Environmental Management Plan

(EMP)

UPGRADING OF T0805 ROAD (16.8KM) TO LOW VOLUME SEAL (LVS) STANDARD AT SUSUWE TO BICO BORDER POST IN THE BWABWATA NATIONAL PARK KWANDO CORE AREA, ZAMBEZI REGION

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ABBREVIATIONS

Acronym	Description
CEPM	Consulting Engineers and Project Managers
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
I&AP	Interested and Affected Parties
LVS	Low Volume Seal
MoA	Memorandum of Agreement
RA	Roads Authority
RE	Resident Engineer
RKPC	Ritta Khiba Planning Consultants

1. INTRODUCTION

1.1 Background

CEPM & Partners Engineers Pty. Ltd (CEPM) were appointed (14 MAY 2024) by the Roads Authority to offer consultancy services for detailed design, and tender documentation of access roads in & around Katima Mulilo, Zambezi Region. Ritta Khiba Planning Consultant cc appointed as the Environmental Consultants and as Environmental Assessment Practitioners responsible for obtaining environmental clearance for the proposed upgrading and construction of T0805 Road to Low Volume Seal standards in Katima Mulilo, Zambezi Region (see figure 1 for Locality). The implementation of this project would be guided by the Memorandum of Agreement (MoA) signed between the three parties namely: Katima Mulilo Town Council, Roads Authority and Road Fund Administration.

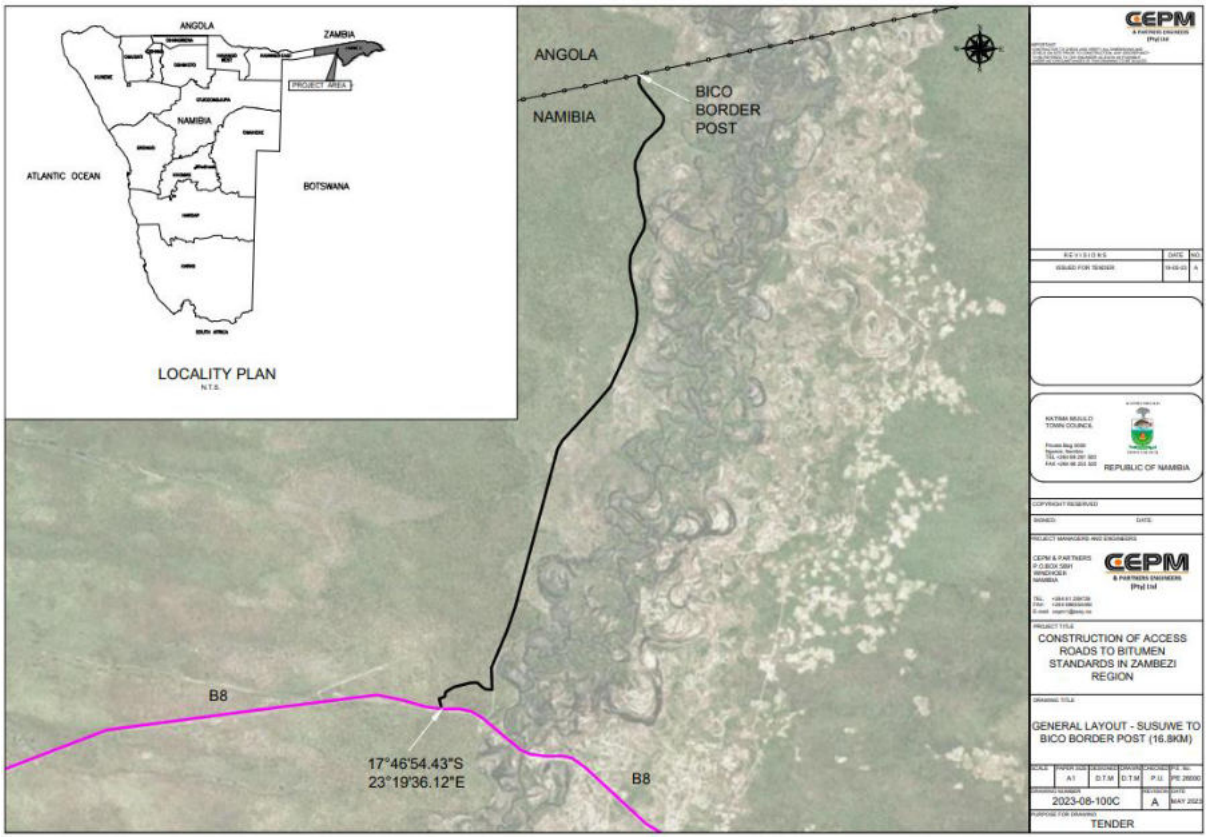

Figure 1: T0805 Road, Katima Mulilo, Zambezi Region

Source: CEPM (2024)

Road projects are generally intended to improve the natural, economic and social welfare of people and the environment. Namibia's economy is highly dependent on a healthy natural environment and striking a balance in meeting demands for economic development such as upgrading of T0805 Road to Low Volume Seal (LVS) Standards in Katima Mulilo, Zambezi Region Namibia and

maintaining biological diversity can be a challenge. Therefore, it is of utmost importance that both the environment and development sectors should integrate efforts in identifying synergies in order to ensure that natural resources are harvested in an environmental and socially acceptable and sustainable manner.

