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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED MINING OF BASE AND RARE METALS, PRECIOUS METALS AND SEMI PRECIOUS STONES ON MINING CLAIMS (MCs) NUMBER 73947 AND 73948 AT OTUANI VILLAGE, KUNENE REGION, NAMIBIA.

Environmental and Social Management Plan (ESMP)

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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
EC	Environmental consultant
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EPL	Exclusive Prospecting license
GHGs	Greenhouse Gasses
HAIA	Heritage and Archaeological impact Assessment
ISO	International Organization for Standardization
MEFT: DEAF	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs and Forestry
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
PM	Project manager
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development

The **'Proponent** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e. MAWF.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

1. CHAPTER ONE: BACKGROUND

1.1. Overview

The proponent Mr Hendrick Jahannes Jacobus Fraser has identified the economic potential of mineral deposits found in the Kunene Region. The proponent is a holder of a licence to Mining claims 73747 and 73948 which covers 34 (ha) jointly of a communal owned Otuani village. The mining claims have potential to produce ***base and rare metals, dimension stone, industrial minerals and non-nuclear fuel minerals.***

As per the requirements of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007 and the Environmental Impact Assessment Regulations of 2012), an Environmental clearance certificate is required to undertake these activities. The Ministry of Environment and Tourism (MET) is entrusted to ensure compliance to the EMA 2007 and its regulations. This is because under the 2012 Environmental Impact Assessment (EIA) Regulations of the Environmental Management Act (EMA) No. 7 of 2007, mining is a listed activity that may not be undertaken without an Environmental Clearance Certificate (ECC). This activity is listed under the following relevant sections:

Table 1: Listed Activities -Environmental Management Act No. of 2007

ACTIVITY	RELEVANT SECTIONS
MINING AND QUARRYING ACTIVITIES	- 3.1 The Exploration of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, 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.

1.2. The Environmental Consultant

New Horizon has assigned EnviroPlan Consulting cc as the appointed Environmental Consultant to conduct an Environmental and Social Impact Assessment (ESIA) and develop an Environmental Management Plan (ESMP) for the proposed mining activities and to apply for an Environmental Clearance Certificate from Ministry of Environment, Forestry and Tourism (MEFT).

1.3. Project Location

Mining Claims 73947-73948 blocks are located in Otuani village, Opuwo rural constituency, Kunene Region. It is located approximately 55 km from Opuwo town centre along C43 road to Seisfontein. Figure 1 below shows the mining claims' locality map.

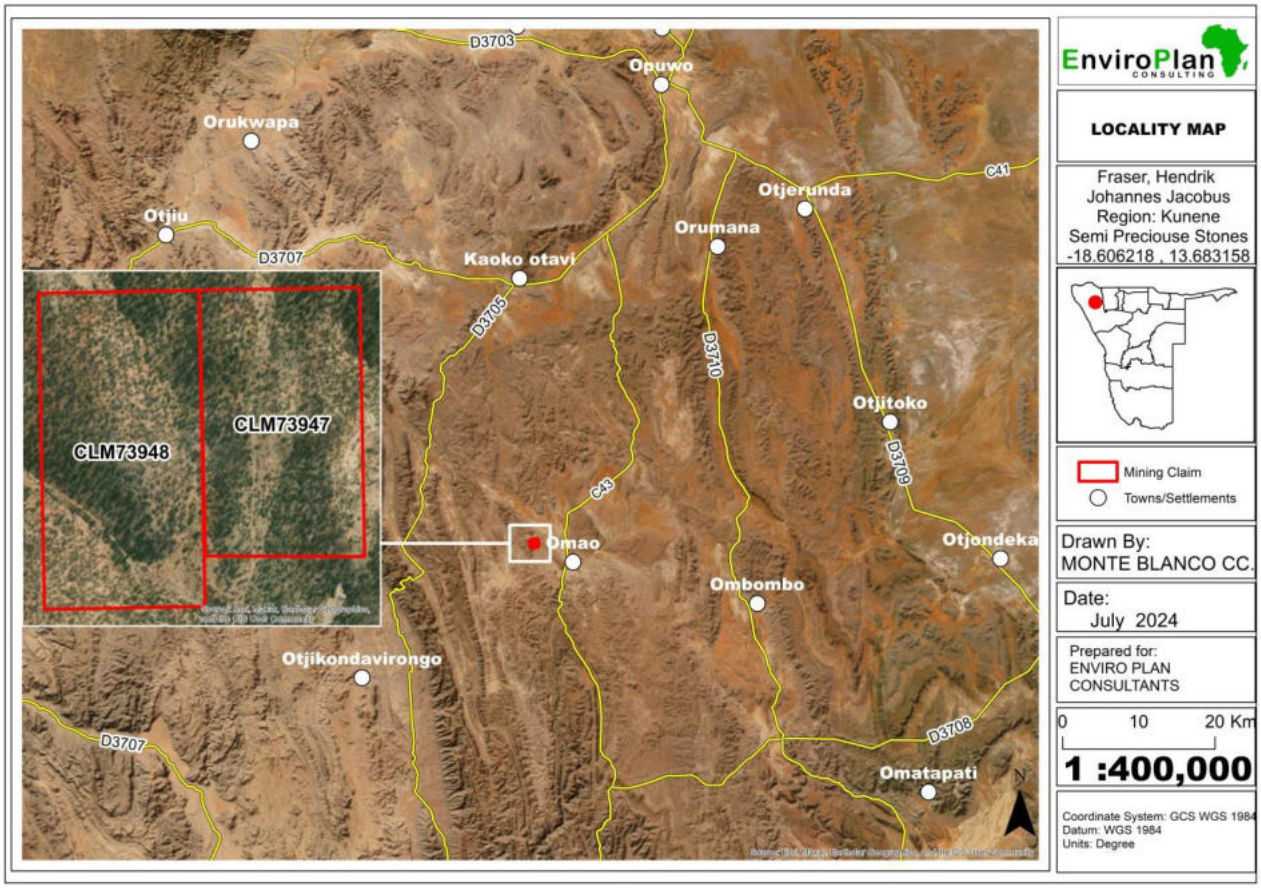

Figure 1: Mining Claims 73947 and 73948 Locality.

1.4. Scope of Work

This scoping study was carried out in accordance with the Environmental Management Act (EMA) (7 of 2007) and its 2012 EIA Regulations (GG No. 4878 GN No. 30).

This Environmental and Social Management plan (ESMP) was developed as a working document for the proponent ensure that there is environmental conservation, social acceptance and sustainability in their operation. The ESMP only covers the proposed mining activities as detailed in the ESIA.

