Excel Dynamic Solutions (Pty) Ltd

ENVIRONMENTAL SCOPING ASSESSMENT (ESA) FOR THE PROPOSED SMALL-SCALE MINING ACTIVITIES ON MINING CLAIMS (MCs) No. 73353 - 73362 LOCATED NEAR OKANGUATI, KUNENE REGION

APP NO: 00170

ENVIRONMENTAL ASSESSMENT REPORT

Author: Ms. Aili Iipinge Reviewer: Ms. Rose Mtuleni Company: Excel Dynamic Solutions (Pty) Ltd Telephone: +264 (0) 61 259 530 Fax2email: +264 (0) 886 560 836 Email: info@edsnamibia.com / public@edsnamibia.com	Client: Papa Smurf Investments CC Contact person: Licky Richard Erasmus Cell phone: +264 (81) 1281015 Postal Address: P.O Box 22534 , Windhoek, Namibia Email: abisai@dynamicnam.com

September 2022

EXECUTIVE SUMMARY

Papa Smurf Investments CC (*hereinafter referred to as the Proponent*), intends to conduct small-scale mining activities on Mining Claims No. MCs 73353 - 73362, located near Okanguati in Kunene region. These Mining Claims were applied by the Ministry of Mines and Energy (MME) on the 17 June 2022. However, the approval of these MCs are subjected to an Environmental Clearance Certificate (ECC). The 152.8255 ha MCs are located about 9 km near Okanguati in Kunene region. Both MCs are for small-scale mining of industrial minerals (aggregates) as a commodity of interest.

Mining and all extraction-related activities are among the listed activities that may not be undertaken without an ECC under the Environmental Impact Assessment (EIA) Regulations, Subsequently, to ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent, appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

The application for the ECC was compiled and submitted to the competent authority (Ministry of Environment, Forestry and Tourism (MEFT)) as the environmental custodian for project registration purposes. Upon submission an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

Brief Project Description

Planned Activities: Proposed Small-scale mining activities methods

The Proponent intends to adopt a systematic prospecting and mining approach of the following:

1. **Non-invasive Technique:** Detailed prospecting mapping. No ground geophysics surveys are planned for the project.

2. **Invasive Technique:** Trenching and pitting, open pit mining

The Proponent plans to conduct a staged small-scale mining approach with three phases including the Pre-Development Phase, Operation and Maintenance Phase, and the Decommissioning and Rehabilitation Phase.

Public Consultation

Public Consultation Activities

Regulation 21 of the EIA Regulations details steps to be taken during a public consultation process and these have been used in guiding this process. The public consultation process assisted the Environmental Consultant in identifying all potential impacts and aided in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with I&APs about the proposed small-scale mining activities was done through the following means and in this order to ensure that the public is notified and afforded an opportunity to comment on the proposed project:

- A Background Information Document (BID) containing brief information about the proposed project was compiled and shared with the relevant authoritative, and upon request to all new registered Interested and Affected Parties (I&APs)
- Project Environmental Assessment notices were published in *The Namibian* and *New Era* newspapers (12th and 19th August 2022) briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- Public notices placed around the town of Opuwo to inform members of the public of the EIA process and register as I&APs, as well as submit comments. Additionally, the meeting dates were announced in Otjiherero National Radio, by the constituency council.
- A public meeting was scheduled and held on 13 September 2022 under the tree near Okanguati town.

Potential Impacts identified

The following potential negative impacts are anticipated:

- **Positive impacts**: Socio-economic development through employment creation (primary, secondary, and tertiary employment) and skills transfer; Opens up other investment opportunities and infrastructure-related development benefits; Produces a trained workforce and small businesses that can serve communities and may initiate related businesses; Boosts the local economic growth and regional economic development and; Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- **Negative impacts**: Potential disturbance of existing pastoral systems; Physical land/soil disturbance; Impact on local biodiversity (fauna and flora); Habitat disturbance and potential illegal wildlife and domestic hunting in the area; Potential impact on water resources and soils particularly due to pollution; Air quality issue: potential dust generated from the project; Potential occupational health and safety risks, Vehicular traffic safety and impact on services infrastructures such as local roads, Vibrations, and noise associated with drilling activities may be a nuisance to locals; Environmental pollution (solid waste and wastewater), Archaeological and heritage impact and Potential social nuisance and conflicts (theft, damage to properties, etc.).

The potential negative impacts were assessed, and mitigation measures were provided accordingly.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The potential impacts that are anticipated from the proposed project activities were identified, described, and assessed. For the significant adverse (negative) impacts with a medium rating, appropriate management and mitigation measures were recommended for implementation by the Proponent, their contractors, and project-related employees.

The public was consulted as required by the EMA and its 2012 EIA Regulations (Sections 21 to 24). This was done via the two newspapers (*New Era* and *The Namibian*) used for this environmental assessment. A face-to-face consultation meeting was scheduled with the directly Interested and affected parties at under the tree near Okanguati

Most of the potential impacts were found to be of medium-rating significance. With the effective implementation the recommended management and mitigation measures, this will particularly see

the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer (ECO) is highly recommended. The monitoring of this implementation will not only be done to maintain the impacts' rating or maintain a low rating but to also ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

An Archaeological & Heritage Impact Assessment (AHIA) was done by a specialist for this ESA Study. The findings of this AHIA and the Scoping assessment (ESA) were deemed sufficient and conclude that no further detailed assessments are required for the ECC application.

Recommendations

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put into monitoring the implementation of these measures.

It is therefore, recommended that the proposed small-scale mining activities be granted an Environmental Clearance Certificate, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses, and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensure compliance with these specific legal requirements.
- The Proponent and all their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required undertaking specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Site areas where the small-scale mining activities ceased, they need to be rehabilitated, as far as practicable, to their pre-extraction state.

- Environmental Compliance monitoring reports should be compiled and submitted to the DEAF Portal as per provision made on the MEFT/DEAF's portal.

Disclaimer

Excel Dynamic Solutions (EDS) warrants that the findings and conclusion contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and Environmental Management Act (EMA) of 2007. These methodologies are described as representing good customary practice for conducting an EIA of a property for the purpose of identifying recognized environmental conditions. There is a possibility that even with the proper application of these methodologies there may exist the subject property conditions that could not be identified within the scope of the assessment, or which were not reasonably identifiable from the available information. The Consultant believes that the information obtained from the record review and during the public consultation processes concerning the proposed small-scale mining activities work is reliable. However, the Consultant cannot and does not warrant or guarantee that the information provided by the other sources is accurate or complete. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. No other warranties are implied or expressed.

Some of the information provided in this report is based upon personal interviews, and research of available documents, records, and maps held by the appropriate government and private agencies. This report is subject to the limitations of historical documentation, availability, and accuracy of pertinent records, and the personal recollections of those persons contacted.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference
MCs	Mining Claims

DEFINITION OF TERMS

Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).
Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.

Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.
Exclusive Prospecting Licence	Is a license that confers exclusive mineral prospecting rights over land of up to 1000 km2 in size for an initial period of three years, renewable twice for a maximum of two years at a time
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Fauna	All of the animals that are found in a given area.
Flora	All of the plants found in a given area.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.

Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).

Nomadic Pastoralism	Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral nomadism is commonly found where climatic conditions produce seasonal pastures but cannot support sustained agriculture.
Proponent	Organization (private or public sector) or individual intending to implement a development proposal.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.

1. INTRODUCTION

1.1 Project Background

Papa Smurf Investments CC (hereinafter referred to as the Proponent), intends to conduct small scale mining activities on the Mining Claims (MCs) No. 73353 - 73362, located near Okanguati in Kunene region. The Mining Claims were applied for by the Ministry of Mines and Energy (MME) on the 17 June 2022. However, the approval of these MCs are subjected to an Environmental Clearance Certificate (ECC). The 152.8255 ha MCs are located about 9 km near Okanguati in Kunene region as shown in **Figure 1**. Both MCs are for small-scale mining of industrial minerals (aggregates) as a commodity of interest.

Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 EIA regulations, provides a list of activities that may not be carried out without an EIA undertaken and an ECC obtained. Small-scale mining activities are listed among activities that may not occur without an ECC. Therefore, individuals or organizations may not carry out small-scale mining activities without an ECC awarded.

Subsequently, the Proponent appointed Excel Dynamic Solutions (Pty) Ltd (EDS, Environmental Consultant or Environmental Assessment Practitioner (EAP) hereafter), an independent team of Environmental Consultants to conduct the required Environmental Assessment (EA) process and submit the ECC application and EA documents (Scoping Report and Draft EMP) to the Competent Authority, being the Ministry of Mines and Energy (MME) and Ministry of Environment, Forestry and Tourism (MEFT) on their behalf, respectively.

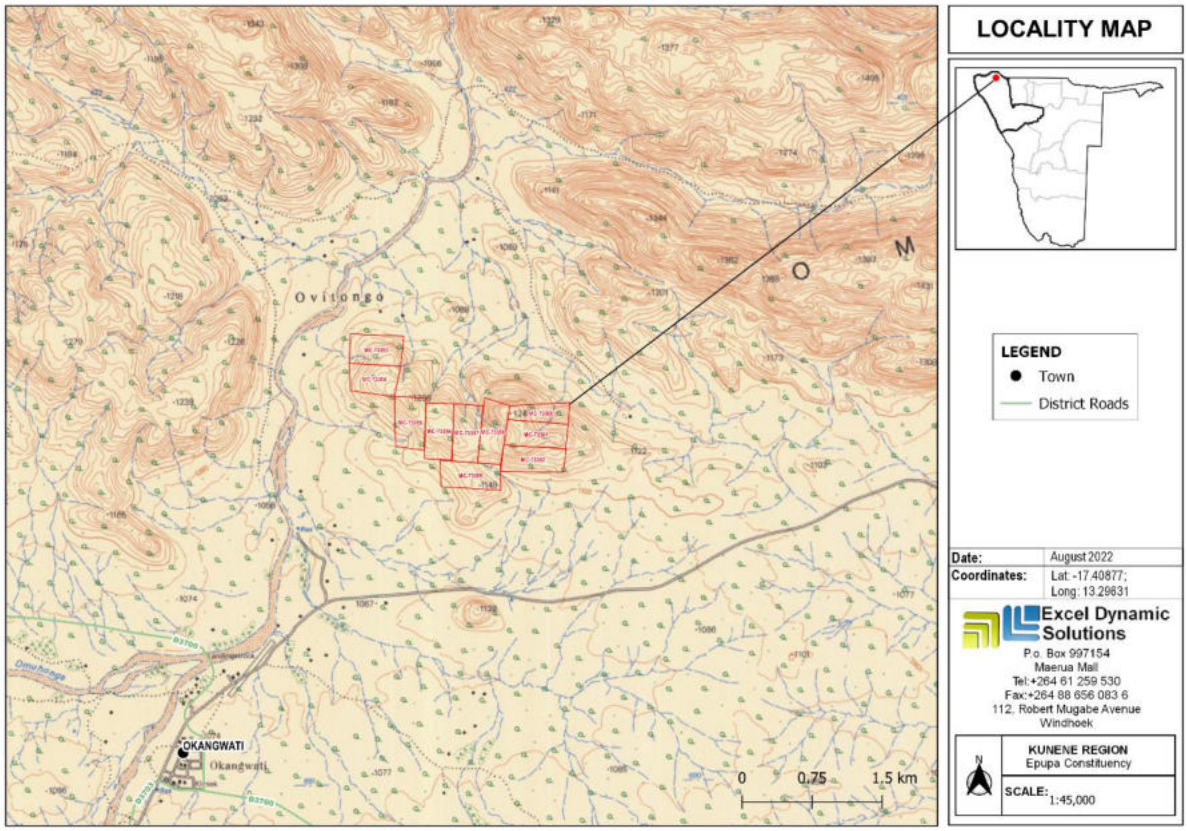

Figure 1:The location of the MCs near Okanguati

1.2 Terms of Reference, Scope of Works and Appointed EA Practitioner

To satisfy the requirements of the EMA and its 2012 EIA Regulations, The Proponent appointed Excel Dynamic Solutions (Pty) Pty (EDS) to conduct the required Environmental Assessment (EA) process on their (Proponent's) behalf, and thereafter, apply for an ECC for small-scale mining activities on the MCs. There were no formal Terms of Reference (ToR) provided to EDS by the Proponent. The consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its EIA Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC (**Appendix A**) is compiled and submitted to the Ministry of Environment, Forestry and Tourism (MEFT), the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP) (**Appendix B**), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

The EIA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. The consultation process and reporting are done by Ms. Aili Iipinge and Reviewed by Ms. Rose Mtuleni. Mr. Nerson Tjelos CV is presented in **Appendix C.**

1.3 The need for the proposed project

The mining industry is one of the largest contributors to the Namibian economy, it contributes to the improvement of local livelihoods. In Namibia, mining activities is mostly done mainly by the private sector. Mining activities have a great potential to enhance and contribute to the development of other sectors and its activities do provide temporary employment, and taxes that fund social infrastructural development. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product (GDP). Additionally, the industry produces a trained workforce and small businesses that can serve communities and may initiate related businesses. Mining activity fosters several associated activities such as manufacturing of mining equipment, and provision of engineering and environmental services. The mining sector forms a vital part of some of Namibia's development plans, namely: Vision 2030, National Development Plan 5 (NDP5), and Harambee Prosperity Plans (HPPs) I and II. Mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. Successful small-scale mining activities on MCs 73353

– 73362 would lead to the mining of the target mineral, which would contribute towards achieving the goals of the national development plans.

2. PROJECT DESCRIPTION: PROPOSED SMALL-SCALE MINING ACTIVITIES

The description of small-scale mining activities and stages to be undertaken is presented below as well as the decommissioning of the mining activities.

2.2.1 Pre-development Phase

The small-scale mining phase includes reconnaissance and mapping to identify the

lithostratigraphic packages. In addition, literature review, fieldwork (lithological (soil/rock) mapping and sampling) will be conducted to verify desktop work.

Operation and maintenance phase

During this phase, extraction of industrial minerals and all associated mining activities will be carried out on site. The Proponent has highlighted that both invasive and non-invasive activities are expected to take place. Non-invasive activities include detailed mapping. No ground geophysical surveys are planned for the project. While invasive activities involve trenching and pitting, open pit mining.

A 10 years' of small-scale mining period is predicted. The selection of the potential mineralization model and mineral targets will be based on the local geology, trenching, and assay results of the samples collected. No explosives will be used during the operational phase.

Other aspects of the proposed small-scale mining activities operations include:

2.2.2 Accessibility to Site

The MCs are accessible via a gravel road from Okanguati. Therefore, all project related vehicles will be using these existing roads to access the MCs. It is also anticipated that, if necessary, onsite new tracks to the different targeted mining site within the MCs will be created. The Proponent may need to do some upgrade on the site access roads to ensure that they fit to accommodate project related vehicles, such as heavy trucks.

2.2.3 Material and Equipment

The requirements of the small-scale mining activities program in terms of vehicles and equipment include: (4X4) vehicles, a truck, water tanks, drill rigs and drilling machines, and a power generator. Equipment and vehicles will be stored at a designated area near the accommodation site or a storage site established within the MCs area.

2.2.4 Services and Infrastructure

- **Water:** Water for the operational phase will be carted from Okanguati constituency office through NamWater. This will be done upon agreement with NamWater, but in case the proponent is sourcing water somewhere, that will be through approved water sources and also water abstraction permits from relevant authority. Estimated monthly water consumptions are at +- 3000 liters, which includes water for drinking, sanitation, cooking, dust control, as well as washing equipment. Potable water will also be made available for the mining crew (workers) on site.
- **Power supply:** Power required during the operation phase will be provided from diesel-generators. About 2000 litres of diesel will be used per day.
- **Fuel (diesel for generators and other equipment):** The fuel (diesel) required for small-scale mining activities equipment will be stored in a tank mounted on a mobile trailer, and drip trays will be readily available on this trailer and monitored to ensure that accidental fuel spills are cleaned up as soon as they have been detected/observed. Fuel may also be stored in a bunded diesel bowser on site, and in jerry cans placed on plastic sheeting to avoid unnecessary contamination of soils.

2.2.5 Waste Management

The site will be equipped with secured waste bins for each type of waste (i.e., domestic, hazardous, and recyclable). Depending on the amount generated, waste will be sorted and collected as regularly as possible and taken to the nearest certified landfill site. An agreement will need to be reached with different waste management facility operators/owners and authorization or permits will be obtained prior to utilizing these facilities, in the case of production of any hazardous waste.

- **Sanitation and human waste**: Portable ablution facilities will be used, and the sewage will be disposed of as according to the approved disposal or treatment methods of the waste products.
- **Hazardous waste**: Drip trays and spill control kits will be available on site to ensure that oil/fuel spills and leaks from vehicles and equipment are captured on time and contained correctly before polluting the site.

2.2.6 Safety and Security

- **Storage Site**: Temporary storage areas for small-scale mining activities material, equipment, and machinery will be required at the campsite and/or small-scale mining activities sites. Security will be supplied on a 24-hour basis at the delegated sites for storage. A temporary support fence surrounding the storage site will be constructed to ensure people and domestic animals are not put at risk.
- **Fire management:** A minimum of basic firefighting equipment, i.e., two fire extinguishers will be readily available in vehicles, at the working sites and camps. The small-scale mining activities crew is required to have the contact details of the nearest fire station at hand in case of a larger scale of fires at site.
- **Health and Safety**: Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while on and working at site. A minimum of two first aid kits will be readily available on site to attend to potential minor injuries.

2.2.7 Accommodation

The mining crew will be accommodated in Okanguati, but if accommodation camp is to be set up near the MCs, necessary arrangements will be made with the Traditional Authority (TA), Community members and Conservancy management. All mining activities will take place during daytime only and staff will commute to site(s) from their place of accommodation if they are not accommodated on site.

2.3 Decommissioning and Rehabilitation Phase

Once the mining activities on the MCs come to an end, the Proponent will need to put site rehabilitation measures in place. Decommissioning and rehabilitation are primarily reinforced through a decommissioning and rehabilitation plan, which consists of safety, health, environmental, and contingency aspects. An unfavorable economic situation or unconvincing small-scale mining activities results might force the Proponent to cease the activities program before predicted closure. Therefore, it is of best practice for the Proponent to ensure the project activities cease in an environmentally friendly manner and site is rehabilitated.