Development takes place on land (in the environment) and hence the quest for economic development requires a trade-off with certain parts of the environment in-order for the development to be realized. Meaning, for development to take place, some part of the environment will be affected. However, it is of utmost importance that such impacts are mitigated through the Environmental Management Plan (EMP).

The aim of environmental assessments is to guide the sustainable utilization of natural resources and to mitigate negative impacts that would otherwise compromise the environmental integrity and future ecosystem benefits.

The Roads Authority (RA) recognizes the importance of maintaining a good road network throughout the country. Road construction projects are generally intended to improve the economic and social welfare of people. Travelling times can then be reduced with increased road capacity which also lowers the costs of vehicle use, while further increasing access to markets, jobs, education and health servicesTsunokawa,1997, pg. xvi)

This development inspired the RA in committing to environmental sustainability and thus produced its own manual (Environmental manual, 1st Edition,2014) that seeks to inform practitioners as to the legal and contractual framework within which roads must be designed and built and to give guidance regarding the requirements of the RA in respect of environmental issues. Therefore, the RA is fully committed to environmental protection, and complement national legislative framework, while fulfilling its mandate. Which is: “The Roads Authority aspires to manage a sustainable road sector which is ahead of national and regional socio-economic needs in pursuit of Namibia’s Vision 2030”.

1.2 Components of the EMP

The purpose of the EMP is to identify potential environmental and social impacts associated with the upgrading T0805 Road from gravel to LVS standards, in-order to ensure compliance to the Environmental Management Act (Act No. 7 of 2007). It is further important to mention that the EMP is to draft and maintain a detailed management plan that, if implemented will effectively prevent/minimise environmental degradation.

This EMP will from part of the project tender and contract. Pre-construction and construction phase mitigating guidelines and construction phase documents as specifications. These clauses/conditions should be in addition to the minimum requirements as set out by RA for Standardise Specification for Civil Engineering Construction. The contents of this EMP shall be deemed to be included in the rates tendered to execute and complete the works.

Aim of the EMP is to ensure that the activities undertaken during the upgrading of T0805 Road from gravel to LVS standards surfaced road are conducted in accordance with the following:

I. Environmental Management Act (Act No. 7 of 2007),

II. EIA Regulations of 2012 (GN: 30),

III. Best environmental practices (benchmarks), and

IV. Any other applicable legislation (*as presented in Table 3.1 to 3.3*)

The EMP provides environmental guidelines to be followed throughout the lifespan of the upgrading of T0805 Road to LVS standards and comprise of the following:

a) Environmental Aspects,

b) Management Objective,

c) Mitigation Measures / Actions Required,

d) Monitoring Indicators, and

e) Party Responsible

1.3 Objective & Scope of the EMP

The construction environmental management plan has been developed to demonstrate that the proposed works will be executed in accordance with legislation safety and environmental requirements with minimal inconvenience to stakeholder including communities and the general public at large. The objective of the EMP is to prevent / minimise (where possible), unacceptable and adverse environmental, social and economic impacts that may arise from the proposed development. Overall, the EMP aims to minimise negative impact/s (real, potential or perceived) that may result from the proposed road upgrade activities.

The EMP does not only focus, and it is not limited to the upgrading of T0805 Road from gravel to LVS standards, but it includes the bigger picture, and serve as the guiding tool to protecting the

natural, bio-physical and socio-economic environment on both the specific site and the surrounding area. This is important because some of the impacts may not be confined to the immediate construction sites.

1.4 Flexibility of the EMP

The EMP is an open-ended document subject to review and updating. During the implementation of a project there is always the possibility that unforeseen issues could arise. This EMP should therefore be revised where necessary to mitigate impacts such as:

a) Lack of information at the time of drafting the initial EMP,

b) Evolution or addition of new activities, or

c) Unintended omission of potential impacts during the development of the initial EMP.

d) Development of industry best practice.

This implies that, in-addition to the information contained herein, any other relevant information that may surface during the construction operations, through internal monitoring and auditing by the Environmental Compliance Officers, can be added to the EMP (evolution of activities), and such changes or inclusions will be binding to the proponent and all contractors / sub-contractors. The EMP will focus on and operate during the construction phase of the project.

1.5 Implementation Framework and Accountability to the EMP

For effective implementation of the EMP, the Institutional roles are presented below. However, the specific roles and responsibilities are defined and broken down as presented in Sections 4 and 5, respectively.

Table 1: Role Players, Institutional Framework

Role-player	Company / Institution	Role
Proponent	Roads Authority	Compliance to the EMP
Resident Engineer	CEPM & Partners Engineers (Pty) Ltd	Compliance to the EMP
Environmental Consultant	Ritta Khiba Planning Consultants (RKPC) cc	Development of the EMP
Environmental Compliance Officer/s (ECO)	Ministry of Environment & Tourism	Monitoring Compliance to EMP: ➢ Un-announced spot checks, ➢ Corrective measures, warning, penalties / fines, license suspension, etc.

Public	Interested and Affected Parties (I&APs)	Report to the ECOs, any activity of environmental concern (e.g., Pollution, Safety Risks, etc.)
Community	Affected parties	Report to the ECO's, any activity that impacts the communities living in close proximity of the project.