1.5. Project Description

Mining activities comprise various phases. For this EIA, the phase-based activities were categorized to enable impact assessment and analysis. The different project sections are as follows:

Construction Phase (Site Preparation)

Access agreements will guide the working relationship between the Conservancy committee and the mining team. The mining team will undertake initial site visits to identify appropriate sites for the establishment of field camps. The field camps are for the safe keep of mining equipment and vehicles before use. No employees will be housed in the MCs. Site preparation activities will begin once surface drainage and ground water conditions are understood. Mining will only commence after ecological sensitive areas are known and agreed jointly with the conservancy.

Land clearing: Small land parcels will be cleared for the establishment of base or field camps and staging areas. Proponent shall ensure that areas identified are those that present minimal disturbance to the natural environment and wildlife.

Creation of access routes and haul tracks: Apart from the existing roads network leading to target areas, additional tracks may be created. Additional roadways may be considered for the purposes of accessing target sites. Where deemed necessary, graveling, and compaction of vehicle track's surfaces may be considered to allow for less track maintenance and seam less flow of traffic. No roads of bitumen standard exist in the area. No permanent structures will be built for mining works.

Fencing: Where deemed feasible, fences will be erected around field camps and target areas. Fencing will serve to keep out livestock from target sites.

Operational Phase

The phase typifies an advance level of mining. While there are various mining methods, the most common is surface mining. The proposed mining activities will commence with open pits on targeted areas. According to Ramani 2012, Surface mining methods dominate the world production of minerals. Currently, almost all non-metallic minerals [more than 95%], most metallic minerals [more than 90%] and a large fraction of coal [more than 60 percent] are mined by surface methods. Of the over 30 billion tonnes of ore and waste materials that are mined each year, surface mining accounts for nearly 25 billion tonnes. The subsurface of the earth is the only source for fossil energy and mineral products, and mining is the only way to get at them".

Open pit: Open-pit is one of the most common mining methods used and starts from the earth's surface, maintaining exposure to the surface throughout the extraction period. The excavation usually has stepped sides to ensure the safety of the miners and a wide ramp where equipment can travel, allowing the product to be removed efficiently from the site of obtaining large blocks or slabs of natural stone from quarries through methods predating modern machinery and technology. These methods have been historically employed by ancient civilizations and traditional stone workers across different regions. The operations of drilling, blasting, loading and hauling will be used and they are common to most methods.

Benefits of open-pit mining include:

- Ease-of-use for mass production
- Small shut-down expense
- Ability to mine selectively for certain grades of ore
- Comparatively small crew size
- Elimination of safety hazards that can accompany complex underground mining operations
- Easy drainage of subsurface water
- No machinery restrictions - even heavy and bulky machinery can be utilized
- Lower capital and operating costs

After mining finishes, the mine area must undergo rehabilitation to minimize environmental damage. This step in the mining process is critical to ensuring the sustainability of the land for future use.

First, waste dumps are contoured to flatten them out and stabilize them. If the ore contains sulphides, it is covered with a layer of clay to prevent rain and oxygen from oxidizing the sulphides into sulphuric acid, which is also known as acid mine drainage.
Then, the waste dump is covered with soil, vegetation is planted, and the area is fenced to prevent livestock from eating the newly planted vegetation. This layer will eventually erode but in the meantime, it will allow the leaching of heavy metals to occur slowly enough for the surrounding environment to absorb them. The open pit is also fenced off to prevent access, and over time fills up with groundwater unless the groundwater levels are excessively deep.

Site Rehabilitation: Dug out trenches will be back filled with waste rock (gangue). Stockpiled top soil will be returned to the backfilled areas. Sites will also be re-vegetated and returned to a pre-exploration state. Rehabilitation will be done concurrently with mining activities (ore removal etc).

Water requirements*:* Water will be sourced from existing boreholes. About 80,000 litres (80 m^3) per day would be required. This amount of water is aimed at suppressing dust around tipping areas and vehicle tracks. Approximately 400 *liters* of domestic water will be needed per day.

Waste management: Waste material generated will be in the form of rock material (non-mineral) and derived from trenching activities. Insignificant amounts of domestic waste will be generated by the mining team. Domestic or general waste will be transported out of the MCs area on a daily basis and disposed at a nearest approved land fill site. There are no licenced waste disposal sites in the project area.

Efluent Management: During mining, sufficient portable chemical toilets will be provided for workers and appropriately emptied according to their manufacturer's operational standards and legislated occupational sanitary provisions. Licenced waste contractors will provide sewage removal services.

Mining equipment, Materials and Services:

Construction equipment will be sourced from contractors proximate to the project site. Were deemed essential, equipment will need to be sourced from elsewhere in the country and/or abroad as per the required and approved operating standards.

Labour sourcing: Temporary or contract employment opportunities will be created during the duration of mining activities. Non-skilled labour force will be sourced locally.

Housing*:* Personnel will be accommodated at an identified mining camp area. Before use of a camp, an environmental risk assessment will be conducted and submitted together with the biannual report of the mining activities.

Decommissioning/Closure Phase

This phase will involve the removal of equipment and dismantling of facilities and safe mining closure. All trenches will be backfilled. The mining timeframe/ period will be determined by the viability of the existing mineral deposits within the claims. The surface affected by mining will be rehabilitated and re-vegetated in accordance with applicable standards. Decommissioning will be done following a detailed study which will guide decommissioning activities to be compliant to the EMA Act of 2007 and its guidelines and regulations.

Environmentally sensitive areas identified

The proposed mining activities are in a sensitive and protected area that is Ombujokanguindi conservancy and village with memorial sites (Himba cemetery) A Specialist Heritage and Archaeological impact Assessment was commissioned for the project area as Appendix C.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the ESMP is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in the project development and implementation. This section looks at the legislative framework within which the proposed project will operate under. The focus is on compliance with the legislation during the planning, mining and operational phases. All relevant legislation, policies and international statutes applying to the project are highlighted in Table 2 below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

The pursuit of sustainability by an Organisation is operationalized by a sound policy and legislative framework that gives operating parameters within its sphere of operation. In this section, relevant legal instruments, as well as their relevant provisions, are identified and analysed on their relevance to the proposed project. A concise explanation is given of the applicability of each of the identified pieces of legislation as well as how New Horizon is supposed to implement environmental compliance to the project. To ensure that the proposed mining activities comply with the legal requirements for good practice and preservation of the environment, a review of applicable Namibian and International legislation, policies and guidelines have been consulted. This review serves to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEA of the requirements and expectations, as laid out in terms of these instruments.

The project triggers the following Namibian legal instruments.

