Environmental Management Plan (EMP)

The Proposed Dune Sand Collection Activities Within the Tses Village Council Jurisdiction of the ǁKharas Region



ECC Application No.: **APP-007179**

Proponent: **Tses Village Council**

April 2026

DOCUMENT INFORMATION

Title: Draft Environmental Management Plan (EMP) – The Proposed Dune Sand Collection Activities Within the Tses Village Council Jurisdiction of the ǁKharas Region

Prepared by:

Author / Environmental Assessment Practitioner (EAP):	Fredrika N. Shagama
Qualifications:	Ph.D. Student: Civil Engineering (Geotechnics & Environmental Hydrogeology), VSB - Technical University of Ostrava, Czech Republic; Post Graduate Diploma in Environmental Studies, International University of Management (IUM), Namibia; MSc. Geological Engineering (*cum laude*) with a focus in Hydrogeology, VSB - Technical University of Ostrava, Czech Republic; BSc. Geological Engineering, VSB - Technical University of Ostrava, Czech Republic
Professional Affiliations:	Environmental Assessment Professionals of Namibia (EAPAN) - Practitioner (Membership No. 183); Geoscience Council of Namibia (GSCN) – Geoscientist, Registration No. GSCN/G-057; International Association of Hydrogeologists (IAH) - Full Member, Membership No.139790; Namibian Hydrogeological Association (NHA) – Member
Contact Details:	Mobile No.: +264 81 749 9223; eias.public@serjaconsultants.com Postal Address: P.O. Box 27318, Windhoek, Namibia
Signature:	
Date:	21 April 2026

SERJA'S STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the EIA Study and prepare this Environmental Management Plan (EMP) for the Proposed Dune Sand Collection Activities within the Tses Village Council Jurisdiction of the ǁKharas Region, Serja Hydrogeo-Environmental Consultants cc declares that we:

- do not have, to our knowledge, any information or relationship with the Tses Village Council (Proponent), nor the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) that may reasonably have the potential of influencing the outcome of this EMP and the subsequent Environmental Clearance Certificate applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007, and its 2012 Environmental Impact Assessment (EIA) Regulation, as well as other relevant national and international legislation, guidelines, policies, and standards that govern the project activities as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings, or some of these may not be favourable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines, and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the project, other than remuneration (professional fees) for work performed to conduct the EIA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

Disclaimer: Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.

…….

Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: April 2026

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Meaning
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
HSE Officer	Health, Safety & Environmental Officer
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Fisheries, Water, and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MIME	Ministry of Industries, Mines and Energy
NHC	National Heritage Council (NHC) of Namibia
PPE	Personal Protective Equipment
PRO	Public Relations Officer
PVC	Polyvinyl chloride
Reg, S	Regulation, Section
TCDC	Tses Community Development Committee (a community representative group)

1 INTRODUCTION

1.1 Project Background and Location

Due to the growing demand for suitable construction and other industrial materials to support regional infrastructure development, including road and railway projects, the Tses Village Council proposes to extract (collect) and supply dune sand from its jurisdiction at the site located about 1.7km south of the Village Centre. The approximate GPS coordinates of the site are: -25.897748, 18.118933, and the locality maps are shown in Figure 1-1 and Figure 1-2. The collected dune sand from the Tses Village site will be supplied to the construction industry and other industries (consumers) in the ǁKharas Region.

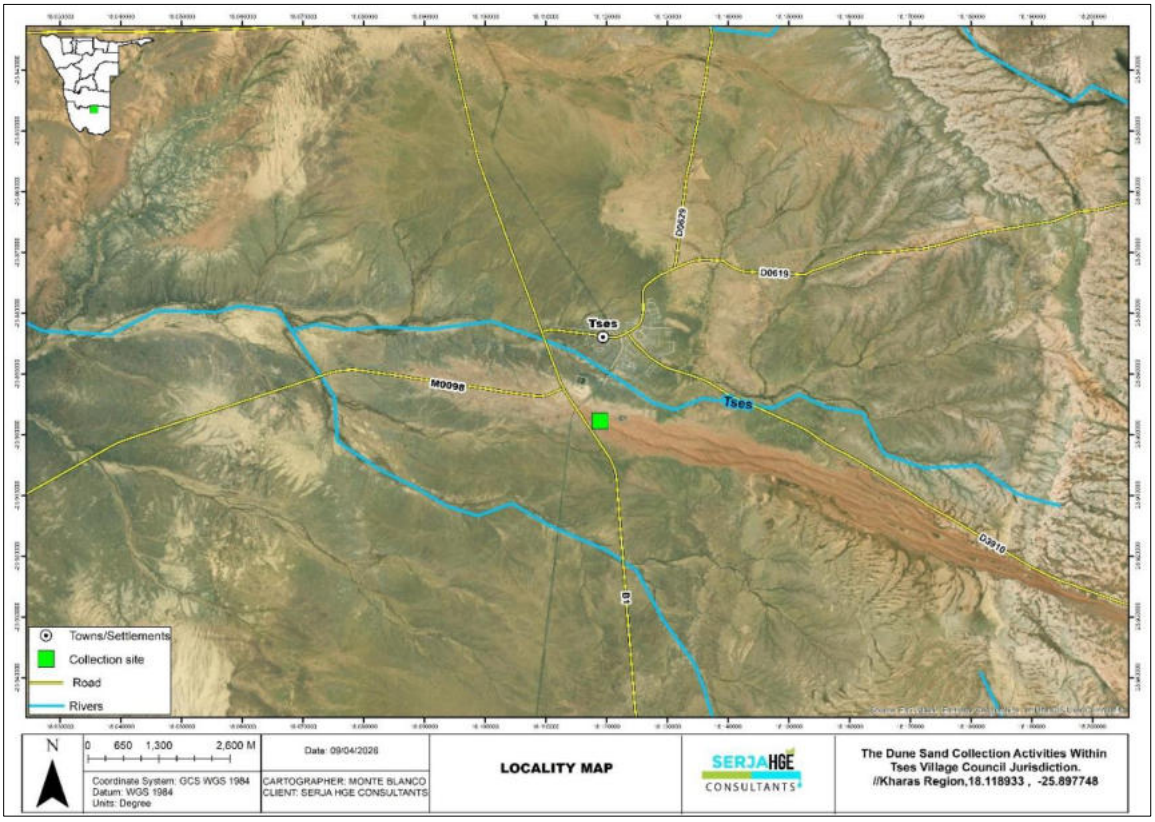


Figure 1-1: Locality map of the proposed dune sand collection in the Tses Village, ǁKharas Region

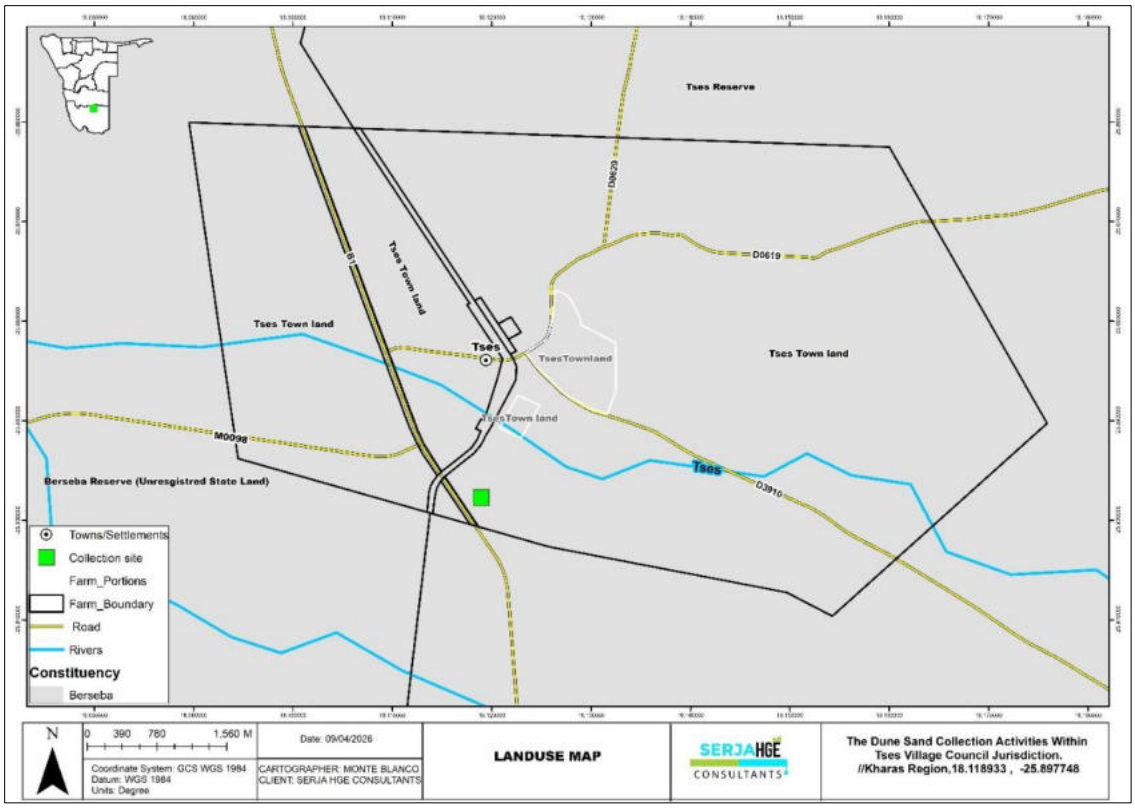


Figure 1-2: The land use (farm) map with the regional constituency in relation to the project site in Tses

1.2 Purpose of the Draft Environmental Management Plan (EMP)

The Draft EMP was developed in accordance with Regulation 8(j) of the EIA Regulations (2012), which states that it should be included in the Environmental Assessment Scoping report. A '**Management Plan**' is defined as:

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

An EMP (herein referred to as an EMP) is one of the most important outputs of the EIA process, as it synthesizes all proposed management & mitigation actions and monitoring actions, sets them to a timeline, and assigns specific responsibilities. It provides a link between the impacts identified in the EIA process and the required mitigation measures to be implemented to manage project impacts. It is important to note that an EMP is a statutory document, and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and can be amended to address project changes/or environmental conditions, and compliance monitoring feedback.

