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REVISED ENVIRONMENTAL MANAGEMENT PLAN (EMP)

NAMIBIA MINERAL DEVELOPMENT (PTY) LTD (DOLOMITE DIMENSION STONE), KARIBIB, ERONGO REGION

JUNE 2021

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DOCUMENT INFORMATION		
Title	Revised Environmental Management Plan (EMP) for an existing Dolomite Mine, in Karibib, Erongo region	
ECC Application Reference number	APP-003907	
Listed Activity	Activity 3: Mining and Quarrying Activities 3.2 The Other forms of mining or extraction of any natural resources whether regulated by law or not.	
Location	10 km south of Karibib Town, adjacent to the Otjimbingwe Road	
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TABLE OF CONTENTS

CHAPTER 1 ..... **1**

1. INTRODUCTION **1**

1.1 Brief Project Description 1
1.2 The Environmental management plan (EMP) 1
1.3 Purpose 2
1.4 Objective 2
1.5 Scope 2
1.6 Possible adjustments to the EMP 2
1.7 Implementation Framework and Accountability to the EMP 3

2. PROJECT INFORMATION **5**

2.1 Project Location 5
2.2 What is Dolomite (Wollastonite)? 5
2.3 Proposed Mining Activity 5
2.4 Alternatives considered 5
2.5 Project Location 6
2.6 Geological maps of the area 7
2.7 Current status (3 June 2021) 8

3. COMPLIANCE AND LEGAL REQUIREMENTS **12**

3.1 Compliance to the EMP 12
3.2 Environmental Management Act (No.7 of 2007) 12
3.3 EMP Requirements 12
3.4 Listed Activities requiring EIA and EMP 13
3.5 Other Legal Framework relevant to the EMP 13
ROLES AND RESPONSIBILITIES 16
3.6 Roles and Responsibilities 16
3.7 EMP Context 18
3.8 Disciplinary Action 18
3.9 Non-Compliance 18

4. POTENTIAL IMPACTS & MITIGATION MEASURES **19**

4.1 Design phase 19
4.2 Planning phase 19
4.3 Mining Site Preparation 19
4.4 Operational Phase 20
4.5 Impact Themes and Mitigation Measures 20

5. REHABILITAITON **37**

5.1 Designing a Rehabilitation Plan 37
5.2 Recommended Measures 37

6. CONCLUSION **39**

7. APPENDICES **40**

A2 Staff member equipped with PPE 41
A6 Trucks Transporting ore to South Africa securely covered with Canvas 41
A7 Staff Ablution facilities available on-site 43
A8 All waste oil collected from Machinery is stored in drums and taken to Navachab mine for recycling 44
A9 Waste is sorted in litter drums and collected at site 45
A10 Top soil/Overburden piles used for backfilling (Mining Rehabilitation) 46

LIST OF TABLES

Table 1.1: Roleplayers, Institutional Framework 3
Table 2.1: EMP Requirements as outlined in Section 8 of the EIA Regulations 12
Table 2.2: Listed activity: - Activity 3: Mining and Quarrying 13
Table 2.3: Relevant legislation and applicability thereof 13
Table 5.1: Mining Phases against which mitigation measures are required 19
Table 5.2: EMP Impact Identification Themes and Associated Aspects 20
Table 5.3: Mitigation measures pertaining to staff Recruitment and Induction 21
Table 5.4: Mitigation measures pertaining to Health and Safety 24
Table 5.5: Mitigation measures pertaining to waste management 29
Table 5.6: Impacts pertaining to environment and cultural heritage 33
Table 5.7: Potential impacts pertaining to cultural heritage ..... **Error! Bookmark not defined.**
Table 5.8: Mitigation Measures pertaining to Socio Economic Impacts 35

LIST OF FIGURES

Figure 1: Project Location – Karibib, Erongo Region ..... **Error! Bookmark not defined.**
Figure 2: Geological map of the project area – Erongo Region .... **Error! Bookmark not defined.**
Figure 3: Current Status (on-going mining activities since the 1990's)**Error! Bookmark not defined.**

ABBREVIATIONS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (Act No. 7 of 2007)
EMP	Environmental Management Plan
MET	Ministry of Environment and Tourism
NMD	Namibia Mineral Development
SM	Site Manager
TEC	Tortoise Environmental Consultants

CHAPTER 1

1. INTRODUCTION

The Namibia Mineral Development (PTY) LTD Mine (NMD) is located about 10 km south of the town of Karibib in Erongo Region. The mining activities entails extraction of Dolomite rocks for export. Dolomite is classified as dimension stone (MME[2]). According to the operator (NMD), the mining operation has been ongoing since early 1990.

An Environmental Clearance Certificate (ECC) was issued in 2018 and the operator (Namibia Mineral Development PTY LTD) hereby apply for renewal. As a result, an environmental audit was conducted at the mine on 3 June 2021, as part of the reconnaissance survey to revise the Environmental Management Plan (EMP), by auditing compliance to the old EMP mitigation of the potential impacts from the mining activities.

In general, mining activities have potential to cause adverse impacts on the affected environment and hence a comprehensive environmental management plan is a pre-requisite. This document constitutes the REVISED EMP, Environmental Audit Findings and compliance to the previous EMP.

1.1 Brief Project Description

The Namibia Mineral Development Mine is located approximately 10 km south of Karibib Town in Erongo Region. The mine covers an area of about 215 m x 215 m, and the current borrow pit / quarry is about 20 m deep.

Mine location: GPS coordinates: Latitude: **-21.96812** & Longitude: **15.88683**

The area falls within the thorn bush savannah vegetation that is characterised by large open grasslands and sparse thorn shrubs of mainly Acacia species. Livestock farming is the historical agricultural practice in the area and cattle and sheep are often seen roaming around the wider landscape.

The underlying geology is characteristic of dolomite deposits (marbles). Other mines are existent in and around Karibib, such as the Navachab Gold Mine.

1.2 The Environmental management plan (EMP)

[2] Ministry of Mines and Energy

The EMP outlines mitigation measures against specific activities, steps, stages or processes of the proposed development. Thus, the EMP can be defined as the tool to prevent / minimize the impacts identified during the EIA process. Furthermore, the EMP outlines specific roles and responsibilities for role-players against which can be evaluated and non-compliance is punishable.

1.3 Purpose

The aim of the EMP is to ensure that the mining and operation of the Mining Operation is conducted in accordance with the following:

i. Environmental Management Act (No. 7 of 2007),
ii. EIA regulations of 2012 (GN: 30), and
iii. Best environmental practices (benchmarks)
iv. Any other applicable legislation *(as presented in Table 2.2)*

The EMP provides environmental guidelines to be followed throughout the lifespan of the Mining operations. The guideline comprise of the following:

a) Environmental Aspects,
b) Management Objective,
c) Mitigation Measures / Actions Required,
d) Monitoring Indicators, and
e) Party Responsible

1.4 Objective

The objective of the EMP is to prevent / minimize (where possible), unacceptable and adverse environmental, social or economic impacts that may arise from the proposed development. Overall, the EMP aims to prevent any negative impact/s (real, potential or perceived) that may result from the proposed development.