- *The Constitution of the Republic of Namibia (1990).*
- *Environmental Assessment Policy of Namibia 1994.*
- *Environmental Management Act No. 07 of 2007.*
- *EIA Regulations GN 57/2007 (GG 3812).*
- *The Water Act 54 of 1956.*
- *The Water Resources Management Act No. 11 of 2013.*
- *Pollution Control and Waste Management Bill.*
- *Atmospheric Pollution Prevention Ordinance 11 of 1976.*
- *National Solid Waste Management Strategy.*
- *Soil Conservation Act 76 of 1969.*
- *Road Traffic and Transport Act, No. 22 of 1999.*
- *Forest Act 12 of 2001.*
- *Mineral Policy of Namibia*
- *National Policy on Climate Change for Namibia (2011).*
- *National Climate Change Strategy & Action Plan 2013 – 2020.*
- *Nature Conservation Ordinance (1996).*
- *National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022.*

- *Labor Act 11 of 2007.*
- *Health and Safety Regulations GN 156/1997 (GG 1617).*
- *Public Health Act 36 of 1919.*
- *Public and Environmental Health Act 1 of 2015; and*
- *National Heritage Act 27 of 2004.*

These above-listed legislations and policies and their inclusion in the proposed project assessment are further presented in Table 2 overleaf

Table 2: Polices, legal and administrative regulations

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the sustainable objectives which include: *Guarding against over utilization of biological natural resources,* *Limiting over-exploitation of non-renewable resources,* *Ensuring ecosystem functionality,* *Maintain biological diversity.*	Mining activities can interfere with ecological processes. Attention should be given to the state of water resources and biodiversity.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia states Schedule 1: Screening list of policies/ plans/ programmes/ projects subject to environment must be accompanied by environmental assessments. “The development activities" are on that list.	The activity triggers an environmental impact assessment prior to commencement.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical, and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes, and plans.	The proposed development requires the assessment of all possible environmental and social impacts to avoid, minimise or compensate environmental damage associated with the activities.
Environmental Management Act No. 07 of 2007	Requires that activities with significant environmental impact are subject to an environmental assessment process (Section 27). Requires for adequate public participation during the environmental assessment process stakeholders to give their opinions about a project (Section 2(b-c)). According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Section 3 (2) (b) states that "community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted and facilitated" is key. Section 3 (2) (e) states that "assessments must be	The nature of the proposed mining and interrelated activities has potential to cause adverse environmental impacts to the surrounding environment. Activities such as trenching can cause significant environmental impacts. Therefore, proper assessments should guide project planning The EIA study considered full stakeholder participation. Stakeholder consultation was fully conducted. The proposed development is involving the utilisation of natural resources (water and land). Therefore, benefits from the implementation of the project must be shared equally. Environmental cost relating to project shall not be borne by communities found in the project area and surroundings. Project shall not commence without an environmental clearance

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	undertaken for activities which may have a significant effect on the environment or the use of natural resources".	certificate
EIA Regulations GN 57/2007 (GG 3812)	Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in an Environmental Scoping Report (GN No 30 S8) and an EIA report (GN No 30 S15).	The implementation of the project triggers the need for consultation of all affected and interested stakeholders regarding the development at all project development phases from planning to operation of the facility. A stakeholder and I&APs consultation meeting were held in respect to this, and all the concerns and issues were noted and addressed in this report.
The Water Act 54 of 1956	The Act was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas.	The activities directly affecting water conservation, management and use therefore, requires the implementation of water conservation measures.
Minerals (Prospecting and Mining) Act, 1992 (Act no. 33 of 1992)	Act provides the licensing procedures, the rights of holders, the administration, and the ownership of minerals. In addition, the Act requires mining companies to provide detailed studies on the	Prospecting or mining operations shall not commence except in accordance with license granted.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	potential impact of the operations to the surrounding environment, how to mitigate them and rehabilitations plans	Renewals of MCs are accommodated twice for two-year periods, with the area decreasing by 25 per cent with each renewal
Pollution Control and Waste Management Bill	The bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	The proposed activity triggers Section 21 and 22 of the bill. Activities such as trenching transportation, primary crushing may require the robust adoption of in-situ pollution mitigation measures. Contractors of the civil works of the project should make it mandatory that they manage their waste in a manner that do not cause environmental harm and risk both to the surroundings and the local communities.
Atmospheric Pollution Prevention Ordinance 11 of 1976	The law provides for the prevention of atmospheric pollution and for matters incidental thereto. The law regulates and prohibit pollution from industries particularly smoke and dust. The ordinance considers air pollution from point sources but does not address air quality standards,	Mining activities will most likely affect ambient air quality. Efforts to suppress and monitor dust should be adopted as recommended in the ESMP.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Solid Waste Management Strategy	The Strategy ensures that the future directions, regulations, funding, and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders. Waste disposal presents a challenge to solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	Mining activities can potentially generate significant amount of waste material that need careful management. The obligation to meet waste management objectives should be borne by both proponent and contractors. The proponent should limit the exposure of waste to the natural environment and surrounding. In-situ waste management plans should be adopted and implemented prior the commencement of operations. Rock waste and other non-mineral waste should be stored and disposed in an environmentally friendly manner. Waste should be carted away to licences waste disposal sites.
Soil Conservation Act 76 of 1969	The Act established to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of the water sources in the Republic of Namibia.	The construction of auxiliary infrastructure such as access roads or tracks to mining targets should include systems and mechanism for preventing erosion.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Road Traffic and Transport Act, No. 22 of 1999	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.	Mitigation measures should be provided for if the roads and traffic impacts cannot be avoided. Should the proponent wish to undertake activities involving road transportation or creation new access adjoining national roads, relevant permits will be required from the Ministry of Works and Transport
Forest Act 12 of 2001	Section 10 (1) set out the aim of the forest management as to: The purpose for which forest resources are managed and developed, including the planting of trees where necessary in Namibia is to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment.	The proposed project will likely result in the disturbance of indigenous vegetation of conservation significance including the disruption of biological processes.
	(b) Any living tree, bush or shrub growing within 100 metres of a river, stream, or watercourse.	The project will not result in the removal of living trees, bushes and shrubs growing within 100m of a river, stream, or watercourse.
	(2) A person who wishes to obtain a licence to cut and remove the vegetation referred to in subsection (1) shall, in the prescribed form and	The removal of trees in the above instances would require the contractors or sub-contractors to acquire necessary forestry