3 PROJECT ALTENATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section highlights the different ways in which the project can be

undertaken, and identifies alternatives that may be the most practical, but least damaging to the environment.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

The alternatives considered for the proposed development are discussed in the following subsections.

2.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the proposal of small-scale mining activities on the MCs, be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is to be discontinued, the current land use for the proposed site will remain unchanged.

This no-go option is considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative, is undertaken to establish what benefits might be lost if the project is not implemented. The key losses that may never be realized if the proposed project does not go ahead include:

- Loss of foreign direct investment.
- About 5-10 temporary job opportunities for community members will not be realized.
- No realization of local business supports through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- Loss of potential income to the local and national government through land lease fees, license lease fees, and various tax structures.
- Improved geological understanding of the site area regarding the targeted commodities.
- Socio-economic benefits such as skills acquisition to local community members would be not realized.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project, although, in the case where parts of the project site are considered environmentally sensitive and/or protected, one or severally sections of the site may be identified as no-go zones.

2.2.2 Small-scale mining activity’s location

The mining location dependents on the geological setting (regional and local), the economic geology, and the small-scale mining activities and mining history of the MCs area. Therefore, finding an alternative location for the planned small-scale mining activities is not possible. This means that the mineralization of the target commodities is area-specific, and small-scale mining activities targets are primarily determined by the geology (host rocks) and the tectonic environment of the site (an ore-forming mechanism). The tenement has sufficient surface area for future related facilities, should an economic mineral deposit be defined.

Furthermore, the national mineral resources’ potential locations are also mapped and categorized by the Ministry of Mines and Energy, on exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licenses, reconnaissance licenses, and exclusive reconnaissance licenses. Information on MCs 73353 -73362 and other licenses are available on the Namibia Mining Cadastral Map here https://portals.landfolio.com/namibia/ as shown in (**Figure 3**)

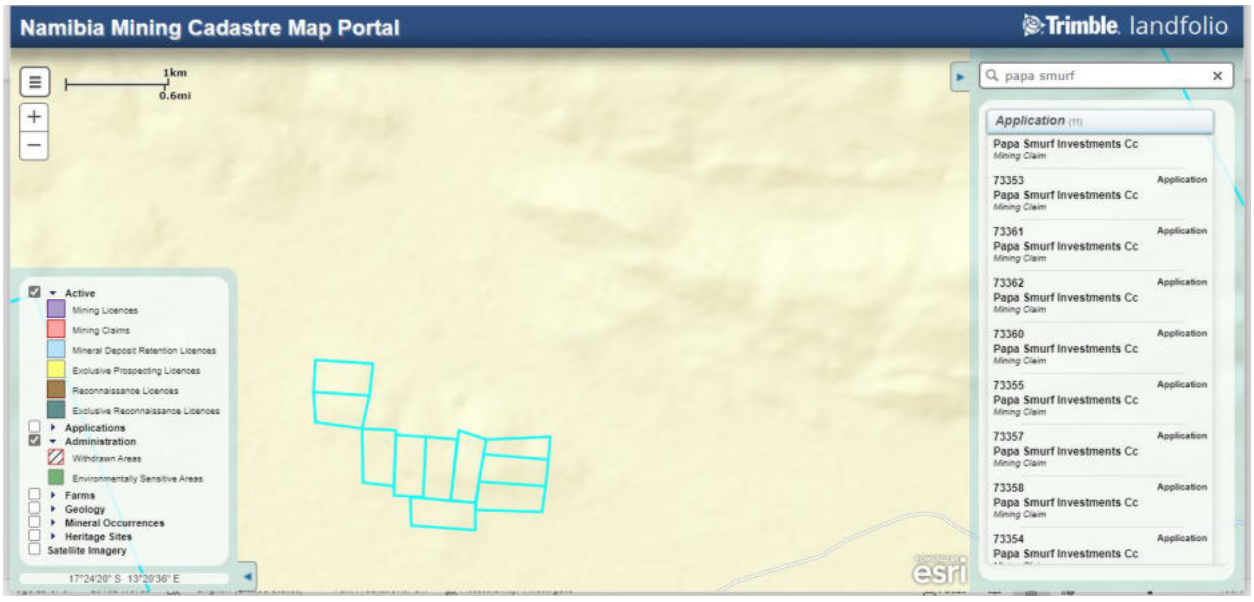

Figure 2: The location of MCs 73353 -73362 on the National Mining Cadastre

3. LEGAL FRAMEWORK: LEGISLATION, POLICIES AND GUIDELINES

A review of applicable and relevant Namibian legislation, policies, and guidelines to the proposed development is given in this section. This review serves to inform the project Proponent, Interested and Affected Parties, and the decision-makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed small scale mining activities.

3.2 The Environmental Management Act (No. 7 of 2007)

This EIA was carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30).

The EMA has stipulated requirements to complete the required documentation to obtain an ECC for permission to undertake certain listed activities. These activities are listed under the following Regulations:

- 3.1 The construction of facilities for any process or activities which requires a license, right of other forms of authorization, and the renewal of a license, right, or other forms of authorization, in terms of the Minerals (Prospecting and Mining Act, 1992).
- 3.2 other forms of mining or extraction of any natural resources whether regulated by law or not.
- 3.3 Resource extraction, manipulation, conservation, and related activities.

Other legal obligations that are relevant to the proposed activities of Client: MCs No. 73353 – 73362 related activities are presented in**.**

Table 1: Applicable local, national and international standards, policies and guidelines governing the proposed development

Legislation / Policy / Guideline: Custodian	**Relevant Provisions**	**Implications for this project**
The Constitution of the Republic of	The Constitution of the Republic of Namibia (1990 as amended) addresses	By implementing the environmental

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Namibia, 1990 as amended: **Government of the Republic of Namibia**	matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include: "…the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the: "…Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State."	management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability. Ecological sustainability will be main priority for the proposed development.
Minerals (Prospecting and Mining) Act (No. 33 of 1992): **Ministry of Mines**	Section 52 requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder.	The Proponent should enter into a written agreement with landowners before carrying out small-scale mining activities

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
and Energy (MME)	Section 52(1) mineral licence holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilised for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance. Section 54 requires written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area. Section 68 stipulates that an application for an Mining Claims (MCs) shall contain the particulars of the condition of, and any existing damage to, the environment in the area to which the application relates and an estimate of the effect which the proposed prospecting operations may have on the environment and the measures to be taken to prevent or minimize any such effect. Section 91 requires that rehabilitation measures should be included in an application for a mineral license.	on their land. On communal land, the Proponent should engage the Traditional Authorities for land use consent. An assessment of the impact on the receiving environment should be carried out. The Proponent should include as part of their application for the MCs, measures by which they will rehabilitate the areas where they intend to carry out mineral small-scale mining activities. The Proponent may not carry out small-scale mining activities within the areas limited by Section 52 (1) of this Act.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Nature Conservation Amendment Act, No. 3 of 2017: **Ministry of Environment, Forestry and Tourism (MEFT)**	National Parks are established and gazetted in accordance with the Nature Conservation Ordinance, 1975 (4 of 1975), as amended. The Ordinance provides a legal framework with regards to the permission of entering a state protected area, as well as requirements for individuals damaging objects (geological, ethnological, archaeological and historical) within a protected area. Though the Ordinance does not specifically refer to mining as an activity within a protected area (PA) or recreational area (RA), it does restrict access to PA's and prohibits certain acts therein as well as the purposes for which permission to enter game parks and nature reserves may be granted.	The MCs falls in Ovitongo Conservancy Therefore, the Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of protected areas and other State land in the Project Site area. The Proponent will also be required to comply with the existing and planned local operational management plans, regulations and guidelines of the three conservancies.
The Parks and Wildlife Management Bill of 2008: **Ministry of Environment, Forestry and Tourism (MEFT)**	Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous biological resources, and the management of protected areas, to conserve biodiversity and to contribute to national development.	

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Mine Health & Safety Regulations, 10th Draft: **Ministry of Health and Social Services (MHSS)**	Makes provision for the health and safety of persons employed or otherwise present in mineral licenses area. These deal with among other matters; clothing and devices; design, use, operation, supervision and control of machinery; fencing and guards; and safety measures during repairs and maintenance.	The Proponent should comply with all these regulations with respect to their employees.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): **Ministry of Mines and Energy (MME)**	Regulation 3(2)(b) states that "No person shall possess [sic] or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The Proponent should obtain the necessary authorisation from the MME for the storage of fuel on-site.
The Regional Councils Act (No. 22 of 1992): **Ministry of Urban and Rural Development (MURD)**	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning perspective, their duties include, as described in section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns,	The relevant Regional Councils are IAPs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Kunene therefore, they should be consulted.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	
Traditional Authority Act (Act No. 25 of 2000): **Ministry of Urban and Rural Development (MURD)**	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leadership, the Chiefs, to exercise control on behalf of the state and the residents in their designated area.	The MCs considered under this project are predominantly located near Okanguati and Epupa Constituency which are mainly communal land. Therefore, they should be consulted throughout the Project.
Water Act 54 of 1956: **Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duly of care to prevent pollution (S3 (k)). Provides for control and protection of groundwater (S66 (1), (d (ii)).	The protection (both quality and quantity/abstraction) of water resources should be a priority. The permits and license required thereto should be obtained from MAWLR's relevant

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	Departments (these permits include Borehole Drilling Permits, Groundwater Abstraction & Use Permits, and when required, the Wastewater / Effluent Discharge Permits).
Water Resources Management Act (No 11 of 2013): **Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to: Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (S68).	
National Heritage Act No. 27 of 2004: **Ministry of Education, Arts and Culture (MEAC)**	To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.	The Proponent should ensure compliance with this Acts' requirements. The necessary management measures and related

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
The National Monuments Act (No. 28 of 1969): **Ministry of Education, Arts and Culture (MEAC)**	The Act enables the proclamation of national monuments and protects archaeological sites.	permitting requirements must be taken. This done by consulting with the National Heritage Council (NHC) of Namibia. The management measures should be incorporated into the Draft EMP.
Soil Conservation Act (No 76 of 1969): **Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001: **Ministry of Environment, Forestry and Tourism (MEFT)**	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a)	The proponent will apply for the relevant permit under this Act if it becomes necessary.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	
Public Health Act (No. 36 of 1919): **Ministry of Health and Social Services (MHSS)**	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617): **Ministry of Health and Social Services (MHSS)**	Details various requirements regarding health and safety of labourers.	
Public and Environmental Health Act No. 1 of 2015: **Ministry of Health and Social Services (MHSS)**	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition	The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	liable to be injurious or dangerous to health.	is safe, or not injurious or dangerous to public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels. The public and environmental health should be preserved and remain uncompromised.
Atmospheric Pollution Prevention Ordinance (1976): **Ministry of Health and Social Services (MHSS)**	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	The proposed project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented on site.
Hazardous Substance Ordinance, No. 14 of 1974: **Ministry**	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the	The Proponent should handle and manage the storage and use of hazardous

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
of Health and Social Services (MHSS)	environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	substances on site so that they do not harm or compromise the site environment
Road Traffic and Transport Act, No. 22 of 1999: **Ministry of Works and Transport (Roads Authority of Namibia)**	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant permits must be applied for.
Labour Act (No. 6 of 1992): **Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)**	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the prospecting and small-scale mining activities do not compromise the safety and welfare of workers.

3.3 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are as listed in **Table 2** below.

Table 2: International Policies, Principles, Standards, Treaties and Convention applicable to the project

Statute	Provisions	Project Implications
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors. **Principle 1:** Review and Categorization **Principle 2**: Environmental and Social Assessment **Principle 3:** Applicable Environmental and Social Standards **Principle 4:** Environmental and Social Management System and Equator Principles Action Plan **Principle 5:** Stakeholder Engagement **Principle 6:** Grievance Mechanism **Principle 7:** Independent Review **Principle 8:** Covenants	These principles are an attempt to: '…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'

Statute	Provisions	Project Implications
	Principle 9: Independent Monitoring and Reporting **Principle 10:** Reporting and Transparency	
The International Finance Corporation (IFC) Performance Standards	The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below. **Performance Standard 1**: Assessment and Management of Environmental and Social Risks and Impacts	The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development

Statute	Provisions	Project Implications
	Performance Standard 2: Labour and Working Conditions **Performance Standard 3:** Resource Efficient and Pollution Prevention and Management **Performance Standard 4:** Community Health and Safety **Performance Standard 5:** Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement **Performance Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources **Performance Standard 7**: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities **Performance Standard 8:** Cultural Heritage **Performance Standard 9:** Financial Intermediaries (FIs) **Performance Standard 10:** Stakeholder Engagement and Information A full description of the IFC Standards can be obtained from http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-	opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.

Statute	Provisions	Project Implications
	social-standards?cq_ck=1522164538151#ess1	
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention.	The project activities should not be such that they contribute to desertification.
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings.	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Relevant international Treaties and Protocols ratified by the Namibian Government

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.
- World Heritage Convention, 1972.

4 ENVIRONMENTAL BASELINE

The proposed small-scale mining programme will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in laying down background "information" of the status quo and future projections of environmental conditions after proposed works on the MCs. This also helps the EAP in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures provided.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted in the Kunene. Further information was obtained by the Consultant during the site visit.

4.1 Biophysical Environment

4.1.1 Climate

Climate has impacts on mining activities. Climatic conditions may be used to determine the appropriate and/or inappropriate times and conditions to conduct operational activities on the MCs. The Kunene Region generally receives the low levels of rainfall, with the highest rainfall averages recorded mainly from January to April (average monthly rainfall: 2.9mm to 9.4 mm), and the lowest rainfall averages (below 0.5 mm) recorded mostly between May and August. High levels of relative humidity (55-75%) are experienced between August and March, while lower relative humidity levels occur between April and September (https://tcktcktck.org/namibia/Kunene/opuwo).

5.1.1 Topography

The topography of the region is mainly mountainous; thus the MCs are also found in a mountainous landscape. The MCs lies in an elevation that ranges between 550 and 1200m above mean sea level (AMSL). Below is the map showing the topographic map **Figure 3** .

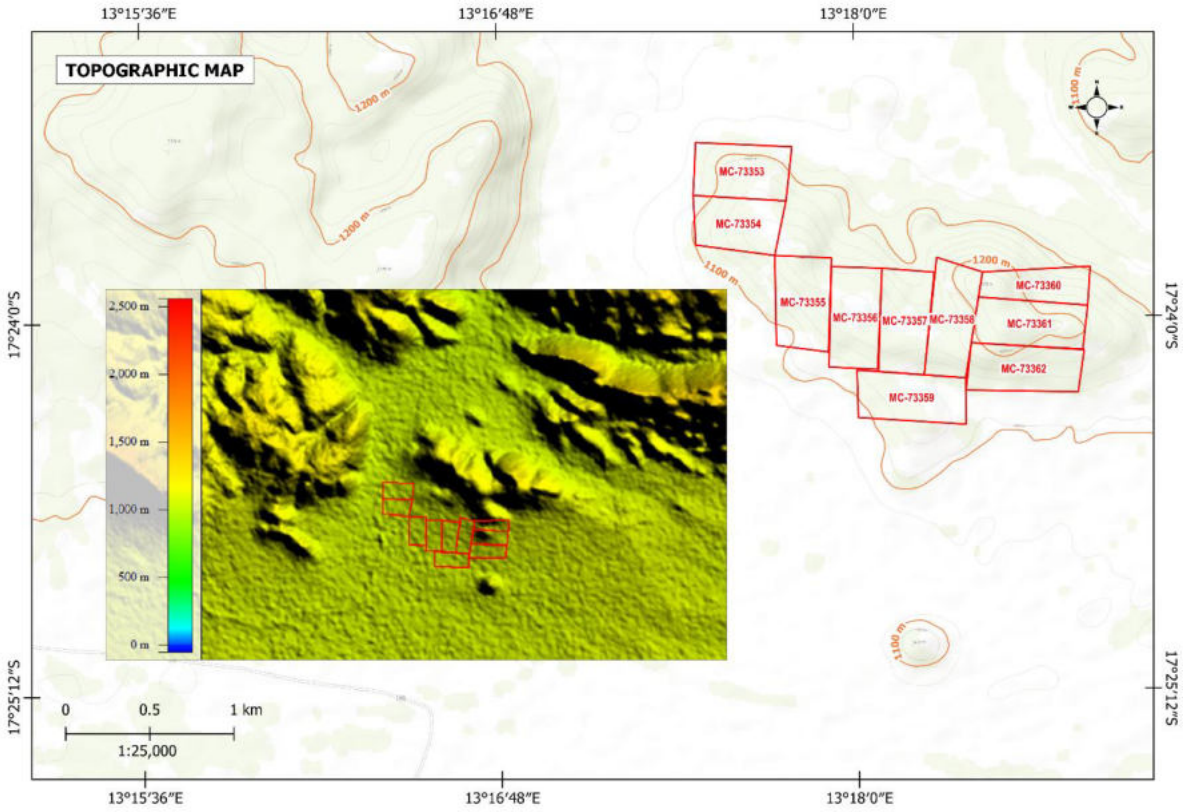

Figure 3:Topographic map of project area near Opuwo

5.1.Geology

The Geology of Kunene Region is classified mainly under the Otavi Group (Ls). Mendelsohn (2000) pointed that Kunene Region has the oldest rocks and the Damara supergroup and gariep complex. Mendelsohn (2000) further point that besides diamond, all valuable minerals are found in the western side of the country. The geology of all the mining claims is dominated by metasedimentary rock . Such rock are formed through the deposition and solidification of sediment that was buried underneath subsequent rock and was subjected to high pressures and temperatures, causing the rock to recrystallize. The general geological map for the site is shown in Figure 4 and Figure 5 the typical rocks that are found within the MCs.