2. PROJECT INFORMATION

2.1 Project Location and Route Description

T0805 Road (the project site) is located at Susuwe to Bico Border post in the Bwabwata National Park Kwando Core Area, Zambezi Region of Namibia. The region is situated on the north-eastern part of Namibia. It connects Namibia to four neighbouring countries, Angola, Botswana, Zambia and Zimbabwe. The region is also known for its ever-green vegetation and abundant wildlife as a result of good rainfall. The region receives the country's highest annual rainfall and is virtually surrounded by perennial rivers, making it the logical target for agricultural development in an otherwise arid country. The region is the third smallest in Namibia, covering a total land area of 14 785 km^2 and is susceptible to pressure from potentially conflicting land use demands.

T0805 Road is located in Zambezi Region of Namibia. The road starts at coordinate: Lat: 17°46'53.19"S / Lo: 23°19'36.21"E (X: -34795.003; Y: -466979.325) and ends at coordinate: Lat: 17°39'0.51"S / Lo: 23°22'13.09"E (X: -39432.782; Y: -481646.519)

- The total existing street length is 16.8 km (CEPM, 2024).

The road is currently unsealed and is planned to be designed and constructed as a Low Volume Seal (LVS). Drainage will be addressed by designing an appropriate vertical alignment in conjunction with the correct positioning of drainage structures, while retaining the existing horizontal alignment. The necessity for electrical installations, excluding street lights, will be investigated. Proposed culvert positions are located at approximate chainages 4+000 and at certain observed low points, which will be accurately identified upon completion of the survey. Intersections will be designed for access roads within the park, with new signs to replace the faded ones. Additionally, given that army bases existed before independence, there is a probability of unexploded ordinances; therefore, demining by the police may be necessary before any works commence.

The road to the Bico border post in Bwabwata National Park poses a safety risk due to the presence of wild animals. The Park is home to large concentrations of elephants and buffalo, as well as sable and roan antelope, waterbuck, impala, kudu, giraffe, and wildebeest. The main predators in the area

include lions, leopards, cheetahs, and hyenas, making it one of the last refuges for the African wild dog in Namibia. Along the river, common reedbuck, red lechwe, sitatunga, and hippos can often be seen. Additionally, the birdlife is diverse, featuring species such as the Wattled Crane, Western Banded Snake Eagle, Wood Owl, Narina Trogon, Cape Parrot, and both Red-billed and Yellow-billed Oxpeckers.

T0805 Road is important for local economic development. The existing gravel road traverses' shallow areas prone to water inundation, creating slippery conditions that pose risks to users. Nonetheless, the upgrading of the T0805 Road will be implemented based on the availability of funds See images below for the current condition of the Road.

Figure 2: Current condition of T0805 Road, Zambezi Region

Source: RKPC (2024)

2.2 Envisioned Road Works

Upgrading a road from earth to low volume seal involves several key steps: first, site preparation includes clearing and grading the existing surface for proper drainage. Next, a compacted gravel base layer is constructed using various sizes of crushed stone and sand to enhance stability. Following this, a bituminous binder mixed with fine aggregate is applied to create the low volume seal, providing a durable and smooth surface. Finally, compaction and finishing touches, such as road markings, ensure safety and functionality for long-term use. A geotechnical investigation for preliminary construction materials prospection such as gravel and water are being conducted and it will inform the number of gravel pits that will need to be established.

An investigative study entailing surveying and analysis of material quality was undertaken to assess the factors such as terrain, soil stability, drainage and water supply. A detailed design plan was thereafter developed, which outlines road alignment, cross sections, amongst others. The materials investigation was conducted in accordance with the Roads Authority's Manual. The investigations

for construction material sources (subgrade, general, selected, wearing course, building sand and concentrate aggregates) were carried out in the phases described below.

The following road works shall be undertaken as part of the upgrading of T0805 Road to LVS standards.

Road works

The following main road works shall be undertaken on this gravel road:

- Clearing and grubbing (for new Borrow Pits for example)
- Opening of borrow areas and reinstating thereof afterwards
- Construction of the road formation, including road bed preparation, cut and fill
- Construction of a 150mm gravel wearing course compacted to 95% of Modified AASHTO density, as Subbase layer.
- LVS Surfacing layer to be 19 mm Cape seal with double slurry seal.
- Supply and installation of roads signs
- Street lights to be installed.
- Finishing the road and road reserve

Drainage works

The drainage works on this gravel road shall comprise the following:

- Construction of earth berms and open drains where indicated on site by the Engineer;
- Provision of erosion protection;
- There are numerous box culverts already available. These culverts would need upgrading, an increase of their capacity, provision of additional structures in line with the applicable return period, major or minor repairs, lengthening or replacement works, whichever is applicable to the specific drainage structures.
- Construction of required additional box culverts (minimum 900mm×600mm) with cast in situ concrete floor slabs, concrete walls and precast concrete beams or cast in situ concrete deck slabs;
- Construction of any other appropriate drainage structures suitable to the terrain of the project area;
- Extending existing culverts as required in line with the typical cross sections
- Construction of concrete inlet and outlet structures with cast in situ concrete floors at all culverts.