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	manner, apply for the licence to a licensing officer who has been designated or appointed for the area where the protected area is situated.	permits first.
National Policy on Climate Change for Namibia (2011)	The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation."	Measure should be adopted by NHIG to prevent or minimise toxic emissions into the atmosphere. Dust suppression and monitoring will be employed, to ensure those air quality objectives tied to climate change mitigation are met.
National Climate Change Strategy & Action Plan 2013 – 2020	The Strategy outlines Namibia's response to climate change. The strategy aims to address and plan for action against climate change, both through mitigation and adaptation actions. In its adaptation strategy, the Strategy recognises the role of a sustainable water resource base.	The development should adopt measures that strengthen sustainable utilization of water resource. The implementation should be very careful on not to cause harm to the available water resources but improve the management through various conservation technics.
	The Strategy proposed strategies that aim to: Strategic Aim 1: Further improve the overall climate change understanding and related policy responses in water resources sector. Strategic Aim 2: Monitoring and data collecting technologies of surface and underground water are	The proponent should invest capital on strengthening climate change and adaptation through cleaner production systems implementation. Certification by international standards such as ISO14001 can help with climate sustainability, and is recommended.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	developed and implemented at basin/watershed level.	
Nature Conservation Ordinance (1996)	This ordinance relates to the conservation of nature; the establishment of game, parks, and nature reserves; the control of problem animals; and highlights matters incidental thereto.	The activities of the project are highly localized. The likelihood of project activities interference with any protected parks and nature reserves objectives is non-existent. However, there is need for proper designing and planning of the drainage and water network of the project to make sure that any service infrastructure is not in conflict with the provisions listed in the Nature Conservation Ordinance. All species of birds are protected except the game birds mentioned in *Schedule 6* which can be hunted.
National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022	The action plan was operationalized in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	The proposed project during construction and operation phases potentially triggers ecosystem threats from pollution. As such mechanisms for environmental compliance and monitoring will be put in place, ultimately aimed at protecting biodiversity.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Labour Act 11 of 2007.	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47).	Proposed mining activities invite significant amount of laborious work. Therefore, there is need to ensure that proponent ensures employees a working environment that is safe, and adequate facilities provided for the upkeep of employee welfare standards. The Ministry of Labour and Safety demands that a health management policy will be drafted and instituted.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety requirements.	-Occupational health and safety provisions during construction and operational phases should be clearly outlined. -Compliance monitoring and responsibilities for compliance monitoring should be clearly stated
Public Health Act 36 of 1919	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."	Compliance to the Public Health Act will be ensured in relation to the following: - Sanitation facilities -Communicable diseases -Emergency healthcare provision - COVID 19 workplace measures
Public and Environmental Health Act 1 of 2015.	To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Heritage Act 27 of 2004	Section 48(1) states that "A person may apply to the (Heritage) Council for a permit to carry out works or activities in relation to a protected place or protected object" Protects and conserves cultural heritage and cultural resources with special emphasis on places and sources of National heritage including graves, artefacts, and any objects older than 50 years.	The project impacts are localized and there are prehistoric Himba graves in the same village with the MCs but not the proximity to the MCs. However, if heritage resources (e.g., human remains etc.) discovered during implementation, guidelines dictate that a permit be acquired from the National Heritage Council of Namibia for relocation of any artefacts or specimen. - Heritage study was commissioned
SANS 1929: 2005	Dust particulates from excavations /ore crushing that are smaller than 1mm are deemed dangerous to both plants and humans. As such a dust monitoring following the ASTM D1739 method should be used for monitoring dust emissions from any crushing plant anticipated. Dust chemical analysis and fallout quantities are specified for industrial and residential environs.	A dust fallout monitoring plan can be instituted around project area

3. CHAPTER THREE: INTEGRATION OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN INTO OPERATIONS

3.1. ESMP Organisation, Responsibility And Authority

This section describes the key functionaries in the planning, implementation and monitoring of the **Environmental and Social Management Plan (ESMP**). Copies of this ESMP shall be kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

The implementation of this ESMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

Site instruction entries

The Site Instruction Book entries will be used for the recording of general site instructions as they relate to the works on site and ESMP measures. It will also be used for the issuing of stop-work orders issued by the ECO for the purposes of immediately halting any particular activities of the Contractor in lieu of the environmental risk that they may pose.

Environmenmtal Control Officer diary entries

The purpose of these entries will be to record the comments of the **Environmental Control Officer** (ECO) as they relate to activities on the site including infringements, possible changes to the ESMP or work stop orders.

Method statements

Method statements from the Contractor will be required for specific sensitive actions on request of the authorities or ESM. A method statement forms the baseline information on which sensitive area work takes place and is thus considered a “live document” in that modifications can be negotiated between the Contractor and EC if or as required. The Contractor (and, where relevant, any subcontractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the approved methodology. Changes in the methodology must be reflected by amendments to the original approved Method Statement. Amendments must be signed by both the Environmental Consultant (EC) and Project Manager (PM), denoting that the change is environmentally acceptable. The Contractor must also sign the amended Method Statement.

All method statements will form part of the ESMP documentation and are subject to all terms and conditions contained within the ESMP main document. The Method Statement shall cover applicable details with regard to:

- Mining procedures;
- Materials and equipment to be used;
- How and where materials will be stored;
- The containment of accidental leaks or spills;
- Timing and location of activities; and
- Any other information deemed necessary by the ESM.

The Contractor must submit the method statement two weeks before any particular mining activity is due to start, especially with respect to impacts on sensitive ecosystems. Work may not commence until the method statement has been accepted by the Geologist and ECO, and clearly communicated to the workforce. The Contractor shall, except in the case of emergency activities, allow 14 days for consideration and approval of the Method Statement. The Geologist and the ECO may require changes to a Method Statement if the proposal does not comply with the specifications or if, in the reasonable opinion of the ECO, the proposal may result in damage to the environment in excess of that permitted by the specifications. Approved Method Statements shall be communicated to all relevant personnel.

All Method Statements listed below, shall be provided by the Contractor before the activity commences:

(i) *Bunding*

Method of bunding for static plant and bulk fuel storage.

(ii) *Camp establishment and fencing*

- *Location and layout of the Contractor's Camp.*
- *Method of installing fences required for working areas and Contractor's Camp.*

(iii) *Drilling*

Location and layout of target mining areas and camp site areas.

(iv) *Demolition*

Proposed method of demolition, including handling and disposal of materials.

(v) *Dust*

Dust control protocol.

(vi) *Fire and hazardous substances*

- *Handling and storage of hazardous wastes.*
- *Emergency spillage procedures and compounds to be used.*

- *Emergency procedures for accidental fire.*
- *Methods for the disposal of hazardous materials.*

(vii) *Fuels and fuel spills*

- *Methods of refuelling vehicles.*
- *Details of methods for fuel spills and clean-up operations.*

(viii) *Protection of archaeological resources*

Methods for dealing with archaeological resources in the event that any are found.

(ix) *Protection of environmentally sensitive resources (fauna and flora)*

- *Methods for dealing with conservation areas or areas identified as environmentally sensitive requiring protection.*
- *Locality and preparation of onsite nursery to house vegetation relocated from mining areas or propagated locally for replanting purposes.*
- *Details of methods dealing with the identification, transportation and transplanting of flora species of conservation value.*
- *Details of methods dealing with the identification, capture and relocation of fauna species of conservation value.*

(x) *Rehabilitation*

Rehabilitation of disturbed areas after mining is complete.

(xi) *Solid waste management*

Solid waste control and removal of waste from Site.