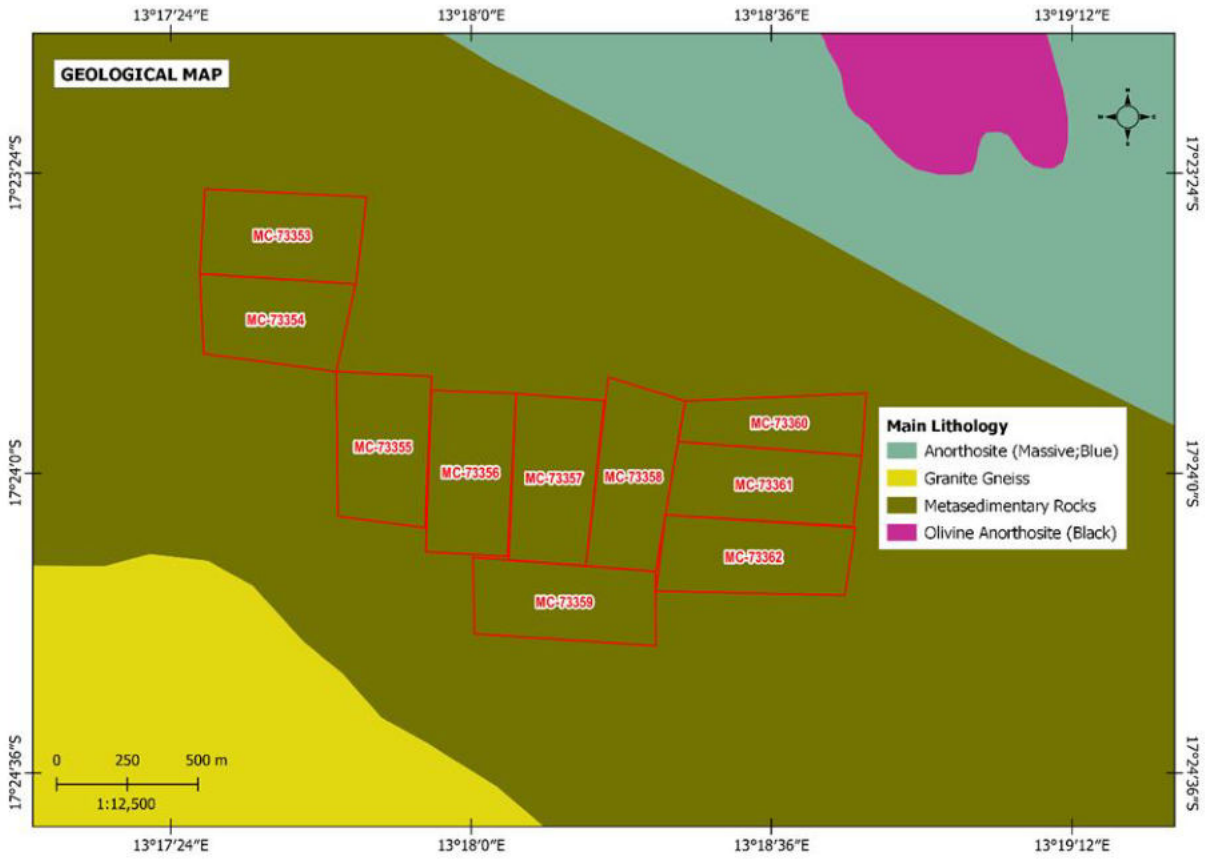

Figure 4: A map of the general geology of the project area

Figure 5: The typical granite rock found within the MCs

5.1.2 Soils

The majority portion of the MCs containing rock outcrops, they are defined as visible exposures of bedrock or other geologic formations at the surface of the Earth (Mendelsohn et al, 2003). These soils have a very low fertility level and therefore only the toughest vegetation survive here (Mendelsohn et al, 2003). Figure 6 below shows the soil types found within the MCs area and **Figure 7** shows a typical soil type found within the MCs.

Durring prospecting phase of the project, soil sampling may be conducted**.** Therefore, the Soil Conservation Act (No 76 of 1969) should be considered to ensure that soils are conversed in way that does not promote soil erosions, which result in creation of gullies (refer to the EMP).

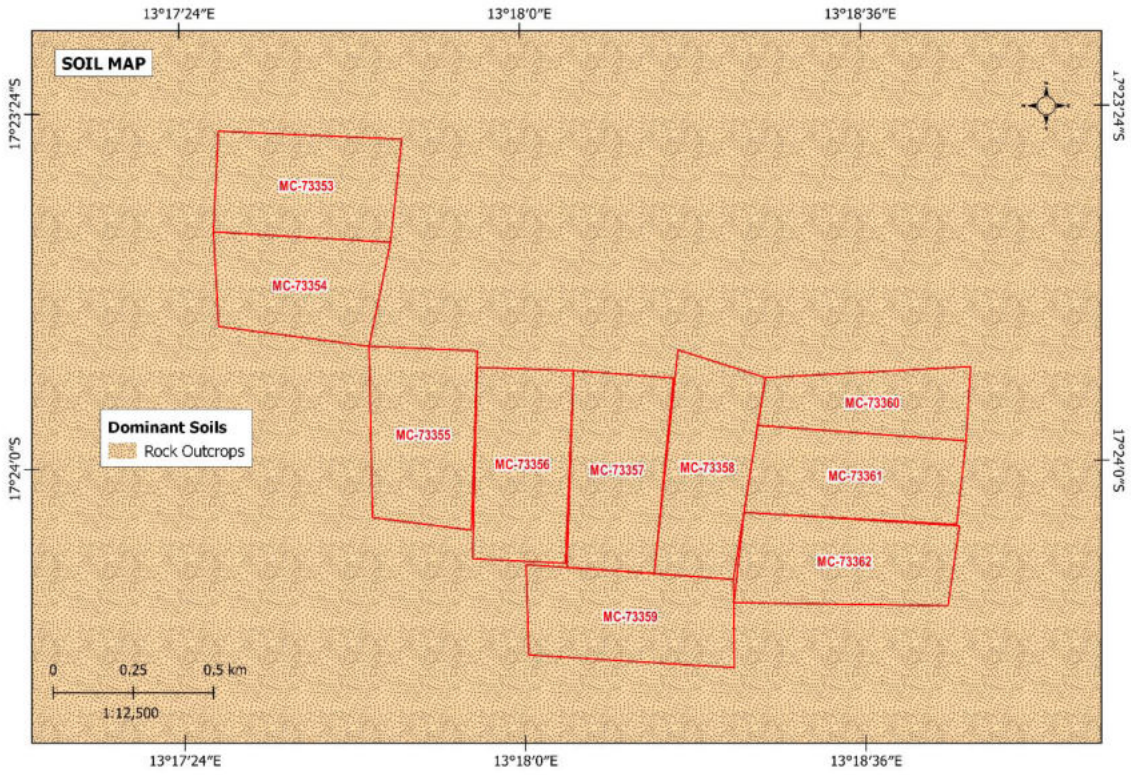

Figure 6: shows the dominant soil types found within the MCs

The typical soil type found within the proposed MCs

5.1.3 Hydrology, Water Resources and Groundwater Vulnerability to Pollution

In terms of hydrology, there is Ombuka river (surface water/) that passes through the MCs on the northwestern direction. The MCs falls within the rock bodies with little underground water. Figure **8** shows the hydrological map around the MCs

In the case of consideration abstraction of water from onsite water sources, it is recommended that the Proponent should obtain a water abstraction permit, as required under the Water Act No. 54 of 1956 (enforced), and the Water Resources Management Act, No. 11 of 2013.

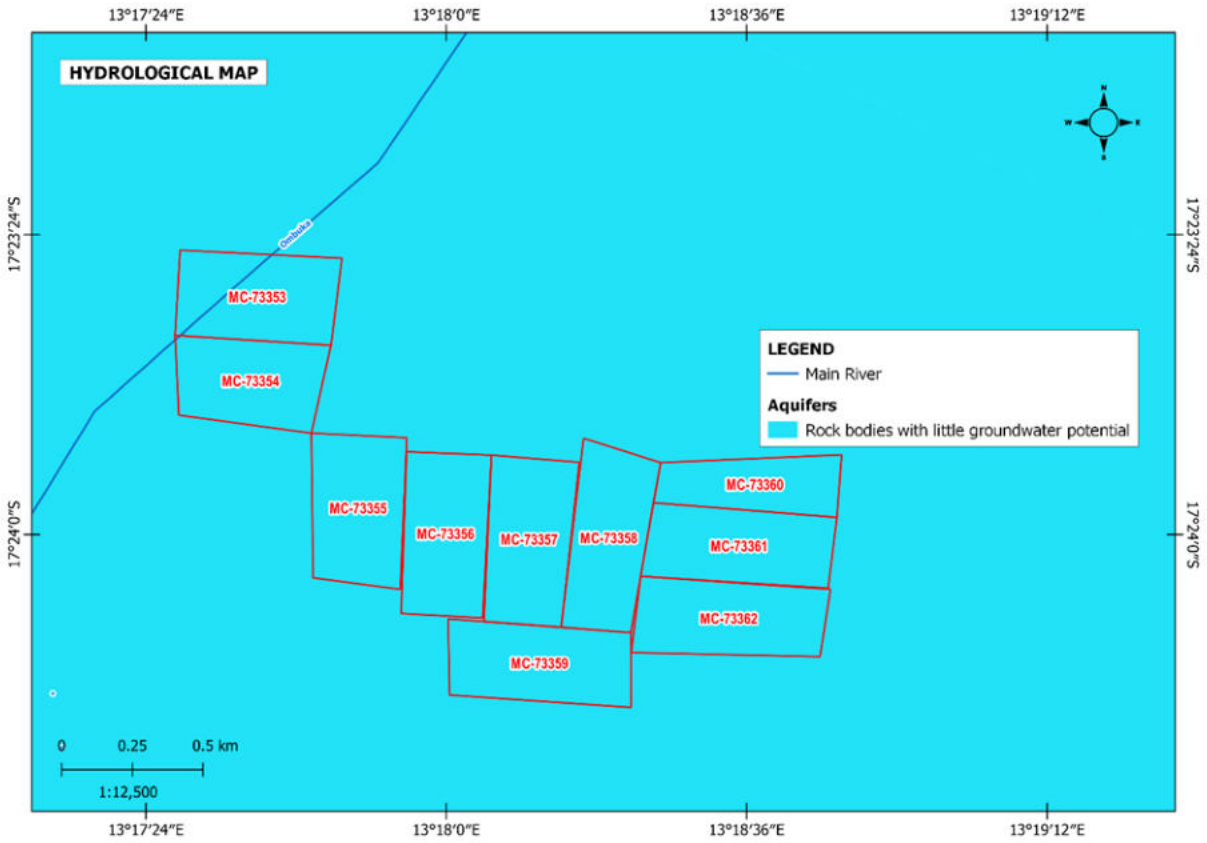

Figure 3: Hydrology and groundwater vulnerability map

5.1.6 Flora and Fauna

Flora

The MCs falls within the mixed broadleafed mountainous woodland. The vegetation within the study site is dominated by mopane trees (*Colophospermum mopane*) and purple-pod terminalia (*Terminalia prunioides),* which are co-dominant, with mopane more common in red sandy areas and T. prunioides increasingly dominant and quite encroaching as the calcrete content of the soil increases. Various *Commiphora species, Moringa ovalifolia* and *Sterculia africana* are characteristic on the mid-slopes and/or higher slopes, with *Sesamothamnus guerichii,* also occurring on the calcrete slopes above the proposed dam site and more southerly tailings alternative .**Figure 10** show the vegetation map around the MCs.

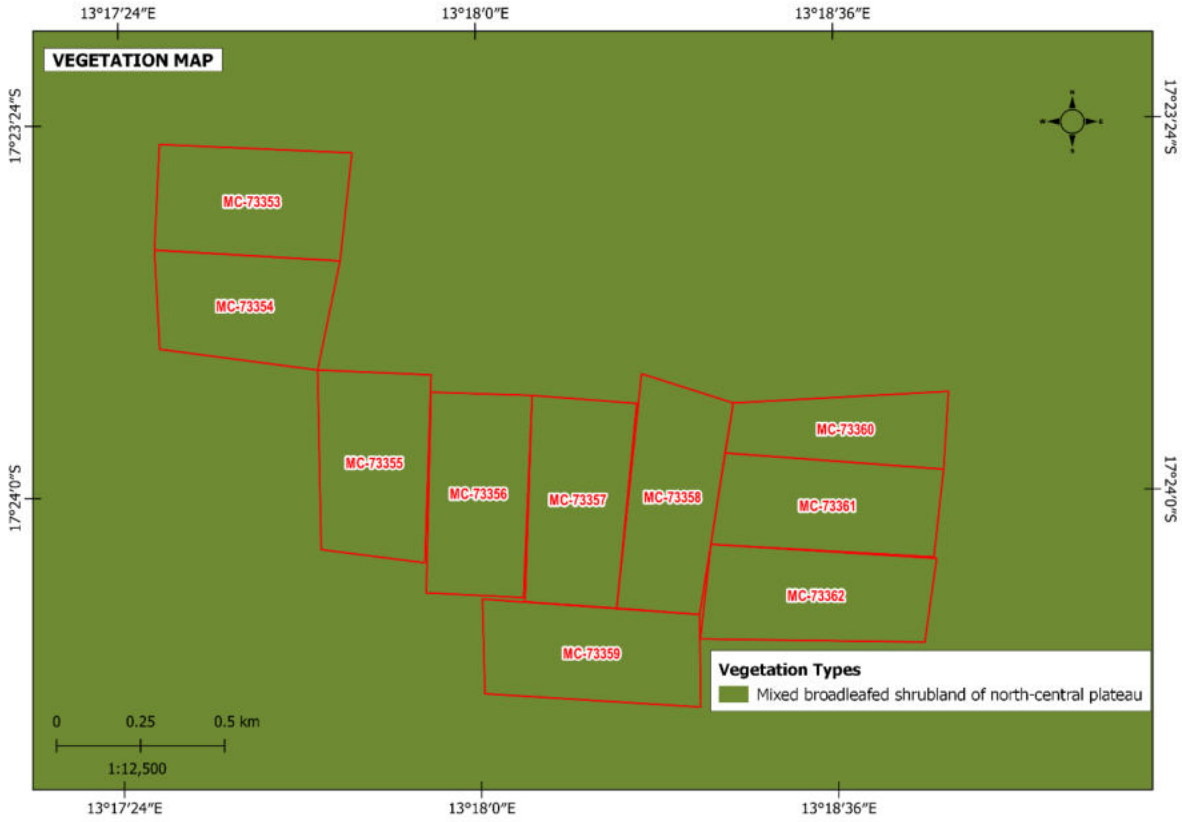

Figure 4:The vegetation map around the project area

Fauna

The MCs are located within a communal land and the conservancy. No animal was observed onsite however, there were some kraal , footprint and animal dropping, meaning there are some livestock found within the Mining Claim.

Figure 5 The animal dropping observed during the site visit

Sensitive Areas within and around MCs: No-go zone areas on the MCs

The areas presented below are regarded as sensitive within the MCs during the mining phase:

Ombuka river (surface water) –This river lies within the Northwest part of the MCs. **Figure 9** below shows the area considered hydrologically sensitive within the MCs. The area marked in red is regarded as no-go zone during the mining phase.

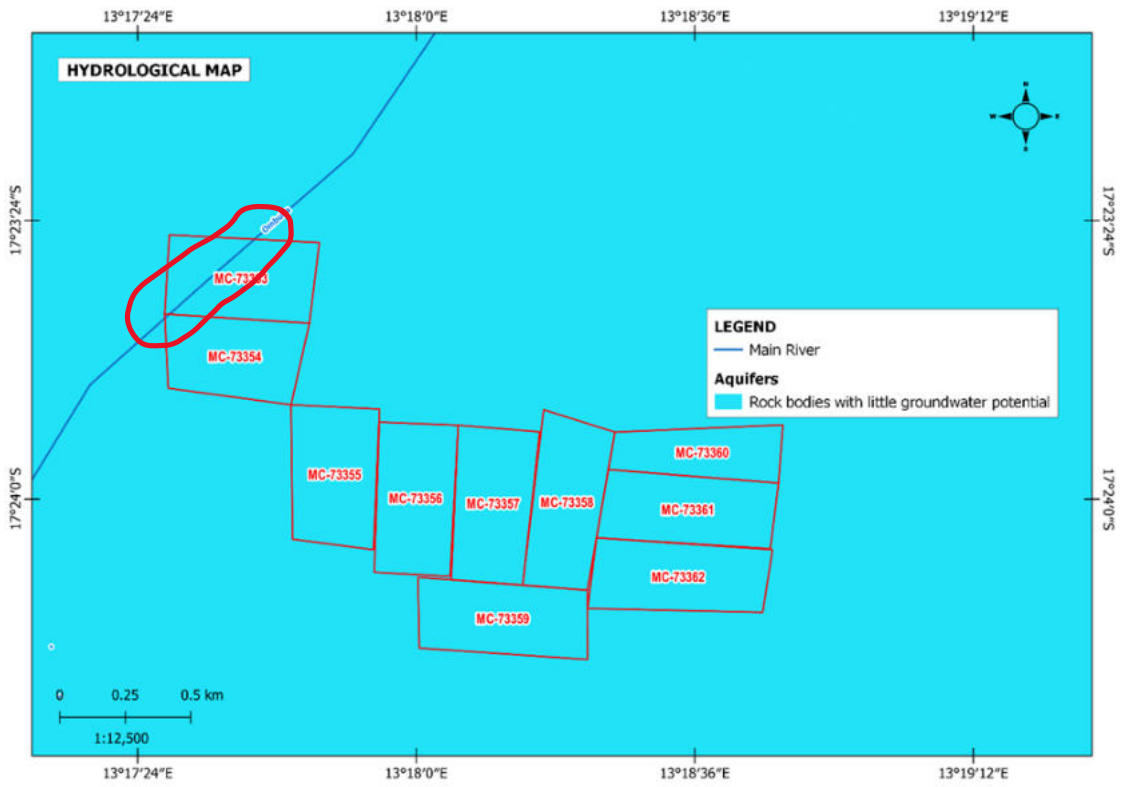

Figure 6: Sensitivity (no-go zone areas) of MCs 73353 – 73362

.

