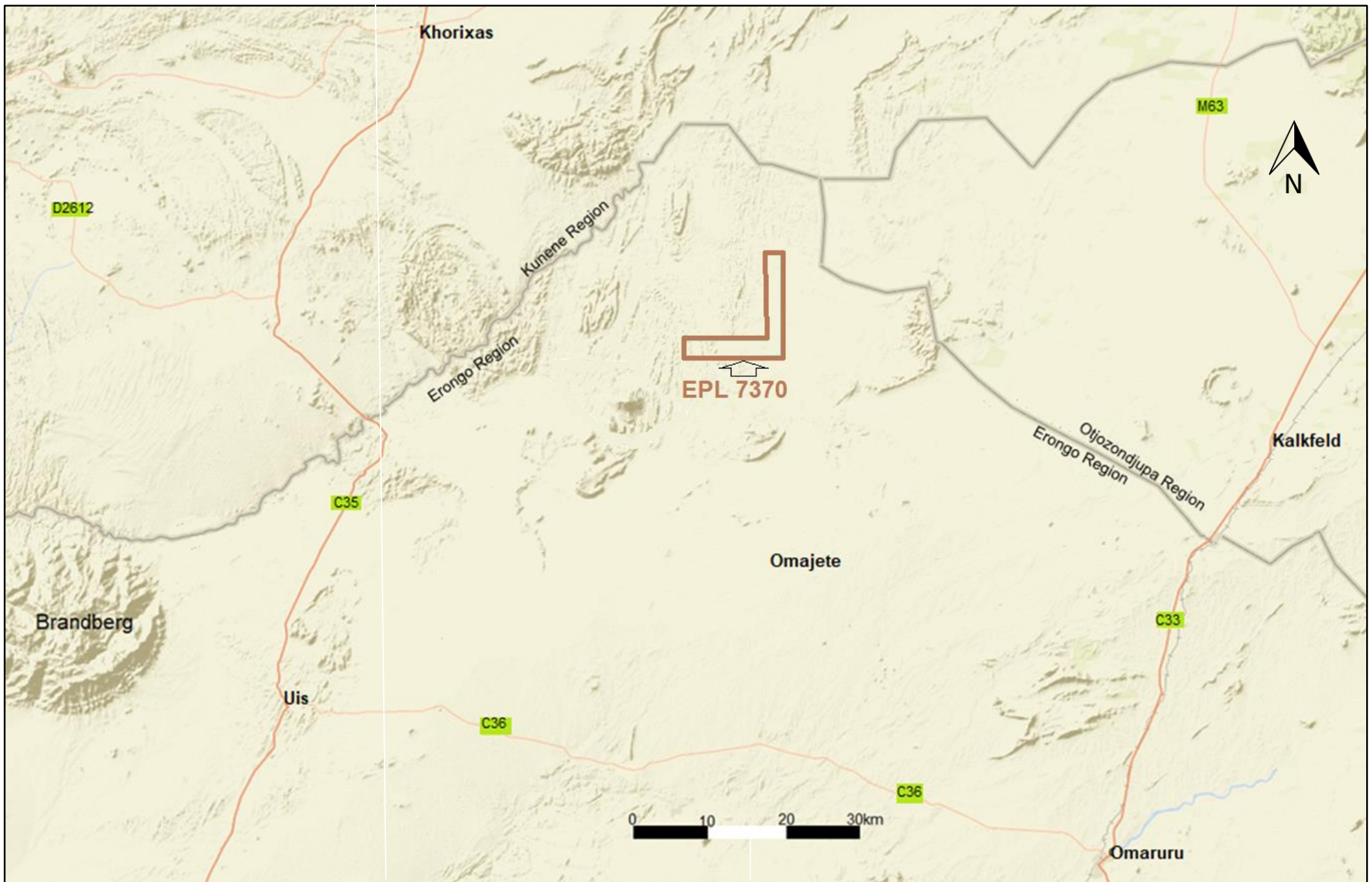


Figure 1.2: Detailed regional location of the EPL 7370 Area (Source: <http://portals.flexicadastre.com/Namibia>).



## 1.5 Approach, Alternatives, Key Issues and Methodology

### 1.5.1 Terms of Reference (ToR) and Approach

Risk-Based Solutions (RBS) was appointed by the Proponent to prepare the EIA and EMP Reports in order to support the application for Environmental Clearance Certificate (ECC) for the EPL No. 7370 with respect to the proposed exploration activities. The EIA process reviewed the receiving environmental settings (physical, biological, socioeconomic and ecosystem services, function, use values and non-use) and proposed / ongoing exploration activities, identified the impacts and then assessed the likely impacts (positive and negative) on the receiving environment (Table 1.1).

The key deliverable comprised this EIA Report and a separate Environmental Management Plan (EMP) report detailing appropriate mitigation measures that will enhance the positive impacts and reduce the likely negative impacts identified. The EIA and 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 and Tourism (MET) through the Ministry of Mines and Energy (the Competent Authority) for review and issue of the Records of Decisions (RDs).

The EIA and EMP processes have 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 and Tourism (MET) and the client (Proponent). Both the EIA and EMP Reports have 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, EIA and EMP reporting.