The EMP is therefore aimed at guiding environmental management throughout these phases of the project, namely planning & design, mining (dune sand collection phase), and the post-mining phase (rehabilitation of disturbed sites).

2 BRIEF DESCRIPTION OF THE PROJECT ACTIVITIES

The main activities will entail fencing the sand collection (extraction) area with a mesh fence around the project site to restrict unauthorized public access and, for safety reasons, prevent community children from playing with mining equipment or in the sand pits.

Once the site is secured for regulated mining, the extraction of sand will commence by the Proponent and or their contracted operator (Sand Extraction/Mining Contractor). Mining and extraction will only be done by hauling and loading the dune sand into designated trucks for transport to consumers.

There will also be a setup of project infrastructure, including equipment storage and vehicle parking areas on-site.

It should be noted that the site is not a greenfield, because there has been some dune sand collection done on-site before, as shown in some photos of the current condition of the site in **Error! Reference source not found.**.

Figure 2-1: The current condition of the dune sand collection site in Tses on the 7th of April 2026

2.1 The Dune Sand Mining Process

The dune sand collection (mining) will entail the following:

- Sand removal using front-end loaders and excavators.
- Extraction methods, such as surface scraping (removing top layers of loose sand) and bench excavation (controlled cutting of dune slopes).
- Avoiding over-steepening dunes to reduce collapse and erosion.

2.1.1 Site Preparation

The dune sand mining process will commence with demarcating the selected and approved area (avoiding sensitive habitats). This will entail the establishment of buffer zones (from infrastructure). Furthermore, there will be minimal clearing of vegetation within the targeted site footprint only. This will entail leaving a limited area for the storage of project equipment and erecting structures such as shade for site personnel (such as a security guard), fencing of the site, and installation of a site ablution facility (2 toilets), as well as the security gate and signage at the site. There will be no need for the construction of an access road, because there are already two existing sandy single-track access roads to the site (from the Village and from the B1). There will be a need to install or set up stormwater diversion berms (shallow ditches) to divert rainwater away from the site during rainy seasons.

Once the site is cleared (in phases), the topsoil will be stripped and stored separately on-site to be used for rehabilitation.

2.1.2 Controlled Mining (Excavation)

To ensure that the mining activities are done in an environmentally and socially responsible manner, the method to be used to collect the dune sand will be as follows:

- Shallow, wide-area excavation (borrow pit method) **at the maximum depth between 2.5 and 3m in a lateral expansion way, to avoid excavating a deep pit. This is also because shallower mining pits are easy to rehabilitate and allow natural infilling by wind-blown sand, particularly for an area like Tses.**
- Strip sand in layers (benching approach).
- Material Selection: Target clean, well-sorted dune sand (free of organic material), and void mixing with subsoil layers.

2.1.3 Loading and Transport

The mined sand will be loaded onto tipper trucks/haul trucks with an excavator and transported to railway construction sites, other projects in the area/region, or stockpile areas. The dune sand loads will be covered to prevent the sand from being blown from the trucks or spilled on public roads during transportation, and water will be sprayed on the sand on-site during windy conditions (to minimize/avoid dust generation). Haul routes will be well planned and used to minimise dust and disturbance.

2.1.4 Stockpiling

The collected dune sand will be temporarily stored in stockpile areas, either on-site close to the extraction site (within the site premises) or near the final sand-required sites, such as railway works or other purposes in the region. The stockpiles will be kept as low-profile to reduce wind erosion.

2.1.5 Progressive Rehabilitation

Progressive rehabilitation is crucial in reducing long-term environmental damage. Hence, the disturbed dunes will be reshaped to a natural profile using the stockpiled topsoil that was put aside during site preparation (stripping), while avoiding steep slopes (to reduce erosion risk). Where feasible, the surfaces will be stabilized using brush packing and or natural regeneration.

2.1.6 Site Closure and Final Rehabilitation

Once the project activities are completed (owing to depleted desired dune sand material on-site), infrastructure and waste will be removed from the site. The vegetation on and around the site will be monitored for recovery (for instance, the dominant indigenous grass re-seeding (*Stipagrostis spp*. (lovegrass))). Therefore, the steps of final rehabilitation are as follows (in order of appearance):

1. Backfill of the pit (where feasible)
2. Re-contour to mimic natural dune surface
3. Spread the remaining topsoil (from progressive rehabilitation stage)
4. Re-vegetate with native species (re-seeding with *Stipagrostis spp* and others, where possible)
5. Remove the infrastructure, waste, and equipment.

2.1.6.1 Post-Closure Monitoring

Once closure and final rehabilitation are done, there will be monitoring for erosion, vegetation establishment, and illegal access to the site.

The required resources and services that will be required for the dune sand mining activities will be provided by the Village Council throughout the project life cycle. These resources and service infrastructure are listed below.

2.1.7 Required Resources and Services Infrastructure

2.1.7.1 Human resources

The project will potentially employ about 7 to 15 local people (depending on the project's needs). Locals will be prioritised for employment (semi-skilled to unskilled labour). The workforce will comprise machine operators, labourers, security guards, etc.

2.1.7.2 Accommodation for workers

Workers will be commuting to the project site from their homes in Tses village to the work site. The skilled project workforce that is from outside the area will be accommodated in established accommodation facilities in Tses or in the nearby areas.

2.1.7.3 Site Accessibility

The project site can be accessed either from the B1 road via an existing sandy single-track or from the Tses Village Centre via the existing sandy single-track road.

2.1.7.4 Vehicles and equipment

The project equipment, machinery, and vehicles will be stored in designated areas inside the site premises. Machinery and vehicles such as excavators, dump trucks, bulldozers, loaders, support vehicles (such as 4x4 wheel-drive cars and other maintenance vehicles), etc., will also be parked at designated areas on-site.

2.1.7.5 Water supply

The water supply for the project will be supplied from the Tses Village Council water supply system. The water will likely be stored in a water storage tank on-site, to be used for the project (drinking) and dust suppression. To preserve fresh water resources, semi-treated water (if available) will be used for dust suppression.

2.1.7.6 Fuel supply

Diesel will be used for machinery and equipment, and a fuel generator to ensure an uninterrupted fuel supply to the project. Therefore, a 23,000-litre tank or a less-bunded fuel tank is anticipated for the site to ensure an uninterrupted supply during the project activities. The base of the tank will be lined with the impermeable Polyvinyl chloride (PVC) material under a concrete layer to prevent accidental oil spills from infiltrating the soil and groundwater. There will be oil spill control measures onsite, i.e., the absorbent material contained in the fuel spill equipment (such as a natural sponge-like material) that can absorb accidental fuel spillage or leaks. It is anticipated that the fuel tank will be refilled once a week. The Village Council will apply for a consumer installation certificate for the tank from the Ministry of Industries, Mines, and Energy (MIME).

2.1.7.7 Occupational health and safety

All project workers will be supplied with appropriate and adequate personal protective equipment (PPE) while carrying out project activities on-site. The site will also be equipped with a fully furnished first aid kit.

2.1.7.8 Site Security

The site will be fenced off using a mesh wire. The fencing will serve both as protection of the site from potential vandalism and theft of project equipment and infrastructure, and as a means of preventing unauthorized public access. Thus, protecting the vulnerable community members, such as unsuspecting children, from falling into the pit, and playing with the dangerous project equipment, as well as preventing local animals from entering the site.

2.1.7.9 Accidental fire outbreaks

The site vehicles and machinery will be equipped with fire extinguishers in case of accidental fire outbreaks. Therefore, a minimum of two fire extinguishers will be on-site.

2.1.7.10 Waste management (solid waste)

All waste generated from the project activities will be sorted, stored on-site in designated waste containers, and transported to the approved solid waste dumping site in Tses (for solid/domestic waste only).

2.1.7.11 Human waste/sanitation

Given the site distance from the Village centre (where proper toilets are and convenience purposes), the Tses Village Council will install at least two portable toilets for the workers and project-related visitors at the site. The toilets will be emptied according to the manufacturer's instructions and as regularly as deemed necessary.

2.1.7.12 Hazardous waste (fuels)

Hazardous waste (such as fuels and oils) that may be used on-site will be properly contained in designated waste containers on-site for disposal at the approved hazardous waste facility in Windhoek. Therefore, no hazardous waste will be disposed of in the project area or any other unapproved waste management facility in the project area or the ǁKharas Region at large.

2.2 Decommissioning and Rehabilitation of the Site

Once the dune sand mining is completed (due to low demand or depletion of the resource), the project infrastructure will be dismantled. The site (sand mining/borrow pit) will be rehabilitated in accordance with environmental regulations, usually by reshaping (levelling, as much as possible) and re-vegetating. Topsoil is replaced, and disturbed areas are stabilized to prevent erosion and encourage natural regrowth, ensuring long-term environmental sustainability.

Decommissioning and rehabilitation are primarily addressed through a decommissioning and rehabilitation plan that encompasses safety, health, environmental, and contingency aspects. Therefore, it is best practice for the Proponent to ensure the project and associated activities are ceased in an environmentally friendly manner, and sites are rehabilitated by carrying out the following:

- Dismantling and removal of all associated infrastructures from the project site areas.
- Carrying away all project equipment and vehicles.

- Clean up of site working areas and transporting the recently generated waste to the nearby appropriate and approved waste management facility.

Further decommissioning and rehabilitation practice at the site will include:

- Backfilling of pits and trenches associated with the site.
- Closing of holes and trenches to ensure that they do not pose a risk to both people and animals in the area post-dune sand collection activities.
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left as close to their original state as possible.