Upgrading T0805 Road from gravel to LVS standards offers numerous benefits, including improved safety through better traction and visibility, enhanced durability that reduces

maintenance costs, and leading to better air quality. This upgrade also increases accessibility for emergency services and public transport, potentially raises property values, and fosters local economic growth. Overall, it enhances the quality of life for residents, promoting community pride and satisfaction.

2.3 Accommodation of Traffic

Construction work is to be carried out in a manner that enables accommodation of traffic on the existing roads/ tracks or in the road reserve. Temporal road signs and traffic control measures will be erected to warn road users of the ensuing construction activities; and ensure safe passage of public traffic in accordance with the requirements of the specifications.

2.4 Field Investigations

During the site visit, areas along the street were investigated for signs that show the presence of road construction materials. These signs include the type of vegetation, topography, land-use and geographical characteristics. Community members were also consulted for guidance on areas that are traditionally used for earth dams and wells as they predominantly contain gravel material.

The road surface of the existing gravel roads consists of well compacted to loosely compacted material through the road section of the road.

3. LEGISLATIVE FRAMEWORK

The environmental impacts associated with the construction of T0805 to LVS standards required to be investigated in compliance with the EIA Regulations published in Government Notice No. 30 of 2012 read with Section 27 of the Environmental Management Act, 2007 (Act No. 7 of 2007).

The required environmental studies encompass the undertaking of a Basic Assessment. This study was undertaken as per the manual of the road authority's category of roads. In that manual the roads are categorized by the type of assessment they need. Based on that this road falls into category of an EMP.

In the development of the EMP for the upgrading of T0805 Road project, a thorough Environmental Assessment (EA) was conducted. This assessment meticulously evaluated the potential effects of the project on local ecosystems, air and water quality, and nearby communities. Key findings from the EA have been integrated into the EMP to address identified environmental concerns and to outline specific mitigation measures. These measures include strategies to minimize habitat

disruption, manage emissions, and ensure water runoff control. By incorporating the EA's insights, the EMP aims to safeguard environmental quality throughout the construction process and beyond.

The proposed project is a listed activity in terms of Section 10.1 The construction of- (b) public roads, Section 4.2 Mining and Quarrying Activities, Section 3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not, and Section 4.3 Water Resource Developments. As well as Section 8.1, the abstraction of ground or surface water for industrial or commercial purposes. The proponent is therefore required to submit a report detailing the EMP. The competent authority will issue a decision subsequent to their review of the EMP.

Table 2, summarises the legislation and policy guidelines that are relevant to the proposed project and is not exhaustive.

Table 2: Relevant Legislation and Policy Guidelines utilized for the EMP

Title of legislation, Policy or guideline	**Implications for proposed project (please read all Acts with their Regulations)**
The Namibian Constitution of 1990	The Constitution clearly indicates that the State shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.
Water Resources Management Act No. 11 of 2013	This Act protects all water resources in Namibia. The Act also laid down conditions to ensure that proper wastewater treatment is provided, including requirement for wastewater discharge permit from the Directorate of Water Affairs.
Environmental Assessment Policy of Namibia (1995)	This Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.
Environmental Management Act No. 7 of 2007	This Act provides a list of projects requiring an Environmental Assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment.

Roads Authority Manuals	These are various manuals all contractors are or must be aware of when dealing with road construction works in Namibia. These manuals are on, but not limited to: • Procedures Manual (1st Edition, October 2014) • Material Manual (1st Edition, October 2014) • Structures Manual (1st Edition, October 2014) • Drainage Manual (1st Edition, October 2014) • Survey Manual (1st Edition, October 2014) • Geometrics Manual (1st Edition, October 2014) • Environmental Manual (1st Edition, October 2014) • Construction Manual (1st Edition, October 2014) • Economic Evaluation Manual (1st Edition, October 2014) • Standard Drawings Manual (1st Edition, October 2014)
Public Health Act, No. 36 of 1919 and Amendments and Regulations	This Act makes provision for the prevention and control of infectious diseases, venereal diseases and epidemics. It also regulates sanitation, food and public water supplies.
Nature Conservation Ordinance No. 4 of 1974 (as amended)	Guides the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.
Labour Act No. 11 of 2007	Consolidate and amend the labour law; to establish a comprehensive labour law for all employers and employees; to entrench fundamental labour rights and protections; to regulate basic terms and conditions of employment; to ensure the health, safety and welfare of employees; to protect employees form unfair labour practices; to regulate the registration of trade unions and employers' organisations; to regulate collective labour relations; to provide for the systematic prevention and resolution of labour disputes; to establish the Labour Advisory Council, the Labour Court, the Wages Commission and the labour inspectorate; to provide for the appointment of the Labour Commissioner and the Deputy Labour Commissioner; and to provide for incidental matters.
MEFT Policy Document – Community-Based Tourism Development (June 1995)	This document contains the approved Ministry policy for providing support to, and encouraging the development of, community-run tourism activities and enterprises on communal land. This Policy document provides a framework for ensuring that local communities have access to opportunities in tourism development and are able to share in the benefits of tourism activities that take place on their land. Support for the involvement of rural communities in tourism enterprises is important: a) To implement to government policy of giving communities access to development opportunities and b) Because where tourism is linked to wildlife and wild landscapes, the benefits to local communities can provide important incentives for conservation of these resources.