(xii) *Topsoil handling and stockpiling*

Details on stripping, handling and stockpiling of topsoil.

(xiii) *Wash areas*

Location, layout, preparation and operation of all wash areas.

(xiv) *Storm water management*

Details of how storm water is to be handled on Site.

3.2. Environmental Education

Before any work is commenced on the Site, the entire Contractor's staff including foremen shall attend an environmental education talk, presented by the EC with. The Contractor shall liaise with the

EC prior to the commencement date to fix a date and venue for the talk. The Contractor shall ensure that all the employees attend the talk.

Follow-up education talks shall be held for any new employee/s coming onto Site from time to time. The EC shall ensure that all attendees sign an attendance register, and shall provide the ECO with a copy of the attendance register.

3.3. Record Keeping

All records related to the implementation of this management plan (e.g. site instruction book, ECO diary, induction records, method statements) must be kept together in an office where it is safe and can be retrieved easily. All relevant records should be kept for a minimum of two years after mining operations seized and should at any time be available for scrutiny by any relevant authority or stakeholder.

It is recommended that photographs (fixed-point photographs for better comparisons before/during/after) are taken off the site prior to, during and immediately after mining as a visual reference. These photographs should be stored with related documents and other records related to this ESMP.

3.4. Environmental Completion Statement

An Environmental Completion Statement will be prepared by the EC for submission to the Department of Environmental Affairs (Ministry of Environment and Tourism) indicating completion of the project and compliance with the ESMP and conditions. This statement will be prepared after the final audit after the rehabilitation phase.

3.5. Roles And Responsibilities

Duties and Powers of the Environmental Consultant (EC)

The Environmental Consultant is ultimately responsible for:

- The environmental and social consultant will be responsible for the periodic monitoring and evaluation of ESMP implementation.

- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications via the PM.
- Auditing the implementation of the ESMP and compliance on a monthly basis.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document.

- The management and continuous monitoring of the implementation of the ESMP on a daily basis will be the responsibility of the Resident Engineer.

Duties and Powers of the Project Manager

The Geologist is ultimately responsible for:

- The Project Manager (PM) of the proponent will act with restricted powers and responsibilities as delegated by the proponent in writing.
- For this project it is envisioned that the function of the Environmental Control Officer (ECO) will only require part time inputs. The PM may fulfil the function of the ECO thereby taking responsibility of the ECO's duties (see below) on this project.
- Any on-site decisions regarding environmental management are ultimately the responsibility of the PM with consultation with the environmental Consultant. Therefore, the PM must assign the role of ECO to a competent member of its site supervising team. The PM shall assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMP:
    - Ensuring that the necessary environmental authorisations and permits have been obtained by the Contractor.
    - Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
    - Ordering the removal of person(s) and/or equipment not complying with the EMP specifications.
    - Issuing fines for transgressions of site rules and penalties for contravention of the EMP.

Duties and Powers of the Environmental Control Officer

The Environmental Control Officer (ECO) will be a competent person determined by the PM and EC to fulfil the role as the Employer's representative to monitor and review the on-site environmental management and implementation of this EMP by the Contractor.

The ECO's duties will include the following:

- Assisting the PM in ensuring that the necessary environmental authorisations and permits have been obtained.
- Maintaining open and direct lines of communication between the PM, Employer, Contractor, and interested and affected parties with regard to environmental matters.
- Facilitating all communication between the local community and the contractor.
- Regular site inspections of all mining areas with regard to compliance with the EMP.
- Monitoring and verifying adherence to the EMP by verifying that environmental impacts are kept to a minimum.

- Taking appropriate action if the specifications are not followed.
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMP via the PM.

Duties of the Contractor

The contractor shall be responsible for the implementation of the EMP and the action plan, onsite monitoring and evaluation of the EMP through the following;

On the on-set of the project, the contractor through an Environmental Officer shall:

- Develop a Hazard Identification and Risk Assessment report on the on-set of the project to be approved by the environmental Consultant.
- Developing a waste and contractors camp management plan to be approved by the environmental consultant
- Submit a monthly Environmental Performance report to the Environmental Consultant.

In addition, the Contractor shall furthermore ensure that adequate environmental awareness training of senior site personnel takes place and that all mining workers receive an induction presentation on the importance and implications of the EMP.

The presentation shall be conducted, as far as is possible, in the employees' language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the EMP.
- Discussion of the potential environmental impacts of mining activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the specifics of this EMP and its specification (no-go areas, etc.) and of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.
- The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

The induction programme should be developed and submitted to the PM and environmental consultant for approval.

NB: The Contractor shall clearly describe the overall methodology proposed for the task specific related activities in particular method statements.

All method statements must take environmental requirements into account.

3.6. Financing Of Environmental Control

Financing of the environmental requirements as outlined in this document, apart from the appointment of the ESM and specialists, is the sole responsibility of the Proponent and the exploration contractor.

3.7. Amendments of the ESMP

Any party involved with the project can suggest changes to the ESMP via the EC or PM. Such suggestions will be discussed with the Environmental Forum. Approved changes will be minute and drafted into the existing ESMP in the form of an appendix or amendments.

3.8. Procedures for non-compliance

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the PM to impose a penalty. This applies to the Environmental Management Plan (EMP).

In the event of non-compliance, the following recommended process shall be followed:

- The PM shall consult the environmental consultant and if agreed, issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the ECO.
- The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor shall provide the PM with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the ECO.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the PM shall impose a monetary penalty based on the conditions of contract.
- In the case of the Contractor being unable to remedy the situation due to permanent environmental damage already incurred, the PM shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the PM shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.

- In the event of a dispute, difference of opinion etc, between any parties in regard to or arising out of interpretation of the conditions of the EMP, disagreement regarding the implementation or method of implementation of conditions of the EMP etc., any party shall be entitled to require that the issue be referred to independent specialists for determination.
- The PM shall at all times have the right to stop work and/or certain activities on site in the case of safety and ESMP non-compliance or failure to implement remediation measures.