3 LEGAL FRAMEWORK: PERMITTING AND LICENSES

The Proponent is responsible for ensuring that project activities and the EA process conform to the principles of the EMA and that employees act in accordance with such principles. Table 3-1 The list below sets out the requirements of an EMP as stipulated by Section 8(e) of the EIA Regulations, primarily regarding specific approvals and permits that may be required for the project activities.

Table 3-1: List of legal requirements and permits for the project activities

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Environmental Management Act EMA (No 7 of 2007)	Requires that projects with significant environmental impacts undergo an environmental assessment process (Section 27). Details of the principles that are to guide all EAs.	The EMA and its regulations should inform and guide this EA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. For any amendments to the EMP (and subsequent ECC), an appropriate application should be submitted to the Office of the Environmental Commissioner at the Department of Environmental Affairs (DEAF) and Forestry of the MEFT. The contact details are: **Mr. Timoteus Mufeti:** Environmental Commissioner **Tel: +264 61 284 2701**
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	Details requirements for public consultation within a given environmental assessment process (GN 30 S21). Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area."	The Proponent, through their Mining Contractor, should obtain the necessary authorisation from the MIME to store fuel on-site. This entails the application of a consumer installation certificate. The consumer installation certificate is being applied for under a different application with its own EMP. **Mr. Carlo McLeod: Acting Director of Petroleum Affairs** **Tel: +264 61 284 8291**
Forestry Act (Act No. 12 of 2001	The Act provides for the management and use of forests and forest products.	The Proponent will apply for the relevant permit under this Act if it becomes necessary to remove protected trees, such as the protected trees within the site footprints, before they are removed. These protected trees are: black thorn (*Vachellia mellifera*), red-bark acacia/red thorn (*Vachellia reficiens*), giraffe thorn (*Vachellia erioloba*), and stink shepherd's tree (*Boscia foetida*). Contact the MEFT's Forestry Directorate Head Office **Mr. Johnson Ndokosho: Director: Forestry** **Tel: +264 61 208 7666**
National Heritage Act No. 76 of 1969	Call for the protection and conservation of heritage resources and artefacts.	Should any archaeological material, such as bones, unknown graves, old buried equipment, etc., be found onsite, work should stop immediately, and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide whether to clear the area or conserve the site or material. Contact Details at the NHC of Namibia **Mrs. Erica Ndalikokule – Director: NHC** **Tel: +264 61 301 903**

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Hazardous Substance Ordinance, No. 14 of 1974: **regulated by the Ministry of Health and Social Services**	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping, as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The handling, storage, and use of hazardous substances should be managed properly to prevent harm or compromise to the site environment. For better management and handling of waste fuel, the Proponent or Mining Contractor can contact: **Rent-A-Drum (Windhoek):** https://www.rent-a-drum.com.na/hazardous-waste-management/ Tel: +264 61 244 097/+264 61 244 098 **Waste Oil Recyclers (Oiltech Namibia CC, Windhoek, https://oiltech.com.na/)** **Tel: +264 81 343 5676** **Contact Wesco Engineering Services and Waste (Pty) Ltd** https://www.wesco.com.na/page/waste-management (in Walvis Bay). Tel: +264 64 213 200

4 EMP IMPLEMENTATION RESPONSIBILITIES

The Tses Village Council (the Proponent) is ultimately responsible for implementing the EMP. However, the Proponent may delegate this responsibility, or any part of it, at any time as they deem necessary. The roles and responsibilities of all delegates/parties involved in the effective implementation of this EMP are set out. Table 4-1.

Table 4-1: The EMP implementation responsibilities for the dune sand collection activities

Role	Responsibilities
Tses Village Council (Proponent)	-Managing the implementation of this EMP and updating and maintaining it when necessary. -Management and monitoring of individuals and/ or equipment on-site in terms of compliance with this EMP and issuing fines for contravening EMP provisions. -Overseeing or conducting regular monitoring of environmental parameters (air quality, noise levels, etc.) as per the EMP. -Identifying non-conformances and recommending corrective actions. -Ensuring the timely implementation of corrective measures by the Contractor. -Maintaining detailed records of environmental monitoring, inspections, incidents, and corrective actions.
Sand Extraction/Mining Contractor (if the Proponent will not be undertaking dune sand mining/collection themselves)	The responsibilities of the Sand Mining Contractor (and subcontractors, if any) in the implementation of the EMP will be to: -Ensure that the relevant commitments contained in the EMP Action Plans are adhered to. -Compile relevant procedures and method statements for approval by the Project Manager before initiation of project activities at the site. -Ensure that all relevant staff are trained in procedures. -Maintain records of all relevant environmental documentation applicable to their work.
Project/Site Manager (from the Tses Village Council)	This individual will be responsible for ensuring that the project activities are completed on time. The Manager's duties and responsibilities will include: -Ensure that relevant commitments contained in the EMP are adhered to. -Ensure relevant staff are trained in procedures entailed in their duties.

Role	Responsibilities
	-Maintain records of all relevant environmental documentation for the project. -Reviewing the EMP annually and amending the document when necessary. -Issuing fines to individuals who may be in breach of the EMP provision and, if necessary, removing such individuals from the site. -Cooperate with all relevant interested and affected parties/stakeholders. -Development and management of schedules for daily activities. -Carrying out site inspections and audits to ensure compliance with EMP. --Ensure that the relevant commitments contained in the EMP Action Plans are adhered to. -Ensure that all relevant staff are trained in procedures. -Maintain records of all relevant environmental documentation applicable to their work.
Health, Safety, & Environmental (HSE) Officer, commonly referred to as Environmental Control Officer (ECO)	The Proponent may assign the responsibility of ensuring EMP compliance throughout the project life cycle to a designated member of staff or an external qualified and experienced person, referred to in this EMP as the HSE Officer. This officer will have the following responsibilities: -Management and facilitation of communication between the Proponent and communities / I&APs and stakeholders regarding this EMP. -Conducting site inspections of all areas concerning the implementation of this EMP (monitor and audit its implementation). -Advising the Proponent or Project Manager on the removal of person(s) and/or equipment not complying with the provisions of this EMP. -Making recommendations to the Manager with respect to the issuing of fines for contraventions of the EMP. -Undertaking an annual review of the EMP and recommending additions and/or changes to this document.
Public Relations Officer (PRO)	The Tses Village Council's PRO will be responsible for the following tasks: -Liaising between the stakeholders, communities, and the Proponent. -Ensure effective communication with stakeholders and the community. -Organising and overseeing public relations activities, -Managing public and community relations issues.

Role	Responsibilities
	-Preparing and submitting public relations reports, if required. -Collaborating with personnel and maintaining project-related open communication among personnel.
The Tses Community (through the Tses Community Development Committee (TCDC)	The role of the community in helping the Tses Village Council to implement the EMP and monitor implementation (to promote transparency and cooperation) will be to: -Represent community interests and act as a liaison between the community and the Tses Village Council, where necessary. -Participate in stakeholder engagement meetings and decision-making processes related to site operations and management. -Assist in communicating project updates, rules, and opportunities to the wider community. -Monitor compliance with the project EMP at the community level. -Oversee transparency and fairness in dune sand sales, including reviewing records and raising concerns, where necessary. -Report grievances, conflicts, or environmental/social concerns from community members to the Tses Village Council or Project Manager. -Support awareness and education initiatives on environmental protection, safety, and responsible resource use. -Participate in periodic reviews or audits of project performance, especially regarding social and economic benefits. -Encourage community adherence to site rules (e.g., controlled access, safety measures, and prevention of illegal sand mining within the Village) -Provide input into rehabilitation and closure plans to ensure community expectations are considered, and rehabilitation is carried out satisfactorily.

4.1 Financing of Environmental Control (Monitoring)

The financing of environmental requirements, as outlined in this document, apart from the appointment of the Environmental Assessment Practitioner (Environmental Consultant) and specialists, is the sole responsibility of the Tses Village Council (and their contractor(s), if any. Therefore, it is accepted that the Tses Village Council allocate the cost required to implement this EMP, which includes environmental compliance monitoring (bi-annual environmental monitoring). Any responsibilities not defined in this document or where any uncertainties arise in this matter will be the responsibility of Tses Village Council.

4.2 Amendments of the EMP

Any party involved with the project can suggest changes to the EMP via the Environmental Consultant. Therefore, such suggestions or changes will need to be discussed collectively. Approved changes will be drafted and incorporated into the existing EMP as an appendix or amendments.

4.3 Procedures for non-compliance with the EMP

The Tses Village Council shall comply with the environmental specifications and requirements on an ongoing basis, and any failure to do so will entitle the Office of the Environmental Commissioner to impose a penalty. This also applies to the Environmental Management Plan. In the event of non-compliance, the following recommended process shall be followed:

- The environmental consultant shall issue a notice of non-compliance to the Sand Extraction/Mining Contractor and Proponent, stating the nature and magnitude of the contravention. A copy shall be provided to the project ECO/HSE Officer.
- The Tse Village Council 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 environmental consultant 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 project ECO/HSE Officer.
- The Office of the Environmental Commissioner shall at all times have the right to stop work and/or certain activities on site in the case of safety and EMP non-compliance or failure to implement remediation measures.

4.4 Fines and Penalties related to the EMP Contraventions

The following fines and penalties apply to the transgressions listed below. It will be issued after the procedures contained herein have been duly followed, and only in severe cases and after repeated non-compliance. Each specific penalty justifies the gravity of the transgression.

4.4.1 Penalties

Where non-repairable damage is inflicted upon the environment or failure to comply with any of the environmental specifications, the Proponent shall be liable to pay a penalty fine.