1.5 Scope

The EMP does not only focus, and it is not limited to the boundaries of the proposed mining area (mining claim boundaries), mining operation or mining sites, but it includes the bigger picture, and serve as the guiding tool to protecting the natural, bio-physical and socio-economic environment both in the surrounding area, and beyond the scope of the mining operations. The bigger picture is important because, most impacts (e.g Water pollution, noise pollution, ecological impacts, solid waste etc) may not be confined to the boundaries of the mining site.

1.6 Possible adjustments to the EMP

The EMP is an open-ended document and maybe considered inconclusive. In other words, the EMP should allow room for adjustments if new information becomes available at a later stage, in which new / additional mitigation measures may become necessary.

The necessity of possible adjustments to the EMP may be attributed to:

a) Lack of information at the time of drafting the initial EMP,
b) Evolution or addition of new activities, or
c) Unintended omission of potential impacts during the initial project design and development of the initial EMP.

This implies that, in-addition to the information contained herein, any other relevant information that may surface during the mining operations, through internal monitoring or auditing by the environmental compliance officers (ECOs), can be added to the EMP (evolution of activities), and such changes or inclusions will be binding to the proponent and all contractors / sub-contractors.

1.7 Implementation Framework and Accountability to the EMP

The content of this document is binding to all parties who have a role to play in the Mining Design, Access Roads, Site Preparation, Mining Activities, Rehabilitation and Decommissioning of the Mining operations.

For effective implementation of the EMP, the Institutional Framework is presented below. However, the specific roles and responsibilities are defined and presented in Sections 5 and 6, respectively.

Table 1.1: Role-players, Institutional Framework

Role-player	Company / Institution	Role
Proponent	Namibia Mineral Development (PTY) LTD	Manage mining operations and compliance to EMP
Contractor/s		Mining and compliance to the EMP
Environmental Consultant	Tortoise Environmental Consultants (TEC)	Development of the EMP
Environmental Compliance Officer/s (ECO)	Ministry of Environment &Tourism (MET) – Department of Environmental Affairs (DEA),	Monitoring Compliance to EMP: ➢ Un-announced spot checks, ➢ Warning, penalties / fines, license suspension, etc

Public	Interested and affected parties (I&APs)	Report to the ECOs, any activity of environmental concern (e.g Pollution, safety risks, etc)

2. PROJECT INFORMATION

2.1 Project Location

The Karibib Wollastonite mine is located on the outskirts of the town of Karibib, in the Erongo Region, adjacent to the Otjimbingwe main road (Figures 1).

Mine location: GPS coordinates: Latitude: **-21.96812** & Longitude: **15.88683**

2.2 What is Dolomite (Wollastonite)?

Dolomite is a rock / mineral which is categorised under dimension stones. It has unique properties and occurs in a brilliant white colour, making it a sought after marble.

2.3 Proposed Mining Activity

The mine employs modern mining techniques (which entails excavation and minimal blasting) to extract blocks of Dolomite (dimension stone for export.

2.4 Alternatives considered

The EIA regulations stipulate that, for the proposed activity, "*alternatives should be identified in relation to type of activity or the location, different means of meeting the general purpose and requirements of the proposed activity".*

The proposed activity focuses on a specific resource (white dolomite) and the proposed mining will take place within the confinement of the mining claims as regulated by the Mining act. As a result, the EIA could not identify alternatives in terms of the both the location or different type of resource for exploitation.