5.2 Heritage and Archaeology

5.2.1 Local Level and Archaeological Findings

The Kunene Region is not well explored archaeologically. Early investigations by MacCalman (1972) and MacCalman and Grobbelaar (1965) drew attention to the presence of late Pleistocene evidence from the area, and more spectacularly, observations on stone tool use by contemporary hunter-gatherer groups. More recent investigations have documented a late Holocene occupation sequence (Albrecht et al 2001) and some of the detailed archaeological characteristics of nomadic pastoral settlement patterns in the area (Kinahan 2001). The area is also considered to have a high cultural heritage sensitivity due to the possible impact of various development initiatives on the traditional life and historical sites of the OvaHimba people (Kinahan 2013). The archaeological evidence available so far indicates that the Kunene Region will have abundant traces of Pleistocene occupation but that much of this evidence will have been displaced by sheet erosion on high angle slopes, Holocene age material is also present within the landscape (Kinahan 2013).

Also, results from this desktop assessment shows that no declared sites are located near or within the Mining Claims except for one archaeological feature located far from the MC no 73357 as shown in Figure 18 below.

Figure 7: Archaeologically significant gravestone for residence within the MCs

5.2.2 Surrounding Land Uses

The MCs crosses and overlies within communal land and conservancy as previously stated under Chapter 1.The Proponent is required to secure a signed agreement from the affected landowners, Traditional Authority and Ovitongo Conservancy Management to gain access to the areas of interest for mining investigations as per the Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Minerals Policy of Namibia..

1. Section 52 (1) The holder of mineral licence shall not exercise any rights conferred upon such holder by this Act or under any terms and conditions of such mineral license –

    (a) In, on or under any and until such time as such holder has entered into an agreement in writing with the owner of such land containing terms and conditions relating to the payment of compensation, or the owner of such land has in writing waked any right to such compensation and has submitted a copy of such agreement or waiver to the Commissioner.

Section 2.2.3 of the Draft Minerals Policy of Namibia states that the Licence Holder and/or mineral explorers currently have to negotiate a contract with landowners to gain access for or mining purposes.

7 Socio-Economic conditions

Opuwo is the regional capital of the Kunene Region and is located about 720 km from the City of Windhoek, 230 km from Oshakati and 255 km from Kamanjab Village. Opuwo Town is located on the North Western part of Namibia in the Kunene Region, and is recognized as a regional capital and administration head of the Regional Government and other O/M/As, providing various government services to the region's inhabitants. Opuwo Town is one of the fast developing towns in northern Namibia, targeted and earmarked by investors and developers in the country. Currently, as per the 2011 population and housing census, the regional capital has a population of 7,657 inhabitants.

There organizations and offices in the Opuwo town include Opuwo Police Station, Opuwo District Hospital, Ministry of Home Affairs (Department of Civic Affairs / Regional Civic Registration Office / Kunene Region) and Opuwo Department of Works. There is a Christian church and a small

airfield in town, Opuwo Airport. There are also Putuavanga Senior Secondary School and Opuwo Primary School. The construction sector is the main contributer to the growth and an upsurge in the local economy of Opuwo town, according to Opuwo Town Council.

Economic Activities and Potential areas of investment

The discovery of iron ore and copper in the mountains around Opuwo town has put the town in a favourable position for the establishment of processing plants and industrial areas. This will result in job creation and value addition for its products, such as steel factories and others. The discovery of iron ore in the mountain of Opuwo District and the idea of constructing the Agra-Fria and Baynes Hydro Power station have increased the potential for Opuwo Town to become the industrial hub of Kunene Region. The critical potential areas of investment are: Land servicing and property development, Industrial zoning and plant structures, Accommodation and Tourists' Facilities (Lodge, Hotels B&Bs), Housing, Shopping malls, Warehousing, SME Stalls, Truck port/dry port, Abbatoir and Butchery – value addition for local beef and other meat products.

Comparative and Competitive Advantages of Opuwo Town

The competitive advantages of this town include:

• The area is rich in mineral resources, that can be translated into fast tracking the development of the town and her people (iron ore and copper). This advantage can also translate in the constituency adding Geo-tourism to its tourism basket.

• Huge opportunity for small-scale mining .

• The Ovahimba people are an advantage as the town will lend itself to greater cultural tourism. Potential to expand cultural tourism is currently being realized through marketing and customer service.

Opuwo is divided is divided into two constituencies (Opuwo Urban and Opuwo Rural).

Opuwo Urban Constituency

Opuwo Urban Constituency is the constituency that hosts the regional capital – Opuwo Town. The constituency has the population of 12,421, with the landscape of 25,758 Square kilometres. Opuwo Urban Constituency is regarded as Kunene North's business center, tourist hub and gate to the Epupa Constituency and former Kaokoland Areas. Business potential in this area is high due to the natural beauty (landscape or scenery), and the Ovahimba people and their culture,

who make this constituency stand out from among the other Kunene constituencies. Opuwo Town is recognized and proclaimed as the Regional Capital and the Head Administration Center for the Regional Government of the Kunene Region.

Economic Activities

Most of the economic activities in Opuwo Urban Constituency take place in Opuwo town, which is the urban center and the business hub for the Regional Capital. The main economic activities in the constituency are agriculture, focusing mainly on communal livestock farming, retail, and accommodation, as well as tourist facilities. The communal farmers sell their livestock through MeatCo auctions and day-to-day sale bargaining with Angolans and local people from Northern urban areas who are engaged in “Kapana” businesses (Kapana business is a small business, where the owner sells grilled meat in small pieces, i.e. barbeque style). The constituency is rich in minerals (gems/precious natural stones, copper and iron ore), which are yet to be explored and processed in the constituency for job creation and value addition for local products.

Potential Investment Areas

Opuwo Urban Constituency has great potential of becoming the industrial hub of Kunene Region due to its strategic location and it being the home to the regions capital, Opuwo. Due to the increase in business and infrastructural development, the Regional Council proclaimed this area a formal settlement. Potential areas of investment lie in land servicing and property development, industrial zoning, accommodation and tourists’ facilities (Lodges, Hotels and Bed and Breakfast – B&B), housing, shopping malls and service stations at Omakange.

Opuwo Rural Constituency

Opuwo Rural Constituency is one of the most remote constituencies in Kunene Region. The Constituency has the population size of 14,850 with the capacity of 25,758 Square kilometres. Opuwo Rural Constituency is located between Opuwo Urban and Sesfontein Constituency, it borders Omusati Region to the East, Sesfontein to the South, Atlantic Ocean to the West, Epupa Constituency on the Northwest and Opuwo Urban to the North. The administration center is located at Otuani Informal Settlement where Kunene Regional Council intends to proclaim the area as a “Proclaimed Settlement”.

Economic Activities

Opuwo Rural Constituency's main economic activities are in agriculture – communal livestock farming, conservancies – trophy hunting, and copper mining at Otuani. The communal farmers generally sell their livestock through MeatCo auctions and day-to-day bargaining with Angolans and local people from the northern urban areas who are engaged in "Kapana" businesses. The constituency is rich in minerals (gems/precious natural stones, copper and iron ore, but they are not yet fully explored to the benefit of the local people, for example in job creation and value addition).

Potential Investment Areas

Opuwo Rural Constituency has great potential of becoming the mining hub of the Kunene region through setting up or establishing a copper processing plant at Otuani. Other potential investments are accommodation (B&B) and other tourist facilities, housing, butchery and tannery factory, service stations and shopping center/s.

Summary of Demographics and Socio Economy of Kunene region and Opuwo Constituency:

Indicators		Values	
		Kunene	Opuwo
Population Size	Males	43 603	13 376
	Females	43 253	13 896
Sex ratio: Males per 100 females		101	96
Age composition, %	Under 5 years	17	17
	5 – 14 years	25	27
	15 – 59 years	51	50
	60+ years	7	7
Literacy rate, 15+ years, %		65	62
Education, 15+ years, %	Never attended school	37	43
	Currently at school	9	11
	Left school	50	42
Labour force, 15+ years, %	In labour force	67	63
	Employed	64	59
	Unemployed	36	41
	Outside labour force	24	37
	Farming	32	47

Main source of income, %	Wages & Salaries	41	27
	Cash remittance	5	3
	Business, non-farming	8	12
	Pension	12	10
Housing conditions, % Households with	Safe water	67	62
	No toilet facility	63	74
	Electricity for lighting	32	28
	Wood/charcoal for cooking	51	62

Source: 2011 Population and Housing Census Regional Profile, Kunene Region, Page (iii & vii)

8 PUBLIC CONSULTATION PROCESS

Public consultation is an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and to what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done in accordance with the EMA and its EIA Regulations.

7.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request. Newspaper advertisements of the proposed small-scale mining activities were placed in two widely read national newspapers in the region (The Namibian Newspaper and New Era Newspaper). The project advertisement/announcement ran for two consecutive weeks inviting members of the public to register as I&APs and submit their comments. The summary of pre-identified and registered I&APs is listed in **Table 4** below and the complete list of I&APs is provided in **Appendix D**.

Table 3: Summary of Interested and Affected Parties (I&APs)

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Mines and Energy
Ministry of Health and Social Services
Regional, Local and Traditional Authorities
Kunene Regional Council
Okanguati constituency office
General Public
Landowners /Interested members of the public

Namibia Community Based Tourism Association

7.2 Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regards to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed small-scale mining activities works was compiled and delivered to relevant Authoritative Ministries, and upon request to all new registered Interested and Affected Parties (I&APs);
- Project Environmental Assessment notices were published in The Namibian and New Era (12 and 19th August 2022), briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns;
- Public consultation meeting was announced in the Otjiherero National Radio by the Constituency office council.
- Public notices were placed at frequented places such as Okanguati Police Station and Okanguati Constituency office as shown in **Figure 15** to inform members of the public about the EIA process and register as I&APs, as well as submit comments.
- A public meeting was scheduled and held on 14 September 2022, at Under the tree near Okanguati at 12H00 (**Figure 16**).

Figure 8: **The site notices placed around Opuwo (a) Okanguati Police Station b) Okanguati Constituency Office**

Figure 16: Consultation meeting held on the 13 September 2022, under the tree near Okanguati

Issues were raised by I&APs and these issues have been recorded and incorporated in the environmental report and EMP. The summarized issues raised during the public meeting are presented in **Table 5** below. The issues raised and responses by EDS are attached under **Appendix G** and **H**

Table 4: Summary of main issues and comments received during the first public meeting engagements

Issue	Concern
Employment	Will the Proponent hire local people during the mining phase
Publicity	The proponent must inform us when the MCs are granted the ECC

8. IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

8.1 Impact Identification

Proposed developments/activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the mining activities are listed as follow:

Positive impacts:

- Creation of jobs to the locals (primary, secondary and tertiary employment).
- Producing of a trained workforce and small businesses that can service communities and may initiate related businesses.
- Boosting of the local economic growth and regional economic development.
- Open up other investment opportunities and infrastructure-related development benefits.

Negative impacts:

- Disturbance to the grazing area
- Land degradation and Biodiversity Loss.
- Generation of dust
- Water Resources Use
- Soil & Water Resources Pollution
- Waste Generation
- Occupational Health & Safety risks
- Vehicular Traffic Use & Safety
- Noise & Vibrations
- Disturbance to Archaeological & Heritage Resources
- Impacts on local Roads
- Social Nuisance: local property intrusion & disturbance
- Social Nuisance: Job seeking & differing Norms, Culture & values
- Impacts associate with closure and decommissioning of small-scale mining works

8.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified, and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in **Table 6**, **Table 7**, **Table 8** and **Table 9**, respectively.

In order to enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact;
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria were applied in this impact assessment:

8.2.1 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. **Table 6** shows rating of impact in terms of extent of spatial scale.

Table 5: Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

8.2.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 7** shows the rating of impact in terms of duration.

Table 6: Duration impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

8.2.3 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 8** shows the rating of impact in terms of intensity, magnitude or severity.

Table 7: Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	Very high deterioration, high quantity of deaths, injury of illness / total	Substantial deterioration, death, illness or injury, loss of habitat / diversity or	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or	Low deterioration, slight noticeable alteration in habitat and	Minor deterioration, nuisance or irritation, minor change in species /

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
	loss of habitat, total alteration of ecological processes, extinction of rare species	resource, severe alteration or disturbance of important processes	resource, moderate alteration	biodiversity. Little loss in species numbers	habitat / diversity or resource, no or very little quality deterioration.

8.2.4 Probability of occurrence

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. **Table 9** shows impact rating in terms of probability of occurrence.

Table 8: Probability of occurrence impact rating

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

8.2.5 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact "without mitigation" is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this section, for this assessment, the significance of the impact without prescribed mitigation actions is measured.

Once the above factors (**Table 6**, **Table 7**, **Table 8** and **Table 9**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SIGNIFICANCE POINTS (SP) = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (**Table 10**).

Table 9: Significance rating scale

Significance	***Environmental Significance Points***	***Colour Code***
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L
Neutral	0	N
Low (negative)	-1 to -30	L
Medium (negative)	-30 to -60	M
High (negative)	-60<	H

Positive (+) – Beneficial impact

Negative (-) – Deleterious/ adverse+ Impact

Neutral – Impacts are neither beneficial nor adverse

For an impact with a significance rating of high (-ve), mitigation measures are recommended to reduce the impact to a medium (-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the small-scale mining phases is done for pre-mitigation and post-mitigation.

The risk/impact assessment is driven by three factors:

Source: The cause or source of the contamination.

Pathway: The route taken by the source to reach a given receptor

Receptor: A person, animal, plant, eco-system, property or a controlled water source. If contamination is to cause harm or impact, it must reach a receptor.

A pollutant linkage occurs when a source, pathway and receptor exist together. Mitigation measures aim firstly, avoid risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk would reduce to lower significance (Booth, 2011).

This assessment focuses on the three project phases namely; the prospecting, small-scale mining activities and decommissioning. The potential negative impacts stemming from the proposed activities of the MCs are described, assessed and mitigation measures provided thereof. Further mitigation measures in a form of management action plans are provided in the Draft Environmental Management Plan.

8.3 Assessment of Potential Negative Impacts

The main potential negative impacts associated with the operation and maintenance phase are identified and assessed below:

8.3.1 Disturbance to the grazing areas

The MCs are overlying a communal land and the conservancy that practice livestock farming wildlife (Flora and fauna conservation). Small-Scale mining activities such as site clearing, trenching, and drilling can potentially lead to the disturbance of grazing land. This will potentially affect the grazing land available to' livestock and wildlife, and since the farmers greatly depend on these types of farming for subsistence and commercial purposes, this would have an impact on their livelihood through potential feeding/grazing for animals and eventual losses.

The effect of mining activity on the land (when done over a wider spatial extent), if not mitigated, may hinder animal husbandry in the area and its surrounding. The project area might experience loss of its pastoral system over time. Losing grazing pastures for livestock and wildlife minimizes the number of animals on the farms and overall farming activity in the area, and lead to loss of livelihoods. Under the status quo, the impact can be of a medium significance rating. With the

implementation of appropriate mitigation measures, the rating will be reduced to a lower significance. The impact is assessed in **Table 11** below.

Table 10: Assessment of the impacts of small-scale mining activity on grazing areas

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -4	M: -3	M: -5	M/H: 5	M: -60
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: 3	L: -24

Mitigations and recommendations to lower the possibility of disturbance and loss of the Pastoral system

- Any unnecessary removal or destruction of grazing land, due to mining activities should be avoided.
- Vegetation found on the site, but not in the targeted small-scale mining activities areas should not be removed but left to preserve biodiversity and grazing land.
- Workers should refrain from driving off road and creating unnecessary tracks that may contribute to the loss of grazing land.
- Environmental awareness on the importance of the preservation of grazing land for local livestock should be provided to the workers.

8.3.2 Land Degradation and Loss of Biodiversity

Fauna: The trenching, pitting and drilling activities done for detailed small-scale mining activities would result in land degradation, leading to habitat loss for a diversity of flora and fauna ranging from microorganisms to large animals and vegetation. Endemic species are most severely affected since even the slightest disruption in their habitat can results in extinction or put them at high risk of being wiped out.

The presence and movement of the mining workforce and operation of project equipment and heavy vehicles could disturb the livestock and wildlife present on the MCs. This may occur through human and vehicle movements or potential illegal hunting (poaching) of local wildlife, reducing the numbers of faunal species, which eventually negatively impacts tourism in the community.

Un-rehabilitated and/or unfenced boreholes, trenches and pits could pose a high risk of unstable ground that could lead to animals falling into holes and pits, causing injuries and potentially deaths.

Flora: The direct impacts of mining activities on flora and vegetation communities will mainly occur through clearing for the small-scale mining activities access roads and associated infrastructure. The dust emissions from drilling may affect surrounding vegetation through the fall of dust. Some loss of vegetation is an inevitable consequence of the development. However, given the abundance of the shrubs and site-specific areas of small-scale mining activities on the MCs, the impact will be localized, therefore manageable.

Under the status, the impact can be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a low significance rating. The impact is assessed in **Table 12** below.

Table 11: Assessment of the impacts of small-scale mining activities on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -4	M: -4	M: -6	M/H: 4	M: -56
Post mitigation	L/M: -3	L/M: -3	L/M: -4	L/M: 3	L: -30

Mitigations and recommendations to minimize the loss of biodiversity

- The Proponent should avoid unnecessary removal of vegetation, to promote a balance between biodiversity and their operations.
- Vegetation found on the site, but not in the targeted small-scale mining activities site areas should not be removed but left to preserve biodiversity on the site.
- Shrubs or trees found along trenching, drilling, or sampling spots on sites should not be unnecessarily removed.
- Protected and threatened plants along trenching, drilling, or sampling spots on sites should not be unnecessarily removed.
- Movement of vehicle and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to the vegetation.