The Tses Village Council or its Mining Contractor is deemed NOT to have complied with this specification if:

- Within the boundaries of the site, site extensions, and haul/ access roads, there is evidence of contravention of the specification, environmental damage due to negligence,
- The safety of the site personnel and the public is being compromised due to negligence.
- The Proponent fails to comply with corrective or other instructions advised by the environmental consultant within a specific time,
- the Proponent fails to respond adequately to complaints from the public, and
- Payment of any fines shall not absolve the offender from being liable for prosecution in terms of any law.

The suggested penalties for transgressions regarding the biological, physical, and social components are provided in Table 4-2 below.

Table 4-2: The penalties suggested for transgressions

Actions leading to erosion:	A penalty equivalent in value to the cost of rehabilitation plus 20%.
Oil spills:	A penalty equivalent in value to the cost of the clean-up operation plus N$1,000.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of restoration plus N$2,000.
Damage to trees:	A penalty of a maximum of N$5,000 shall be paid for each tree removed without prior permission, or a maximum of N$2,000 for damage to any tree, which is to be retained on site.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of the restoration operation plus N$2,000.
Damage to the sensitive environment:	A penalty equivalent in value to the cost of the restoration operation plus 20%.
Damage to cultural sites:	A penalty of a maximum of N$100,000 shall be paid for any damage to any cultural or historical site.
Damage to natural fauna:	A penalty of a maximum of N$2,000 for damages to any naturally occurring animal.
Accident due to safety negligence:	A penalty of a maximum of N$50,000 for injuries to personnel or the public.

5 ENVIRONMENTAL MANAGEMENT MEASURES

5.1 Key Identified Potential Negative Impacts

The key potential negative impacts identified, described, and assessed in the EIA Report, for which the management measures (action plans) have been provided, are listed below:

- Soil and water pollution: improper handling of waste may lead to pollution of surrounding soils and eventually water resources systems (through wastewater runoff and infiltration).
- Land use change: The conversion of the natural landscape into a borrow (sand mining) pit can permanently alter landscapes, affecting the aesthetic value of the area.
- Depletion of local groundwater table: excavation of sand mining sites may affect the local water table, leading to changes in groundwater levels.
- General environmental pollution through mishandling of project-related waste.
- Loss of biodiversity through the removal of vegetation that may be found within the target sites of the site.
- Vehicular traffic: potential increase in local traffic due to site activities.
- Potential habitat destruction due to excavations for material sourcing can lead to the destruction of natural habitats for local biodiversity, if a larger area is needed.
- Impact on air quality: dust and particulate matter generated during the sand excavation, hauling, and transportation can compromise air quality in the surrounding area.
- Noise associated with the movement of heavy machinery and trucks can disturb nearby locals and animals.
- Occupational and community health and safety: Improper handling of materials and equipment may cause health and safety risks to workers and locals.
- Archaeological or cultural heritage impact through the uncovering of unknown objects during excavation.

The management and mitigation measures are provided under the next chapter for implementation.

5.2 Environmental Management and Mitigation Measures

Management actions are aimed at avoiding the above-listed potential negative impacts where possible; where this is not possible, measures are provided to reduce their significance. Management and mitigation measures recommended for the potential impacts in the EIA Report were based on the following:

- Planning and Design Phase (Table 5-1),
- Dune Sand Collection/Mining (Operational and Site Maintenance Phase) (Table 5-2),
- Specific Management and mitigation measures for the dune sand collection (mining) pit – establishment and utilization (Table 5-3).
- Rehabilitation of the project site and related disturbed areas (Table 5-4).

5.2.1 Planning and Design: Management and mitigation measures

The measures proposed for implementation to manage and mitigate the environmental and social impacts during the planning phase are presented in Table 5-1.

Table 5-1: Planning and Design Management and mitigation measures for the impacts of dune sand mining activities

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP training should be provided to all workers on-site. -All site personnel should be aware of the necessary health, safety, and environmental considerations applicable to their respective work. -The implementation of this EMP should be monitored. The site should be inspected, and a compliance audit should be done throughout **the project activities (monthly) and biannually for overall EMP implementation.** -The EMP non-compliance penalty system should be implemented.	-Records of EMP compliance/monitoring conducted biannually -The ECC is renewed every 3 years -Records of EMP training conducted.	-Tses Village Council -Project Manager	Throughout the phase, and when deemed necessary
Poor community consultation and communication before the commencement of dune sand mining	The failure by the Proponent to notify and engage the community (through the TCDC) after issuance of the ECC could result in a lack of transparency, mistrust, and potential conflicts about site operations, sand sales, and management procedures	-A formal stakeholder engagement meeting should be held with the TCDC (community representatives) before the project activities start. -The roles, responsibilities, and operational procedures should be communicated to the community (sharing information of the assigned Public Relations officer (PRO) and Project Manager for future logging of complaints related to the project. -Develop and adopt a transparent operational plan for sand extraction, sales, and site management. -All agreements and decisions made during the meeting should be documented (in the form of minutes and other records). -A communication channel (e.g., regular meetings or reporting structure) between the Village Council and the community should be established before the project starts.	-The number of stakeholder meetings held before and during operations -The approved and documented operational plan is in place -Meeting minutes and attendance registers available -There is a reduced number of community complaints or disputes	-Tses Village Council, with the Community Development Committee -HSE Officer	Before commencement of mining and ongoing throughout the project lifecycle

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Site security infrastructure and community safety (erection of mesh wire fence and access gate)	Unauthorized access to the mining site leads to safety risks (injuries, accidents, illegal sand removal)	-A durable mesh wire fence should be erected around the site, including the machinery/equipment storage area, and the site shade area. -A lockable access gate(s) should be installed at designated entry/exit points of the site fence. -Restrict access to authorized personnel only. -An access control register/logbook should be maintained at the site.	-The fence is fully installed around the perimeter/site -The gate is functional and lockable -There is an access register in use and updated daily	-Sand/Extraction Mining Contractor (herein after the *Mining Contractor*) -Project Manager	Before the commencement of mining operations
	Risk of injury to community members (especially children and livestock) entering the active mining area	-Site boundaries should be demarcated clearly. -Warning and safety signage should be installed in local languages (*Afrikaans and Nama/Damara*) -Community awareness of site dangers should be conducted. -Ensure that the fence height and structure prevent easy entry.	-Warning signs installed and visible -No reported unauthorized entry incidents -Community awareness sessions conducted	-Project Manager -Mining Contractor	Before and during operations (mining phase)
	Livestock entering the site is causing injury or disruption to operations	-Ensure that the fence is livestock-proof (appropriate height and mesh size). -The fence should be regularly inspected for damage, and repairs should be done immediately.	-There are zero or minimal livestock intrusion incidents -The fence integrity is maintained (no major breaches)	-Project Manager -Mining Contractor	Continuous (inspection weekly; repairs as needed throughout the mining phase)
	Temporary visual disturbance to the surrounding environment	-Neutral-coloured fencing materials should be used, where feasible. -A neat and orderly site boundary should be maintained.	-The fence visually blends with the environment where possible. -No community complaints regarding aesthetics	-Project Manager -Mining Contractor	During this phase, maintenance is undertaken throughout the mining phase.
	Risk of injuries to workers (cuts, falls, handling hazards)	-The site workers should be provided with appropriate and adequate PPE (gloves, boots, face masks, helmets, etc.) -Workers should be trained on safe installation practices. -Site establishment (construction) activities should be supervised at all times.	-There are zero lost-time injuries -PPE compliance -Toolbox talks are conducted regularly	-Mining Contractor	During fence and gate installation

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Ensure proper handling of tools and materials.			
	Deterioration leading to reduced effectiveness (security breaches)	-Routine inspections should be conducted. -Fence damaged sections should be repaired promptly -The gate locks and hinges should be maintained.	-Inspection records available -Repairs are conducted within 48 hours of detection	-Project Manager -Mining Contractor	Throughout the project lifecycle
Employment opportunities	'Outsiders' are given employment opportunities at the expense of capable locals. Unfair employment practices between men and women	-Make provisions to maximise the use of local labour. All unskilled labour shall be sourced from local communities. -Specific recruitment procedures should be spelled out. -At least 25% of recruits must be women for non-strenuous jobs. -Employment contracts should be well prepared for every employee, and compensation should follow the stipulated minimum wage.	-There is a provision for a detailed recruitment plan in their project plans	-Tses Village Council, with the help of the TCDC (community representatives/local development committee to determine employment considerations	Pre-mining (operational) phase
Procurement of goods and services	The awarding of services and goods tenders to out-of-area/region companies at the expense of local businesses	-The procurement stage for the project activities (dune sand mining works) should follow a fair and transparent process. -Encourage the provision of goods and services that are locally available, and should be sourced from locally available businesses, especially small and medium businesses in the area and nearby Towns in the Region. If companies are not available in the ǁKharas Region, companies in nearby Towns, such as Keetmanshoop, should be considered. -If any project contract is awarded to an out-of-area company, they should be obliged to team up with an available local company to ensure capacity building for locals.	-Records of local or regional businesses involved in the service provision to the project	-Tses Village Council Procurement Unit	Pre-mining, and where necessary throughout the mining phase
Occupational health and safety	Health and safety risks to the workers	-All project workers should undergo environmental induction before starting the site activities. -Ensure that Contractors who tender make provision for the co-opting of an HIV/AIDS health officer from the regional health office in their tender application	-Environmental, health, and safety inductions are carried out before project activities start on-site	-Project Manager	Pre-mining (operational) phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-It should be mandatory to include the cost of personal protective equipment (PPE) for all workers, as well as first aid kits, in the project planning budget.			
Conflicts	Community conflicts owing to nuisances caused by the contractor Lack of communication between the Proponent and the community	-An HSE Officer/ECO from the Village Council should be assigned to take responsibility for the implementation of all provisions of this EMP. -A public relations officer (or if the HSE Officer will take up this role) should be introduced to the community, and their contact details provided to community leaders.	-There is an HSE Officer and PRO assigned to the project -The meeting is arranged before the project activities start	-Tses Village Council -Project Manager -PRO	Pre-mining (operational) phase
Irresponsible use of water resources	Water wastage due to careless practices. Leaks from tanks and taps	-Water should be used sparingly and encourage the re-use and recycling of water for certain activities, such as washing of non-greasy (non-hydrocarbon contaminated) equipment and vehicles, as well as dust suppression.	-Water is used sparingly and reused-	-Tses Village Council -Project Manager	Pre-mining (operational) phase
Biodiversity	Loss of Flora due to unauthorized removal of protected species	-The area to be constructed on the site, as well as lay-down areas, access routes, etc., should be demarcated. The workforce must be instructed to operate within these boundaries. -Any activity resulting in the chopping down of trees or the removal of vegetation without the required authorisation is strictly prohibited. Therefore, a permit for removing protected trees should be **obtained from MEFT's ǁKharas Region's Forestry Office – see contact details in Table 3-1. Please refer to Appendix 2 for the list of protected tree species occurring on and around the project site.** -With the help of the Forestry Directorate, all protected tree species should be tagged so that they are visible and not removed.	-The permits for removing protected tree species (where extremely necessary) are issued -Barricading tape (to indicate working areas) is in place -Biodiversity conservation awareness is raised among workers/personnel	-Tses Village Council -Project Manager	Pre-mining (operational) phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Disruption of hydrological systems by the sand mining pit	Altering natural drainage patterns, causing changes in surface water flow, and potentially exacerbating flooding	-The dune sand collection pit should be designed with controlled slopes and drainage outlets to prevent water stagnation or rapid runoff. -Plan for the implementation of progressive rehabilitation, where parts of the pit are restored while others are still in use. -The rehabilitation of the mining site should be costed for in the Village Council's financial years, and funds should be kept aside for this phase.	-The mining pit site is planned outside areas with natural drainage paths or floodplains -The recommended measures are implemented, and improvements are made throughout, as needed -There is a provision for rehabilitation funds	-Tses Village Council -Project Manager	Pre-mining (operational phase), and then continuing/ongoing