2.5 Project Location

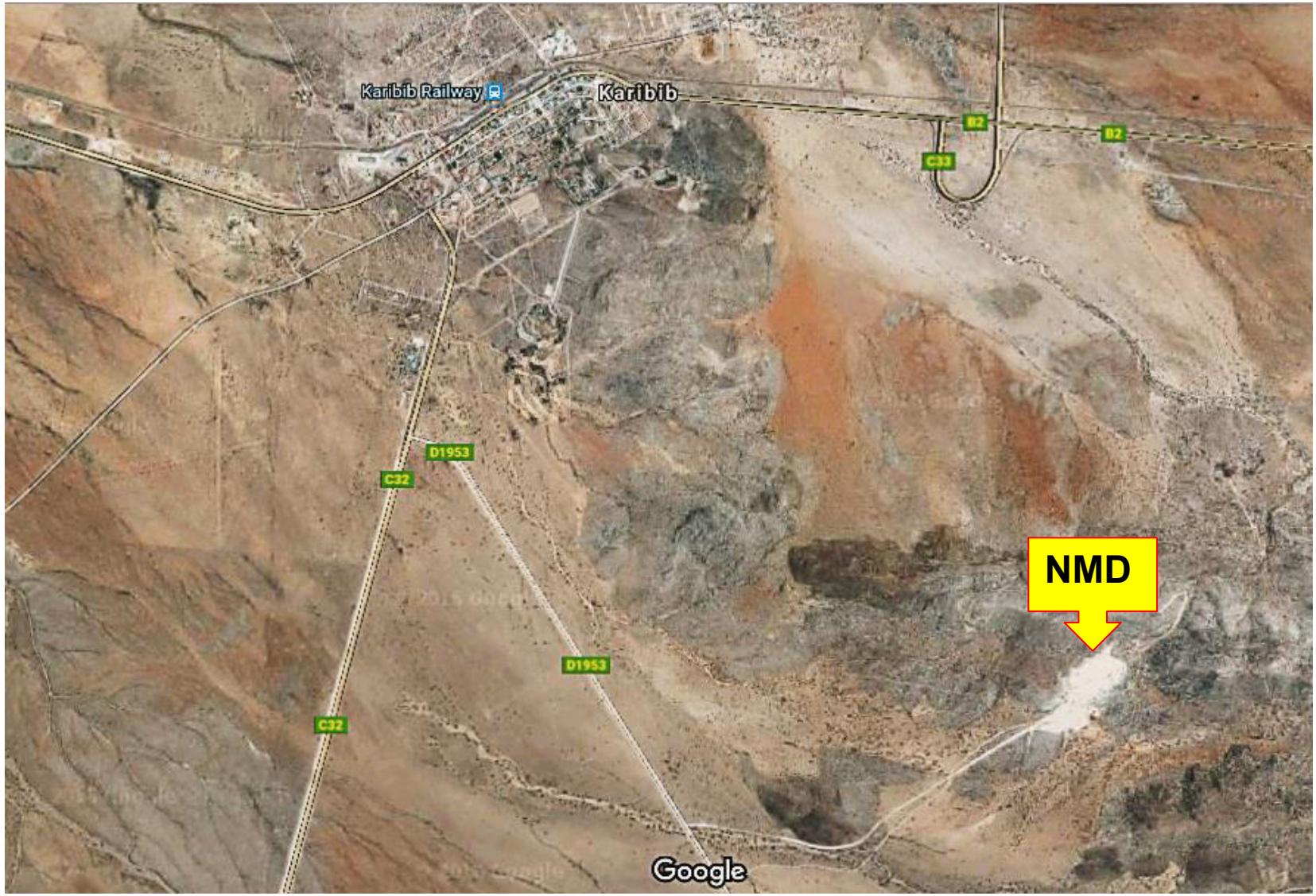


Figure 2-1: Mine Location – Karibib, Erongo Region

2.6 Geological maps of the area

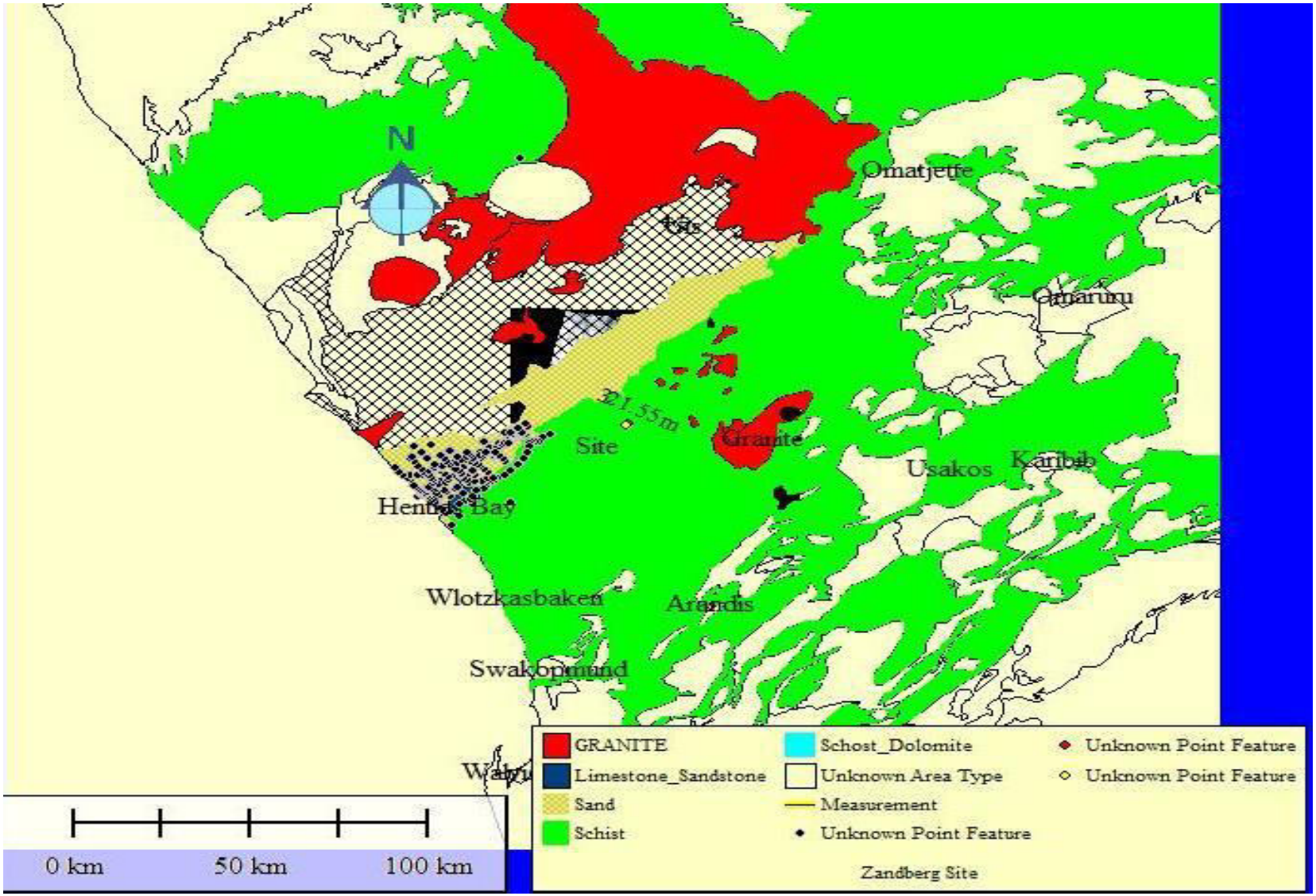


Figure 2-2: Geological map of the project area – Erongo Region

2.7 Current status (3 June 2021)

	
Mining pit (Open Cast) were dolomite rock is mined using excavators and loaded on tipper trucks	**Dolomite rocks transported to processing plant using tipper trucks**

Processing plant were dolomite rock is crushed and processed into dolomite ore

Ore from processing plant is stored in canvas bags for loading and transported to South Africa for further processing

	
Transportation of the Ore to South Africa using heavy duty trucks	• **Waste Oil is collected and stored in drums** • **Drums are transported to Navachab mine for further recycling**

Staff members are provided with PPE

On-site Ablution Facilities for the staff at the mine

Figure 2-8: Current Status (3 June 2021)

3. COMPLIANCE AND LEGAL REQUIREMENTS

3.1 Compliance to the EMP

The EMP is binding to the proponent, and all contractors / sub-contractors to be engaged in the mining / operation of the Mining Operation. This implies that each and every entity that may have any kind of engagement or involved in / with the operations of the Mining Operation should comply with the EMP throughout the project lifespan. Non-compliance may have serious consequences e.g withdrawal of licenses by the authorities, which means project closure.

3.2 Environmental Management Act (No.7 of 2007)

The EMP should conform to the provisions of the Environmental Management Act (EMA), Act No. 7 of 2007 and EIA regulations of 2012 (Government Notice: 30).

The EIA Regulations defines a '*Management Plan*' as:

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

3.3 EMP Requirements

Table 3.1: EMP Requirements as outlined in Section 8 of the EIA Regulations

Requirement
(j) a draft management plan, which includes – *(aa) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure;* *(bb) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and* *(cc) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.*

3.4 Listed Activities requiring EIA and EMP

The Environmental Management Act (Act No. 7 of 2007) and EIA Regulations of 2012 (Government Notice No: 30), highlights that listed activities may not be undertaken without an Environmental Clearance Certificate (ECC).
The proposed mining of dimension stones (Dolomite – dimension stone) is a listed activity and falls under Activity 3: Mining and Quarrying Activities.

Table 3.2: Listed activity: - Activity 3: Mining and Quarrying

Activity 3 Mining and Quarrying Activities
3.1 The construction 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.* *3.4 The extraction or processing of gas from natural and non-natural resources, including gas from land fill sites.* *3.5 The extraction of peat.*

This implies that an Environmental Scoping Exercise should be undertaken and an EMP should be developed, and should be submitted to the Ministry of Environment and Tourism (MET) as part of the application for an Environmental Clearance Certificate (ECC).

3.5 Other Legal Framework relevant to the EMP

In addition to the EMA and the Environmental Assessment Policy, there exists a host of legal and policy documents and guidelines that govern environmental management as presented in table 2.2 below: The proponent has the responsibility to ensure that the mining activities conforms to all other relevant legal requirements.