PROPOSED / ONGOING PROJECT ACTIVITIES	ALTERNATIVES TO BE CONSIDERED	KEY ISSUES ASSESSED IN THIS EIA WITH MITIGATION MEASURES PROVIDED IN THE EMP REPORT		
(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 key targets  (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 targets  (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: A number of economic deposits are known to exist in different parts of Namibia and some have been explored by different companies over the years;  (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
				Socioeconomic, archaeological and Cultural impacts on the local societies and communities
		Impacts on the Biological Environment	Flora	
			Fauna	
			Habitat  Ecosystem functions, services, use values and non-Use or passive use	

## 1.5.2 Environmental Assessment Process and Steps

The EIA and EMP process used for this project took into considerations the provisions of the Environmental Impact Assessment (EIA) Regulations, 2012 and the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) as outlined in Fig. 3.1. The environmental assessment steps undertaken or still to be taken are summarised as follows:

- (i) Project screening process was undertaken in January 2020;
- (ii) A Draft BID / Scoping Report prepared in February 2020;
- (iii) Public / stakeholders notices published in the local newspapers as well as via direct emails communications to key stakeholders undertake and to be undertaken between 18<sup>th</sup> February and 13<sup>th</sup> March 2020;
- (iv) Final BID / Scoping Report prepared in March 2020;
- (v) Prepared the Draft EIA and EMP Reports in February – March 2020;
- (vi) Comments and inputs from the public and stakeholder consultations used to finalise the EIA and EMP Reports in March 2020, and;
- (vii) The Final EIA and EMP reports used to support the application for Environmental Clearance Certificate (ECC) for the proposed minerals exploration activities in the EPL 7370 area. The formal application for ECC is planned to be submitted to the Environmental Commissioner through the Ministry of Mines and Energy (Competent Authority) during the week starting **16<sup>th</sup> March 2020**.

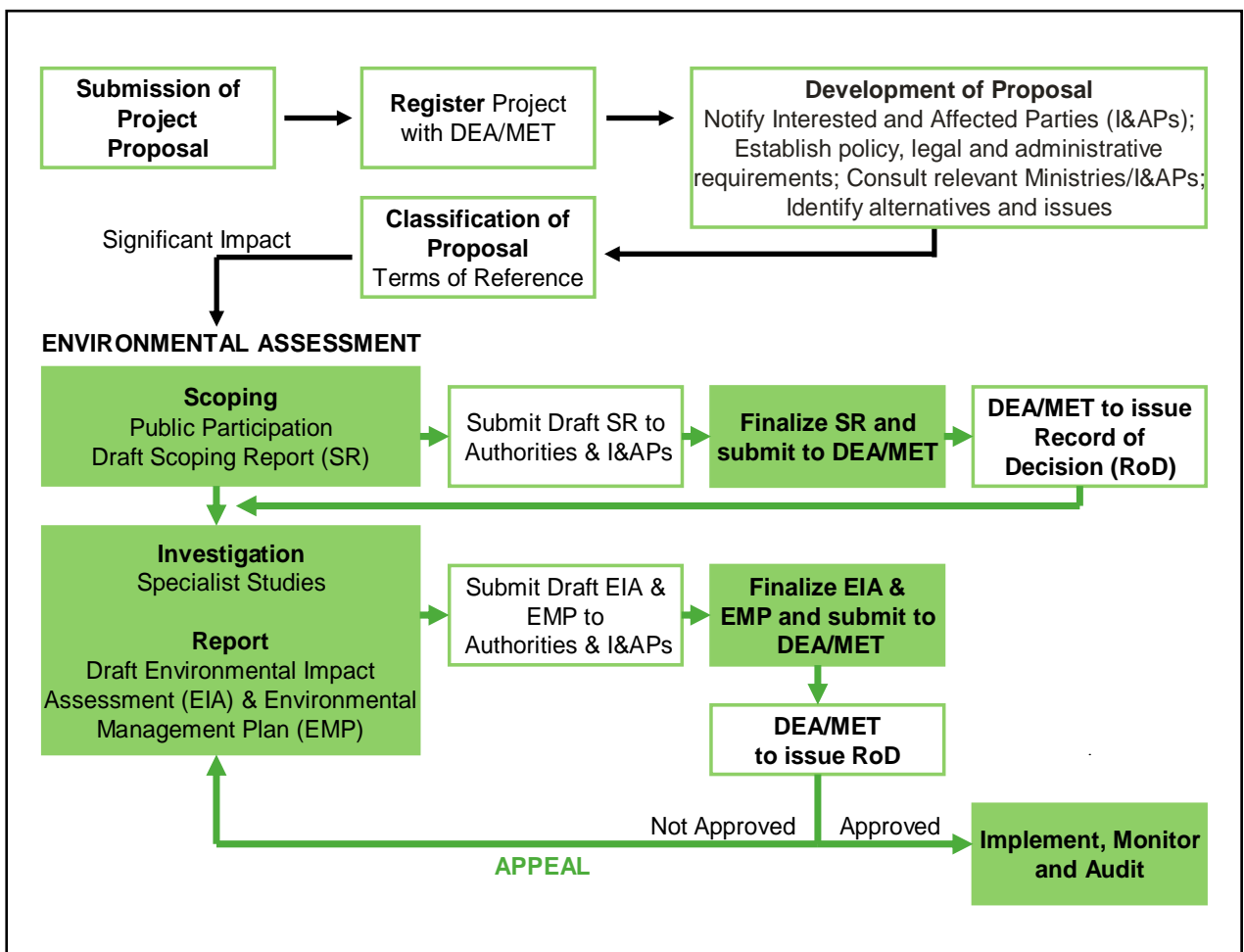


Figure 1.4: Schematic presentation of Namibia's Environmental Assessment procedure.



### 1.5.3 Assumptions and Limitations

The following assumptions and limitations underpin the approach adopted, overall outcomes and recommendations for this 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 Competent Authority and the Environmental Commissioner.

### 1.6 Structure of the Report

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

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: Conclusions and Recommendations-** Summary of the findings and way forward.
7. **SECTION 7: Annexes**

## **2. DESCRIPTION OF THE EXPLORATION**

### **2.1 General Overview**

The overall aim of the proposed / ongoing project activities (exploration / prospecting programme) is to search for potential economic minerals resources covering base, rare and precious metals groups within the EPL area. The exploration activities to be undertaken as assessed in this environmental assessment are as follows:

- (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 (i) and (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 (i) - (iii) above), and;
- (v) Prefeasibility and feasibility studies (Subject to the positive results of (i) - (iv) above).

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 Initial Desktop Exploration Activities**

The following is description of the proposed initial desktop exploration activities to be implemented by the Proponent as assessed in the EIA Report:

- (i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data;
- (ii) Purchase and analysis of existing Government high resolution magnetic 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.