5.2.2 Dune Sand Mining (Collection) Phase: Management and mitigation measures for impacts

The measures proposed for implementation to manage and mitigate the environmental and social impacts of dune sand mining are provided in Table 5-2.

Table 5-2: Management and mitigation measures for the impacts from dune sand collection works (mining) - Operational Phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP training should be provided to all workers on-site. -All site personnel should be aware of the necessary health, safety, and environmental considerations applicable to their respective work. -The implementation of this EMP should be monitored. The site should be inspected, and a compliance audit should be done throughout **the project activities (monthly) and biannually for overall EMP implementation.** -The EMP non-compliance penalty system should be implemented.	-Records of EMP compliance/monitoring conducted biannually -The ECC is renewed every 3 years -Records of EMP training conducted.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase, and when deemed necessary
Conflict	Communities are dissatisfied with the activities	-Establish clear communication with the community (and or through their community leaders) on the anticipated schedule/timeframe for operations by:	-There are records of minutes from the	-Project Manager	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Nuisances caused by the project activities	a) Means for lodging a complaint concerning dune sand extraction, and provision of feedback to the complainant stating how the issue is being addressed. b) Reporting back on issues raised and how addressed by the Village Council. -The detailed mining programme should be presented in ongoing meetings with the local community.	community engagement meetings. -There is a community communication plan related to the project	-Mining Contractor -Public Relations / Liaison Officer (PRO)	
Poor record-keeping and a lack of transparency in dune sand sales	Failure to maintain proper records of dune sand sales and transport, leading to potential financial mismanagement, disputes, and a lack of accountability	-A formal record-keeping system for all sand sales and transport (logbooks, receipts, digital tracking if possible) should be established. -A responsible individual for record management should be assigned to the project. -Regular audits of sand sales records should be conducted. -Regular financial and operational reports should be provided to the TCDC. -All transactions should be receipted and traceable.	-The availability of up-to-date sand sales records -The number of audits conducted and the compliance rate -The percentage of transactions properly recorded and receipted -Transparency reports shared with stakeholders	-Tses Village Council (alongside the Financial/Administrative Officer) -Project Manager	Before the commencement of sales, and maintained continuously throughout operations.
Soils	Physical soil/land disturbance and loss of topsoil	-Stockpiled topsoil and excavated materials should be used to backfill the excavated and disturbed sites after completing work on the pits. -Soils that are not within the intended footprints of the road and its reserve should be left undisturbed, and soil conservation implemented as far as possible. -Project vehicles/machinery should stick to the access route provided and not unnecessarily create further tracks on-site by driving everywhere, causing soil compaction and erosion. -The movement of vehicles to and across the site should be controlled.	-No proliferation of informal vehicle tracks created by project activities. -No new erosion gullies. -No signs of soil compaction -No disturbance to unmarked areas on-site.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
Soil and water resources	Soil and water pollution from garbage, sewage, chemicals, fuels, oils, or any other	-Accidental spills must be cleaned immediately to avoid the pollution of the wetland and groundwater, since the soil around the site is highly permeable. -Hazardous waste should be disposed of in the prescribed manner to prevent contamination of soils (see waste management heading).	Inspection daily, reporting, and regular cleaning up	Project Manager -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	objectionable or undesirable material	-In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste -If fuel is stored at the site, fuel tanks must be properly bunded. The volume of the bounded 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 1.5 times the holding capacity. -Drip trays should be available for all equipment that is intended to be used for the project. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned every morning, and the spillage should be handled as hazardous waste. -All cleaning of equipment should take place within the site, and the water from the washing operation should be collected in a tank and disposed of in an agreed manner.			
Irresponsible use of water resources	Water wastage due to careless practices on-site. Leaks from water tanks and taps	-Educate the workforce on sustainable and effective use of water, e.g., clean equipment in containers. -Water should be used sparingly. It is the Project Manager's responsibility to ensure that water conservation is strictly enforced. -Water tanks/taps and earth dam liner breakages must be fixed immediately. 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 -Water conservation awareness to all personnel	-Mining Contractor -Project Manager	Throughout the phase
Biodiversity	Loss of Flora – protected species	-Avoid unnecessary removal and disturbance of site vegetation. -Vegetation found on the site, but not in the actual footprint, should not be disturbed; therefore, it should be avoided. -The area to be constructed on the site, as well as lay-down areas, access routes, etc., should be demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or the removal of vegetation without the required authorisation is strictly prohibited. Therefore, a permit for removing protected trees should be **obtained from MEFT's**	-No complaints of unauthorised vegetation removal associated with project personnel. -No intentional disturbance and destruction of site vegetation -Barricading tape (to indicate working areas)	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Planting of alien flora species in the area	**IIKharas Region Forestry Office – see contact details in Table 3-1.** -All protected tree species should be tagged to stay visible. -Avoid leaving equipment or machinery leaning on vegetation. -Environmental awareness on biodiversity preservation (both plants and even small animals encountered onsite) should be provided to the workers during EMP induction. -No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason. -The removal of trees with a stem diameter of 200mm or more is prohibited. -The top 150mm of topsoil must be stored separately for use to rehabilitate the mining pit. -The removal of sand material at excavation sites shall be focused on where the least significant vegetation exists. -All alien vegetation that has established itself should be eradicated during progressive rehabilitation.	-Biodiversity conservation awareness is raised among workers/personnel -Regular review of photographic records.		
	Impact on fauna: livestock and wild animals such as reptiles and birds.	-The killing, snaring, trapping, and stealing of community livestock is strictly prohibited. -The illegal harvesting of wildlife is strictly prohibited. -Refrain from disturbing or killing small soil and animal species found on and around the site. -Visible breeding sites for birds and animals occurring on and around the sites should not be destroyed or disturbed. -Refrain from removing or destroying the bird nests on trees. -The sand mining pit and associated trenches should be secured and backfilled or levelled upon completion of works to prevent animals from falling into trenches or even drowning during rainy seasons. -The recommended speed of 30km/hr around, to and from road working sites, should be adhered to while looking out for animals and people (especially children) in the community.	-No complaints of stolen and killed livestock by the project workers. -No reports of illegal hunting or trapping of wild animals in the area associated with the project personnel -No intentional disturbance and destruction of habitats and faunal species	-Mining Contractor -Project Manager -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Incorporate Environmental awareness and biodiversity preservation into the employment contracts of all workers.			
Waste management	<u>Project waste:</u> Incorrect or infrequent disposal of building rubble. Waste blown by wind (e.g., plastic bags and material seals).	-Project waste should be stored in skips and should regularly be removed from the site for disposal at the nearest approved municipal waste disposal site. -Empty plastics, wrapping waste, strapping, etc., should be secured in containers for general waste to prevent wind-blown waste.	-Daily inspection and clean up. -There are sufficient waste storage containers for different types of waste -No littering caused by project personnel -No visible litter around the project area -Provision of sufficient waste storage containers -Waste management awareness -Waste disposal permits for the municipality -Environmental, Health, and Safety Statements and Policy are in place	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
	<u>Domestic waste</u> from the on-site workers: Increased general waste	-Waste should be separated according to cardboard/paper materials, plastic, bottles, and tins. -The various waste types should be disposed of at appropriate municipal and recycling facilities. -Appropriate containers should be placed on site for waste separation, and the workforce trained and sensitised accordingly. In other words, sufficient waste bins should be provided along the road at each working site to prevent waste or rubbish from being thrown into the environment. -Only the general waste, which cannot be recycled, shall be disposed of at the nearest approved Council's waste disposal facility. -The workforce must be sensitised to dispose of waste responsibly and not to litter, not on and around the project site, or in the wider environment. -Domestic waste, which cannot be recycled, should be stored in a skip and removed once a week (as per the Village Council waste removal schedules in the Village) to an approved waste disposal site. -Ensure that there is no waste left on-site or scattered within the site premises.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-All domestic and general project waste produced daily should be contained on-site until such time that it is transported to designated waste sites. -No waste may be buried or burned on site or anywhere else. -A penalty system for the irresponsible disposal of waste onsite and anywhere in the area should be implemented.			