Table 3.3: Relevant legislation and applicability thereof

Legal Requirements		
Legislation considered	***Relevant Organ of State / authority***	***Aspect of Project***
Pollution Control and Waste Managemen	**MET, MHSS and others**	The Pollution Control and Waste Management Bill, intents to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. Upon gazettement, the Bill will repeal the

t Bill *(in preparation)*		Atmospheric Pollution Prevention Ordinance (11 of 1976). The Bill also provides for noise, dust or odour control that may be considered a nuisance. Furthermore, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and advocates for a waste management licence for any activity relating to waste or hazardous waste management.
Public Health Act (Act No. 36 of 1919)	**Ministry of Health and Social Services**	The Public Health 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 liable to be injurious or dangerous to health. The proponent should ensure that the workers are provided with protective gear to mitigate an health risks. The activities should also be conducted in a manner that does not pose any danger to the general public and that any emissions which could be considered a nuisance should be contained at acceptable levels.
Atmospheric Pollution Prevention Ordinance (Act No.11 of 1976)	**Ministry of Health and Social Services**	This Ordinance serves to control air pollution from point sources. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health.
Water Resources Management Act (Act No. 11 of 2013)	**Ministry of Agriculture, Water and Forestry**	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Therefore, any watercourse on/or in close proximity to the site and associated

		ecosystems should be protected in accordance with the listed principles. Water is one of the most important resources, and determinant factor for any development. Therefore, water abstraction should satisfy the provisions of the water act (water abstraction / borehole permit should be applied from the respective Ministry).
Labour Act (Act No. 11 of 2007)	**Ministry of Labour and Social Welfare**	The provisions of the Labour Act relating to the Health and Safety of employees at work sets out the duties of the employer and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, mining safety and electrical safety. The regulations states that, no employer shall require or permit an employee to work in an environment that is deemed unfit without protective measures in place. The proposed activity should adhere to the requirements of the Act and associated regulations. Schedule 135 of the Act states that appropriate measures shall be maintained to ensure that noise levels do not increase by more than 7 dB(A)Leq above residual background sound levels. Similarly in habituated areas adjacent to access roads maximum noise levels shall not exceed 85 dB(A).
Regional Councils Act, 1992 (Act No. 22 of 1992)	**Ministry of Regional and Local Government, Housing and Rural Development**	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate regional development. The Regional Council is considered to be an interested and affected party (I&AP) and reserve the right to comment on the project and EMP.

ROLES AND RESPONSIBILITIES

This section outlines the roles and responsibilities of the respective key personnel responsible for the day to day activities to ensure effective implementation of the EMP.

3.6 Roles and Responsibilities

For accountability, it is necessary to assign responsibilities in-order to ensure accountability. The key role-players for project implementation are;

a) The **Environmental Compliance Officer (ECO)** representing the Ministry of Environment, Forestry and Tourism (MEFT), or an appointed independent environmental officer, who is responsible for environmental monitoring and auditing.

b) **The Contractor** (entity carrying out the actual mining).

c) **The Site Manager (SM),** the person responsible for the day-to-day management during mining and operation of the Mining Operation. The site manager during the mining and the site manger during operation, may be the same person, but it can also be different people.

3.6.1 The Environnemental Compliance Officer (ECO):

The ECO refers to the party responsible for the environmental monitoring and auditing to ensure that the provisions of the EMP are complied with.

The ECO shall have adequate environmental knowledge to understand and interpret the EMP and pertaining environmental aspects associated with the project. The specific tasks of the ECO are as follows:

- To undertake all monitoring and auditing activities in-order to ensure compliance with the EMP.
- Conduct site inspection prior to the commencement of activities; and at reasonable intervals (e.g every month, quarterly or annually), throughout the duration of the project. Depending on the risks, some projects may be inspected more frequently (e.g every month).
- Shall compile Progress Reports immediately after site inspections, Compliance Reports, pertaining to any non-compliance incident/s, and a Rehabilitation Report following the conclusion a specific activity.
- The ECO shall liaise closely with all key stakeholders i.e the **Site Manager** and **MEFT – DEA.**

- Shall provide guidance on any environmental management issues, incidents or emergencies that may arise throughout the project lifespan.
- Shall assist in providing recommendations for remedial action in the event of non-compliance.
- Auditing or monitoring activities may involve investigation, as well as structured observation, measurement, and evaluation of environmental data over a period of time.
- The ECO shall contact regular inspections (unannounced spot checks) and shall compile compliance on non-compliance report to the respective authorities (MET or any other relevant authority).

3.6.2 The Contracter:

The following are the specific responsibilities of Contractor:

- Appoint a Site Manager (SM) to oversee the daily onsite activities.
- Liaise closely with the SM and ECO on any environmental management issues, incidents or emergencies.
- Ensure that all activities on and around the site are conducted in accordance with the requirements of the EMP at all times.
- Ensure that all sub-contractors and visitors to the site are conversant with the requirement of the EMP, relevant to their roles on site.
- Shall develop a **communication strategy** between the contractor, Site Manager, workers, the ECO and any other relevant stakeholder.
- Shall develop an **organisational structure** to ensure that:

  - There are clear channels of communication;
  - There is an organisational hierarchy for effective implementation of the EMP; and
  - Conflicting or contradictory instructions are eliminated;
  - Ensure that all instructions and official communications regarding environmental matters shall follow the organisational structure as determined
  - Ensure that that EMP requirements are assigned to specific people / positions with the capacity and experience required for implementation.

3.6.3 The Site Manager:

The **Site Manager (SM)** should:

- Ensure that each team recruited to work at the mining site (including staff members, contractors / sub-contractors of Namibia Mineral Development (Pty) Ltd, adheres to the EMP;

- Ensure that a **copy of the EMP is kept on site at all times and should be furnished to authorities at any given time**.
- Ensure that all staff attend an induction session before commencement of any work on site and that they are adequately informed of the requirements of the EMP;
- Shall take special care to prevent irreversible damage to the environment;
- Ensure that mining works are within the boundaries of the mining site as specified Site Map and boundary markings (visible pegs, tape etc).

3.7 EMP Context

Environmental management is not only concerned with the final results of the Contractor's operations, but also with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standards of the day-to-day operations required to complete the Works.

The EMP is an important tool and necessary to mitigate / counter negative environmental or social impacts that may arise from the project. However, in the absence of audits and monitoring, it will become ineffective.

3.8 Disciplinary Action

The EMP is a legally binding document and non-compliance with the EMP shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- ✓ Fines / penalties,
- ✓ Legal action,
- ✓ Withdrawal of license/s
- ✓ Suspension of work.

The disciplinary action shall be determined according to the nature and extend of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

3.9 Non-Compliance

The Contractor and Site Manager shall be deemed to have **not** complied with the EMP if:

- There is evidence of contravention of the EMP and associated indicators.
- The Contractor and SM have failed to comply with corrective or other instructions issued by the ECO or qualified authority.

- The contractor and SM fail to respond to complaints from the public.