4. CHAPTER FOUR: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN IMPLEMENTATION AND MONITORING

4.1. Preperation and Production/ Mining/ Operational Phase

Table 3: ESMP Project preparation and Production phase

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Conflict	• Communities dissatisfied with the activities • Nuisances caused by the contractors	• Clear communication between contractor and community and farmers, on the schedule/timeframe for operations and the duration of the mining phase. This should be provided for in the form of a Public Consultation Plan (PCP) which should include at least: o One meeting for site-handover and to introduce the local community and farmers to the Contractor o A system for the on-going management of the communication between the Contractor and local community and farmers, which should include: ▪ A means for lodging a complaint concerning a mining activity ▪ Provision of feedback to the plaintiff from the Contractor stating how the issue is being addressed ▪ Report back on issues raised and how addressed from the Contractor to the PM and client • PM and contractor should present detailed mining programme during a meeting with the local community and the conservancy.	• Minutes of meetings • Draw up PCP	PM, EC and Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• Ensure that relevant stakeholders are adequately informed throughout the production/ mining process and that there is effective communication with and feedback to the PM and client. • The contractor shall appoint a person from the mining team to take responsibility for the implementation of all provisions of this ESMP.	Meetings and communication.	PM, EC and Contractor.
	Poaching and trapping	No poaching or trapping will be allowed and is a criminal offence.	PM, EC and Contractor to monitor	Contractor.
Dangerous work area	Existence of dangerous/hazardous work areas	• The work areas must be set out and isolated and demarcated by means of danger tape on a daily basis. The demarcated work area may only contain materials, equipment, and personnel required to execute the work. • Once the work for the day is completed, the demarcated area must be cleaned of any spilled materials and waste products. This must be disposed of in the allocated containers. • If the work area is dangerous or sensitive, the danger tape should stay in place until work is complete or not sensitive anymore.	• Inspections for approval. • Record excavation/backfill schedule in the site instruction records.	PM and Contractor.
Threats to the health and safety of mining workers.	• Insufficient provision of safety equipment • Negligent behaviour	• The contractor must adhere to the regulations pertaining to health and safety, including the provision of protective clothing, failing which the contract may be suspended with immediate effect. • Failure to remedy such lack of provision may result in the immediate cancellation of the contract according to the clauses stipulated in the Specific and General Conditions of Contract. • The contractor should comply with all relevant labour laws as stipulated by the Labour Act. • First aid kits to be readily available in case of injuries	Regular visual inspection and records kept of safety equipment and materials issued.	PM and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		Dust protection masks shall be provided to staff members if they complain about dust.	Regular inspections and attendance to work complains.	PM, EC and Contractor.
		Workers in the vicinity of sources of high noise should wear necessary protection gear.	Regular Inspection	PM, EC and Contractor.
		NO person is allowed to smoke close to fuel storage facilities and in portable toilets at the Exploration site since the chemicals used in chemical toilets are highly flammable.	Regular Inspection.	PM, EC and Contractor.
		Workers should not be allowed to make use of the existing neighbourhood facilities. Potable water must be provided to workers to avoid dehydration.	Regular Inspection.	PM, EC and Contractor.
		Portable toilets should be available on site in the following ratio: 2 toilets for every 50 females and one toilet for every 50 males.	Regular Inspection.	PM, EC and Contractor.
	Low productivity and increase health risk of workforce due to high temperatures.	• Provide hats, ample drinking water • Provide regular breaks.	Daily checking of weather forecast.	PM, EC and Contractor.
	Fire incident.	• Foam fire extinguishers must be in close proximity to fuel kept on site • There should be trained personnel to handle this equipment • At least two extinguishers should be placed in the workshop.	Foam fire extinguisher should be available when work commences.	PM, EC and Contractor.
Health and social pathology.	• Increase prostitution and associated social pathologies and health	• Prohibit unauthorized people on site and secure Exploration area, while monitoring entrance and exits. Contract penalties. Workers are not allowed to reside on the mining site.	Daily monitoring by contractor. Record visitors in a	Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	risks • Sex workers are hired from the local communities by the mining team.		site-visit book	
	• Health and safety risks to the workers and public due to uncontrolled access • Unsafe traffic conditions, the lack of personal protective clothing, etc.	Specify health and safety risk avoidance measures.	Daily monitoring by contractor	Contractor
Alcohol abuse.	Use of alcohol on the mining site.	At no stage may a mining worker be allowed on site under the influence of alcohol.	• Daily monitoring by contractor. • Spot checks.	PM and Contractor
Lack of privacy.	Intrude on neighbouring properties.	Under no circumstance are workers allowed to intrude on neighbouring properties.	Regular monitoring by PM.	PM and Contractor
PRODUCTION/ MINING AREA				
Mining site	Visual nuisance of the mining activities.	• The boundaries of the mining area shall be demarcated prior to any work commencing on the site • The production area should be clearly marked.	PM and Contractor should agree on demarcation lines.	PM, EC and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION

	Improper conduct on the mining site.	• The production area should adhere to the following requirements:
		  ○ Access should be controlled and only workers allowed within the boundaries of the campsite
		  ○ Records should be kept and all visitors should sign in and sign out of a visitor's logbook
		• The contractor should in no way permit or allow sexual activities to take place at the mining area.
			Regular visual and record inspection by the PM.	PM, EC and Contractor.