	Hazardous waste: Accidental/negligent spillages from equipment working on site. Storage of hazardous materials.	-Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. -Contact Wesco Group https://www.wesco.com.na/page/waste-management and or Oiltech Namibia https://oiltech.com.na/ to salvage the spilled materials -Bitumen 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 accessible only to the site foreman. Wesco Group or Oiltech should be approached to collect these wastes periodically or as needed	-Daily inspection and clean up.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
	Ablution waste (sewage): on-site workers.	-Open defecation and urinating in public are strictly prohibited. Workers should be provided with appropriate toilets on-site. -Only portable chemical toilets should be used on-site. 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 Tses Village's sewage management system for handling and treatment. -Spillage or leakage is to be cleaned up and fixed immediately.	-Daily inspections and clean-up. -There are sufficient toilets at the site for workers -No open defecation by project workers -There are sewage removal operators	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
Air quality	Dust generation: Dust proliferation due to soil's fine content, resulting in	-Soil stacks should be placed downwind from the main activity areas. -All site areas and soil stacks should be regularly wetted.	-Daily visual monitoring for dust nuisance and safety	-Project Manager -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	localized poor air quality and poor visibility.	-A reasonable amount of water should be used to suppress the dust on-site during windy conditions. -Vehicles should be driven at a speed of 30km/hr to avoid the generation of dust owing to high speeds. -The dune sand loads on trucks should be covered to prevent the sand from being blown from the trucks or spilled on public roads during transportation. -Haul routes should be well planned and used to minimise dust and disturbance.	-No complaints from the Tses community about dust -Records of how dust complaints or grievances have been addressed.		
Noise	Noise from vehicles and mining activities	-All machinery should be calibrated and maintained regularly. -Noise from vehicles and equipment on sites should be reduced to acceptable levels. -Project activities such as excavation, hauling, and transporting of materials from the site should be done between 08:00 am and 5:00 pm to prevent noise generated by equipment and movement of heavy vehicles. -When operating excavators and other noise-generating machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise.	-Daily monitoring. -No noise-related complaints from the community -Records of how noise complaints or grievances have been addressed -Workers operating machinery and noisy equipment are equipped with noisy PPE	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
Vehicular traffic safety	Presence of heavy vehicles in the area	-Vehicle drivers and equipment/machinery operators should have valid and appropriate driving licenses or operating permits and adhere to the road safety rules. -Make provision for haul roads and maintain them so that the local small vehicles can continue to use community access roads. -Drivers should drive slowly (30km/hour or less) while on-site. -Vehicles should be in a roadworthy condition and serviced regularly to avoid accidents owing to mechanical faults. -Vehicle drivers should only make use of the designated site access roads provided and as agreed. -Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol.	-No complaints from members of the public regarding vehicular traffic issues related to the project activities. -All personnel operating the project vehicles and machinery are appropriately licensed and possess valid driving licenses. -Demarcated areas for parking, offloading, and loading zones on-site.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Project vehicles should be parked within the boundary or demarcated areas for such purpose at sites. -Deliveries from and to the site should be done optimally during weekdays and between the hours of 08:00 am and 5:00 pm.			
Occupational and local (community) health and safety associated with project activities	General health and safety for workers	-During induction, personnel should be provided with an awareness training of the risks of mishandling equipment and materials on site. -Appropriate and written warning signage should be placed on-site, where visible. -A fully furnished first aid kit should be placed at each working site to attend to minor injuries, while major injuries should be attended to at the Tses Clinic and further in Keetmanshoop. One or two site personnel should be trained on how to administer first aid. Ensure that all workers know where the first aid kit is located on-site. -Establish an emergency rescue system for the evacuation of injured people, if needed. -Emergency procedures for accidents shall be communicated to all workers. -Projected loads should be securely fastened to vehicles to avoid falling off and injuring people. -Heavy vehicles and equipment should be properly secured to prevent any harm or injury to both project personnel and locals. -When working on site, employees should be properly equipped with personal protective equipment (PPE) such as coveralls, masks, gloves, safety boots, earplugs, safety glasses, and hard hats (helmets). -Personnel should not be allowed to consume alcohol or other intoxicants before and during working hours, as this may lead to mishandling of equipment, resulting in health and safety risks.	-A comprehensive health and safety plan for the activities is compiled. -Availability of fully furnished first aid kits -Trained workers to administer first aid	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Community health and safety	-Project trenches should be progressively backfilled. -Ensure that goods and projected loads are securely fastened to vehicles to avoid falling and injuring people along the roads. -Warning signage should be erected at the site. -The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs written in languages such as ***Afrikaans, Nama/Damara, and English***.	-The project site and trenches are backfilled progressively -There are sufficient, clear, and appropriate warning signs near risk site areas -The community is encouraged to stay away and exercise precautions at all times when nearby	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
	Potential increase of prevalence of HIV and AIDS, as well as other sexually transmitted diseases (STDs) prevalence	-Engage workers in sexual health talks and training about the dangers of engaging in unprotected sexual relations, which result in contracting HIV/AIDS and other sexually transmitted infections. -Provision of condoms and sex education through the distribution of pamphlets and health training. These pamphlets can be obtained from the Tses Clinic, and if necessary, from the Keetmanshoop major health centre (Hospital). -Emphasize the continued recruitment of locals to avoid the influx of out-of-area people into the community for casual work that local people can carry out. Thus, reducing the creation of new sexual relations between local women and out-of-area men results in the potential local transmission of STDs and HIV/AIDS.	-No new infections recorded linked to project workers -Occupational health and safety personnel -Sex and Health Education/Awareness -Provision of condoms at the site	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
Fire management	Accidental fire outbreaks	-Portable and serviced fire extinguishers should be available at the site and in the vehicles. -Open fires are strictly prohibited on and around the site. -Make provision for smoking areas for workers who smoke. This is to ensure that the cigarettes' fire is completely extinguished and disposed of in the allocated bins on-site. -Personnel and visitors alike must be sensitised about responsible fire protection measures and good housekeeping, such as the removal of flammable materials	-No veld fires recorded (due to the presence of project personnel) -Fire extinguishers (1 per vehicle) and a minimum of 2 extinguishers at the camp	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		(e.g., rubbish, plastics, papers, clothing, dry vegetation, and hydrocarbon-soaked soil) near hazardous substances' containment and handling areas. -Flammable materials should not be left or thrown near the areas. Regular inspections should be carried out to check for these materials at the site. -Potential flammable areas and structures, such as fuel storage tanks, should be marked as such with visible signage. -Raise awareness among workers on the impact of careless handling of fires and flammable substances in the workplace.			
Archaeology and heritage	Accidental disturbance of archaeological or heritage objects	-**A 50m buffer zone around the Tses Village cemetery (at GPS coordinates: -25.896768, 18.120214, and the old water reservoir at these GPS coordinates: -25.898287, 18.119874, as shown in Figure 5-1). Therefore, no project activity should be done within the buffer zone.** -If any other archaeological materials, human burials, or skeletal remains are uncovered during earthworks, the work in the immediate area should be halted, and the finds would need to be reported to the NHC, which may require inspection by an Archaeologist. The ECO should have the area fenced off and contact NHC (Tel: +264 61 244 375) and the National Forensic Laboratory (+264 61 240 461) immediately. -Avoid direct damage to archaeological or heritage sites that may be encountered during excavations. -All accidental discoveries shall be reported immediately to an archaeologist/heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice, the HSE Officer will advise the necessary actions to be taken. -The Mining Contractor and its subcontractor should adhere to the provisions of Section 55 of the National Heritage Act in the event significant heritage and cultural features are discovered in the course of project activities.	-Preservation of all artefacts and objects that are discovered onsite -Salvage equipment -Flag tapes -GPS (site marking)	-Project Manager -Mining Contractor -HSE Officer	As and when required throughout the project phase