4. POTENTIAL IMPACTS & MITIGATION MEASURES

The EMP has been structured to provide mitigation measures in accordance with the scope of work during the mining and operation phases of the Mining Operation. The EMP requirements should be considered at all stages / phases of the development process as follows:

- Design;
- Planning;
- Mining Site preparation, and
- Operational Phase

4.1 Design phase

The design phase entails the conceptual framework (what, where, how big, etc) and architectural design (sketch and projected image), and machinery for the proposed development. It is important that, already at this stage, the Architectural and Engineering design, as well as recommended mining machinery should meet environmental standards, particularly with regard to aesthetic, visual, waste management etc).

4.2 Planning phase

During the planning phase, it is imperative that the design is re-evaluated and if any environmental concern is detected at this stage, corrective measures should be applied. In-addition, a contingency plan should be in place, in case, unforeseen environmental concerns are detected later.

4.3 Mining Site Preparation

To provide a systematic guide for the development of mitigations measures, mining site preparation can be broken down / sub-divided into different development stages / phases as presented in the table 5.1 below.

Table 4.1: Mining Phases against which mitigation measures are required

Phase	Description
Phase 1	Access roads to mining sites
Phase 2	Site Clearing and deployment of machinery
Phase 3	Decommissioning – Removal of all unwanted material after the mining operation, cleanup, landscaping, and rehabilitation

4.4 Operational Phase

For ease of reference and monitoring during operation, the EMP is sub-divided into different themes and for each theme, the following aspects are highlighted:

- ✓ Potential Impact,
- ✓ Environmental Management Objective
- ✓ Mitigation Measures / Management Action/s required
- ✓ Indicator/s for Monitoring and Compliance
- ✓ Party responsible for implementation

4.5 Impact Themes and Mitigation Measures

The EMP has been categorised into different socio-economic and environmental themes. Themes serve as a quick guide to the recommended EMP remedial actions, during both Mining and Operational phases (Table 5.2).

Table 4.2: EMP Impact Identification Themes and Associated Aspects

EMP Themes	Specific Aspects
A – Staff induction	Induction
	Site Demarcation
	Communication
B – Health and Safety	General safety at work place
	Road Safety
	Ablution facilities
	Dust and Noise
C – Pollution and Waste Management	General waste: *Material waste (off cuts), concrete rubble, garden & domestic waste,*
	Vehicle emissions (smoke)
	Oil Spills
	Any other waste
D – Environment	Access roads
	Ecology
	Water
	Rehabilitation
E – Cultural Heritage	Heritage resources / artefacts
F – Socio economic	Employment opportunities for Locals
	Alcohol and Drug use at mining site
	Working hours
	HIV / AIDS
	Security

SECTION A: STAFF INDUCTION

Table 4.3: Mitigation measures pertaining to staff Recruitment and Induction

	Potential Sources of Impacts: ✓ Employees working without employment contracts (recipe for labour disputes) ✓ Lack of adequate induction to inform the workers the Do's and Dont's ✓ No formal orientation of the mining process and workers are often disoriented ✓ Poor Communication No presentation of the EMP and workers are not aware of the content and risks associated with the activities / actions			
Aspect	**Objective**	**Mitigation Measures**	**Indicators for Monitoring and Compliance**	**Status (Audit findings)**
Recruitment	To ensure that all workers have employment contracts (Labour Act No. 11 of 2007)	Formalize recruitment of all staff with Contracts, stating nature of employment, duration and remuneration to protect both parties and avoid labour disputes later on	Copy of staff contracts	**Verified (staff confirmed that they have employment contracts)**
Staff Induction	To ensure that all staff / employees are conversant with the requirements of the EMP	Induction for all workers on the provisions of the EMP before work commencement, covering but not limited to: Safety, Health and Environmental (SHE) measures, emergency response, reporting of incidents, HIV/AIDS awareness, alcohol and substance abuse, etc	Induction Minutes and Attendance Register, Signed by each and every staff member Staff members appointed at a later stage should also undergo induction	**Verified (Site manager confirmed that all staff undergo compulsory induction before appointment**

		Staff operating equipment (such as trucks, loaders, jack hammers, compressors etc.) shall be adequately trained and sensitised against potential hazards Conduct Quarterly induction reviews and reflect on workers conduct	Quarterly minutes	
	Availability of the EMP on site for ease of reference	Ensure that a copy of the EMP is kept on site and accessible by team leaders	Availability of EMP on site and accessibility by team leaders	**Verified (a Copy of the EMP is kept on site for reference)**
	Punitive measures for staff, to ensure compliance	Adopt a disciplinary system to discipline staff for non-compliance, for offences such as littering, speeding, safety risk both to themselves and to others, not using ablution facilities, etc.	Number of fines issued daily / per month	**Verified (punitive measures are in place to ensure compliance)**

Communi-cation	Ensure effective communication throughout the mining period (project lifespan)	Develop a communication strategy (Chanel & medium of communication) All correspondence should be written and signed off by witnesses (e.g Site Manager / team leaders) The contact numbers for the Site Manager and Team Leaders must be available onsite (displayed) in case of emergencies.	Communication Strategy Letters, e-mail, Notices, Minutes List of contact numbers available on site	**Verified (is mostly done via E-mail, Notices)**
Site Demarcation	To contain all project activities within the site boundaries and prevent mining activities from extending beyond the mining claims	Demarcate the mining site with visible marking (e.g. fence, pegs, tape etc.) If need be, obtain permission from relevant authorities to make use adjacent land e.g for temporary staff accommodation or machinery warehouse	Temporary fencing or any other visible site demarcation in place Mining activities are contained within the project site	**Verified (boundary markings – sign boards)**
Notice Board	To warn the public of the mining site	Erect a notice board at the site entrance to notify the public of the mining activities on site	Visible notice board	**Verified (Rock marking indicating mining site in place at entrance)**

SECTION B: OCCUPATIONAL HEALTH AND SAFETY

Table 4.4: Mitigation measures pertaining to Health and Safety

	Potential Sources of Impacts: ✓ Inadequate training of employees or contractors on risks associated with mining activities ✓ Safety hazards may occur if equipment is not handled in the correct manner ✓ Employees not receiving the correct Personal Protective Equipment (PPE) for their specific responsibilities. ✓ Employees not adhering to safety rules implemented at the site Noise generated by mining vehicles and equipment during the mining activities			
Aspect	**Objective**	**Mitigation Measures**	**Indicators for Monitoring and Compliance**	**Status (Audit findings)**
General Occupational Health and Safety of the employees (injuries)	To ensure safe working conditions and adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617)	Develop a Health and safety Plan Identify potential hazards and develop responses to eliminate sources of risk or minimize workers' exposure to hazards Provide adequate and appropriate personal protective equipment for all workers Provide training to all workers on relevant aspects of	Health and Safety Plan Hazard risk and safe work condition audit report Personal protective equipment issue (Distribution register)	**Verified** **Staff attended health and safety training workshop (A1)** **All staff members are provided with full PPE (A2)** **Fire Extinguishers are available throughout the mining site (A3)**

		occupational health and safety associated with their daily work Provide sufficient fire extinguishers and train staff on how to use them and the applications thereof Assign designated area for storage of mining material so that it does not pose danger to the staff	Training schedule and attendance register Availability fire extinguishers and evidence training (e.g minutes, training pictures etc	
Accidents and incidents	To ensure safe working conditions	Document and report occupational injuries, illness and fatalities, including near misses. Investigate causes and take appropriate action to eliminate risks where possible Provide adequate access to first aid and medical assistance in cases of work related accidents or injuries	Accident and incident register (including near misses) Root causes analysis report Incident review (cause and elimination of hazard) First aid kit availability and adequacy audit report	**Verified** **First aid kit available on site (A4)**
Physical Hazards to workers	To ensure safe working conditions	Eliminate physical hazards to workers and mitigate any residual risks	Hazards risk report	**Verified (No physical hazards on site)**