No field work is envisaged at this stage of the proposed exploration activities which can last between six (6) to twelve (12) months.

## **2.3 Regional Reconnaissance Field-Based Activities**

The following is detailed outline of the proposed regional reconnaissance field-based exploration activities to be implemented by the Proponent as assessed in the EIA Report:

- (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.

Scope and scale of the possible field work is very limited to visiting specific delineated localities in order to validated the recommendations of the initial desktop activities.

## **2.4 Initial Local Field-Based Activities**

The following is detailed outline of the proposed initial local field-based exploration activities to be implemented by the Proponent as assessed in the EIA Report:

- (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

Scope and scale of the possible field work is very limited working on specific delineated localities in order to assess the economic viable of the target/s.

## **2.5 Detailed Local Field-Based Activities**

The following is detailed outline of the proposed detailed local field-based exploration activities to be implemented by the Proponent as assessed in the EIA Report if economic and viable targets are delineated within the EPL area:

- (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, and;
- (iv) Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).

Scope and scale of the possible field work is likely to be extensive over a localised specific delineated locality in order to assess the economic viable of the target/s.

## **2.6 Prefeasibility and Feasibility Studies**

The following is detailed outline of the proposed prefeasibility and feasibility studies related exploration activities to be implemented by the Proponent as assessed in the EIA Report if economic and viable targets are delineated within the EPL area:

- (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

Field-based support and logistical activities will be very extensive because the local field-based activities will be undertaken on a specific area for a very long time (up to one year or more in some instances). The activities will be supported by existing tracks and campsites / lodging facilities available in the area.

### 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 falls within the categories of listed activities that cannot be undertaken without an Environmental Clearance.

##### 3.2.2 Competent 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 and Tourism (MET)	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
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 Forestry (MAWF)	<p>The Directorate of Resource Management within the Department of Water Affairs (DWA) at the MAWF 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.</p> <p>The National Botanical Research Institute's (NBRI) mandate is to study the flora and vegetation of Namibia, in order to promote the understanding, conservation and sustainable use of Namibia's plants for the benefit of all. The Directorate of Forestry (DOF) is responsible for issuing of forestry permits with respect to harvest, transport, and export or market forest resources.</p>

### 3.3 Recommendations on Permitting Requirements

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

- (i) Valid Exclusive Prospecting License (EPL) as maybe 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 and Tourism (MET);
- (iii) The Proponent shall apply for a fresh water abstraction and waste water discharge permits from the Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Forestry (MAWF) before drilling a water borehole and discharge wastewater into the environment respectively, and;
- (iv) All other permits as maybe become applicable during the proposed exploration operations.

### 3.4 Standards and 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 3.2) while the drinking water quality comparative guideline values are shown in Table 3.3.

Table 3.2: 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 3.3: 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

## **4. SUMMARY OF NATURAL ENVIRONMENT**

### **4.1 Climate**

Summer rainfall is brought by northeast winds, generally from October to April. The average rainfall varies considerably and ranges between 380 mm and 450 mm. The mean annual gross evaporation is between 3000 mm -3200 mm. The numbers of rainfall events expressed as an annual average in days as determined from the regional data is 10-30 days. The sun shines for an annual average of 10 hours a day. The annual mean temperature for Otjiwarongo area is around 24°C with the mean monthly temperatures ranging between 23°C to 14°C throughout the year. Based on regional data sets, temperatures at 08h00, 14h00 and 20h00 are estimated to be around 14°C, 24°C and 18°C respectively.

### **4.2 Topography**

The regional terrain around the EPL 7370 is rocky and rugged in nature with steep slopes characterising the mountainous sections whilst the foothills of the mountains are flat and gently undulating. Within the EPL area, the drainage is dendritic in nature with ephemeral streams, often steeply incised, forming small early stage tributaries of the Ugab Ephemeral River and its tributaries of Okasako and Ozongombo Ephemeral Rivers.

### **4.3 Likely Fauna 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 Birds

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 Sensitive Areas – Vertebrate Fauna

The following sensitive areas are of most concern at the proposed / ongoing development site:

- (i) **Ugab Ephemeral River and associated tributaries such as the Okasako and Ozongombo Ephemeral Rivers:** Drainage lines, albeit ephemeral, are the lifelines in the drier parts of Namibia with a variety of vertebrate fauna attracted and/or associated with such features. Although not as important as perennial rivers, well vegetated ephemeral drainage lines are still viewed as important habitat for a variety of vertebrate fauna in the general area. It is recommended that development attempt to avoid these drainage lines as far as possible, and;
- (ii) **Carbonate Terrain / Mountainous and rocky areas:** Maybe biotic richness and endemism.

### 4.4 Likely Flora Diversity

#### 4.4.1 Trees/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 juttae* (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*. 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.

#### 4.4.2 Grass

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 of the grasses are exclusively associated with the proposed / ongoing developments area nor protected species, which minimises the overall effect on grasses.

### 4.4.3 Other

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

### 4.4.4 Protected Species / Sensitive Areas

The following are the key likely protected species / sensitive areas that maybe found within the EPL area:

- (i) Protected species: The protected tree species along the **Ugab Ephemeral River and associated tributaries such as the Okasako and Ozongombo Ephemeral Rivers:** Drainage lines, albeit ephemeral, are the lifelines in the drier parts of Namibia with a variety of vertebrate fauna attracted and/or associated with such features. Although not as important as perennial rivers, well vegetated ephemeral drainage lines are still viewed as important habitat for a variety of vertebrate fauna in the general area. It is recommended that development attempt to avoid these drainage lines as far as possible, and;
- (ii) **Carbonate Terrain / Mountainous and rocky areas:** Maybe biotic richness and endemism.