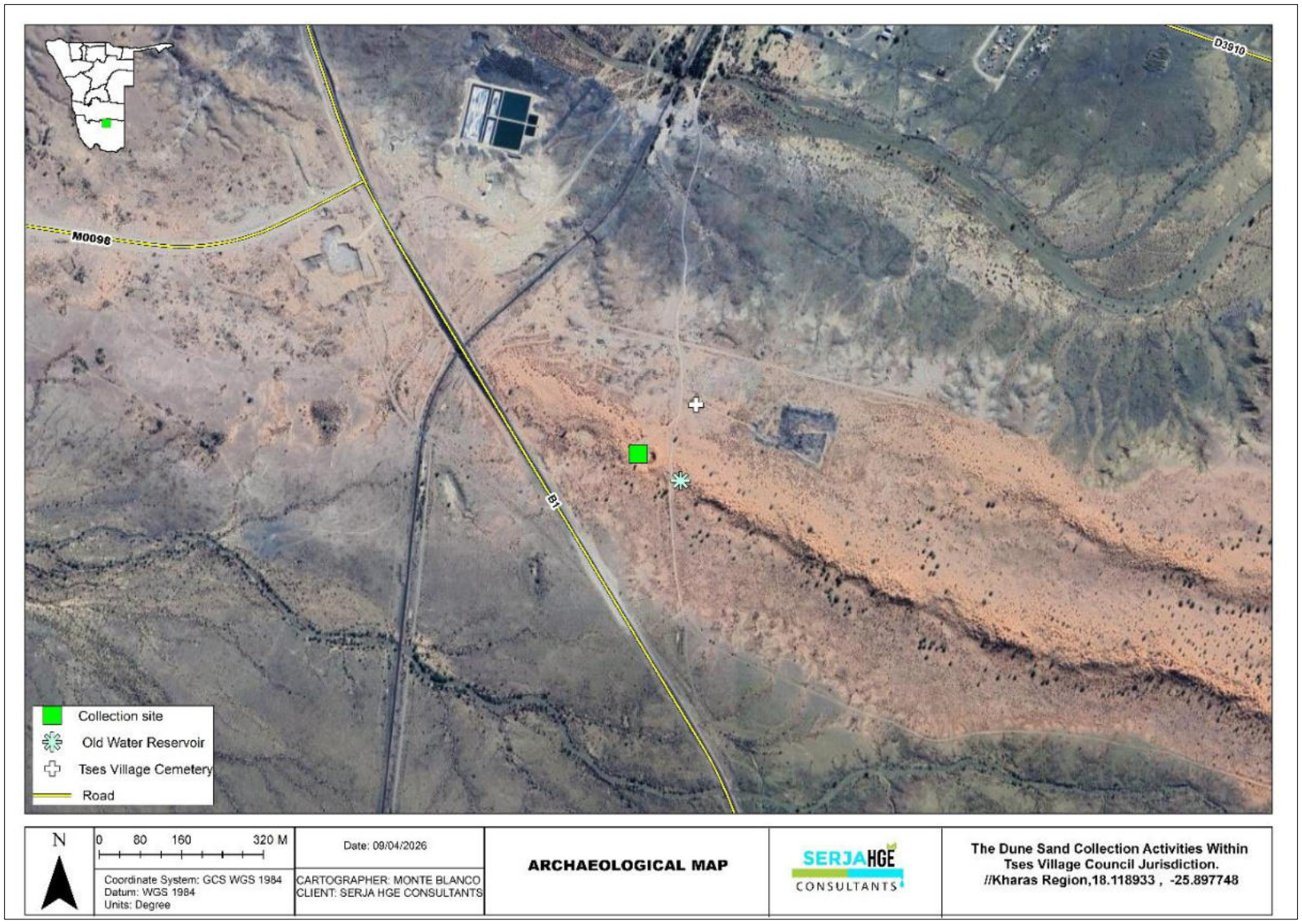


Figure 5-1: The known archaeological sites near the project site (Tses village cemetery at the GPS coordinates: -25.896768, 18.120214, and an old water reservoir at these GPS coordinates: -25.898287, 18.119874)

5.2.3 Management and mitigation measures for impacts stemming from the establishment and utilization of the dune sand collection pit (site)

The measures proposed for implementation to manage and mitigate the environmental and social impacts of the sand mining (collection) pit are provided in Table 5-3.

Table 5-3: Specific Management and mitigation measures for the dune sand collection (mining) pit – establishment and utilization

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Conflict	Communities are dissatisfied with the activities. Nuisances caused by the excavation activities	-Establish clear communication between the Mining Contractor and community (and or through their community leaders) on the anticipated timeframe for operations at the sites. This should be done as follows: a) Means for lodging a complaint concerning materials extraction, and provision of feedback to the complainant from the Contractor stating how the issue is being addressed. b) Report back on issues raised and how addressed from the Contractor to the Project Manager.	-There are records of minutes from the community engagement meetings. -There is a community communication plan related to the mining site	-Project Manager -Mining Contractor -Public relations/Liaison Officer	Throughout the phase
Soils	Physical soil/land disturbance and loss of topsoil	-Stockpiled topsoil and excavated materials should be used to backfill the excavated and disturbed sites after completing work on the pits. -Soils that are not within the intended footprints of the mining site should be left undisturbed, and soil conservation implemented as far as possible. -Project vehicles and machinery should stick to the access route provided and not unnecessarily create further tracks on-site by driving everywhere, causing soil compaction and erosion.	-No proliferation of informal vehicle tracks created by project activities. -No new erosion gullies. -No signs of soil compaction -No disturbance to unmarked areas on-site.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
Loss of vegetation, habitat, and local communities	impact on the natural environment, such as loss of vegetation and habitat for some wild animals, and generally affects	-Shape and rehabilitate the used excavated areas of the site to blend in with the surrounding landscape. -The site should be fenced off to prevent people and livestock from injury by falling therein, and after mining, the pit should be rehabilitated to be made equally safe.	-The number of complaints from road users/public regarding the visual impact -The efforts of progressive rehabilitation have been reshaped to an acceptable slope (e.g., ≤30° or as specified)	-Project Manager -Mining Contractor -HSE Officer	Planning & design phase (before excavation begins) Progressive rehabilitation is done.

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	the local environment (communities).		-The topsoil is replaced and evenly spread -Evidence of vegetation re-establishment (good vegetation cover) -There are no visible signs of erosion or unstable slopes after rehabilitation. -The number of safety incidents (target: zero injuries to people/livestock)		Fencing is done before operations start.
Water resources	Lowering of the groundwater table owing to excavation activities	-The excavation depth should be limited to minimize the impact on the groundwater table. This can help in reducing the drawdown effect. -Excavate in phases rather than all at once. This allows for localized groundwater impacts to stabilize between phases. -Consider establishing retention ponds or sumps to collect water that seeps into the excavation area. This can help in maintaining a higher groundwater level nearby. -Upon completion of excavation activities, the site should be rehabilitated, thus restoring natural drainage patterns and vegetation, which can help to recharge groundwater.	-Monitoring of the water movement in the mining pit and acting accordingly -Implementation of the provided measures, where possible.	-Mining Contractor -Project Manager -Mining Contractor	Throughout the phase
Disruption of hydrological systems by the presence of the mining pit	Altering natural drainage patterns may cause changes in surface water flow in the area.	-Use perimeter drainage channels or bunds to divert surface water away from active areas of the sand mining pit, thus reducing the risk of erosion or sediment transport downstream. -Avoid excavating below the water table or altering the natural infiltration capacity of the soil. -Limit the size and depth of pits to maintain surface hydrology balance. -Plan for the implementation of progressive rehabilitation, where parts of the pit are restored while others are still in use.	-Monitoring of the water movement in the mining pit and acting accordingly -Implementation of the provided measures, where possible.	-Project Manager -Mining Contractor	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Biodiversity	Loss of Flora	-Avoid unnecessary removal and disturbance of site vegetation. -Vegetation found on the site, but not in the actual footprint, should not be disturbed; therefore, it should be avoided. -The area to be constructed on the site, as well as lay-down areas, access routes, etc., should be demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or the removal of vegetation without the required authorisation is strictly prohibited. Therefore, a permit to remove protected trees should be **obtained from MEFT's IIKharas Region Forestry Office – see contact details in Table 3-1.** Please also see Appendix 2. • Black thorn (*Vachellia mellifera*) • Red-bark acacia/red thorn (*Vachellia reficiens*) • Giraffe thorn (*Vachellia erioloba)* • Stink shepherd's tree (*Boscia foetida*). -All protected tree species should be tagged to stay visible. -Avoid leaving equipment or machinery leaning on vegetation. -Environmental awareness on biodiversity preservation (both plants and even small animals encountered onsite) should be provided to the workers during EMP induction. -No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason. -All alien vegetation that has established itself should be eradicated during progressive rehabilitation.	-No complaints of unauthorised vegetation removal associated with project personnel. -No intentional disturbance and destruction of site vegetation -Barricading tape (to indicate working areas)	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase
	Impact on fauna: livestock and wild animals such as reptiles and birds.	-The killing, snaring, trapping, and stealing of community livestock is strictly prohibited. -Refrain from disturbing or killing small soil and animal species found on and around the site. -Visible breeding sites for birds and animals occurring on and around the sites should not be destroyed or disturbed. -Refrain from removing or destroying the bird nests on trees.	No complaints of livestock being stolen or killed by the project workers. -No intentional disturbance and destruction of habitats and faunal species	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-The project-associated trenches should be secured and backfilled or levelled upon completion of works to prevent animals from falling into trenches. -The recommended speed of 30km/hr around, to and from sites, should be adhered to while looking out for animals and people (especially children) in the community. -Incorporate Environmental awareness and biodiversity preservation into the employment contracts of all workers.			
Vehicular traffic safety	Presence of heavy vehicles in the area	-Vehicle drivers and equipment operators should have valid and appropriate driving licenses and adhere to the road safety rules. -Make provision for haul roads and maintain them so that the local small vehicles can continue to use their community roads. -Drivers should drive slowly (30km/hour or less) on the roads. -Project vehicles should be in a roadworthy condition and serviced regularly to avoid accidents owing to mechanical faults. -Vehicle drivers should only make use of the designated site access roads provided and as agreed. -Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol. -Project vehicles should be parked within the boundary or demarcated areas for such purpose at sites. -Deliveries from and to the site should be done optimally during weekdays and between the hours of 08:00 am and 5:00 pm.	-No complaints from members of the public regarding vehicular traffic issues related to the project activities. -All personnel operating the project vehicles and machinery are appropriately licensed and possess valid driving licenses. -Demarcated areas for parking, offloading, and loading zones on-site.	-Project Manager -Mining Contractor -HSE Officer	Throughout the phase

5.3 Rehabilitation of the Dune Sand Mining Pit Site and Associated Activities

The aims of a Site Rehabilitation Plan

The aims of the rehabilitation plan are to:

- Return the disturbed area to an acceptable post-mining state.
- Ensure that all areas are stable, and there is no risk of erosion.

- Prevent alien plant invasion on the site until the site is in a stable state.
- Ensure that all areas are free-draining and non-polluting post-mining activities.

The continuous rehabilitation program will attempt to restore the area to an acceptable standard as close to its baseline environmental state as possible.

The measures proposed for implementation to decommission and rehabilitate the mining pit site are provided in Table 5-4.