Road Safety	To prevent traffic hazards / inconveniences from earth moving machinery during mining period	Signage to warn motorists about mining activities and presence of earth moving machinery All trucks transporting mining materials (e.g sand / gravel) should be covered with suitable material (e.g net, tarpaulin, canvas etc) Adhere to traffic rules and speed limits both on and off the mining site	Public Complaints / Incident report/s	**Verified** **Warning signs erected to alert motorist of mining site (A5)** **All trucks transporting ore covered with canvas (A6)**
Ablution Facilities	To reduce health risks and environmental pollution and ensure healthy working environment with appropriate and user friendly ablution facilities	Ensure adequate, hygienic (clean) and user-friendly ablution facilities for all staff (minimum of 1 toilet per 15 workers) Appoint a cleaner or rotate cleaning responsibilities among workers. If necessary, designate Male and female toilets Ablating and urination, other than at the toilet facility provided, shall be strictly prohibited.	Toilet cleaning schedule and inspection reports Provision for toilet paper (to avoid the use of newspapers and other non-biodegradable materials) Incident reports or complaints of waste discharge into the environment	**Verified** **Staff ablution facilities available on-site (A7)** **Staff provided with toilet paper and hand washing soap**

		Effluent should be discharged in accordance with the effluent discharge regulations.		
Dust and Noise	To mitigate dust and noise impacts to both employees and the public To minimise noise disturbances during the mining phase.	Adopt applicable dust suppression measures to mitigate dust impacts, Provide dust masks and ear muffs to all employees operating in a dusty or noisy environment	Incident Report	**Verified (All staff members provided with full PPE including dust masks, and ear muffs)**
Fire Risk / **Hazard**	To mitigate fire risk	Storage areas for hazardous chemicals are to comply with standard fire safety regulations. Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. Use and Contain fire for cooking purposes and apply caution to prevent an un-controlled fire throughout the project lifespan.	Induction report (evidence) on fire risks, management and response mechanisms	**Verified** **Fire extinguishers installed on- site** **Safety signs erected on site** **No chemicals are used on site. The mine does not use any chemicals for mining operations.**

		Any fire outbreak could lead to loss of life, property and grazing The same fire caution should be adopted by smokers (smother the cigarette bud before disposing in appropriate waste bin or burry underground. Provide / install Fire extinguishers in accordance with safety regulations		

SECTION C: POLLUTION AND WASTE MANAGEMENT

Table 4.5: Mitigation measures pertaining to waste management

	Potential Sources of Impacts: ✓ Generallly, mining sites generate considerable amounts of waste, with no proper waste management and disposal systems ✓ Disregard of the pollution impacts (often considered insignificant e.g littering, oil spills etc) ✓ Poor management, storage and disposal of concrete and cement or spillages from equipment used for mining (e.g. cement mixers), and general spillage of contaminated wash or wastewater ✓ Oil spills (includes fuel, grease, etc) ✓ Leaking or broken sewerage pipes Storage of unwanted waste (e.g old / waste tyres) and poor disposal systems dispose			
Aspect	**Objective**	**Mitigation Measures**	**Indicators for Monitoring and Compliance**	**Status (Audit Findings**
Vehicle emissions	Reduce greenhouse gas (GHG) emissions from poorly maintained or malfunctioning equipment (vehicles / machinery	All vehicles and equipment shall be kept in good working order and serviced regularly (in accordance with the servicing frequency of the specific machinery), in order to prevent emission of poisonous smoke etc	Vehicle servicing records Reports of smoke emissions from machinery	**Verified (On-site mechanic ensures all vehicles and equipment are kept in good working condition)**
Oil Spills	Ensure waste oil is managed appropriately and pollution is prevented at all costs	Provide concrete bunding for fuel storage and transfer on site. The bunding should be bigger than the fuel storage tank/s to allow a bit of	Concrete bunding at all fuel storage and handling sites	**Verified (waste oil is collected from all machinery and stored in drums and then send to Navachab**

		working space around tank/s (e.g 20% bigger than the tank/s) Bunding and concrete slabs should be installed at each point where hazardous materials are handled. Use of sheeting to prevent soil contamination (e.g during vehicle servicing) Waste oil should not be stored onsite indefinitely and should be recycled (transfer to oil recycling companies) If an oil spill occurs, collect the contaminated soil, store in drums and dispose at appropriate waste disposal site (e.g Municipal disposal site) All vehicles and machinery should be fitted with oil drip trays to prevent oil from dripping to the ground Appropriate equipment to deal with emergency spill incidents must be readily available on site. This includes spill kits for hydrocarbon spills, drums or containers for contaminated water	Drums or containers for oil recycling and proof of oil transfer to recycling companies Oil drip trays for each vehicle	**mine for recycling) (A8)**

Handling of Chemicals		Staff induction and training on the use of all hazardous chemical substances used onsite (including fuel, greases and oils). Keep a stock register for all chemicals and the storage should be well ventilated. Chemicals should be properly labelled and ensure access control. Personnel handling hazardous chemicals should be issued with appropriate Personal Protective Equipment (PPE). Immediately clean all spillage of chemicals, fuels, lubricants etc. Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site.		**Verified (No chemicals used on site)**
Solid Waste	To prevent pollution and maintain a clean environment	Classify waste into different categories e.g Material waste (wood, steel, corrugated iron etc), Building rubble (concrete), Garden Waste (tree stumps, branches etc), and Domestic Waste (Litter – cans, plastics, tissues etc)	Scattered waste, Littering and any other unsightly waste at the site (eyesore)	**Verified** **Waste is sorted in litter drums and collected by the Local Authority for recycling and disposal (A9)**

		Each category should be disposed off in accordance with the Municipal Regulations and in the most suitable and environmentally acceptable manner All waste produced on site should be contained and disposed as per Municipal regulations No onsite burying, dumping or burning of waste material shall be permitted. Ensure appropriate waste collection and removal from the site and dispose at appropriate municipal waste disposal sites		
Waste Water	To avoid effluent discharge into the environment	Refer to regulations on effluent disposal Be on the lookout and repair any leaking or broken sewer pipes (regardless of how small it may be perceived)	No leakage of sewer pipes	**Verified (No leakage or broken pipes observed on-site)**