Campsite Establishment				
Negative impact on the social and ecological environment.	Establishment of campsite.	• One campsite should be established for all mining activities • The contractor must negotiate the use of existing facilities before considering entering new terrain. • The contractor must receive approval to use a facility or land in writing. This approval must state the remuneration and conditions of use. • Devise a layout for the site so that internal circulation of workers and vehicles in relation to the various mining functions is optimised.	Contractor and PM should agree on a satisfactory area.	Contractor with approval of the Client, EC and PM
	Conduct on campsite.	• No one is allowed to reside on the campsite • The campsite may act as a facility for the storage of exploration material, temporary stockpile sites, and fuel installations etc, required by the Contractor or subcontractors and suppliers. • Materials must be stored in a separate closed-off premise that is sufficiently prepared to protect the environment for pollution, such as impermeable floors, closed containers and a security fence.	Daily monitoring by contractor.	Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	Stockpiling materials on site.	• Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site. • Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills.	• Daily monitoring by contractor. • Regular visual and records inspection by the PM.	PM and Contractor.
		• Stockpiles must be of a safe height of less than 2m high and 45° slope angle. Cement stacks must not be higher than 1.5m. • Protect all fluids containers from low temperatures to avoid leaks and pollution.	Regular visual and records inspection by the PM.	PM and Contractor.
BIOPHYSICAL ENVIRONMENT				
Drainage issues.	Surface run-off.	Surface protection work is recommended on the river bed.	Daily inspection of the surface protection work.	EC, Contractor.
Soil pollution	Garbage, cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material.	• Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils (see waste management heading). • In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste.	Daily monitoring and regular visual inspection by contractor.	EC, Contractor
	Soil pollution by fuel leaks	If fuel is stored at the mining camp, fuel tanks must be properly bunded. The volume of the bunded area must be sufficient to hold 1.5 times the capacity of the storage tanks. The floor of the bunded area must be impermeable and the sides high enough to achieve the 1.5 times holding capacity.	Daily monitoring by Contractor and regular visual inspection by PM	EC, Contractor
		Drip trays should be available for all equipment that is intended to be used during mining. These trays should be placed underneath each	Daily monitoring and regular visual	EC, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		vehicle while the vehicles are parked. The drip trays should be cleaned every morning and the spillage handled as hazardous waste.	inspection by contractor.	
	Soil pollution by cement mixed on the ground.	Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose.	Daily monitoring by Contractor and regular visual inspection by PM	EC, Contractor
	Cleaning of equipment.	All cleaning of equipment should take place within the mining site and the water from washing operation should be collected in a tank and disposed of in agreed manner.	Daily monitoring by Contractor.	EC, Contractor
	Heavy vehicles/ movement of vehicles across site.	The movement of vehicles to and across the site should be controlled. Mining material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil.	Daily visual inspection and monitoring by Contractor.	EC, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
DRILLING /TRENCHING/PITS	Mining activities	• The contractor in consultation with the environmental consultant and/or PM shall visit all potential mining sites prior to excavation. The engineers and surveyors must then draft a plan for approval before commencement of excavations. This plan must indicate the required resources and sensitive areas that may not be mined (indication of the mature trees). • No removal of trees with a stem diameter of 200mm or more. Protect clusters of trees and individual trees with a space buffer of at least 5m. • The top 150mm of topsoil must be stored separately for use to rehabilitate the borrow pit. • The removal of material at excavation sites shall be focused where the least significant vegetation exists. • The contractor shall liaise with the applicable local residents regarding the location of excavation sites. • No drilling may be done on any sensitive or open space areas.	Contractor and environmental consultant to visit all potential excavation sites.	EC, Contractor
ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	**SOURCES OF IMPACTS**	**MITIGATION MEASURES**	**MONITORING ACTIONS AND METHODS**	**RESPONSIBILITY FOR IMPLEMENTATION**
WATER CONSERVATION				
Irresponsible use of water.	Water wastage due to careless practices during mining.	• Establish a water plan which, should include at least the following: o A description of: ▪ The source of the water ▪ Where and how the water will be stored ▪ How the water will be distributed/utilised o Describe measures that will be taken to conserve	Daily inspections and condition reports.	PM, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		water at each of the above-mentioned phases • Educate the work force on sustainable and effective use of water, e.g. clean equipment in containers. • No member of the exploration team is allowed to wash clothes OR vehicles on the mining site.		
	Leaks from tanks and taps.	Water should be used sparingly throughout the proposed activities. It is the responsibility of the site coordinator to ensure that water conservation is strictly enforced.	Daily inspections and condition reports.	PM, EC and contractor.
		Water tanks / taps must be fixed. The water tank or taps must have water meters and be accessible to visual inspection. All faulty and leaking taps and pipes shall be immediately repaired.	Daily inspections and condition reports.	PM, EC and contractor.
Groundwater contamination.	Refuse, garbage, cement, concrete, chemicals, fuels, oils or any other objectionable or undesirable material.	• Accidental spills must be cleaned immediately to avoid the pollution of the wetland, and ground water, since the soil around the site is highly permeable. • No member of the mining team is allowed to wash clothes OR vehicles on the mining site.	Inspection daily, reporting, and regular clean up.	PM, EC and contractor.
CONSERVATION OF VEGETATION				
Loss of biodiversity	Clearing of vegetation (removal of trees etc).	• The area to be constructed on the site, as well as lay-down areas, access routes, etc should be clearly demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or removal of vegetation without the required authorisation is strictly prohibited. • All protected tree species will be tagged so that they are visible during mining works.	Regular review of photographic records. Take photographs before mining starts as a record. Monitoring by the EC	PM, EC and contractor.
	Planting of alien vegetation.	• No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason.	Regular inspection of site vegetation by the	PM, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• At the end of mining all alien vegetation that has established should be eradicated.	EC.	
WASTE MANAGEMENT				
Waste.	Incorrect disposal of building waste.	All activities generating waste should regularly be removed off the site for disposal at a regulated disposal site.	Regular inspection on site.	PM, EC and contractor.
	solid waste blown by wind (e.g., cement bags).	Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste.	Daily inspection and clean up.	PM, EC and contractor.
Increased general waste.	General waste from the mining personnel.	• Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. • The various waste types shall be disposed of at appropriate municipal and recycling facilities. • Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. • Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility.	Daily inspection and clean up.	PM, EC and contractor.
WASTE MANAGEMENT				
Domestic waste	Domestic waste from mining team.	• The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the mining site and not at the campsite. • Sufficient waste bins should be supplied.	Daily inspection and clean up.	PM, EC and contractor.
		Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week.	Regular inspection.	PM, EC and contractor.
Hazardous waste.	Accidental / negligent spillages from equipment working on site.	• Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. • Contact Wesco Group to salvage the spilled materials (see	Daily inspection and clean up.	PM, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		Appendix A for the contact details).		
	Storage of hazardous materials.	Hydrocarbon products waste, oil sludge, oily rags, contaminated spill clean-up materials, contaminated soils and other hazardous materials waste must be kept off-site or in a dedicated separate container on site. These containers must be locked and only accessible by the site foreman. Wesco Group should be approached to collect these wastes periodically or as needed.	Daily inspection and clean up.	PM, EC and contractor.
Ablution waste.	Mining team and visitors.	• Only portable chemical toilets will be used on site and at the campsite. Under no circumstances may the waste from these toilets be dumped in the veld. The waste should be removed at least once a week to the nearest municipal sewage site. Alternatively, it may be pumped out into sealable containers and stored until it can be removed by truck. If stored, the containers should be kept out of direct sunlight and should not be stored for longer than a month. People responsible for cleaning these toilets should be provided with latex gloves and masks. • Spillage or leakage to be cleaned-up and fixed immediately.	Daily inspections and clean-up.	PM, EC and contractor.
DUST CONTROL				
Dust generation.	Dust proliferation due to fines content of soil.	• Soil stacks should be placed downwind from the main activity areas • All production areas and soil stacks should be regularly wetted.	Visual monitoring for dust nuisance and safety	PM, EC and contractor.
NOISE CONTROL				
Noise generation.	Noise from vehicles and mining activities.	• All machinery should be calibrated and maintained regularly. • Mining activities should be discontinued during night-time hours (18h00 to 07h00) and over week-ends.	• Daily monitoring. • Complaints from neighbours. • Records of how these have been	PM, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
			addressed.	

4.2. Post-Mining Phase

Table 4: ESMP, Post mining phase

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Hazardous-unattended mining site	Temporary structures, equipment, materials, waste and facilities used for mining activities.	Clear and clean the mining site to the satisfaction of the PM.	Inspection of the site by the PM	PM, EC
Land degradation	• Unrehabilitated mining areas	Rip the terrain and access routes and replace the stored topsoil evenly over the terrain. Securely seal exploration boreholes	Inspection by PM, EC after rehabilitation.	Contractor, EC and Engineer.

4.3. Decommisioning Phase/ Permanent Mine closure

The decommissioning of mining activities should follow a decommissioning ESMP which will be approved by MEFT. The impacts caused by mining activities will be rehabilitated, workers should be compensated for loss of employment.

5. CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Arising from the analysis by the consultants, the proposed mining activities brings negative and positive impacts to the proposed project site and nearby environs. Therefore, the project proponent and the Project Manager should effectively implement the contents of this ESMP and consult the Environment Consultant regularly for sustainable mining activities.

5.2. Recommendations

In order to alleviate any negative impacts that may emanate from the proposed project, the contractor and proponent should follow recommendations as follows:

Environment and Social Management Plan recommendations

In order to ensure a healthy and safe environment in the proposed site and its environs, a plan for environmental management has to be instituted through monitoring. This involves the collection and analysis of relevant environmental data as well as periodic documentation and reporting.

5.3. External Auditing

The key to a successful ESMP is appropriate monitoring and review to ensure effective functioning of the ESMP and to identify and implement corrective measures in a timely manner. In the event that discrepancies are identified, the problem must be investigated and attended to. All the results obtained during environmental monitoring must be documented for audit purposes.

An audit of the environmental management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards. Audits should be conducted during the operational phase of the facility to ensure adherence to the management measures contained in the ESMP.

5.4. Recommendation to MEFT

Having looked at the potential impacts of the proposed project development, the risks associated with the development and the mitigation measures contained in this ESMP, EnviroPlan Consulting cc hereby recommends that the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs (MEFT:DEA) approve the proposed mining activities and issue an Environmental Clearance Certificate (ECC) on condition that the proponent will ensure complete compliance to the developed Environmental and Social Management Plan (ESMP).

APPENDIX I: ENVIRONMENTAL MONITORING AND REPORTING

EC: ENVIRONMENTAL MONITORING REPORT

Report No:…… Date:……

Method Statements	**Contractor:**	**Date received:**

Issue	Observation	Remedial action	Compliance
1 Exploration			
1.1 All plant, personnel, etc. restricted to works area?			
1.2 Contractor's Camp located in area of low environmental sensitivity as indicated by the Engineer?			
1.3 Where needed, sensitive areas adequately fenced off?			
1.4 Fencing well maintained?			
1.5 No unauthorized entry, stockpiling, etc. outside work areas?			
1.6 All vehicles and plant remain on designated routes?			
1.7 Information posters put up and maintained where needed?			
1.8 No smoking in hazardous areas?			
1.9 Basic fire fighting equipment available on Site?			

Issue	Observation	Remedial action	Compliance
1.10 No burning of wastes as a means of disposal?			
1.11 Staff aware of procedures in the event of spills/leaks?			
1.12 Materials for dealing with spills/leaks available?			
1.13 Emergency contact numbers displayed at Contractor's office?			
1.14 Complaints Register up to date?			
1.15 Archaeological material found on Site mitigated?			
1.16 No animals trapped or harmed?			
1.17 No flora removed or damaged outside work areas?			
1.18 Adequate drainage and retaining works in place to control erosion/siltation?			
1.19 Restricted traffic over stabilised areas?			

Issue	Observation	Remedial action	Compliance
1.20 No concrete mixing on bare ground?			
1.21 Concrete batching restricted to area of low environmental sensitivity?			
1.22 All wastewater from concrete mixing area disposed of via wastewater management system?			
1.23 Concrete mixing area kept neat and clean?			
1.24 Suitable screening and containment of cement silos?			
1.25 All visible remains of excess concrete removed on completion of concrete work?			
1.26 No pollution from drilling operations?			
1.27 Location and rescue of plants undertaken by suitably qualified contractor?			

Issue	Observation	Remedial action	Compliance
1.28 Rescued plants moved to nursery if direct transplantation not possible?			
1.29 After vegetation clearance, all unstable areas are properly stabilized?			
1.30 Cleared vegetation properly disposed of?			
1.31 All wastes removed from cleared area and disposed of?			
1.32 Mulched vegetation stored in bags?			
1.33 Fertilizers containing phosphates not used?			
1.34 No planting undertaken where Exploration works have not yet been finished?			
1.35 No unauthorized traffic on revegetated areas?			
2 Materials			

Issue	Observation	Remedial action	Compliance
2.1 Exploration materials adequately secured to ensure safe deliveries?			
2.2 All materials being stored inside Contractor's Camp?			
2.3 All imported materials free of weeds, litter, etc.?			
2.4 Stockpile areas approved?			
2.5 Topsoil stripped and stockpiled at a suitable site prior to earthworks?			
2.6 No spoil stockpiled outside agreed areas?			
2.7 Spoil stockpiles correctly shaped and protected?			
2.8 All plants used for landscaping/rehabilitation are local and indigenous?			
2.9 Plants adequately protected during transit and at storage facilities?			
2.10 Plants healthy and free from diseases and pests?			

Issue	Observation	Remedial action	Compliance
3 Plant			
3.1 Fuel/oil storage facilities adequately secured and protected against leakage?			
3.2 Safety signage provided at fuel storage areas?			
3.3 All electrical/petrol pumps suitably equipped and placed not cause any danger of ignition?			
3.4 Fuel storage areas comply with fire safety regulations?			
3.5 Necessary authorizations obtained for temporary above ground fuel tanks?			
3.6 Capacity of a fuel tank does not exceed 9000 ℓ?			
3.7 Fuel tanks erected at least 3.5 m away from buildings, boundaries or other flammable materials?			
3.8 Adequate toilet facilities provided for staff (min. 1 toilet per 30 workers)?			

Issue	Observation	Remedial action	Compliance
3.9 Toilets adequately maintained?			
3.10 All workers use toilets?			
3.11 Scavenger-proof bins with lids provided at eating areas?			
3.12 Waste temporarily stored inside Contractor's Camp in weather- and scavenger-proof bins?			
3.13 No burying or dumping of wastes on site?			
3.14 Waste management system in place?			
3.15 Refuse disposed of at licensed landfill?			
3.16 Adequate waste-water management system in place?			
3.17 Approval for discharge of contaminated water into municipal sewer system?			

Issue	Observation	Remedial action	Compliance
3.18 Runoff from workshops, fuel depots, etc. directed into conservancy tanks for disposal at approved site?			
3.19 Wash areas placed and built in such a way that does not cause any pollution?			
3.20 All maintenance of plant and equipment takes place in workshop?			
3.21 All plant is well maintained (no leaking)?			
3.22 Workshop has a bunded, impermeable floor sloping towards oil trap?			
3.23 Contractor's Camp tidy?			
3.24 All plant and machinery have drip trays, which are checked and emptied daily?			
3.25 All repairs on machinery using fuels or lubricants done over a drip tray?			

Issue	Observation	Remedial action	Compliance
3.26 Static plant located within a bunded area?			
3.27 Measures in place to minimise dust generation?			
3.28 No handling/transport of erodible materials under high wind conditions?			