- No onsite vegetation should be cut or used for firewood related to the project's operations. The Proponent should provide firewood for his onsite camping workers from authorized firewood producer or seller.
- Design access roads appropriately in a manner that disturbs minimal land areas as possible.
- Vegetation clearing to be kept to a minimum. The vegetation of the site is largely low and open and therefore whole-sale vegetation clearing should only be applied where necessary and within the MCs footprint.
- Formulate and implement suitable and appropriate operational management guidelines for the cleared areas. Incorporated in the guidelines are the progressive rehabilitation measures.
- Workers should refrain from disturbing, killing or stealing farm animals and killing small soil and rock outcrops' species found on sites.
- Prevent the killing of species viewed as dangerous – e.g. various snakes – when on site;
- Poaching (illegal hunting) of wildlife from the area is strictly prohibited.
- Environmental awareness on the importance of biodiversity preservation should be provided to the workers.
- Avoid the removal and/or damaging of protected flora potentially occurring in the general area –

8.3.3 Generation of Dust (Air Quality)

Dust emanating from site access roads when transporting small-scale mining activities equipment and supply to and from site may compromise the air quality in the area. Vehicular movements from heavy vehicles such as trucks would potentially create dust even though it is not always so severe. Additionally, activities carried out as part of the small-scale mining activities works such as drilling would contribute to the dust levels in the air. The medium significance of this impact can be reduced to a low significance rating by properly implementing mitigation measures. The impact is assessed in **Table 13** below.

Table 12: Assessment of the impacts of small-scale mining activities on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M/L: -4	M/H: 4	M: -40

Post mitigation	L - 2	L - 2	L- 2	L - 1	L - 6

Mitigations and recommendations to minimize dust

- Small-scale mining activities vehicles should not drive at a speed more than 40 km/h to avoid dust generation around the area.
- The Proponent should ensure that the small-scale mining activities schedule is limited to the given number of hours and days of the week. This will keep the vehicle-related dust level minimal in the area.
- When and if the project reaches the advanced stages of small-scale mining activities producing high dust levels, a reasonable amount of water should be used on gravel roads, using regular water sprays on gravel routes and near small-scale mining activities sites to suppress the dust that may be emanating from certain small-scale mining activities areas on the MCs.

8.3.4 Water Resources Use

Water resources is impacted by project developments/activities in two ways. Through pollution (water quality) or over-abstraction (water quantity), or at times, both.

The abstraction of more water would negatively affect the local communities (communal farmers and livestock) that depend on the same low potential groundwater resource (aquifer).

The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Commonly, small-scale mining activities use a lot of water, mainly for drilling. However, this depends on the type of drilling methods employed (diamond drilling is more water-consuming compared to drilling methods such as reverse circulation for instance) and the type of mineral being explored for.

The planned Reverse Circulation drilling method requires about 4000 litres of water per month. This water will be used for drilling purposes, drinking and other domestic purposes. Given the low to medium groundwater potential of the project site area, the Proponent may consider carting some of the water volumes from outside the area and store it in industry standard water reservoirs/tanks on site, if necessary. Although small-scale mining activities may be requiring this much water, this would also be dependent on the duration of the small-scale mining activities works and number of small-scale mining activities boreholes required to make reliable interpretation on the commodities explored for. The small-scale mining activities period is

temporally limited, therefore, the impact will only last for the duration of the small-scale mining activities and ceases upon completion.

Without the implementation of any mitigation measures, the impact can be rated as medium, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in the **Table 13** below.

Table 13: Assessment of the project impact on water resource use and availability

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 3	L/M - 4	M/H - 4	M - 40
Post mitigation	L/M - 1	L/M - 1	L - 2	L/M - 3	L - 12

Mitigations and recommendations to manage water use

- Water abstracted from boreholes or supplied by carting should be used efficiently.
- Water reuse/recycling methods should be implemented as far as practicable. Water used to cool off small-scale mining activities equipment may be captured and used for the cleaning of project equipment, if possible.
- Water storage tanks should be inspected daily to ensure that there are no leakages, resulting in wasted water on site.
- Water conservation awareness and saving measures training should be provided to all the project workers.

8.3.5 Soil and Water Resources Pollution

The proposed small-scale mining activities are associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate/pollute soils and eventually groundwater and surface water. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, and equipment as well as potential wastewater/effluent from small-scale mining related activities.

The spills (depending on volumes spilled on the soils) from machinery, vehicles and equipment could infiltrate into the ground and pollute the fractured or faulted aquifers on site, and with time reach further groundwater systems in the area. However, it should be noted that the scale and

extent/footprint of the activities where potential sources of pollution will be handled is relatively small. Therefore, the impact will be moderately low.

Pre-mitigation measure implementation, the impact significance is low to moderate and upon implementation, the significance will be reduced to low. The impact is assessed in **Table 14** below.

Table 14: Assessment of the project impact on soils and water resources (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 4	M/H - 3	M - 6	M - 4	M - 52
Post mitigation	L - 2	M - 3	L - 3	L/M - 3	L - 24

Mitigations and recommendations to manage soil and water pollution

- Spill control preventive measures should be in place on site to manage soil contamination, thus preventing and/or minimizing the contamination from reaching surface and ground water bodies. Some of the soil control preventive measures that can be implemented include:
    - Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites.
    - Maintain equipment and fuel storage tanks to ensure that they are in good condition thus preventing leaks and spills.
    - The oil storage and use locations should be visually inspected for container or tank condition and spills.
- All project employees should be sensitized to the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures.
- The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible.
- Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training, and mentor new workers as they get hired.
- Project machinery and equipment should be equipped with drip trays to contain possible oil spills when operated on site.

- Polluted soil should be removed immediately and put in a designated waste type container for later disposal.
- Drip trays must be readily available and monitored to ensure that accidental fuel spills along the tank trailer path/route around the mining sites are cleaned on time (soon after the spill has happened).
- Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.
- Washing of equipment contaminated by hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources.

8.3.6 Waste Generation

During the mining phase, domestic and general waste is produced on site. If the generated waste is not disposed of in a responsible way, land pollution may occur on the MCs or around the sites. The MCs are in an area of moderate sensitivity to pollution. Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in case of spills and leakages. Therefore, the small-scale mining programme needs to have appropriate waste management for the site. To prevent these issues, biodegradable and non-biodegradable wastes must be stored in separate containers and collected regularly for disposal at a recognized landfill/dump site. Any hazardous waste that may have an impact on the animals, vegetation, water resources and the general environment should be handled cautiously. Without any mitigation measures, the general impact of waste generation has a medium significance. The impact will reduce to low significance, upon implementing the mitigation measures. The assessment of this impact is given in **Table 15**.

Table 15: Assessment of waste generation impact

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M - 5	M – 50
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

Mitigations and recommendations to waste management

- Workers should be sensitized to dispose of waste in a responsible manner and not litter.
- After each daily works, the Proponent should ensure that there is no waste left on the sites.
- All domestic and general operational waste produced daily should be contained onsite until such that time it will be transported to designated waste sites.
- No waste may be buried or burned on site or anywhere else.
- The small-scale mining activities site should be equipped with separate waste bins for hazardous and general/domestic waste.
- Sewage waste should be stored as per the portable chemical toilets supplied on site and regularly disposed of at the nearest treatment facility
- Oil spills should be taken care of by removing and treating soils affected by the spill.
- A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.
- Careful storage and handling of hydrocarbons on site is essential.
- Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater.
- An emergency plan should be available for major/minor spills at the site during operation activities (with consideration of air, groundwater, soil, and surface water) and during the transportation of the product(s) to the sites.

8.3.7 Occupational Health and Safety Risks

Project personnel (workers) involved in the small-scale mining activities may be exposed to health and safety risks, which could result from accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving heavy machinery or vehicles) accidents. The site safety of all personnel are the Proponent's responsibility and should be adhered to as per the requirements of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919). The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the Proponent's personnel or local domestic animals.

The use of heavy equipment, especially during drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel,

equipment and vehicles. It may also lead to widespread veld fires if an outbreak is not contained and if machinery and equipment are not properly stored and packed, the safety risk may be a concern for project workers and residents.

The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low. This impact is assessed in **Table 16** below and mitigation measures provided.

Table 16: Assessment of the impacts of small-scale mining activities on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/L - 2	M - 6	M/H - 4	M – 44
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Mitigations and recommendations to minimize health and safety issues

- The Labour Act's Health and Safety Regulations should be complied with.
- The Proponent should commit to, and make provision for full medical check-up for all the workers at site to monitor the impact of project related activities on them (workers).
- As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs.
- When working on site, employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, and hard hats.
- Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible.
- Drilled boreholes that will no longer be in use or to be used later after being drilled should be properly marked for visibility and capped/closed off.
- Ensure that after completion of small-scale mining activities holes and trenches, drill cuttings are put back into the hole and the holes filled and levelled, and trenches backfilled respectively.

- An emergency preparedness plan should be compiled, and all personnel appropriately trained.
- Workers should not be allowed to consume alcohol or any other intoxicants prior to and during working hours nor allowed on site when under the influence, as this may lead to mishandling of equipment which results into injuries and other health and safety risks.
- The site areas that are considered temporary risks should be equipped with cautionary signs.

8.3.8 Vehicular Traffic Use and Safety

The district roads are the main transportation routes for all vehicular movement in the area and provide access to the MCs and connect the project area to other towns such as okanguati Traffic volume will increase on these district roads during small-scale mining activities as the project would need a delivery of supplies and services on site.

Depending on the project needs, trucks, and medium and small vehicles will be frequenting the area to and from mining sites on the MCs. This would potentially increase slow moving heavy vehicular traffic along these roads. This would add additional pressure on the roads, and the impact would be felt by the local road users such as those accessing farms (via local access gravel and single-track roads).

However, the mining related heavy trucks will only be transporting materials and equipment to and from site, limited number of times a month during mining phase . Therefore, the risk is anticipated to be short-term, not frequent, and therefore of medium significance. Pre-mitigation, the impact can be rated medium and with the implementation of mitigation measures, the significance will be low as assessed in **Table 17** below.

Table 17: Assessment of the impacts of small-scale mining activities on road use (vehicular traffic)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 4	M/H - 3	L/M - 4	M/H - 5	M - 55
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Mitigations and recommendations to minimize impact on road safety and related vehicular traffic issues.

- The transportation of mining activities materials, equipment and machinery should be limited to reduce the pressure on local roads.
- The heavy truck loads should comply with the maximum allowed speed limit for respective vehicles while transporting materials and equipment/machinery on the public and access roads (40km/h).
- Any carting of water to the site should be done on limited occasions in containers that can supply and store water for as long as possible.
- Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses and adhere to the road safety rules.
- Drivers should drive slowly (40km/hour or less) and be on the lookout for livestock and wildlife as well as residents/travelers.
- The Proponent should ensure that the site access roads are well equipped with temporary road signs conditions to cater for vehicles travelling to and from site throughout the project's life cycle.
- Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents owing to mechanical faults.
- Vehicle drivers should only make use of designated site access roads provided and as agreed.
- Vehicle drivers should not be allowed to operate vehicles while under the influence of any intoxicants.
- No heavy trucks or project related vehicles should be parked outside the project site boundary or demarcated areas for such purpose.
- To control traffic movement on site, deliveries from and to site should be carefully scheduled. This should optimally be during weekdays and between the hours of 8am and 5pm.
- The site access road(s) should be upgraded to an unacceptable standard to be able to accommodate project related vehicles as well as farm vehicles.

8.3.9 Noise and vibrations

During the mining phase, the mining activities may be a nuisance to surrounding communities due to the noise produced by the activity. Excessive noise and vibrations can be a health risk to workers on site. The mining equipment used for drilling on site is of medium size and the noise level is bound to be limited to the site only, therefore, the impact likelihood is minimal. Without

any mitigation, the impact is rated as of medium significance. To change the impact significance to low rating, the mitigation measures should be implemented. This impact is assessed in **Table 18** below.

Table 18: Assessment of the impacts of noise and vibrations from small-scale mining activities

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M/H - 3	M – 30
Post mitigation	L - 1	L/M - 2	L - 2	L/M -2	L - 10

Mitigations and recommendations to minimize noise

- Noise from operations' vehicles and equipment on the sites should be at acceptable levels.
- The mining operational times should be set such that no small-scale mining activities is carried out during the night or very early in the mornings.
- Mining hours should be restricted to between 08h00 and 17h00 to avoid noise and vibrations generated by small-scale mining activities equipment and the movement of vehicles before or after hours.
- When operating drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise.

8.3.10 Disturbance to Archaeological and Heritage resources

The specialist archaeological assessment conducted, indicates that some sections and within the boundaries of the proposed project site area are highly sensitive and archaeologically significant in terms of heritage resources that characterizes the need of a detailed investigation of any other existing archaeological cultural materials in the areas. This area was mapped out, and coordinates taken to establish "No-Go-Zones", due to their sensitivity the areas were documented, and they should be protected either by fencing them off or demarcation for preservation purposes or excluded from any development i.e., no small-scale mining activities should be conducted near these recorded areas through establishment of buffer zones.

Therefore, this impact can be rated as medium significance if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be reduced to a lower rating. The impact is assessed in **Table 19**.

Table 19: Assessment of the impacts of small-scale mining activities on archaeological & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M/H - 4	M – 52
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Mitigations and recommendations to minimize impact on archaeological and heritage resources

- If any archaeological material or human burials are uncovered during the mining phase then work in the immediate area should be halted, the finds would need to be reported to the heritage authorities and may require inspection by an archaeologist.
- Buffer zones should be maintained around known significant archaeological, historical or cultural heritage sites as far as possible.
- A “No-Go-Area” should be put in place where there is evidence of sub-surface archaeological materials, archaeological site, historical, rock paintings, cave/rock shelter or past human dwellings. It can be a demarcation by fencing off or avoiding the site completely by not working closely or near the known site. The ‘No-Go Option’ might have a NEUTRAL impact significance.
- On-site personnel (s) and contractor crews must be sensitized to exercise and recognize “chance finds heritage” in the course of their work.
- During the mining phase , it is important to take note and recognize any significant material being unearthed and making the correct judgment on which actions should be taken.
- If there is a possibility of encountering or unearthing of archaeological materials, then it is better to change the layout design to avoid the destruction that can occur.
- Direct damage to archaeological or heritage sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued.

- All ground works should be monitored and where any stratigraphic profiles in context with archaeological material are exposed, these should be recorded, photographed and coordinates taken.
- The footprint impact of the proposed mining activities should be kept to minimal to limit the possibility of encountering chance finds within the MCs boundaries.
- A landscape approach of the site management must consider culture and heritage features in the overall planning of small-scale mining activities infrastructures within and beyond the license / MCs boundaries.
- Subject to the recommendations herein made and the implementation of the mitigation measures, adoption of the project HMP/EMP should be complied.
- An archaeologist, Heritage specialist or a trained Site manager should be on-site to monitor all significant earth moving activities that may be implemented as part of the proposed project activities.
- When there is removal of topsoil and subsoil on the site for small-scale mining activities purposes, the site should be monitored for subsurface archaeological materials by a qualified Archaeologist or Site manager.
- Show overall commitment and compliance by adapting “minimalistic or zero damage approach” throughout the small-scale mining activities.
- In addition to these recommendations above, there should be a controlled movement of the small-scale mining activities crew, in order to limit proliferation of informal pathways, gully erosion and disturbance to surface and sub-surface artifacts such as stone tools and other buried materials.
- There should be controlled movement of heavy loads such as abnormal vehicles and kinds of heavy-duty machineries within the MCs. This means avoiding chances of crossing paths that may lead to the destruction of on and sub-surface archaeological materials
- It is essential that cognizance be taken of the larger historical landscape of the area to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage or archaeological resources be exposed or uncovered during small-scale mining phases of the proposed project, these should immediately be reported to the heritage specialist or heritage authority (National Heritage Council of Namibia).
- The Proponent and Contractors should adhere to the provisions of Section 55 of the National Heritage Act in event significant heritage and culture features are discovered during mining works.

- Whoever is going to oversee mitigation and monitoring measures should have the authority to stop any mining activities or construction activities that is in contravention with the National Heritage Act of 2004 and National Heritage Guidelines as well as the overall project EMP.

8.3.11 Impact on Local Roads/Routes

Mining projects are usually associated with movements of heavy trucks and equipment or machinery that use local roads frequently. The heavy trucks travelling on the local roads and exert more pressure on roads. The local roads may not be in a good condition for heavy vehicles, which may make it worse and difficult to be used by all vehicle types. This will be a concern if maintenance is not done and care taken during the mining phase. The impact would be short-term (during small-scale mining activities only) and therefore, manageable.

Without any management and or mitigation measures, the impact can be rated as medium and to reduce this rating to low, the measures will need to be effectively implemented. The assessment of this impact is presented in **Table 20**.

Table 20: Assessment of small-scale mining activities on local services (roads and water)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M/H - 4	M - 3	M - 6	M - 3	M – 39
Post mitigation	L - 1	L - 1	M/L - 4	M/L -2	L - 12

Mitigations and recommendations to minimize the impact on local services

- Heavy trucks transporting materials and services to site should have a limited schedule to avoid daily travelling to site, except in cases of emergencies.
- The Proponent should consider frequent maintenance of local roads on the farms to ensure that the roads are in a good condition for use.
- Avoid unnecessarily affecting areas viewed as important habitat – i.e. ephemeral rivers; rocky outcrops; clumps of protected tree species; lappet-faced vulture nesting sites.

- Make use of existing tracks/roads as much as possible throughout the area and do not drive off-route (could cause mortalities to vertebrate fauna and unique flora; accidental fires; erosion related problems, etc.);
- Avoid off road driving at night as these increases mortalities of nocturnal species;
- Implement and maintain off-road track discipline with maximum speed limits (e.g. 30km/h) as this would result in fewer faunal mortalities and limit dust pollution;
- New tracks should be established in a manner that causes minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines; and select routes that do not require the unnecessary removal of trees/shrubs, especially protected species;
- Rehabilitate all new tracks created.

8.3.12 Social Nuisance: Local Property intrusion and Disturbance or Damage

The presence of some non-resident workers (workers from outside the local area) may lead to social annoyance to the local community. This could particularly be a concern if workers enter or damage private property. The private property referred to herein could be houses, fences, vegetation, or livestock and wildlife or any properties of economic or cultural value to the farm/landowners or occupiers of the land. The damage or disturbance to properties might occur to private and public properties. The unpermitted and unauthorized entry to private property may cause clashes between the affected property (land) owners and the Proponent.

Pre-implementation of mitigation measures, the impact is rated as of medium significance. However, upon mitigation (post-mitigation), the significance will change from medium to low rating. The impact is assessed below (**Table 21**).