SECTION D: ENVIRONMENT

Table 4.6: Impacts pertaining to environment and cultural heritage

	Potential Sources of impacts: ✓ Uncontrolled routes (everyone drives wherever they want) ✓ Disregard of environmental values, concerns and recommendations ✓ Lack of awareness amongst workers and contractors of how their actions may impact on the environment ✓ Soil erosion due to the clearance of vegetation, excavations ✓ Loss of topsoil due to lack of rehabilitation and restoration measures ✓ Lack of adequate storm water management and drainage systems			
Aspect	**Objective**	**Mitigation Measures**	**Indicators for Monitoring and Compliance**	**Status (Audit Findings)**
Landscape alteration	Establish only one (1) route for both entry & exit to each mining site	Clearly demarcate the road, inform staff (drivers) accordingly	Meeting Minutes, signed by drivers	**Verified (Only one entry and exit route is used to access mining site**
Ecological damage / disturbance (fauna and flora)	Remove trees only as necessary (if it obstructs the mining process) Where possible, minimize disturbance to plants and animals	Acquire permits from relevant authority for the removal or cutting down of protected trees (Permits to remove protected trees required from Forestry, MAWF)	Photographic records of site before mining commencement Regular review of photographic records	**Verified (No disturbance to vegetation is permitted on site**

Land degradation	To mitigate soil erosion	Adopt soil protection measures (particularly against wind and storm water – runoff) Re-use the topsoil / overburden for backfilling. Compacted soil should be ripped to ensure effective re-vegetation Re-vegetated with suitable indigenous vegetation Minimise the length and steepness of slopes to mitigate erosion	Photographic records of site before mining commencement Regular review of photographic records	**Verified (Top soil/Overburden piles used for backfilling) (A10)**
Water Pollution	To prevent water pollution (surface and ground water)	The mining activities shall be kept above the water table Control and manage seepage and run-off of contaminated water from the mine (both waster produced on the mine and storm water) Maintain a buffer of 100 m from watercourses. Ablution facilities must be located at least 100 m away from streams or freshwater	Water management report	**Verified** **Mining operations are above water table)** **Ablution facility located 300 m away from water source (borehole)**
Visual Impact	Minimize / limit visual impact	Limit Landscape alteration Colour Schemes for infrastructure (buildings, walls, fences etc) should blend in with the natural environment	Colour Schemes presented and approved by authorities	**Verified**

SECTION F: SOCIO-ECONOMIC

Table 4.7: Mitigation Measures pertaining to Socio Economic Impacts

	Sources of impacts: ✓ Unfair labour practices ✓ Lack of awareness among the employees ✓ Unwillingness to support the locals			
Aspect / Activity	**Objective**	**Mitigation Measures / Management Actions**	**Indicators for Monitoring and Compliance**	**Status (Audit Findings)**
Employment opportunities for Locals	Promote benefits to the local community Promote benefits to local communities	Recruit locals for unskilled labour Quotas for local employment must be set, and the contractor's contract must specify that these positions shall only be filled by non-local persons if it can be demonstrated that no suitable local persons must be identified (e.g. through local advertising) to fill these positions.	Employee structure and proportion of local employment	**Verified (Site manager confirmed locals are given preference during recruitment)(A11)**

		Where possible, procure materials from local suppliers		
Alcohol and Drug use	Prevent alcohol and drug use at the mining site	Ban and warn the employees against the use of alcohol and drug at mining site Provide awareness on the dangers and health impacts of alcohol and drug use	Drunk / Misbehaving employees Monitor presence of alcohol at the mining site	**Verified (Employees are subject to alcohol breathalyser test before being granted access to mine)**
Long working hours	Adhere to the Labour Act No. 11 of 2007	Operate within the prescribed working days and hours as per the Namibian Labour laws and regulations. Provision for overtime or compensatory time off for long hours worked	Verification of working hours against the labour Act	**Verified (Site manager confirmed strict adherence to Labour Law)**
HIV / AIDS	Provide HIV / AIDS awareness to employees	Provide HIV / AIDS awareness at induction Avail Condoms in Toilets at site	Availability of condoms at mining site	**Verified (Employees are briefed on HIV-AIDS awareness during induction)**
Security	Orientation of workers about security for both equipment and themselves	Orientate all staff about the security of equipment and themselves & provide contact numbers for Police and other emergency services e.g. Ambulance	Proof of security orientation and emergency contact numbers	**Verified** **Staff are oriented on security of equipment and guarding against theft** **Emergency contact details available on site**

5. REHABILITAITON

Socio-economic development is very important for our livelihood and provides services, income and employment opportunities, and hence activities such as mining are vital and necessary for development. However, such developmental activities should be conducted in a thoughtful and forward looking manner. In other words, developmental activities, such as mining should consider the environmental wellbeing at the end of the project (closure). Therefore, for recovery and restoration, the mining activities should be conducted in a sustainable manner throughout the project lifespan.

Rehabilitation is the process of repairing and taking all the necessary actions to limit the damage caused by the developmental activity in-order to minimise potential impacts and to make the land suitable for other uses or simply to beautify the affected area (so that it does not become an eyesore). Rehabilitation can also be referred to as the measures taken to repair damaged environments (example re-vegetating, removal of unwanted infrastructure, cleaning up pollution etc).

5.1 Designing a Rehabilitation Plan

A rehabilitation plan refers to a set of steps or measures to be taken in-order to ensure that negative impacts associated with the development at hand are mitigated. This however requires prior planning and integration of rehabilitation activities throughout the project lifespan. Meaning, rehabilitation measures should be taken right from the beginning of the project.

The environmental characteristics of an area where a project is located plays a vital role in designing a rehabilitation plan.

5.2 Recommended Measures

The mine is situated within the Karibib Town lands and as a result, a rehabilitation plan should be developed in consultation with the town council to ensure that the area is integrated in the town planning for future use.

Balancing the demands of an activity such as mining with township development is not always clear cut. The principle is minimal disturbance to the general area surrounding the mine in order to safeguard the environment.

It is recommended that the mining site should be fenced off to prevent people, livestock and wildlife from wondering around the mine and the animals from getting injured, e.g falling in the mining pit.

Aspect	Objective	Management Actions	Indicator	Status (Audit Findings)
Rehabilitation	Rehabilitation Plan (RP)	Develop a Rehabilitation Plan (RP)	Rehabilitation Plan with a monitoring schedule Inspections reports	**Rehabilitation Plan is still underdeveloped** **Monthly inspection to be conducted by the Karibib Town Council**
	Limit environmental damage	Re-use the topsoil / overburden for backfilling Compacted soil should be ripped to ensure effective re-vegetation Re-vegetate the affected with suitable indigenous vegetation.		
	Access to the mining site	Access roads to mining site should be limited to control after the project closure		
	Although land can rarely be rehabilitated back to its former natural state, every effort shall be made to minimise the impact of the mining scars	A shallow borrow pit, is easier to rehabilitate than a very deep one		
		The borrow pit edges and all steep slopes should be flattened, so that it does not become dangerous to animals		
	Landscaping	Landscaping – refers to re-shaping man-made landforms to blend in with the natural environment		

6. CONCLUSION

The EMP recommends measures to be implemented by the proponent (Namibia Mineral Development PTY LTD), and its sub-contractors, in order to manage the mining activities in an environmental friendly manner, and in accordance with the provisions of the Environmental Management Act (Act No.7 of 2007) and EIA regulations of 2012.