## 4.5 Summary of the Socioeconomic Settings

### 4.5.1 Overview

Social impacts at the exploration stage are likely to be minimal and tend to be positive in an event of a discovery of economic minerals resources. A clear understanding of these impacts may help communities understand and anticipate the effects of exploration. One of the major possible impacts of the proposed / ongoing exploration activities include employment expectations and unrealistic expectations about the development of a mine and coexistence opportunity / conflicts associated with the current land uses such as conservation and tourism operations activities being undertaken by the local communities of Okemyenya, Ondundotjiuapa, Otjotopera, Omutiwanduka and Okamaera areas. It's important for local communities to bear in mind that 99.9% of the exploration projects will not advance to a mine development.

### 4.5.2 Agriculture

As an important cattle, game and small stock (goats and sheep) farming area and consequently a source of employment and livelihood as well as renewed interest from a tourism point of view, the importance of the local area is invaluable. The surrounding EPL area falls within the long-established communal farming communities but highly venerable to climate change due to its arid environment, recurrent drought and desertification. According to the submission made by the local community, the situation has forced pastoral farmers to find temporary homage between these mountains as they still contain grazing grass during drought. The farmers are further even forced to climb between the rocks and hills to harvest grass for their animals if it becomes difficult for the animals to climb the mountains.

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 local 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).

### 4.5.3 Conservation and Tourism

There are numerous existing tourism ventures in the area with the tourism potential viewed as relatively high (Mendelsohn et al. 2002). The EPL area is within the general area set aside by the currently

registered Ohungu Conservancy and the upcoming Kandepoina Conservancy. The zonation map divides the conservancies in the following parts:

- ❖ Settlement and farming, Wildlife breeding area and transit area, and;
- ❖ Hunting and exclusive tourism area.

The farmers only move temporary into Conservancy areas during severe drought times and also with permission and supervision of the conservancy management committees.

## **4.6 Ground Components**

### **4.6.1 Regional and Local Geology**

The EPL 7370 Area falls within the metasedimentary rocks of the Damara represented by the Kuiseb and Karibib Formations as well as sounding Damara Granites (Geological Survey of Namibia, 1999 and Miller, 2008, 1992, 1983a and 1983b). Schists and quartzites, together of iron ore lenses form the lower units of the stratigraphy.

According to Miller, (1992) it 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 and subordinate limestone and evaporitic rocks. Local alkaline ignimbrite with associated subvolcanic intrusions range from 840 to 720 million years in age.

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) (Geological Survey of Namibia, 1999 and Miller, 2008, 1992, 1983a and 1983b).

The Kalahari cover consisting of thin sand/silt/calcrete deposits; hence they are not major source of water supply in the area (Miller, 2008). Some of these deposits, such as the gravels, clays and calcretes, are also potential local materials that can be used in the various construction activities associated with different infrastructure development at various stages of the mine life cycle.

### **4.6.2 Water**

#### **4.6.2.1 Overview**

According to the Department of Water Affairs and Forestry, (2001) and the geology of the EPL area falls within an area with very limited economic groundwater water resources (aquifers) as shown in Fig. 4.1. Water supply in the general area is from local groundwater resources (Department of Water Affairs, 2001). The local settlements get water supply from the limited groundwater resources associated with the local carbonates and fractured terrain in the general area. The proposed / ongoing project activities (exploration programme) will utilise limited local groundwater resources if available. No site-specific hydrogeological specialist study, groundwater modelling or water sampling and testing activities have been undertaken for this study.

#### **4.6.2.2 Sources of Water Supply**

The source of water supply for the proposed / ongoing exploration and in particular drilling of exploration boreholes if need arises to drill, will be from existing groundwater resources. Alternatively, water will be trucked to an exploration as may be required. The proponent must obtain permission from the land owners before using water from any existing local boreholes and infrastructures. If there is a need to drilling a water borehole to support the proposed / ongoing exploration programme, the proponent must obtain permission from the land owner and Department of Water Affairs in the Ministry of Agriculture, Water and Forestry (MAWF). In an event of discovery of economic minerals resources, the sources of

water supply for the mining related operations will be supplied through NamWater from groundwater resources if proven to be available following a detailed hydrogeological and groundwater modelling study that must be undertaken as part of the EIA supporting the feasibility study. Currently, potential available groundwater resources in the area will not be sufficient to support any new larger-scale mining related operation within the EPL 7370.

#### **4.6.2.3 Water Vulnerability Assessments and Recommendations**

Possible targets for vulnerable groundwater resources in this area are the Ephemeral River Channels and fractured zones and faults that outcrop on the surface without impermeable infillings. Although the general area does not have economic water resources some parts of the EPL area may hold localised potential groundwater resources (Fig. 4.1). The granite and the carbonate rocks both have very poor primary and secondary porosity, permeability and all associated hydraulic properties. The overall water vulnerability to pollution as a result of the proposed / ongoing exploration as well as other existing activities is moderate as shown in Fig. 4.2.

The general area has a number of Ephemeral River Channels which could be potential pathways for pollution migration especially during the rainy season from November to March. Discharge of liquid or solid wastes including waste water, chemical, fuels or oils into any public stream is prohibited and the proponent must implement the provisions of the EMP on water and waste management as detailed in the EMP report.

It is hereby recommended that a detailed site-specific hydrogeological specialist study including groundwater modelling, water sampling and testing shall be undertaken as part of the EIA and EMP that may be implemented to support the feasibility study for any viable mining project that may be development within the EPL area, if economic resources are discovered.