Table 21: Assessment of social impact of community property damage or disturbance

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M - 3	M - 4	M/H - 3	M – 27
Post mitigation	L - 1	L - 1	M/L - 4	M/L -2	L - 12

Mitigations and recommendations to minimize the issue of damage to or intrusion of properties

- The Proponent should inform their workers on the importance of respecting the farmers' properties by not intruding or vandalising property or snaring and killing their livestock and wildlife.
- Any workers or site employees that found guilty of intruding privately owned properties, should face disciplinary action or be dealt with as per their employer' (Proponent)'s code of employment conduct
- The project workers should be advised to respect the community and local's private properties, values, and norms.
- No worker should be allowed to wander or loiter on private property without permission.
- The project workers are not allowed to kill or in any way disturb local livestock and wildlife on farms.
- The cutting down or damaging of vegetation belonging to the affected farmers or neighbouring farms is strictly prohibited.

8.4 Cumulative Impacts Associated with Proposed Small-scale mining activities

According to the International Finance Corporation (2013), cumulative impacts are defined as "those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones".

Similar to many other mining projects, some cumulative impacts to which the proposed project and associated activities potentially contribute are:

- **Impact on road infrastructure:** The proposed small-scale mining activities contributes cumulatively to various activities such as farming activities and travelling associated with tourism and local daily routines. The contribution of the proposed project to this cumulative impact is however not considered significant given the short duration, and local extent (site-specific) of the intended mineral small-scale mining activities.
- **The use of water**: While the contribution of this project will not be significant, mitigation measures to reduce water consumption during small-scale mining activities are essential.

8.5 Mitigations and Recommendations for Rehabilitation

The rehabilitation of explored (disturbed) sites will include but not be limited to the following:

- Backfilling of trenches and or pits in such a way that subsoil is replaced first, and topsoil replaced last.
- Levelling of stockpiled topsoil, to ensure that the disturbed land sites are left as close to their original state as much as possible.
- Closing off and capping of all small-scale mining activities drilling boreholes to ensure that they do not pose a risk to people and animals in the area. The boreholes should not only be filled with sand alone, as wind will scour the sand and re-establish the holes.
- Removal of small-scale mining activities equipment and vehicles from the site. Transporting all machinery and equipment as well as vehicles to designated offsite storage facilities.
- Clean up of site working areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the facility operator/owner).

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusion

In conclusion, it is crucial for the Proponent and their contractors to effectively implement the recommended management and mitigation measures, in order to protect both the biophysical and social environment throughout the project duration. This would be done with the aim of promoting environmental sustainability, while ensuring a smooth and harmonious existence and purpose of the project activities in the host community and environment at large. It is also done to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed. Lastly, should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing the mineral mining activities and related activities.

9.2 Recommendations

The potential positive and negative impacts stemming from the proposed small-scale mining activities on MCs No. 73353 – 73362 were identified, assessed and appropriate management and mitigation measures (to negative impacts) made thereof for implementation by the Proponent, their contractors and project related employees.

Most of the potential impacts were found to be of medium rating significance. With the effective implementation the recommended management and mitigation measures, this will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away.

An Archaeological & Heritage Impact Assessment (AHIA) was done by a specialist for this ESA Study. The findings of this AHIA and the Scoping assessment (ESA) were deemed sufficient and concluded that no further detailed assessments are required to the ECC application.

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures.

It is therefore, recommended that the proposed mining activities may be granted an Environmental Clearance Certificate provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensuring compliance with these specific legal requirements.
- The Proponent and all their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Site areas where small-scale mining activities have ceased are rehabilitated, as far as practicable, to their pre-small-scale mining activities state.

10 REFERENCES

Booth, P. (2011). Environmental Conceptual Site Model Exercise: Source – pathway – receptor. WSP Global: Semantic Scholar.

Erongo Regional Council (2015). URL: http://www.erc.com.na/economy/infrastructure/

Kinahan, J. (2001) the presence of the past: archaeology, environment and land rights on the lower Cunene River. Cimbebasia 17: 23-39.

Kinahan, J. (1997) Epupa Hydropower Feasibility Study. Phase 2, Archaeological Survey. Commissioned by Burmeister & Partners on behalf of NAMANG. QRS Project Report No. 8

Manheimer. (2018). Retrieved from Tree Atlas of Namibia: http://treeatlas.biodiversity.org.na/viewspec.php?nr=20

Mendelsohn. (2006). A digest of information on key aspect of Otjozondjupa and Omaheke geography. Namibia: Research and Information Services of Namibia.

Mendelsohn. (2003). *The Atlas of Namibia: A Portrait of the land and its people.* pg 14 -18

Mendelsohn, J. (2003). Atlas of Namibia: A Portrait of the Land and its People. Windhoek: The Ministry of Environment and Tourism of Namibia.

Miller, R. McG. 1983a. The Pan-African Damara Orogen of South West Africa/Namibia, 431-515. In: Miller, R.McG. (Ed.) Evolution of the Damara Orogen of South West Africa/Namibia. Spec. Publ. geol. Soc. S. Afr., 11, 515 pp.

Moll, Eugene (2013). Watter Boom is dit?. ISBN 978-1-77007-832-1.

Namibia Statistics Agency (2014). 2011 POPULATION AND HOUSING CENSUS: Erongo Regional Profile. *Basic Analysis with Highlights*. URL: p19dptss1rt6erfri0a1k3q1mrhm.pdf (d3rp5jatom3eyn.cloudfront.net)

NSA. (2011). Retrieved from https://digitalnamibia.nsa.org.na/

NSA. (2011). Digital Namibia: Namibia statistics of Namibia. Retrieved February 17, 2021, from https://digitalnamibia.nsa.org.na/

Peter L Cunningham (2022) Vertebrate fauna and flora expected in the MCS 7646 – Arandis area (desktop study)

[Desktop Study – Baseline/Scoping]

SASSCAL WeatherNet, 2020. http://www.sasscalweathernet.org/weatherstat_monthly_we.php

Vigne. P (2000). Options for Livelihoods Diversification in Omaheke Region. A Report on a semi-structured interview Survey conducted by Oxfam Canada in Collaboration with the Ministry of Agriculture, Water and Rural Development. Windhoek: Oxfam Canada.

Wagner, P. A. (1910). The geology of a portion of the Grootfontein District of German South-West Africa. *South African Journal of Geology*, *13*(1), 107-128.

Kinahan, J. (2001) The presence of the past: archaeology, environment and land rights on the lower Cunene River. Cimbebasia 17: 23-39

Kunene Regional Council (2015). Development Profile 2015: The Ultimate Frontier. URL: https://kunenerc.gov.na/documents/53359/0/Dev_profile.pdf/e20fcb44-46e3-effa-6344-2189605e1c7f

Kunene Regional Council (2022). Constituencies and Settlements. URL: https://kunenerc.gov.na/hu/constituency-and-settlement-offices

MacCalman, H.R. & Grobbelaar, B.J. (1965) Preliminary report on two stone working OvaTjimba groups in the northern Kaokoveld of Southwest Africa. Cimbebasia 13: 1-39.

Mendelsohn, J. (2003). Atlas of Namibia: A Portrait of the Land and its People. Windhoek: The Ministry of Environment, Forestry and Tourism.

Namibia Statistics Agency – NSA (2011). 2011 Population and Housing Census Regional Profile, Kunene Region. URL: https://d3rp5jatom3eyn.cloudfront.net/cms/assets/documents/p19dptss1qamvueu17ju7vn12b81.pdf

Namibia Statistics Agency. (2011). 2011 Population and Housing Census

Tree atlas of Namibia. Retrieved from: https://treeatlas.biodiversity.org.na/viewspec.php?nr=27

ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR:

THE PROPOSED SMALL-SCALE MINING ACTIVITIES ON MINING CLAIMS (MCs) No. 73353 - 73362 LOCATED NEAR OKANGUATI, KUNENE REGION

Document Version: **Draft**

Author: Ms. Aili Iipinge **Reviewer: Ms. Rose Mtuleni** **Company: Excel Dynamic Solutions (Pty) Ltd** **Telephone: +264 (0) 61 259 530** **Fax2email: +264 (0) 886 560 836** **Email: info@edsnamibia.com / public@edsnamibia.com**	Client: **Papa Smurf Investment CC** Contact person: **Licky Richard Erasmus** Cellphone: **+264 (81) 128 1015** Postal Address: **P.O Box 22534 Windhoek, Namibia** Email: **abisai@dynamicnam.com**

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

1 INTRODUCTION

1.1 Project Background

Papa Smurf Investments CC (hereinafter referred to as the Proponent), intends to conduct small-scale mining activities on the Mining Claims (MCs) No. 73353 - 73362, located near Okanguati in Kunene region. The Mining Claims were granted by the Ministry of Mines and Energy (MME) on the 17 June 2022. However, the approval of these MCs are subjected to an Environmental Clearance Certificate (ECC). The 152.8255 ha MCs are located about 9 km near Okanguati in Kunene region as shown in Figure 1. Both MCs are for small-scale mining of industrial minerals (aggregates) as a commodity of interest.

All mining and extraction works are among listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC) under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. The relevant listed activities as per EIA regulations are (under):

Mining and Quarrying Activities

- *3.1 The construction of facilities for any process pr activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (and Mining Act), 1992.*
- *3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *3.3 Resources extraction, manipulation, conservation, and related activities.*

Subsequently, the Proponent has appointed Excel Dynamic Solutions (Pty) Ltd (EDS Namibia), an independent team of Environmental Consultants to apply for the project ECC (through the Competent Authority, Ministry of Mines and Energy (MME)), conduct the required Environmental Scoping Assessment process and compile the Scoping Assessment Report and this Draft Environmental Management Plan (EMP) compiled). These two documents together with associated documents are submitted for evaluation and consideration of an ECC to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT).

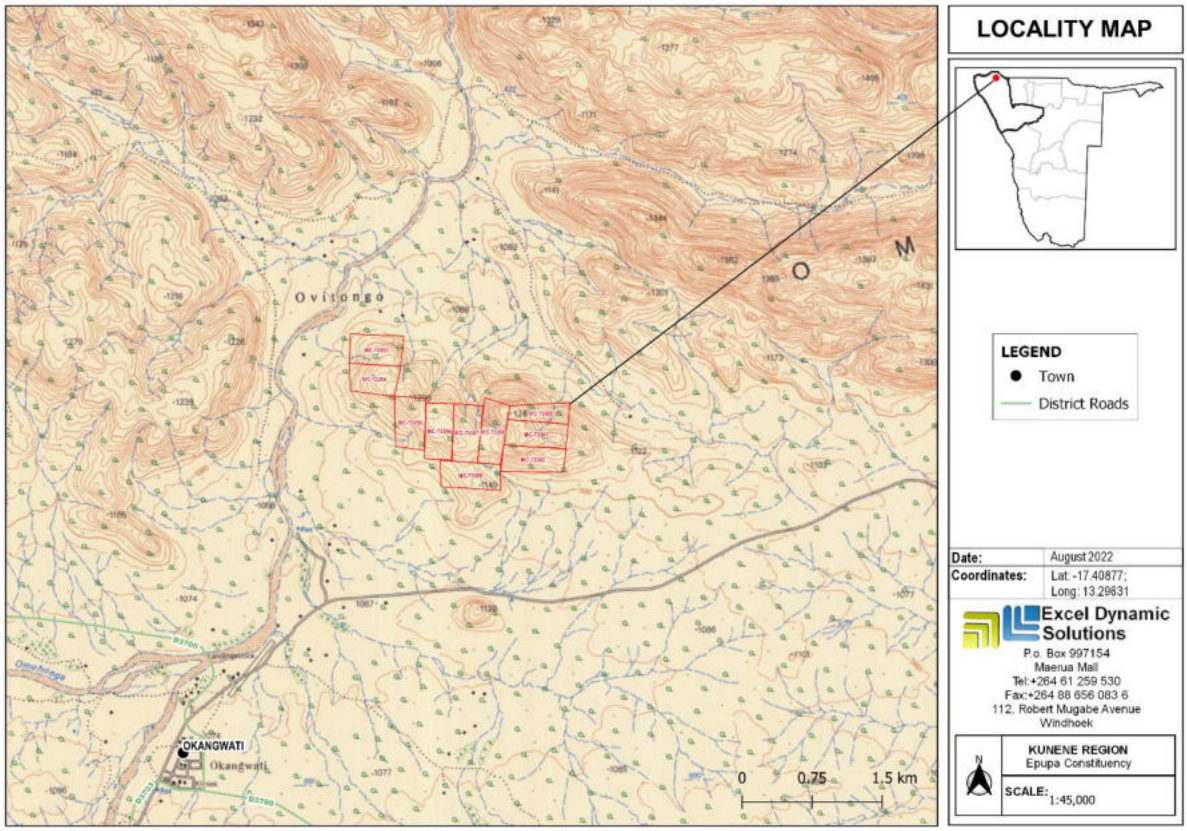

Figure 1: Locality map of MCs 73353 - 73362 near Okanguati, Kunene Region

1.2 Appointed Environmental Consultant and ECC Application

In order to ensure that the proposed activity is compliant with the national environmental legislation the project Proponent had to appoint an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd to undertake the required Environmental Assessment (EA) process (which entailed the compilation of this EMP) and apply for the ECC on their behalf.

The application for the ECC (**Appendix A**) was compiled and submitted to the Ministry of Environment, Forestry and Tourism (MEFT) as the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP) **(Appendix B),** an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

1.3 The Aim of the Draft Environmental Management Plan (EMP)

Regulation 8(j) of the EIA Regulations (2012) requires that a draft Environmental Management Plan (EMP) shall be included as part of the Environmental Assessment (EA) scoping report. A 'Management Plan' is defined as:

"…a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored."

An EMP is one of the most important outputs of the EA process as it synthesizes all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the EA process and the required mitigation measures to be implemented during operation. It is important to note that an EMP is a statutory document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and can be amended to adapt to address project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of the Draft EMP is to ensure that the proposed project activities are undertaken in an environmentally friendly and sustainably manner. This would be done through the effective implementation of recommended environmental management and mitigation measures contained in the EMP, for which the aim is to avoid and or minimize the adverse identified impacts while maximizing the positive impacts.

2 LEGAL OBLIGATIONS GOVERNING THE PROPOSED ACTIVITIES

Upon issuance of the ECC and obtaining any other necessary and required documentation, the Proponent will then prepare for the administrative and technical aspects needed for the actual small-scale mining works on the MCs.

The small-scale mining and associated activities will be required to adhere to certain local, regional, national as well as international legal framework (as detailed in the Scoping Report). The legal requirements provided herein are these in terms of permits or licensing that the Proponent will need to obtain prior to the site works and or renewal of permits throughout the mining phase. These legal requirements are provided under **Table 1**.

Table 1: Applicable and required permits/authorizations/licenses for the proposed small-scale mining activities

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
Environmental Management Act (EMA) No. 7 of 2007	The Act requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). The Act details principles which are to guide all EAs.	The EMA and its regulations should inform and guide this ESA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. Contact details at the Department of Environmental Affairs and Forestry (DEAF), Ministry of Environment, Forestry and Tourism (MEFT) **Office of the Environmental Commissioner (Attention: Mr. Timoteus Mufeti)** **Tel: +264 (0) 61 284 2701**
Environmental Impact Assessment (EIA) Regulations Government Notice 28-30 (Government Gazette 4878))	Details requirements for public consultation within a given environmental assessment process (Government Notice 30 Section 21). Details the requirements for what should be included in a Scoping Report (Government Notice 30 Section 8) and an Assessment Report (Government Notice 30 Section 15).	
Minerals (and Mining) Act (No. 33 of 1992)	Section 48 (3): To enable the Minister to consider any application referred to in section 47 the Minister may (b) require the person concerned by notice in writing to (i) carry out or cause to be carried out such environmental impact studies as may be specified in the notice. Section 54(2): details provisions pertaining to the decommissioning or abandonment of a mine.	The Proponent should ensure that all necessary permits/authorization for these MCs are obtained from the Ministry of Mines and Energy (MME). Contact person and details at the MME (Mining Commissioner) **Mr. Erasmus Shivolo** **Tel: +264 61 284 8167**

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
	Under this Act (Section 51 (1a)), holder of a mineral license cannot exercise any rights on a private land until the holder has entered into an agreement with the owner regarding payment of compensation.	The Proponent should timely enter into and sign access and land use agreement (consent) with respective affected (private) farm owners or representatives of the occupiers of land .
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The Proponent should obtain the necessary authorisation form the MME for the storage of fuel on-site. **Mr. Carlo Mcleod** (Ministry of Mines and Energy: Acting Director – Petroleum Affairs) **Tel: +264 61 284 8291**
Forestry Act 12 of 2001, Amended Act 13 of 2005	Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22 (1)). The Act prohibits the removal of and transport of various protected plant species.	Should there be protected plant species, which are known to occur within the actual project site footprint, and require to be removed, a Permit should be obtained from the nearest Forestry Office (MEFT) prior to removing them. Contact Details at MEFT (Forestry Division Head Office), **Director of Forestry: Mr. Johnson Ndokosho** **Tel: +264 (0) 61 208 7320** johnson.ndokosho@meft.gov.na
National Heritage Act (Act No. 27 of 2004)	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration, or excavation of heritage sites or remains, while Section 48 sets out the	**The Proponent is advised to make an application to the National Heritage Council for a Consent to allow Detailed Archaeological and Heritage Assessment Study of the MCs area**.

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
	procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Section 51 (3) sets out the requirements for impact assessment. Should any objects of heritage significance be identified during the site clearing and excavations, the work must cease immediately in the affected sites and the necessary steps taken to seek authorisation from the Council.	Contact: The Director of the National Heritage Council of Namibia (NHC): **Mrs. Erica Ndalikokule** OR Regional Heritage Officers at the NHC **Mr. Manfred Gaeb and Ms. Agnes Shiningayamwe** **Tel: +264 (0) 61 301 903**
The National Monuments Act No. 28 of 1969	The Act enables the proclamation of national monuments and protects archaeological sites.	
The Road Traffic and Transport Act No. 52 of 1999 and its 2001 Regulations	Provides for the control of traffic on public road and the regulations pertaining to road transport, including the licensing of vehicles and drivers.	**Mr Eugene de Paauw** (Roads Authority- specialist Road legislation), Tel: +264 (0) 61 284 7072

3 DRAFT EMP IMPLEMENTATION, ROLES & RESPONSIBILITIES

As the project Proponent Petrichor Resources Mining is ultimately responsible for the implementation of the EMP. However, they may delegate this responsibility at any time, as they deem necessary during the project phases (usually an environmental control officer or safety, health, and environmental person). The roles and responsibilities of all the parties involved in the effective implementation of this EMP are as follows:

3.1 Competent Environmental Monitoring Authorities (DEAF and Others)

The Department of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT) as the environmental custodian is responsible for enforcing compliance with the EMA, its regulations and full implementation of this EMP. The authority is also responsible for the reviewing of bi-annual reports submitted by the Proponent and grant ECC renewal after every 3 years following an environmental audit.