In-addition, the aim of the EMP is to ensure legal compliance and to prevent environmental fatal flaws for potential social and environmental impacts arising from the mine.

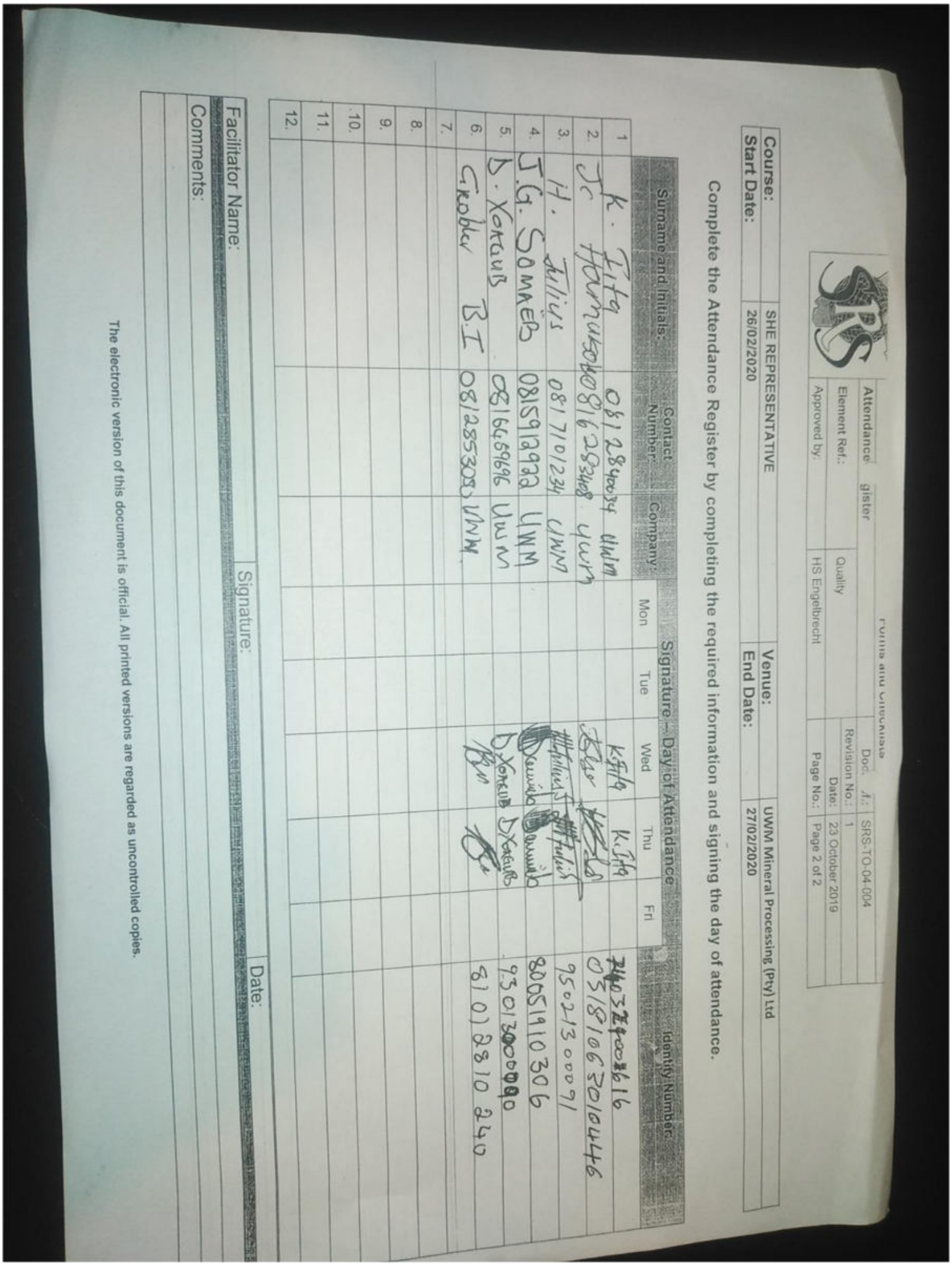
Specific responsibilities have been assigned to role-players in-order to ensure that the EMP is implemented and non-compliance against the EMP is punishable. Therefo*re*, NMD and the key role-players (Proponent, Contractor, Site Manager) as defined under section 4 should:

- ***Read*** the Revised EMP (particularly the site manager) and ensure that they are fully conversant with provisions of the EMP,
- If need be, ***Ask for clarity*** from the EP, ECO or relevant authority,
- Ensure implementation of the recommended mitigation measures, and
- Communicate defaults / challenges to the Environmental Compliance Officer (ECO) as soon as possible.

It is recommended that an Environmental Control Officer (ECO) should monitor (conduct periodic and unannounced EMP audits) throughout the mining lifespan, in-order to ensure compliance in-accordance with the mitigation measures prescribed in the EMP.

7. APPENDICES

A1 Health and Safety Training (Attendance Register)



Forms and Checklists

Attendance …gister		Doc. Ref.:	SRS-TO-04-004
Element Ref.:	Quality	Revision No.:	1
		Date:	23 October 2019
Approved by:	HS Engelbrecht	Page No.:	Page 2 of 2

Course:	SHE REPRESENTATIVE	Venue:	UWM Mineral Processing (Pty) Ltd
Start Date:	26/02/2020	End Date:	27/02/2020

Complete the Attendance Register by completing the required information and signing the day of attendance.

	Surname and Initials:	Contact Number:	Company:	Mon	Tue	Wed	Thu	Fri	Identity Number:
1	K. Iita	0812840034	UWM						[illegible]
2.	J.C. Hamukoshi	0816283408	UWM						03181063010446
3.	H. Julius	0817101234	UWM						95021300091
4.	J.G. SOMAEB	0815912932	UWM						80051910306
5.	D. XOAGUB	0816459696	UWM						[illegible]
6.	Grobler B.I	0812853083	UWM						81012810240
7.									
8.									
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10.									
11.									
12.									

Facilitator Name: Signature: Date:

Comments:

The electronic version of this document is official. All printed versions are regarded as uncontrolled copies.

A2 Staff member equipped with PPE

A6 Trucks transporting Mining ore covered with Canvas

A7 Staff Ablution facilities available on-site

A8 All waste oil collected from Machinery is stored in drums and taken to Navachab mine for recycling

A9 Waste is sorted in litter drums and collected at site

A10 Top soil/Overburden piles used for backfilling (Mining Rehabilitation)

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