Nature Conservation Act No. 5 of 1996 (as amended)	This amends to the Nature Conservation Ordinance of 1975, provide for an economically based system of sustainable management and utilization of game in communal areas. This amend allows for the formation of Conservancies in communal areas.
Hazardous Substances Ordinance No. 14 of 1974	The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings. Hydrocarbons handled during the construction phase may be hazardous thus careful handling and management is vital to prevent spills, explosions, ill-health or death.
Pollution Control and Waste Management Bill of 1999	The Bill promotes sustainable development and the establishment of the Pollution Control and Waste Management Unit; to prevent and regulate the discharge of pollutants to the air, water and land; to make provision for the establishment of an appropriate framework for integrated pollution prevention and control; to regulate noise, dust and odour pollution; to establish a system of waste planning and management; and to enable Namibia to comply with its obligations under international law in this regard.
Draft Wetlands Policy of 2004	This policy strives to complement existing policy instruments regarding sustainable development and sound natural resource management in Namibia. Its implementation provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetlands resource utilization. Furthermore, it facilitates the Nation's efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA's).
National Waste Management Policy, 2010	This policy is focusing specifically on Waste Management and use various technologies waste treatment and disposal to minimise health risks. It is also geared to have a unified waste management system country wide. This policy provides the necessary guidance on the processes related to waste management in the MOHSS, wider Namibia health and social welfare sectors, and other relevant stakeholders. It is taking into consideration the process of integrated waste management from generation to final disposal. This practice also focusses on medical, household, mining, agricultural, and construction waste.
Forest Act No. 12 of 2001 (as amended)	The purpose of this Act guides the use and management of forestry and related resources. The aims of the forest management as per the Act, it is to achieve manage of forest "for which forest resources are managed and developed, including the planting of trees where necessary, to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment."
National Heritage Act No. 27 of 2004	The Act provides for the protection and conservation of places and objects of heritage significance and the registration of such places and object; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.

Soil Conservation, 1969 (Act 76 of 1969) and the Soil Conservation Amendment Act (Act 38 of 1971)	This Act makes provision for the prevention and control of soil erosion.

4. ROLES AND RESPONSIBILITIES

The EMP require the involvement of multiple stakeholders; the Proponent (RA), Resident Engineer (CEPM & Partners Engineers (Pty) Ltd) and the Contractor. Supervision and monitoring are fundamental to the successful implementation of an EMP. It is therefore vital that monitoring of the extent to which the mitigation measures of this EMP, are adhered to by the consultants and contractors. All of the issues described and discussed in this document will require monitoring and it will be the responsibility of the Project Manager (CEPM) to undertake this monitoring according to the specification of this EMP being:

- ✓ Draft and implement a monitoring programme to assess compliance with the EMP.
- ✓ Appoint an Environmental Control Officer during the construction phase.
- ✓ Any issues/problem that are identified must be reported to the Project Manager. So that appropriate action may be taken to rectify the situation.

The following are the responsibilities of the different key stakeholders:

4.1 Roads Authority (RA) and Resident Engineer (RE)

The RA and RE should visit the project site on a regular basis to perform compliance monitoring of the Contractor's operation to this and to other relevant Manuals, Conditions, Standards and Regulations. Any matters of non-compliance are communicated to the Contractor by the RE through the Site Manager.

The following are the responsibilities of the RA and RE:

- RE appoints an Environmental Manager to conduct monthly compliance audits.
- Review reports regarding the implementation of the EMP.
- Give warnings and imposes fines and penalties on the Contractor if the Contractor neglects to implement the EMP satisfactorily and other relevant conditions.
- Be familiar with all aspects of the EMP.

- Responsible for ensuring that the Contractor complies with this EMP throughout the project cycles.
- Review and approve the Contractor's Management Plan based on guidance provided by this EMP.
- Monitor the Contractor's compliance to the EMP on a regular basis.
- Discuss EMP issues at every monthly site meeting with input provided by the RA, RE, Contractor and other relevant stakeholders.
- Communicate to the Contractor, verbally and in writing, regarding any matters of non-compliance.
- Ensure that land areas are properly designated according to the approved site plans, including sensitive environments and "No-Go" areas.
- Undertake damage assessments where incidents, accidents and serious infringements have occurred.
- Inspect and approve all areas that have been rehabilitated by the Contractor.
- Review complaints received and issue instructions to the Contractor as necessary.
- Maintain a record of complaints from the public and communicate the complaints to the Contractor.
- Enforce temporary work stoppages where serious environmental or health & safety infringements and non-compliances have occurred.

4.2 Contractor (including Sub-Contractors)

The following are the responsibilities of the Contractor:

- Fully implement the conditions stipulated in the Authorisation and Record of Decision issued by Environmental Commissioner and any other competent regulatory body having authority over the project or the activities concerned. Fully implement the EMP and ensure compliance throughout the project duration.
- Appoints an Environmental Control Officer or appoint such Officer to oversee all aspects of the implementation of the EMP and communicate with the RE on all EMP-related issues.
- Prepare a Management Plan that includes Sub-Plans, Method Statements and drawings as described below in this EMP.
- Prepare and submit a monthly report concerning environmental management and health and safety issues. The report contents will cover: any training performed; status of training received by all staff and sub-contractors; copies of the Contractor's weekly Site Inspection Forms; summary of any issues or incidents concerning environmental management or health & safety, and what the Contractor has done to address the issues and incidents that have been identified by the Contractor or by the RA and RE.