Further Monitoring institutions include but not limited to:

- **The National Heritage Council of Namibia:** for archaeological and heritage resources (sites and objects).
- **Ministry of Mines and Energy:** for compliance to the relevant small-scale mining requirements, including petroleum products' storage and handling on site.

3.2 The Small-Scale Mining Manager (or the Proponent)

This Manager who may also be the Proponent, will be responsible for the following:

- Development and management of schedules for daily activities in compliance with the EMP.
- Managing/overseeing the implementation of this EMP and updating and maintaining it when necessary.
- Ensure that relevant commitments contained in the EMP Action Plans are adhered to.
- Ensure the relevant staff is trained in procedures entailed in their duties.
- Through consultations and cooperation with the ECO/SHE officer, issuing fines to individuals who may be in breach of the EMP provision and if necessary, removing such individuals from the site.
- Setting up and managing the schedule for the day-to-day activities.
- Ensuring all incidents are recorded and documented.

- Undertaking an annual review of the EMP and amending the document when necessary.

3.3 Safety, Health and Environmental (SHE) or Environmental Control Officer (ECO)

The SHE or ECO (as appropriate) will be responsible for ensuring that project activities are completed on time, efficiently and sustainably. The ECO/SHE Officer's duties and responsibilities will include:

- The SHE Officer will be responsible for the following activities:
- Planning and carrying out site inductions to the workers on-site and visitors to the worksite(s).
- Ensuring compliance with relevant environmental and related authorisations and license conditions.
- Ensure that the requirements of the EMP are carried out during applicable activities throughout the project life span.
- Monitor the overall implementation of the EMP.
- Identifying and appointing of appropriately qualified specialists (were necessary) to undertake the programmes in a timeous manner and to acceptable standards.

3.4 Public Relation Officer (PRO)

The Public Relation Officer will be responsible for the following tasks:

- Liaison between the affected conservancy members, farmers (property owners) and/or occupiers of land as well, other stakeholders, and Petrichor Resources Mining
- Ensure effective communication with stakeholders (affected farmers or landowners or occupiers of land), media (if necessary) and the public.
- Managing public relations issues.
- Preparing and submitting public relations reports, if required.
- Collaborating with personnel and maintaining project-related open communication among personnel.
- Cooperate with all relevant interested and affected parties/stakeholders.

3.5 Archaeology: Chance Finds Procedure (CFP) Implementation Roles

The following personnel have been assigned responsibilities as per the Chance Finds Procedure **(Appendix 1)** as per the provided Archaeological and Heritage Assessment Studies conducted for the proposed activities:

A. Operator

To exercise due caution if archaeological remains are found

B. Foreman

To secure site and advise management timeously

C. Superintendent

To determine safe working boundary and request inspection

D. Archaeologist

To inspect, identify, advise management, and recover remains.

The Proponent should assess these commitments in detail and should acknowledge their obligation to the specific management actions detailed in the Tables of the following sections.

4 ENVIRONMENTAL MANAGEMENT & MITIGATION ACTION PLANS

The environmental management and mitigations measures (management plan actions) provided to the potential adverse impacts associated with the proposed project and its activities are presented under this chapter. The aim of these plan actions is to avoid these potential impacts where possible, and where avoidance is impossible, measures are provided to reduce the impacts' significance (as presented under the impacts' assessment chapter of the Scoping Report).

4.1 Key potential Negative/ (Adverse) Impacts

The summary of key identified potential adverse impacts for which the measures have been developed are as follows:

- Potential disturbance of existing pastoral systems,
- Physical land / soil disturbance,
- Impact on local biodiversity (fauna and flora) and habitat disturbance,
- Potential impact on water resources and soils particularly due to pollution,
- Air quality issue: potential dust from surface excavation,
- Potential occupational health and safety risks associated with the movement / operating of machinery and equipment on site,
- Vehicular traffic safety and impact on services infrastructure such as local roads,
- Vibrations and noise associated with mining activities may be a nuisance to locals,
- Environmental pollution through different types of waste generated on the site,
- Impact on archaeological or cultural heritage resources,
- Potential social nuisance and conflicts between affected farmers / landowners and or neighbouring land users and Proponent.

4.2 The Management and Mitigation of Potential Key Negative Impacts

The management and mitigation measures (action plans) for the potential adverse impacts are presented in **Table 2** for the planning, and small scale (operational and maintenance) phases.

The required management and mitigation plan actions have been presented under **Table 2** in terms of (a) Environmental aspect and issues for which management actions are required, (b) proposed impact mitigation measures, (c) key performance indicator (KPI) for monitoring success levels of management actions, (d) responsible person(s) for implementing the proposed management actions, (e) resources required for implementing management actions and monitoring and (f) implementation timeframes for the proposed management actions.

Table 2: Management and Mitigation Measures for the Planning, small-scale mining Phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
PLANNING PHASE						
EMP implementation and training	Lack of EMP awareness and implications thereof	-A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to respective works on sites. -An EMP non-compliance penalty system should be implemented on site. -The Proponent should appoint an SHE Officer to be responsible for managing the EMP implementation and monitoring.	-All required Plans and systems are compiled and in place Safety, Health and Environmental (SHE) Officer is appointed	-Proponent	-Records of EMP implementation Plans and Systems	Pre-small-scale mining (project activities)
Authorizations	Lack of Agreements, Permits/ Licenses	-All the required agreements and licenses or permits should be applied for and signed, respectively before commencement of work on the MCs, or as required. -The permits, agreements referred to herein include land access & use (by Traditional Authority, conservancy management and Okanguati	-Applicable permits and licenses to obtained from relevant authorities and kept on site for records keeping and future inspections -Agreements signed and obtained from landowners or	-Proponent	-Permits and Licenses	Prior to small-scale mining

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		Constituency office or property owners or representatives of the occupiers of land) for small-scale mining by the landowners/custodian, as well as petroleum storage permits from Ministry of Mines and Energy (MME).	occupiers of land on time, **minimum of 2 months prior to planned commencement date of onsite works** **-Onsite petroleum storage permits obtained**		Signed Land Access and Use Agreements	
Communication between the Proponent and landowners or occupiers of land	Lack of communication (proper liaison) between farmers and Proponent with regards to land use	-The Proponent should appoint a Public Relation Officer (PRO) to liaise with the farmers/landowners. -The PRO should be introduced to the farm/landowners and his or her contact details provided to them prior to undertaking activities for easy communication during the small-scale mining activities. -A clear communication procedure/plan which should include a grievance mechanism should be compiled	-A PRO is appointed -Ongoing Stakeholders' and Public Engagement & Consultation throughout the project cycles, when and as required	-Proponent	-Complaint's logbook -PRO contact details to be provided to the affected farmers/landowners -Records of Stakeholders' and Public Consultations	PRO appointment (Prior to project activities) and their responsibilities throughout the rest of the project phases
Employment	Creation of employment opportunities to the locals	-Preference of local people for employment for jobs should be implemented, i.e., permanent residents from the local area (in and around Okanguati) should be employed for the unskilled	-Number of locals employed for small-scale mining activities -Consultation with the constituency	-Proponent in collaboration with the small-scale mining Manager (if necessary)	-Record of employees -Constituency Council office to assist in identifying unemployed people	Pre-project activities and when necessary, throughout the small-scale mining phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		labour. Out-of-area employment should be justified, for example by the unavailability of local skills only. -Equal opportunity should be provided for both men and women, when and where possible.	councillor's office and local development committee -Notification via the Constituency Office			
Specialised procurement of services	Small-scale mining contractors and other services providers	-All services related to mining activities that the Proponent may need, preference should be given to local providers of such services. If not available locally, the services search should be extended to a regional level (Kunene Region) and lastly, nationally, or international, if all efforts truly yield no success. -Opportunities such as small tenders for instance should be awarded through the established committee.	-Number of hired contractors	-Proponent	-Record of hired or contracted companies or services providers -Local Development Committee -Office of the Constituency Councillor	Pre-project activities and when necessary, throughout

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
Corporate Social Responsibility (CSR)	Social commitment failures	-Consider providing and or donating services such as water supply boreholes to the community they are operating in through the identification of people in need. -Infrastructure should be donated to the community through the Traditional Authority or the Regional Council to the needy communities. -The project owner (Proponent) should fulfil their promises of CSR, upon proper consultation with the local development committees to establish what the community really needs.	-Visible commitment to ensure that the local community is benefitting from the project	-Proponent	-Office of the Constituency Councillor -Local Development Committee to monitor implementation of the CSR	Throughout the small-scale mining phase
SMALL-SCALE MINING PHASE						

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP trainings should be provided to all new workers on site and to old workers (as a refresher) every 6 months. -All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their respective work -The implementation of this EMP should be monitored. -The site should be inspected, and a compliance audit done throughout **the project activities, monthly and compliance monitoring reports submitted to the DEAF bi-annually.** -An EMP non-compliance penalty system should be implemented on site.	-Compliance monitoring conducted monthly for the small-scale mining phase and should be recorded -EMP Refresher training for employees/workers every 6 months -Timely renewal of the Environmental Clearance Certificate (ECC) every 3 years	-SHE Officer	-Monitoring reports by the SHE Officer or ECO -ECC renewed on time -Records of EMP training conducted	Throughout the mining phase
Pastoral land	Impact on grazing areas	-Any unnecessary removal or destruction of grazing land, due to mining activities should be avoided. -Vegetation found on the site, but not in the targeted mining	-Little damage on grass cover and vegetation -Maximum effort implemented to curb	-Small-scale mining Manager -SHE Officer	-None	Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		areas should not be removed but left to preserve biodiversity and grazing land. -Workers should refrain from driving off road and creating unnecessary tracks that may contribute to soil erosion and loss of grazing land. -Environmental awareness on the importance of the preservation of grazing land for local livestock should be provided to the workers	loss of grazing areas with the MCs.			
Land use (physical soils)	Land degradation	-Overburden should be handled more efficiently during small-scale mining works to avoid erosion when subjected erosional processes. -Prevent creation of huge piles of waste rocks by performing sequential backfilling. -Stockpiled topsoil and overburden waste rocks should be used to backfill the explored and disturbed site areas/spots. -Soils that are not within the intended and targeted footprints of the site areas should be left undisturbed and	-No proliferation of informal vehicle tracks. -No new erosion gullies.	-small-scale mining Manager -SHE Officer	-Complaint's logbook	Throughout the small-scale mining phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		soil conservation implemented as far as possible. -Project vehicles/machinery should stick to access roads provide and or meant for the project operations but not to unnecessarily create further tracks on site by driving everywhere resulting in soil compaction				
Water resource	Over-abstraction (Water demand and availability)	-When necessary, make provision for water carting to site to augment onsite water supplies for small-scale mining. -Water should be efficiently used by implementing water saving measures such as recycle and re-use where necessary and possible. This includes using water for cooling mining equipment for the cleaning of project equipment. -Water conservation awareness and saving measures training should be provided to all the project workers so that they understand the importance of	-Proof/ recording/ quantification of water saving efforts -No complaints of water level drops and short in supply from local water users	- small-scale mining Manager -SHE Officer	-Permit issuance (or water purchasing agreements for carting to site)	Water supply agreements to be obtained prior to small-scale mining phase Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		conserving water and become accountable.				
Soil and water resources	Soil and water resources pollution	-Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching water resources bodies. Some of the soil control preventive measures that can be implemented include: (a) Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites. (b) Maintain equipment and fuel storage tanks to ensure that they are in good condition thus preventing leaks and spills. (a) The oil storage and use locations should be visually inspected for container or tank condition and spills. (b) Maintain a fully provisioned, easily accessed spill kit. Spill kits should be located throughout the active project	-No complaints of pollutants on the soils and eventually in the water due to small-scale mining activities -No visible oil spills on the ground or contaminated/polluted spots.	-SHE Officer	-Complaint's logbook -Waste containers -Non-permeable material to cover the ground surface at areas where hydrocarbons and potential pollutants are utilized.	Throughout small-scale mining phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		sites contain the floor dry absorbent material and absorbent booms, pads, mats. These would be suitable for ground surface areas that are covered mainly by hard rocks. -All project employees should be sensitized about the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures. -The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible. -Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired. -Small-scale mining site areas where hydrocarbons will be utilized, the surface should be covered with an impermeable plastic liner (e.g., an HDPE liner), carefully placed to minimize risk of puncturing, to				

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		prevent any spillages from getting into direct contact with the soils and prevent eventual infiltration into the ground. -Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated on site. -In cases of accidental fuel or oil spills on the soils from site vehicles, machinery and equipment, the polluted soil should be removed immediately and put in a designate waste type container for later disposal as per the preceding bullet point. The removed polluted soil should either be completely disposed of or cleaned and returned to where it was taken from on site or can be replaced with a cleaner soil. -Although fuel (diesel) required for small-scale mining equipment will be stored in a tank mounted on a mobile trailer, drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills along the				

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		tank trailer path/route around the small-scale mining sites are cleaned on time (soon after the spill has happened). -Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility. -Washing of equipment contaminated hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources. -Toilet water should be treated by discharging into chemical toilets and periodically emptied out before reaching capacity and transported to a wastewater treatment facility.				
Biodiversity	Loss of Fauna and Flora	**Flora:** -No onsite vegetation should be cut or used for firewood related to the project's operations. The Proponent should provide firewood for his onsite camping	-Incident reports of illegal hunting of wildlife by the project crew/workers.	-SHE Officer	-Complaint's logbook	During site set up, and throughout the small-scale mining phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		workers from authorized firewood producer or seller. -Even if a certain shrub or tree is found along small-scale mining sites, this does not mean that it should be removed. Therefore, care should be taken when exploring without destroying the site vegetation. -Design access roads appropriately in a manner that disturbs minimal land areas and vegetation as possible. -Make use of the existing road network as much as possible and avoid off-road driving. -Vegetation clearing to be kept to a minimum. The vegetation of the site is largely low and open and therefore whole-sale vegetation clearing should only be applied where necessary and within the development footprint. -Formulate and implement suitable and appropriate operational management guidelines for the cleared areas. Incorporated in the guidelines are the progressive	-No complaints of livestock theft, snaring or killing of livestock and wildlife by the project personnel -No disturbance to unmarked areas. No complaints from locals regarding unauthorised vegetation removal or cutting down of trees			

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		rehabilitation measures. These should consider: (a) Post closure land-use measures and/or establishment of self-sustaining indigenous vegetation (b) Erosion management measures -Vegetate the top surface of the cleared areas as soon as it is practicably possible. -Cleared areas should be revegetated with seed or plants of locally occurring species. -Regular monitoring for alien plants within the project's footprint during operations. -No muddy and dirty equipment should be brought onto site as this is likely to carry seed of alien species. **<u>Fauna (domestic and wild)</u>** -Workers should refrain from disturbing, killing or stealing domestic and wild animals and killing small soil and rock outcrops' species found on site.			-Anti-poaching unit of the Namibian Police Force -MEFT's Wildlife Protection Unit	

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Poaching (illegal hunting) of wildlife from the area is strictly prohibited. -Environmental awareness on the importance of biodiversity preservation should be provided to the workers.				
Air Quality	Air quality (dust)	-Small-scale mining vehicles should not drive at a speed more than 40 km/h to avoid dust generation around and within the site area. -The Proponent should ensure that the small-scale mining schedule is limited to the given number of days of the week, and not every day. This will keep the vehicle-related dust level minimal in the area. -Dust control measures such as reasonable amount of water spray should be used on gravel roads and near the small-scale mining site to suppress the dust that may be emanating from certain mining -areas on the MCs. -Dust masks, eye protective glasses and other respiratory personal protective equipment	-Dust suppression measures implemented -Visible efforts to curb dust	-Small-scale mining Manager -SHE Officer	-Grievance logbook -Dust suppression water tanks	Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		(PPE) such as face masks should be provided to the workers on site, where they are exposed to dust. -The impact mitigation measures should be covered in the relevant farm access agreement as required by law on commercial farms. This should also apply to resettled/communal farms, if any. -Excavating equipment should be regularly maintained to that excavation efficiency and so to reduce dust generation and harmful gaseous emissions.				
Waste management	Environmental pollution	-Workers should be sensitized to dispose of waste in a responsible manner and not to litter. -All domestic and general operational waste produced daily should be contained until such that time it will be transported to designated waste sites. -No waste may be buried or burned on site or anywhere	-A register of all waste generated on site is kept on site. -All waste disposal permits from relevant authorities are available on site. -No littering on and around the project site	-Proponent -Small-scale mining Manager -SHE Officer	-Funds to acquire waste storage bins/ drums; and transport all waste from the site. -Waste storage containers	Throughout the phases.

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		else and no wastes left on the sites. -The small-scale mining site should be equipped with separate waste bins for hazardous and general/domestic waste. -Hazardous waste, including emptied chemical containers should be safely stored on site where they cannot be accessed and used by uniformed locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e., on unapproved waste sites. -Oil spills should be taken care of by removing and treating soils affected by the spill. -A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.				