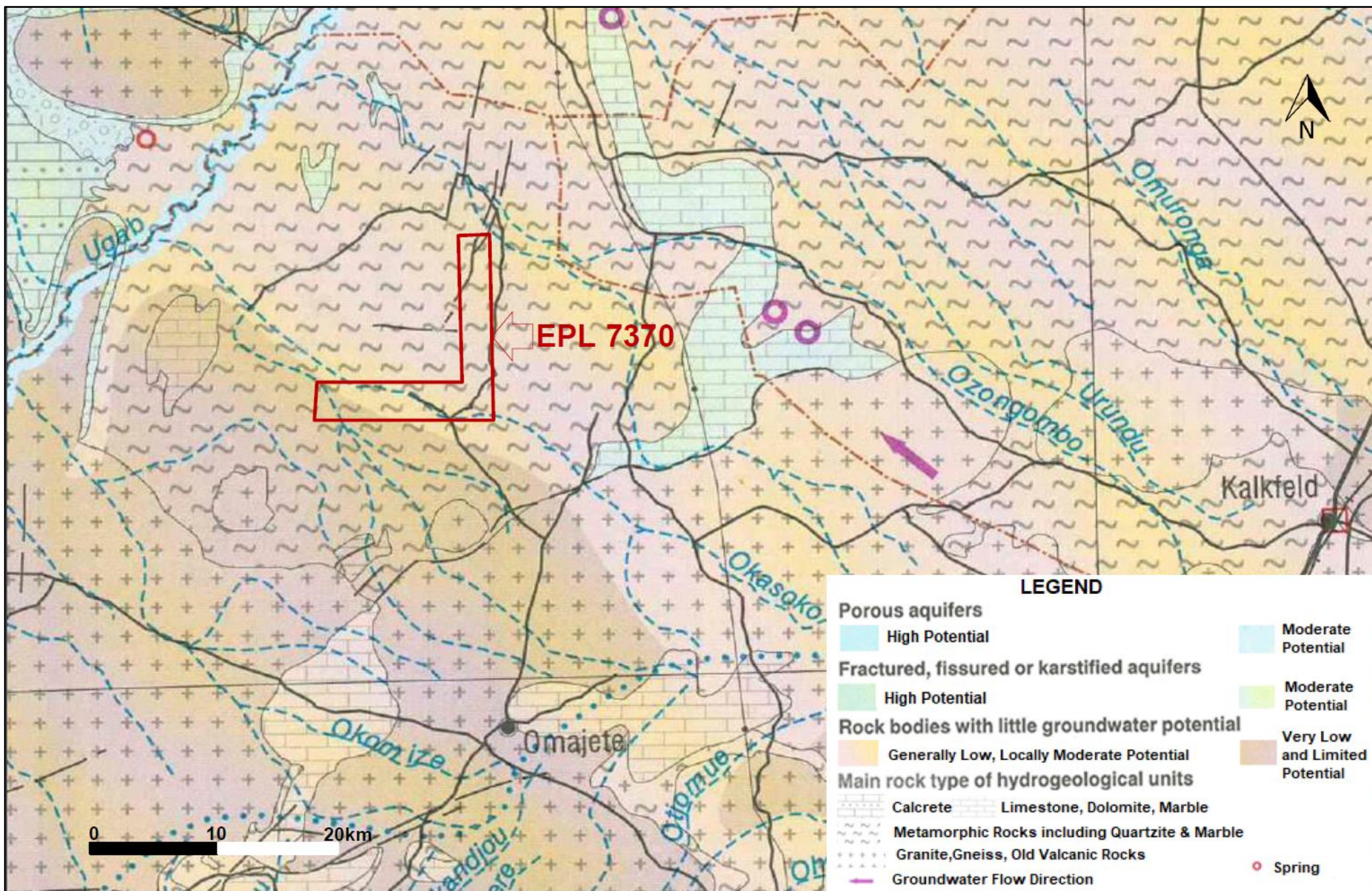


Figure 4.1: Regional hydrogeology and groundwater potential around the EPL 7370 Area (Source: Department of Water Affairs, 2001).