- Ensure that all employees and sub-contractors on site are informed about environmental and health & safety responsibilities, practices and procedures. Perform daily inspections to monitor environmental management and health & safety performance.
- Perform weekly inspections for which Site Inspection Forms must be completed, and submit the completed Forms to the RA and RE on a monthly basis.
- Notify the RE immediately in the event of any accident or infringements of the EMP and ensure appropriate remedial action is taken. Notify the RE at least 10 working days in advance of any activity s/he has reason to believe may have significant adverse environmental impacts (including impacts on the people/ community/ businesses), so that mitigatory measures may be implemented timeously.
- Maintain a register of environmental management, health & safety and HIV/AIDS training for site staff and sub-contractor's staff for the duration of the contract.
- Identification and enforcement of environmental "No-Go" areas (to be approved by the RE).
- Ensure that stockpiles and construction waste is stored and disposed of according to the relevant laws, policies and guidelines. Undertake rehabilitation of all areas affected by project activities to restore them to an acceptable state, as determined by the RA and RE.
- Develop and conduct training and awareness sessions regarding: environmental management practices and procedures for the project; health & safety issues, practices and procedures for the project, and; HIV/AIDS background, prevention, testing, treatment and counselling.

5. THE CONTRACTOR'S MANAGEMENT PLAN AND TRAINING

The Contractor shall submit a ***Management Plan for all activities that could be potentially harmful to the environment.*** The Management Plan shall consist of Sub-Plans and Method Statements related to:

1) Environmental management;
2) Waste management;
3) Noise and vibration management;
4) Health and safety;
5) Recruiting and training workers;
6) Site layout and management, and;
7) Site closure.

Please note: the above can be replaced with any industry's recognized standards as approved by the Roads Authority and/or Resident Engineer

No construction or operational work may commence until the Management Plan has been approved in writing by the RE. Where necessary, changes may be made to the Management Plan, Sub-Plans and Method Statements once construction and operations have commenced. In such instances the proposed changes shall be agreed to in writing by the RE prior to implementing the change.

The Sub-Plan on environmental management shall include a list and location of all petroleum, lubricant, chemical (including concrete and cement), harmful and hazardous substances and material on site. The Sub-plan shall describe the procedures for storage, handling, servicing and maintenance, disposal, and spillage and control procedures for these materials. The Sub-plan shall describe how all staff and sub-contractors will be trained and informed about environmental management issues and practices.

PLEASE NOTE: No explosives are allowed to be stored on site.

The Environmental Management Sub-Plan shall specify:

- Contractor's provision of equipment to clean chemical spills and procedures to be followed in the case of chemical emergencies.
- Contractor's provision of fire suppression equipment (types, locations) and procedures to be followed in case of a fire anywhere on site.
- How the Contractor will perform dust suppression on site and for trucks in transit that transport aggregate materials.
- All emergency telephone numbers and contact persons, and how this information will be kept up to date and posted at relevant locations at all times.

The Waste Management Sub-Plan shall specify:

- How the Contractor's waste management activities on site shall incorporate reduction, recycling, re-use and disposal of waste where appropriate.
- How the Contractor shall dispose of collected wastewater, including vehicle and equipment wash water.
- How all construction rubble and waste shall be removed from site upon completion of construction and operation activities to a licensed landfill site.

Note that the Contractor shall supply the RE with a certificate of disposal, if applicable.

The Noise and Vibration Management Sub-Plan shall specify how the Contractor will minimise noise and vibration through:

- Monitoring of noise and vibration levels.

- Working hours restrictions.
- Timing of excavations and drilling.
- Vehicles and crushers having low noise emissions and complying with the National Regulations for noise and vibration level emissions.
- Regularly maintaining vehicles, machinery and equipment used on site.
- Altering or enclosing equipment to reduce noise at the source, or to isolate it.

The Occupational Health, Wellness and Safety Sub-Plan on shall identify potential health risks and hazards associated with the construction activities, and set out plans and procedures to minimise those risks, as well as emergency procedures to follow in the event of an accident. The Sub-Plan shall describe how all staff and sub-contractors will be trained and informed about health and safety issues, and HIV/AIDS. The Sub-Plan shall specify:

- That the Contractor shall comply with Namibian health and safety laws, regulations and standards.
- Contractor's provision of first aid equipment and supplies (types, locations), and procedures to be followed in case of an injury, accident or illness.
- All emergency telephone numbers and contact persons, and how this information will be kept up to date, posted at relevant locations at all times.

The Site Layout, Management and Closure Sub-Plan shall include:

- Site plans and written descriptions that show locations of, and provide details about, land areas to be cleared, fuel supplies, stockpile sites, offices, vehicle parking, access points, delivery points, equipment cleaning areas, lay-down areas, housing areas for personnel (including location of services, ablution facilities, easting areas, etc.), "No-Go" areas, etc.
- Details on the expected amount of project-related traffic, as necessary for material hauling, construction, etc.
- Details of what is to be performed by the Contractor at site closure, such as: closure and rehabilitation of quarry pits, borrow pits, temporary roads, removal of residual stockpiles and building material, removal of all temporary structures and services, etc.