Table 5-4: Management and mitigation measures for the mining pit rehabilitation

Aspect	Impact	Management and Mitigation Measure(s)	Monitoring actions and Methods	Implementation Responsibility	Timeline
Waste management	Improper handling and disposal of waste would lead to environmental degradation: General site clean-up.	-All infrastructure, equipment, fencing, temporary services, and foreign materials should be removed from the site. -Waste material of any description, including receptacles, scrap, rubble, and tyres, should be removed entirely from the mining area and dis disposed of at the Village solid waste site. No waste should be buried or burned anywhere outside the site (this should be done under supervised and controlled conditions at the solid waste site). -Internal access tracks/roads, not required post-mining, should be closed off. -The sand mining pit will be kept in a neat condition at all times.	Inspection by the Environmental Consultant after rehabilitation	-Tses Village Council -Mining Contractor	During the site closure phase
Unsightly sand mining pit areas	Unstable slopes of an unrehabilitated sand mining pit. Loose sediment washed away from unstable slopes.	-Shape all sides of the sand mining pit to 30° to the horizontal. Rip the terrain and access routes, and replace the stored topsoil evenly over the terrain. -The stockpiled topsoil should be levelled soon after completion of works at sites. Some of the stockpile materials should be used for rehabilitation	Inspection by the Environmental Consultant after rehabilitation	-Tses Village Council -Mining Contractor	Throughout this phase and before abandoning the area

Aspect	Impact	Management and Mitigation Measure(s)	Monitoring actions and Methods	Implementation Responsibility	Timeline
Site closure	Abandoned fencing poses hazards or visual pollution	-The fence and gate should be removed from the site if no longer required and safe to do so (considering public safety). -Rehabilitate disturbed areas along the fence line. -Dispose of or reuse materials responsibly. The site should be cleared of fencing materials. -Site areas should be rehabilitated to an acceptable condition.	Inspection by the Environmental Consultant after rehabilitation	-Tses Village Council -Mining Contractor	During the site closure phase
Rehabilitation of the sand mining pit	Unfenced/unsecured and unrehabilitated mining pit	-Since complete rehabilitation of the project pit (post-mining) is impossible (because one would need to get materials elsewhere to fill up the pit, and this leaves another pit in the area where one gets materials). Therefore, the Proponent should level the site as far as possible to reduce the danger. -The mining pit can also be rehabilitated by using stockpiled materials that were removed from the top layers of the site to raise the base. If the pit cannot be safely rehabilitated and poses a hazard to the communities, it should be fenced off the pit that pose a hazard to the communities. -Refill or reshape pits post-use to prevent them from becoming artificial catchments or stagnant water bodies, which can disrupt downstream flow.	Inspection by the Environmental Consultant after rehabilitation	-Tses Village Council Mining Contractor -HSE Officer	Throughout this phase and before abandoning the area
	Disruption of surface water runoff	-During rehabilitation, restore original contours and re-establish drainage lines to mimic pre-disturbance hydrology closely. -Use natural vegetation to stabilize soil and slow runoff, enhancing water infiltration and reducing erosion.			
	Re-vegetation	-Additional seeding may be carried out using local species (such as the dominant indigenous grass re-seeding (*Stipagrostis spp.* (lovegrass)), if adequate vegetation growth has not been achieved using the seed bank in the topsoil. The site area will remain fenced, and all animals will be kept off until the vegetation is self-sustaining.			

Aspect	Impact	Management and Mitigation Measure(s)	Monitoring actions and Methods	Implementation Responsibility	Timeline
		The steps of final rehabilitation are as follows (in order of appearance): 1.) Backfill of the pit (where feasible), and re-contour to mimic the natural dune surface 2.) Spread the remaining topsoil (from progressive rehabilitation stage) 3.) Re-vegetate with native species (re-seeding with *Stipagrostis spp* and others, where possible). 4.) Remove the infrastructure, waste, and equipment.			
Monitoring of the sand mining pit and action	Lack of monitoring of the efficiency/success of the pit rehabilitation	-Conduct annual inspections at the rehabilitated pit to determine rehabilitation success and assess any potential weed infestations. -Weed control (removal) measures should be implemented.			
	Altered hydrological flows	-Establish monitoring programs to assess changes in surface water flow and drainage post-mining activities. -If the impact is observed, adapt management strategies, such as adding additional drainage or reinforcing certain areas with erosion control structures.	Inspection by an Environmental Consultant after rehabilitation	-Tses Village Council Mining Contractor	Throughout this phase and before abandoning the area

5.4 Environmental Monitoring Actions

To ensure that the implementation of recommended environmental management measures is effective and produces the desired results (minimizing the "medium" and upholding the "low" significance ratings of impacts), certain key impacts will need to be monitored and reported. The ‘’Observation*, compliance status, and ‘’Recommended Action*’’ columns will be completed for every monitoring done on site. Monitoring reports are to be compiled by the project HSE Officer, audited by an Independent Environmental Consultant, and submitted to the DEAF for archiving on a bi-annual basis (every 6 months throughout the project operations) or as required by the Environmental Commissioner (as per the ECC conditions). The environmental components or features provided in the Table will be updated accordingly once the project commences.

6 RECOMMENDATIONS AND CONCLUSION

Based on the assessment of potential impacts by the environmental consultants, the project has some adverse (negative) impacts on the biological, physical, and social environment. However, to minimize the significance of these impacts while maximizing the benefits of the project activities, there should not be significant environmental degradation. It is for this reason that this EMP was developed to ensure sustainable use of the natural resource, thereby promoting prosperity in the area and region at large.

6.1 Recommendations

To mitigate the adverse impacts that may emanate from the dune sand mining and associated activities, the Tses Village Council should follow the recommendations as follows:

6.1.1 Environment Management Plan Recommendations

To ensure a healthy and safe environment in the road area and its environs, an environmental management plan must be implemented through monitoring. This involves the collection and analysis of relevant environmental data as well as periodic documentation and reporting.

- External Auditing: The key to a successful EMP is appropriate monitoring and review to ensure effective functioning of the EMP and to identify and implement corrective measures promptly. If 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 they are effective in operation, meet specified goals, and are performed in accordance with relevant regulations and standards. Audits should be conducted during the facility's operational phase to ensure adherence to the management measures in the EMP.

6.1.2 Conclusion

Considering the potential impacts of the project and its associated activities, the mitigation measures in this EMP are sufficient to manage them. Therefore, Serja HGE Consultants recommends that the Environmental Commissioner approve the proposed dune sand collection (mining) and issue an ECC, subject to the Proponent ensuring complete compliance with the developed EMP.

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

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

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

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

The Project/Site Manager must report the findings to the following competent authorities:

- **National Heritage Council of Namibia: Head Office: +264 61 244 375**

  Technical Office +264 61 301 903
- **National Museum (+264 61 276 800)**
- **National Forensic Laboratory (+264 61 240 461)**

Responsibility:

Operator:	To exercise due caution if archaeological remains are found
Foreman:	To secure the site and advise management promptly
Superintendent:	To determine safe working boundaries and request an inspection
Archaeologist:	To inspect, identify, advise management, and recover remains

Procedure:

<u>Action by a person identifying archaeological or heritage material</u>

a) If operating machinery or equipment, stop work

b) Identify the site with a flag tape

c) Determine the GPS position if possible

d) Report findings to the foreman

Action by the foreman

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

b) Cease any works in the immediate vicinity

Action by the superintendent

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

b) Determine and mark the exclusion boundary

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

Action by an Archaeologist

a) Inspect the site and confirm the addition to the project GIS

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

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

In the event of discovering human remains

a) Actions as above

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

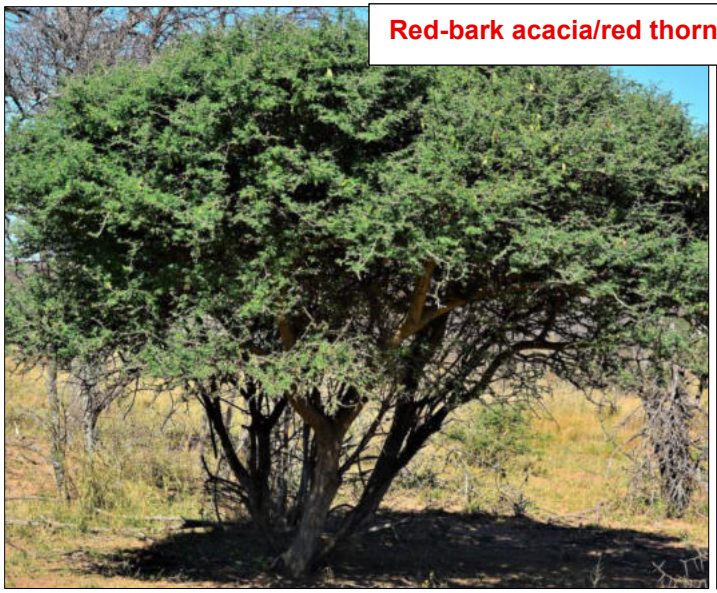
c) Advise and liaise with NHC and Police

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

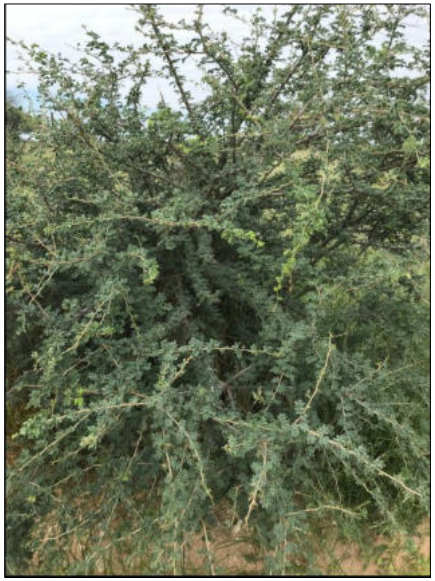
APPENDIX 2: PHOTOS OF SOME IDENTIFIED PROTECTED TREE SPECIES FOUND ON AND NEAR THE SITE

Giraffe thorn tree (*Vachellia erioloba*)

Red-bark acacia/red thorn tree (*Vachellia reficiens*)- protected



Black thorn tree *(Vachellia mellifera)* – protected



Stink shepherd's tree *(Boscia foetida)* – protected