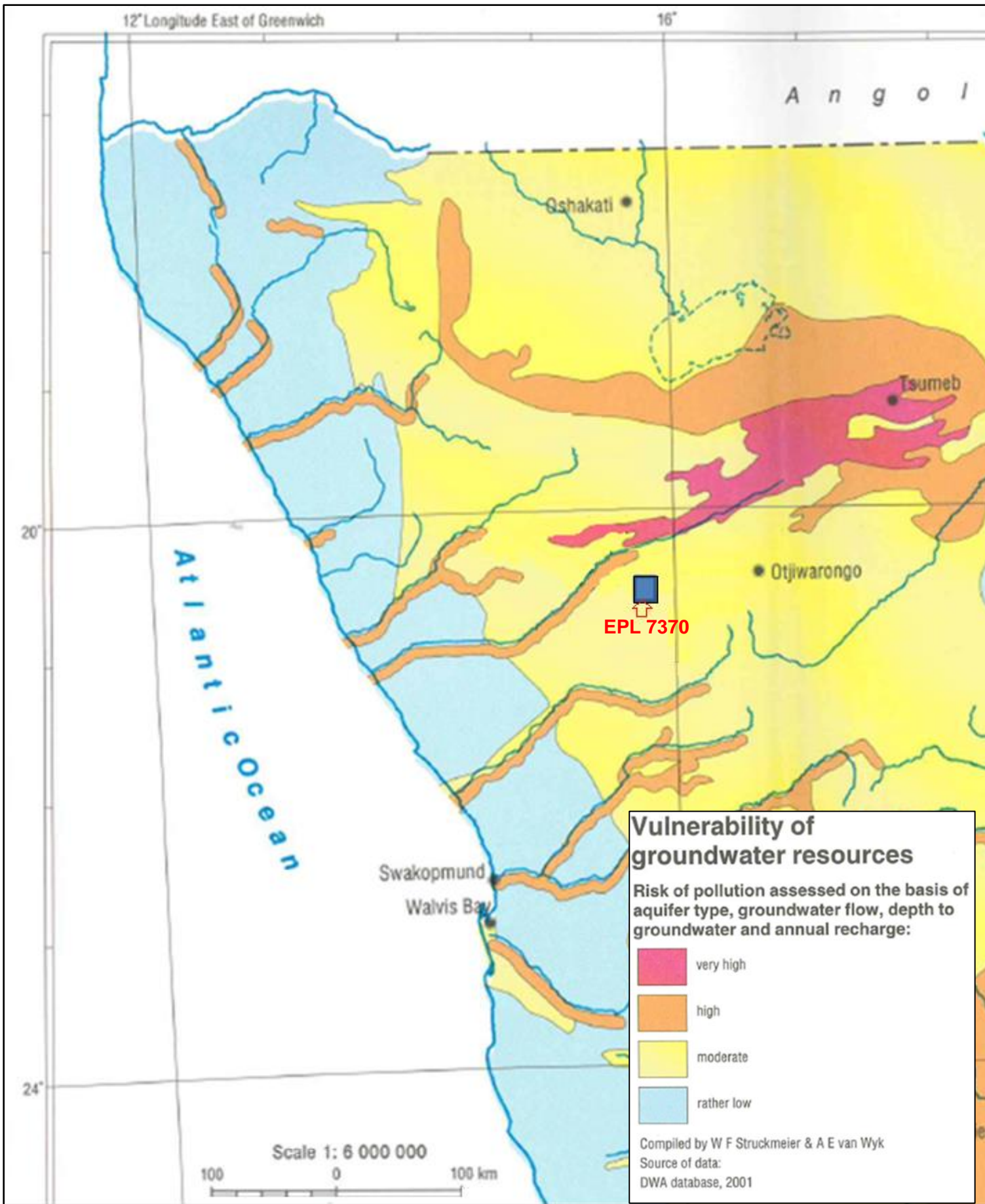


Figure 4.2: Regional groundwater vulnerability around the EPL 7370 (Source: Department of Water Affairs and Forestry, 2001).

## 4.7 Archaeology

### 4.7.1 Overview

Indigenous communities, the descendants of people who lived in Damaraland over thousands of years, still maintain important cultural links with the areas of Okemyenya, Ondundotjiuapa, Otjotopera, Omutiwanduka and Okamaera generally covered by the EPL 7370. Archaeological remains in Namibia are protected under the National Heritage Act (27 of 2004) which makes provision for archaeological assessment of large projects including mineral exploration programmes.

Remains of indigenous settlements, wells, burial grounds and other sites are likely to be found in the general area and are all valuable material evidence of indigenous land ownership and can provide crucial support for land claims.

According to Kinahan (2011), modern humans and their ancestors have lived in Namibia for more than one million years. 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.

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 to our understanding of the African past.

The EPL area falls within the former Damaraland with a rich legacy of archaeological remains which lie scattered over the landscape and especially in this various mountain. According to the local community, this is by far the longest archaeological record in the southern hemisphere, and it contains unique evidence of how humankind learned to cope with one of the most hostile environments on earth.

### 4.7.2 Recommendations

It is likely that the area covered by the EPL 7304 could hold archaeological potential as indicated by the local community. The expectation is therefore:

- (i) A high likelihood of Holocene age archaeological sites, including rock art, associated with outcropping granite;
- (ii) A high likelihood of late precolonial settlement sites throughout the entire tenement, especially in the vicinity of springs and seepages;
- (iii) A high likelihood of early colonial settlement remains relating to the historical occupation of the local areas.

The following is the summary of the recommended actions to be implemented by the Proponent:

- (i) Contractors working on the site should be made aware that under the National Heritage Act any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council;
- (ii) The provisions of the EMP must be implemented and monitored at all times in order to protect potential archaeological sites that may occur in the local area, and;
- (iii) Detailed field survey should be carried out when the Proponent / licence holder has identified specific targets for detailed exploration such as trenching or drilling, or before any form of site-specific invasive exploration activities commences.

## 4.8 Public Consultations Process

### 4.8.1 Overview

Public and stakeholder consultation process was provided for in the environmental assessment process undertaken for the EPL 7370 (Fig. 4.3 - 4.5). 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.

Public consultation process was undertaken during the month of Months February and March 2020. In line with the provisions of the EIA Regulations, 2012 and in order to identify the key Interested and Affected Parties (I&APs), public notices were published in the following newspapers: New Era Daily Newspaper dated 18<sup>th</sup> February 2020 (fig. 4.3), the Confidante Weekly Newspaper dated 27<sup>th</sup> February to 4<sup>th</sup> March 2020 (Fig. 4.4) and Windhoek Observer Weekly Newspapers dated 6<sup>th</sup> March 2020 (Fig. 4.5).

The closing date for registration and submission of written objections, comments or inputs to the environmental assessment process was Friday, 13<sup>th</sup> March 2020. During the public / stakeholder consultation period, no written comments / objections / inputs were received by Environmental Assessment Practitioner (EAP) specific for this EPL No. 7370.

However, based on the previous communications that the EAP have had with the landowners of the farms covered by this EPL, there are major concerns and reservations that the proposed minerals activities are likely have on the fragile desert environment and the socioeconomic settings of the surrounding farms especially, the eco-tourism businesses / activities and conservation efforts that are currently being implemented by the framers (Table 4.3). Key issues raised are discussed below.









## **4.6.2 Concerns of the Local Community**

### **4.6.2.1 Overview of the Objections by Local Community**

Both in the statements made by the Chief Manasse Christian Zeraeua and in the submission made by the local community based on the meetings facilitated by Mr. Abuid Karongee, a Community Activist, there are major valid concerns and reservations about the proposed activities and especially mining activities on the fragile semiarid local environment and the socioeconomic settings of the surrounding communities especially, the eco-tourism activities and conservation efforts that are currently being implemented by the local communities. Nonetheless, in the community objection submission as attached to this report (Annex 1), very little addresses the issues of exploration. Almost the entire community submission is talking about the negative impacts of mining and lack of benefits from the current ongoing mining activities, whilst the Proponent intends to only undertake exploration activities with zero chance of advancing the exploration activities to mining stages (application for a Mining License).

### **4.6.2.2 Outcomes of the Meeting with the Traditional Authority Chief**

The outcomes of the one to one meeting that was held on Tuesday 10<sup>th</sup> March 2020, at Risk-Based Solutions (RBS) CC Offices in Windhoek with the Chief Manasse Christian Zeraeua, the head of the Traditional Authority based at Omatjete with overall jurisdiction over the area covered by the EPL 7370 agreed on the following:

- (i) The Chief Manasse Christian Zeraeua expressed support for the proposed exploration activities because he knew very well the difference between exploration and mining, and;
- (ii) The Chief recommended that the Traditional Authority shall be the key contact and focal point and shall be notified and permission obtained before any field-based activities are undertaken in the area and must be kept updated on progress of the proposed exploration activities in area.