The Contractor must conduct a comprehensive, induction awareness raising and training session. All personnel working on the project, including sub-contractor staff, shall be required to complete this induction session prior to starting work. The Contractor must keep a register with signatures from all who received the training. The induction session shall cover the following topics:

- Contractor's Management Plan.
- Legal and statutory requirements.
- Concepts of due diligence and duty of care.

- Minimising potential impacts such as noise, vibration, air, soil and water quality.
- Location and protection of environmentally sensitive areas, e.g., crop fields, fruit trees, wetlands, wells, boreholes, water channels, power lines, water pipes, homesteads, schools, clinics, etc.
- Waste management and minimization.
- Washing, refuelling and maintenance and materials.
- Communication and stop work procedures.
- Emergency response procedures and contact arrangements in case of an environmental or safety incident.
- Incident reporting procedures for environmental and safety/health incidents.
- HIV/AIDS awareness and prevention: information regarding preventative actions, access to contraceptives, access to testing, access to treatment, and access to counselling services.

The Contractor shall conduct additional training and awareness raising sessions on the topics covered in the induction session for any staff of the Contractor or sub-contractors who did not attend the induction session.

The Contractor shall also conduct HIV/AIDS awareness raising and education sessions for all personnel and sub-contractors every six months for the duration of the project. The Contractor must keep a register with signatures from all who received the training.

The Contractor must demonstrate in each monthly report the status of training received for staff (and sub-contractor) member working on site.

6. COMMUNICATION, RECORD KEEPING, DOCUMENT CONTROL AND COMMUNITY RELATIONS

The Contractor will perform the following types of communication and record keeping:

- The Contractor shall ensure that all his/her senior staff and sub-contractors are familiar with the contents of the EMP and Contractor's Management Plan.
- Keep record of significant incidents (e.g., spills, drillings and blasting impacts, complaints, and legal transgressions, as recorded in the Contractor's weekly Site Inspection Forms) as well as corrective and preventive actions taken, for submission to the RE at the scheduled monthly meetings along with copies of the Site Inspection Forms. The Contractor shall inform the RE immediately about any emergencies (including spillages) on site and along the transport routes. The Contractor shall submit a full report on the handling of the

emergency as soon as possible (i.e., within the following hours or days). The following details shall be discussed in the report:

  - Nature and cause of environmental damage.
  - Type of material spilled and volume spilled.
  - Description of clean-up activities, and restoration actions taken and/or to be taken.

- Keep a register of public complaints in which all complaints are recorded, as well as action taken. The Contractor shall notify the RE of any relevant complaints lodged by a third party and provide appropriate information for inclusion in the Contractor's monthly environmental management and health & safety report.
- Keep records with signed attendance lists of all personnel and sub-contractor staff who attend training and awareness raising sessions conducted by the Contractor. This information is to be included in the Contractor's monthly environmental and health & safety report.
- Submit a monthly written report to the RE that provides details on the Contractor's compliance with the EMP and environmental and health & safety performance. The monthly report on environmental management and health & safety shall include:
  - Findings of the weekly Site Inspection Forms.
  - Notice of any major incidents and complaints and follow up actions taken.
  - Documentation of variations to the EMP, non-compliances and corrective action.
  - Confirmation that appropriates environmental and health & safety training of personnel and sub-contractors has been, and is being, undertaken.
  - Confirmation that emergency procedures are in place and have been effectively communicated to all personal and sub-contractors.

The Contractor shall establish and maintain procedures for controlling all documents required for the EMP that shall be based on a recognized system (e.g., ISO 9000 or similar). These documentation procedures shall ensure that:

- At least one copy of the EMP shall be readily available on site at all times.
- At least one copy of the Contractor's approved Management Plan shall be readily available on site at all times.
- The Contractor shall be responsible for ensuring that documentation is kept up to date and ensure that documentation is reviewed regularly.

The Contractor shall facilitate an ongoing and constructive relationship with local communities and stakeholders adjacent to the project. This will include the following actions:

- Where necessary, the Contractor shall erect and maintain information boards in appropriate locations and positions. Such boards shall also include contact details where members of the public may address any complaints or comments they may have.
- The public shall be kept informed of any activities that may cause a disturbance, such as dust, poor bypass roads, loud and noisy construction activities.
- The Contractor shall maintain a Public Complaints Register in which all complaints are recorded.

7. COMPLIANCE WITH EMP

The Contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand, and adhere to this EMP. Failure by any employee of the Contractor, Sub-contractors, or Suppliers to comply with the EMP shall be considered sufficient cause for the RE to instruct the Contractor to have the relevant employee removed from the site. The RE may also order the Contractor to suspend part or all of the works if there is non-compliance with the EMP. Such suspension shall be lifted only when the offending procedure or requirement is corrected and/or if required remedial measures are put in place.

8. PRE-CONSTRUCTION MANAGEMENT PLAN

The pre-construction or planning management plan is to be used as a guide during the planning, design and detailing of the development components. This part of the plan is to be reference by all involved in decision making during the planning and design phases.