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Careful storage and handling of hydrocarbons on site is essential. -Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater. -An emergency plan should be available for major/minor spills at the site during operation activities (with consideration of air, groundwater, soil and surface water) and during the transportation of the products(s) to the sites.				
	Wastewater generated by small-scale mining workers living on-site.	-Washing of hydrocarbon contaminated equipment, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources. -Sewage waste should be stored as per the portable chemical toilets supplied on site	-Adequate toilet facilities on site.	-Small-scale mining Manager -SHE Officer	-Chemical toilets, waste treatment agents/chemicals -Wastewater discharge permits	At site setup and throughout small-scale mining phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		and regularly disposed of at the nearest wastewater treatment facility. -Emptying of chemical toilets according to the manufacturer's specifications. -All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites in accordance with MAWLR's Water Environment Division standards on wastewater discharge into the environment. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the local groundwater quality.				
Noise	Noise	-Noise from project vehicles and equipment on the working sites of the MCs should be at acceptable levels. -Small-scale mining hours should be restricted to between 08h00 and 17h00 to avoid noise and vibrations generated	-Noise generating activities are limited to weekdays only. -PPE provided to workers operating noisy equipment and in noisy site areas.	-Small-scale mining manager -SHE Officer	-Clearly written placards with operational hours in a day placed at one of the visible access roads to sites	Throughout the project phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		by small-scale mining equipment and the movement of vehicles before or after hours, thus disturbing the tranquillity in the area during the night or early morning hours. -When operating the machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise. -The transportation of small-scale mining materials, equipment and machinery should be limited to once or twice a week only, but not every day. -Target small-scale mining sites that may be found to be within less than 1 km from the residences (farmhouses) should be avoided at all costs. This is done to preserve tranquillity of the residents.				
Health and Safety	Occupational & Community Health and Safety	-The Proponent should commit to and make provision for bi-annual full medical check-up for all the workers at site to monitor	-Compilation of Comprehensive Health and Safety Plan	-Small-scale mining Manager	-Health and Safety Policies -Funds to acquire health and safety	

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		the impact of project related activities on them (workers). -As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs. -When working on site, employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. -Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible. -Drilled boreholes that will no longer be in use or to be used later after being drilled should be properly marked for visibility and capped/closed off. -Ensure that after completion of small-scale mining holes, drill cuttings are put back into the	-Regular health screening of workers -Bi-annual health and safety audits done. -All onsite workers and visitors equipped with PPE.	-Proponent -SHE Officer	related equipment. and to pay for employee medical services -First Aid training for at least 1 personnel at each work site	

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		hole and the holes filled and levelled. -An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Workers should not be allowed to drink alcohol prior to and during working hours nor allowed on site when under the influence of alcohol as this may lead to mishandling of equipment which results into injuries and other health and safety risks. -The site to be equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site.				
Fires	Accidental fire outbreak	-Portable fire extinguishers should be provided on site. -No open fires to be created by project personnel. -Potential flammable areas and structures should be marked as such with clearly visible signage.	-No Fires recorded (due to presence of workers)	-Small-scale mining Manager -SHE Officer	-Fire extinguishers (1 per vehicle) and 1 per working site	Throughout the phases
Archaeology and heritage	Accidental disturbance	-The management and mitigations or recommendation	-Preservation of all artefacts that are	-Small-scale mining Manager	-Technical Consultant	-Archaeologist to be present on-

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
	and destruction of archaeological or heritage objects and sites	to minimize impact on archaeological and heritage resources **are not available, pending a Detailed/Comprehensive Specialist' Study**. The only provisional recommendation to the proposed Detailed Study hereto is that: The Proponent is advised to make an application to the National Heritage Council for a Consent to allow a Detailed Assessment of the area in relation to the proposed activity believed to be an archaeological or heritage site.	discovered around project area -Cessation of work upon discovery/unearthing of unknown objects	-SHE Officer -Archaeologist	(Archaeologist to help identify and advise on heritage object discovery) -Salvage equipment -Flag tapes -GPS (site marking)	site during excavations
Social conflicts	Job seeking, and differing norms and cultures	-The Proponent should prioritize the employment of more local people, and only if necessary and due to lack of skills in the area, out-of-area people can be given some of the work. This is to avoid the influx of outsiders into the area for works that can be done the locals. -The locals to be employed during the project phases should be provided with the necessary training of skills	-No complaints of property theft or damage related to project workers -More local workers who are familiar with the values, and way of living in the area	-Small-scale mining Manager -SHE Officer	-Grievance logbook -Employment Code of Conduct	Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		required for the project to avoid bringing in many out-of-area employees. This way, skills development and transfer is ensured in the nearby communities. -The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. -Out-of-area workers that may be employed (due to their unique work skills) on site should be sensitized on the importance of respecting the local values and norms, so that they can co-live-in harmony with the local communities during the duration of their employment on site.				
	Property intrusion and disturbance	-The Proponent should inform their workers on the importance of respecting the locals' properties by not intruding or damage their homes, fences or snaring and killing their livestock.	-Project workers are educated on what is expected of them while on site in relation to the private and public properties -No complaints of damage to private or	-Small-scale mining Manager -PRO -SHE Officer	-Anti-property intrusion or damage pamphlets or placards placed at every small-scale mining site	Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Any workers or site employees that will be found guilty of intruding peoples 'privately owned properties should be called in for disciplinary hearing and/or dealt with as per their employer' (Proponent)'s code of employment conduct -Site workers should be advised to respect the community and local's private properties, values, and norms. -No worker should be allowed to wander in people's private yards or fences without permission. -Site workers are not allowed to kill or in any way disturb local livestock. -No worker should be allowed to, without permission cut down or damage trees belonging either the farm owner, the neighbouring farms or in the already scarce community vegetation.	public properties by project workers or activities		-Fines for any intentional damage or disturbance of private or public property	
Vehicular Traffic	Traffic safety	-The transportation of small-scale mining materials, equipment and machinery should be limited to once or	-Site access road permits obtained, and requirements fulfilled	-Small-scale mining Manager -SHE Officer	-Vehicular traffic compliance to be included in the annual	Throughout the phases.

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		twice a week only, but not every day to reduce the pressure on local roads. -The heavy truck loads should comply with the maximum allowed speed limit for respective vehicles while transporting materials and equipment/machinery on the public and access roads (40km/h). -The potential carted water to the site (from other source of water supply) should be done once or twice a week in container that can supply and store water for most of the week, thus reducing the number of water-carting trucks on the road daily. -Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses and adhere to the road safety rules. -Drivers should drive slowly (40km/hour or less) and be on the lookout for livestock and wildlife as well as residents/travellers.	-No complaints from members of the public regarding vehicular traffic issues related to the project -All personnel operating the project vehicles and machinery are appropriately licensed and possession of valid driving licenses. -The vehicles are driven at the recommended speed. -Demarcated areas for parking, offloading, and loading zones are on sites		environmental audit reporting	

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-The Proponent should ensure that the site access roads are well equipped with temporary road signs conditions to cater for vehicles travelling to and from site throughout the project's life cycle. -Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents owing to mechanical faults. -Vehicle drivers should only make use of designated site access roads provided and as agreed. -Vehicle's drivers should not be allowed to operate vehicles while under the influence of alcohol. -Sufficient parking area for all project vehicles should be provided for and clearly demarcated on sites. -The Proponent should make provision for safe materials and equipment offloading and loading areas on sites. -No heavy trucks or project related vehicles should be				

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		parked outside the project site boundary or demarcated areas for such purpose. -To control traffic movement on site, deliveries from and to site should be carefully scheduled. This should optimally be during weekdays and between the hours of 8am and 5pm. -The site access road(s) should be upgraded to an unacceptable standard to be able to accommodate project related vehicles and access permits obtained from the Roads Authority.				
Local resources and services infrastructure	Overuse of existing roads and water resources	-The Proponent should consider re-using and recycling water on site to reduce the abstraction of fresh water from the local sources. -The heavy trucks transporting materials and services to site should be scheduled to travel at least twice or thrice a week to avoid daily travelling to site, unless on cases of emergencies. -The Proponent should consider frequent maintenance	The local roads are frequently maintained by the Proponent and movement of heavy trucks is limited -Water saving measures are implement	-Proponent -Small-scale mining Manager	-Road maintenance excavator/bulldozer -onsite water storage tanks	Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		of local roads around their operations to ensure that the roads are in a good condition for other roads users from and outside the area				

4.3 Rehabilitation and Decommissioning measures

Successful rehabilitation requires careful consideration of the local ecological context in combination with rehabilitation goals. The most important steps in undertaking a successful rehabilitation are planning and environmental awareness (environmental education) on the importance of progressive rehabilitation (or post-activity rehabilitation) and its importance to the environment. Furthermore, to successfully implement the planned rehabilitation, practically, this will depend on a few factors, namely the rehabilitation program, characteristics of the site, nature of disturbance, rehabilitation methods, as well as resources availability.

Rehabilitation of the MCs site may include the re-vegetation of areas with species consistent with surrounding vegetation; refilling of trenches in such a way that subsoil is replaced first and topsoil replaces last. The management and mitigation measures (action plans) for the rehabilitation and decommissioning of explored sites and site works, respectively are presented in **Table 3**.

Table 3: Management and Mitigation Measures to rehabilitate the explored sites and decommissioning of the site works

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
Rehabilitation	Explored and damaging of site land and soils	-All small-scale mining boreholes related to the project activities and no longer needed should be capped and backfilled if this is what the farm owners prefer.	-Capped boreholes and backfilled pits -No stockpiled topsoil (topsoil is levelled after completion of each work)	-Proponent	-Record pits excavated (if any)	Pre-site abandonment

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Utilize stockpiled subsoil and topsoil to fill the excavated pits/trenches progressively back, i.e., stockpiled topsoil should be levelled during small-scale mining activities. -Backfilling of all excavated pits and trenches with loose materials but not only be filled with sand alone, as wind will scours the sand and re-establish the holes. -Provision of both financial and technical resources for progressive rehabilitation and post-small-scale mining activities should be made.	-Visible signs of stockpiled topsoil -Annual update of finances reserved for decommissioning and rehabilitation		-Waste containers on sites -Photo records of backfilled sites -Records of campsite and other structures onsite Records of finances set aside for decommissioning activities	
Decommissioning	Structures and infrastructure	-All accumulated waste (hazardous, solid, and general) up until the cessation of small-scale mining activities will be removed site and transported to designated off site waste management facilities -Removal of project vehicles and equipment from the site and taken to designated parking facility off site. -All project support structures such as ablution facility (toilet and washroom system), campsites, temporary field	-No sign of waste or littering seen on site and around site areas -project structures and infrastructure Campsite dismantled, and materials taken away from site	-Proponent		

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		offices and storage containers/tanks shall be demolished, and the waste taken to designated sites. The site areas on which these structures were set up will be rehabilitated to pre-operational state.				

4.4 Environmental and Social Monitoring

To support and ensure that the proposed management and mitigation measures are achieving the desired results throughout the project phases, a monitoring plan must be implemented alongside the mitigation plan. **Table 4** presents the required environmental and social monitoring in terms of each potential impact, parameters to be monitored and monitoring objective. Included in the same Table is the reporting structures for monitoring, frequency, methods to be used, reporting structure, any thresholds that apply and relevant recommended actions (OMAVI, 2020).

The same Table also presents the monitoring implementation for the small-scale mining phase, given the similarity in activities, hence the ‘’reporting structure’’ column presented as ‘’Small-scale mining manager’’. Therefore, the monitoring exercise will be done according to the relevant project stage or phase. In other words, for monitoring of mitigation implementation in the small-scale mining phase, the reporting structure ends with the Small-scale mining Manager.

Table 4: Monitoring requirements to manage and mitigate the potential adverse impacts (updated after Resilient Environmental Solutions, 2019)

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Water and soil pollution									
Soil pollution by hydrocarbon (fuel and lubricant spills)	Complaints from farmers or occupiers of land within the project sites	To prevent contamination of site soils	No complaints from farmers about visible oil spills	Inspection of complaints logbooks	Weekly	SHE officer	SHE Officer> Small-scale mining Manager	A logged complaint	Further consultations with the farm/landowners or custodian
Wastewater generated by small-scale mining workers living on-site.	Open defecation and urination.	To prevent environmental pollution	Adequate toilet facilities on site. Complaints from the public about open defecation and urination.	Visual observation. Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	A logged complaint	Clean-up of affected areas.
Soils									
Loss of topsoil	Increased loss of soil	To prevent loss of topsoil	No proliferation of informal vehicle tracks. No new erosion gullies	Visual observation	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	Proliferation of new vehicle tracks Formation of new gullies in work areas	Rehabilitation of affected explored areas
Air quality									
Increase in dust generation, which might negatively affect occupational and residential	Complaints from public about increased in dust generation.	To reduce public complaints and prevent negative changes in air quality due to	No complaints from the public about increased dust generation.	Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	A logged complaint	Dust suppression around working areas to reduce fugitive dust

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
respiratory health.		small-scale mining activities							
Hydrocarbon emissions from vehicles	Complaints from the public about increased vehicles fumes	Same as above.	No complaints from the public about increased vehicle emissions	Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	A logged complaint	Servicing of vehicles and machinery by a certified service provider
Poaching (Illegal hunting)									
Illegal hunting of wildlife	Reported poaching incidents by projects team	To prevent illegal hunting of wildlife	Incidents reports of illegal hunting of wildlife by small-scale mining workers.	Consultation with the local Police Service for reported incidents of poaching.	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager> local Police Service (Anti-poaching Unit)	An incidents report logged with the local Police Service	Appropriate action will be decided by the local Police Service
Habitat loss (Biodiversity)									
Localised loss of habitat and vegetation	Loss of habitat	To prevent loss of habitat outside areas of interest	No disturbance to unmarked areas within the project area	Visual observation	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	Vegetation clearance outside of marked areas.	Rehabilitation of affected areas to the satisfaction of the SHE Officer
Occupational and Community Health and Safety									
No health and safety plan for small-scale mining activities.	Compiled health and safety plan for small-scale mining activities.	To prevent health and safety impacts	No significant health and safety incidents (i.e., serious injuries or loss of life)	Visual observation Inspection of complaints logbooks	Daily/ weekly	SHE Officer and Small-scale mining Manager	SHE Officer> Small-scale mining Manager	Health and safety incident	Remedy the consequences

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Potential increase in outbreak of wildfires due to project activities	Occurrence of wildfires	To prevent environment damage caused by wildfires	No wildfires recorded (due to presence of small-scale mining workers)	Visual observation	Daily	SHE Officer	SHE Officer> Small-scale mining Manager > local police service	Outbreak of wildfires due to the small-scale mining workers	Rehabilitation of affected areas
Archaeology and cultural heritage (to be updated upon completion of the required Detailed Archaeological and Heritage Assessment Study)									
Potential disturbance of archaeological and cultural heritage resources	Presence or unearthing of archaeological or cultural heritage resources	To prevent destruction of artefacts and sites	Preservation of all artefacts and sites that are discovered within the site boundary or around the project site area	Inspection of records of findings	Daily	SHE Officer Operator	Operator>Foreman> Superintended>SHE Officer>Project Archaeologist>National Heritage Council (NHC)	Unearthing of archaeological or cultural heritage resources	Cease all activities on site and wait for NHC to inspect site and give further instructions / actions
Employment creation and Corporate Social Responsibility (CSR)									
Creation of employment	Creation of employment opportunities	To ensure that locals benefit from the project	Number of locals employed during small-scale mining activities	Inspection of employment records	Monthly	Small-scale mining Manager	Small-scale mining Manager or Proponent	Number of those employed	None
Noise									
Potential increase in noise	Above ambient noise levels.	To ensure that generated noise does not disturb residents.	Complaints from residents about noise generated.	Inspection of complaints logbook	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager	A logged complaint about above normal noise levels	Revision of site activities
Vehicular Traffic									

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Increase in traffic density on declared Roads Authority (RA) roads or damage to these.	Complaints from the public about increase in traffic on the roads. Complaints about damage to RA roads caused by movement of project vehicles and machinery.	To ensure continued ease of access to RA roads by residents	No complaints from the public about increase off traffic due to small-scale mining activities	Inspection of logbooks	Weekly	SHE Officer	SHE Officer> Small-scale mining Manager > Roads Authority	A logged complaint about traffic increase or damage to RA roads	Find alternative access roads for the workforce. Rehabilitation of affected roads
HIV and AIDS									
Potential increase in HIV and AIDS prevalence.	New HIV or sexually transmitted infections (STIs)	To prevent new infections in the area	No new HIV or STIs infections recorded	Liaison with local health facilities	Monthly	SHE Officer	SHE Officer> Small-scale mining Manager > Ministry of Health and Social Services	Recorded new HIV or STIs linked to the small-scale mining workers	Continued sex education and provision of condoms
Social nuisance: Property invasion or disturbance and damage									
Potential intrusion or damage/destruction of private or public properties	Unauthorized intrusion and or damage to properties	To prevent crashes and tensions between the Proponent and the land/property owners	No complaints of property damage or intruding by project personnel	Liaison with property owners or occupiers of land	Monthly	PRO	Small-scale mining Manager (or Proponent)>PRO>Landowners/Occupiers of land or custodian (Traditional Authority)	Arising new complaints	PRO to warn the personnel on respecting people's properties. If persists then Code of Conduct to be implemented

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Environmental Pollution (Littering)									
Environmental pollution from solid waste during small-scale mining activities.	Scattered litter	To prevent littering of the general project area	No visible litter around the project area	Visual observation	Daily	SHE Officer	SHE Officer> Small-scale mining Manager	Visible littering around project site	Clean-up of the affected areas and ensuring small-scale mining workers utilise waste containers provided.
Site Rehabilitation									
Soil and land disturbance because of small-scale mining activities.	Abandoned and stockpiled topsoil as well as very disturbed land surface	To prevent major soil and land damage by project activities	No major soil and land disturbance	Visual observation	Daily	SHE Officer	SHE Officer> Small-scale mining Manager	Visible soil and land disturbance	Effective progressive backfilling of topsoil and rocks

APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator: To exercise due caution if archaeological remains are found.

Foreman: To secure site and advise management timeously.

Superintendent: To determine safe working boundary and request inspection.

Archaeologist: To inspect, identify, advise management, and recover remains.

Procedure:

Action by person identifying archaeological or heritage material

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

Action by foreman

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by an archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

The competent authorities' contact details to report archaeological sites or objects (Small-scale mining Manager and contractor) are as follows:

- National Heritage Council (NHC) of Namibia (061 244 375) or direct contact with the Regional Heritage Officers at the NHC 061 301 903
- National Museum (+264 61 276800),
- National Forensic Laboratory (+264 61 240461).