### **4.6.2.3 Feedback Provided by the EAP and Conclusions**

The EAP acknowledged the submission that have been made by the local community and the Chief as presented in subsection 4.6.2.1 and 4.6.2.2 and Annex 1. The legitimate concerns of the local community were fully acknowledged and respect for the local land rights is hereby fully emphasised with assurances that there will be no way that anyone will enter any of their local areas for exploration without notifying and obtaining permission from the Traditional Authority at Omatjate. The following is the summary of conclusions as presented by the EAP:

- (i) The concerns of the local community are highly valid although wrongly focusing on mining because the lack of technical distinction and understanding between exploration and mining activities;
- (ii) There is no guarantee that the proposed exploration activities will lead to the development of mine because the probability of any EPL to advance to a mining project is 0.001 or equal to zero. Even if a potential economic mining project is developed in the EPL area, it will not happen overnight and as such the local communities will be involved and consulted throughout the whole development process;
- (iii) The initial step of the proposed exploration activities will start with the desktop studies (Initial desktop exploration activities with no fieldwork undertaken) and then will progress as more information becomes available as detailed in Chapter 2 of this report;
- (iv) It is important to emphasise that if there is a need for the Proponent to visit the field in order to verify a target/s, this will only be undertaken with the permission from the Traditional Authority and there will be no activities undertaken without the permission and knowledge of the land Traditional Authority. In cases where there is a need to undertake frequent verification visits or more detailed field-based exploration activities over a specific area, Access Agreements will be negotiated between the License (EPL) Holder / Proponent (subsurface rights holder) and

the Traditional Authority (surface rights holders / community representative). However, it is very highly likely that the area covered by a given EPL will be physically visited as part of the proposed exploration programme because in most cases the area of interest tends to be a very limited local area where the minerals may occur;

- (v) If an exploration programme leads to a discovery of economic mineral deposits, then a prefeasibility and feasibility studies will be undertaken over the local area. During the prefeasibility and feasibility processes, a detailed site-specific Environmental Impact Assessment (EIA) study and preparation of Environmental Management Plan (EMP) report will be undertaken as parts of the feasibility study in order to determine the short and long-term environmental liabilities that may affect the feasibility outcome. During the EIA and EMP processes all key issues will be weighed against the proposed project including the no-go option where the proposed project does not take place and if no mitigation measures that can promote the coexistence of the proposed mining project activities with the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses);
- (vi) With effective planning and consultations with the local farmers, there is definitely opportunity for coexistence between the current proposed exploration activities and the conservation and tourism efforts in the area and especially in areas outside the Conservancies;
- (vii) It is hereby recommended that the proposed exploration be supported by the local community because the exploration process will not be an overnight digging and destruction of their land but a slow increment process of activities based on positive information on the possibility for economic minerals resources occurrences in the area especially in areas that are not participating in the conservancies, conservation and eco-tourism activities. The Proponent shall fully engage and continuously update the local communities through the Traditional Authority in all the activities that they plan to undertake in the area covered by the EPL 7370 in order to promote the coexistence of the proposed exploration activities and the current and future business operations of the land owner, and;
- (viii) As part of initial exploration and in consultation with the Traditional Authority, the Proponent shall implement thematic mapping to delineate various land use zones for specific uses such as the no-go zones, conservation, eco-tourism, adventure tourism and possible minerals exploration and mining etc, within the EPL area. This will greatly improve the multiple land use practices and promote coexistence for all the possible land use options on the farms covered by the EPL 7370.

In addressing the community issues raised in the submitted objection document (Annex 1), although focused on mining and yet the Proponent is only undertaking exploration, key specific recommendations as detailed in Chapter 6, Section 6.2 Recommendations of this report and to be included in the Environmental Management Plan (EMP) report for implementation by the Proponents / License holders as part of the proposed exploration programme.

## 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. 7370 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 Alternatives and Ecosystem Assessments

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 alternatives 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 / ongoing exploration activities do not take place) has been undertake. An assessment of the environmental impacts of a future, in which the proposed / ongoing 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 / ongoing 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 / ongoing 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's also important to understand what benefits might be lost if the proposed / ongoing exploration activities do not take place. Key loses that may never be realised if the proposed / ongoing project activities do not go-ahead include: Loss of potential added value to the unknown underground minerals resources that may occur within the EPL No. 7370, 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 communal land. The area is too dry to be able to conduct full scale commercial agriculture in the area. The local land owners have invested greatly in conservation and eco-tourism business. 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 and the general area but not necessary on the farm covered by the EPL 7370. Due to the limited

scope of the proposed / ongoing exploration and the implementation of the EMP, it's likely that the proposed / ongoing exploration can coexist with the current and potential future land uses options within the area. The Proponent shall focus the exploration activities on farms or parts of the farms thereof that are not participating in the eco-tourism initiative in area;

- (iv) **Potential Land Use Conflicts:** Considering the current land use practices (conservation and eco- tourism) as well as potential other land uses including minerals exploration, it's 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 area especially on farms or parts of the farms thereof that are not participating on in the conservation and eco- tourism. 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 conservation, eco-tourism, mining or adventure tourism etc, within the EPL area will greatly improve the multiple land use practices and promote coexistence for all the possible land use options in this area;
- (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 / ongoing exploration activities will not affect the ecosystem function due to the limited scope of the proposed / ongoing 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, benefits of animals or plants values, and the provision of clean water or scenic views are some of the local ecosystem services associated with the EPL area. However, the proposed / ongoing exploration activities will not affect the ecosystem services due to the limited scope and area of coverage of the proposed / ongoing 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 conservation and eco-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 / ongoing exploration activities will not destroy the current and future use values due to the limited scope of the proposed / ongoing activities as well as the adherence to the no-go zones that may be delineated in the area and the implementation of the EMP for the proposed exploration programme, 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 / ongoing exploration activities will not affect the ecosystem current or future none or passive uses due to the limited scope of the proposed / ongoing 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 / Ongoing Project Activities)

The ongoing exploration activities being undertaken in the EPL 7370 and as assessed in this EIA Report with mitigation measures provided in the EMP Report are as follows:

- (i) Initial desktop exploration activities (no field-work undertaken);
- (ii) Regional reconnaissance field-based mapping and sampling activities;

- (iii) Initial local field-based mapping and sampling activities;
- (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, and;
- (v) Prefeasibility and feasibility studies leading to test mining and mining if proves positive.

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

Based on the finding 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, agriculture, conservation, eco-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 time period (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

### 5.4.3 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 (i.e., 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)

#### **5.4.4 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 / ongoing 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 / ongoing 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 progression approach in advancing exploration.

The step progressional approach will allow the Proponent to the results of exploration success and the implementation of the next stage of exploration 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 have be determined 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.																
<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
	(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
<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
	(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							
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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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N	impact of national character																												
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<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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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)																												
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)																												
1. Initial Desktop Exploration Activities	(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												
2. Regional Reconnaissance Field-Based Activities	(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
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)														
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 and appropriate mitigation measures as presented in the EMP report have been determined on the basis of the impact assessment 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 / ongoing 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 / ongoing 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 / ongoing 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 / ongoing exploration activities.

SIGNIFICANT IMPACT						PHYSICAL ENVIRONMENT					BIOLOGICAL ENVIRONMENT				SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT						
IMPACT SEVERITY [ Magnitude, Duration, Extent, Probability ]	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	
	(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	
	(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
	(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

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	
	(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	
	(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	

## 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 the summary of the overall likely negative and significant impacts of the proposed / ongoing 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 carries a limited **(+)** at national level in terms of fees payable to the Government, 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 carries a limited **(+)** at national level in terms of fees payable to the Government, 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 carries a limited **(+)** at national level in terms of fees payable to the Government, 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 carries a limited **(+)** at national level in terms of fees payable to the Government, 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 high **[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 carries a limited **(+)** at national level in terms of fees payable to the Government, all the other likely impacts are negative **(-)**.

## 6. CONCLUSION AND RECOMMENDATION

### 6.1 Conclusions

Osino Namibia Minerals Exploration (Pty) Ltd (**the Proponent**) intends to undertake exploration activities in the Exclusive Prospecting Licence (EPL) No. 7370 covering base, rare and precious metals groups. The Proponent intends to conduct exploration / prospecting activities starting with desktop studies and aerial surveys, followed by regional field-based reconnaissance work and if the results are positive, implement detailed site-specific field-based activities over key site-specific localities using techniques such as geological mapping, geophysical surveys, trenching, drilling and sampling for laboratory tests. 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.

### 6.2 Recommendations

It's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). The Proponent shall take into consideration the following key requirements for implementing the proposed exploration programme:

- (i) The Proponent shall undertake thematic mapping in order to fully understand the land use plans of the local area and identify areas of possible coexistence and no-go zones;
- (ii) The Proponent shall notify and obtained permission from the Traditional Authority in Omatjete before any field-based activities are undertaken in the area and the Traditional Authority must be kept updated on progress and outcomes of the proposed exploration activities in order for the Traditional Authority to inform the local communities;
- (iii) Before a site-specific detailed exploration activity such as trenching or drilling are undertaken, an archaeological assessment of the shall be undertaken by an archaeologist. Precautionary principle / approach must always be exercised;
- (iv) 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 regulations;
- (v) The community tourism, wildlife breeding and transit areas shall be excluded from site-specific detailed exploration activity such as trenching or drilling or any furfure mining activities as requested by the local community;
- (vi) If resources allow, the Proponent shall consider Corporate Social Responsibilities by supporting broader community initiatives such as improving water supply, education or health related projects in the surrounding area;
- (vii) All exploration sites must be rehabilitated;
- (viii) Where possible, and if water is found during the detailed exploration boreholes drilling operations, the Proponent shall support other land uses in the area in terms of access to freshwater supply for both human consumption, wildlife and agricultural support as may be requested by the local community / land owner/s. The abstraction of fresh groundwater resources shall include water levels monitoring, sampling and quality testing on a bi-annual basis, and that the affected landowners 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, and;
- (ix) Based on the findings of this EIA Report, the Proponent shall prepare an EMP Report with key mitigations measures covering the lifecycle of the proposed exploration activities.



### 6.3 Summary ToR for Test Mining and Mining Stages

In an even that economic minerals resources are discovered within the EPL 7370 area and could lead to the development of mining project, a new Environmental Clearance Certificate (ECC) for mining will be required. The ECC being supported by this EIA Report only covers the exploration phase.

A separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports supported by specialist studies as maybe applicable must be prepared in order to support the application for the new ECC for mining operations. The EIA and EMP studies shall form part of the prefeasibility and feasibility study with respect to the test mining or possible mining operations.

The site-specific EIA and EMP shall cover the area identified to have potential economic minerals resources as well as all areas to be used for infrastructural support areas such as pit / shaft area/s, waste rock, tailings dump, access, office blocks, water and energy infrastructure support areas (water, energy and road / access). In addition to the Terms of Reference (ToR) to be developed during the Environmental Scoping study phase for the test mining / mining stages, the following field-based and site-specific specialist studies shall be undertaken as part of the EIA and EMP for possible test mining or mining operations in an event of a discovery of economic minerals resources and possible development of a mining project:

- (i) Groundwater studies including modelling as maybe applicable;
- (ii) Field-based flora and fauna diversity;
- (iii) Noise and Sound 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.

The aims and objectives of the Environmental Assessment (EA) covering EIA and 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 and Tourism and Ministry of Agriculture, Water Affairs and Forestry, 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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## **8. ANNEXES**

### **1. Stakeholder Consultation materials**