Table 3: EMP Training

Mitigation/Management Action	Responsible Person
The Contractor shall arrange for Environmental and Heritage Awareness Training programmes for the personnel on site, to the satisfaction of the PM and ECO, and familiarise the employees with the contents of this EMP either in written format or verbally	ECO & Contractor

9. PROCEDURES REGARDING NON-COMPLIANCE

The Contractor must fully implement and comply with the EMP on an ongoing basis throughout the duration of project activities. If and when the Contractor fails to do, the RE may impose fines and/or penalties against the Contractor. The procedures that the RE shall follow in matters of non-

compliance must be described in the Contract Document between the RA, RE and with the Contractor.

10. PROPOSED MITIGATION MEASURES TO BE PERFORMED

Table 4: Management of impacts on Biodiversity

Environmental Statement – Biodiversity Conservation				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Loss of vegetation and habitat	1. The demarcation of these habitats must be done in consultation with the relevant Authorities. 2. The relevant must site the actual project footprint. 3. Site clearance must be confined only to areas designated for as in the site layout, and unless absolutely necessary, vegetation will not be removed. 4. Site clearance will be done mechanically, the use of fire is to be avoided. 5. Interference with surrounding vegetation will be minimised, and only vegetation in the way of construction and operational phase will be removed.	All Phases	Daily	Contractor
Death and injury of animals	1. Avoid injury to or death of animals by reducing speed of construction vehicles. 2. Trenches and pits must be inspected daily to monitor for trapped animals. 3. Workers to be discouraged from killing animals and birds for food and relish.	All Phases	Daily	Contractor & RE
Illegal removal of vegetation	1. Any evidence of plant theft (especially protected species) must be followed up with prosecution and penalties levied on the construction company. 2. Construction teams will not, as a contractual obligation be allowed to collect firewood or any other plant resources from surrounding vegetation, wetlands, outcrops and riparian areas. Any evidence of this must be followed up with prosecution and penalties levied on the construction company	All Phases	Daily	Contractor & RE
Protected species	1. Prior to vegetation clearing, the development footprint must be surveyed for plant species of conservation concern.	All Phases	Continuous	Contractor

	2. Protected plants occurring within the footprint should be relocated in consultation with an approved specialist after obtaining the necessary permits from authorities. 3. All protected species occurring within the footprint should be clearly marked for the duration of the construction phase, and should remain intact and undisturbed. If this is unavoidable, the contractor must follow procedures as advised by the RE. 4. Important flora that may become apparent at a later stage should be reported to a specialist and the authorities and be relocated or conserved. 5. If the relocation of protected plants is impossible, the Contractor should plant 3 more the total plants of the same species to be cut at nearby homesteads and schools as directed by the RE.			
Spreading of weeds	1. Where alien invasive plants occur, they must be unrooted, cut and/or chemically treated. (Use only authorised chemicals).	All Phases	Monthly	Contractor
Management of Fauna	1. No wild animal may under any circumstance be handled, removed or be interfered with. 2. No wild animal may be fed on site. 3. If applicable, regularly undertake checks of the surrounding natural vegetation, in fences and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps found on or adjacent to the site. 4. Problem animals and vermin need to be removed by appropriate organisations or authority (i.e., such as the Ministry of Environment, Forestry and Tourism, the Police, the SPCA or a registered exterminator). 5. Do not make use of any pesticides unless approved by the RE and relevant authorities. 6. Important fauna that may become apparent at a later stage should be reported to a specialist and the authorities and be relocated or conserved.	All Phases	Daily	Contractor
General Conservation of biodiversity	1. There was only one cultural heritage sites observed during this assessment that requires no further protection. The project engineer and the contractor should regularly communicate with relevant local authorities to identify cultural	All Phases	Daily	Contractor

	heritage sites. If such sites are found or excavated, construction should immediately stop and relevant authorities should be informed. Construction works can only resume with written approval from the relevant authorities. 2. Site Management Plans depicting preferred site for construction cramps, material storage, no-go sensitive and protected areas, known borrow pits, etc., need to be developed by the contractor with the assistance of the project engineer. These plans need to be documented, refined, updated and agreed on prior to the commencement of works at any location. 3. No water should be abstracted from any source without specific written approval from relevant authorities. 4. Staff members are not allowed to engage in illegal activities such poaching, illegal harvesting forest products including timber and non-timber products. 5. To minimise land degradation, no off-road driving is allowed except on demarcated access and hauling roads. 6. The confines of the site, especially haul and access roads shall be clearly marked and signposted by the contractor. 7. Access and haul roads should be rehabilitated by ripping them so to facilitated water penetration and seed bank establishment. 8. All necessary measures should be implemented to minimise fauna displacement and flora destruction. 9. No fires are allowed on site at all times, unless dually authorised by the RE. 10. Soils from areas infested with invasive flora should not be hauled from those specific areas. The risk of such species dispensing and displacing natural vegetation is very high, thus the RE should be consulted at all times to ensure that invasive plants are not accidentally dispersed.			

	Any person or institution or company not complying with these specifications are liable to fines and penalties as indicated in this EMP and other relevant contracts conditions, relevant laws and regulations.			

Table 5: Management of impacts on Soil

Environmental Statement – Protecting Soils				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Degrading of soil structure	1. Before construction, vegetation and topsoil must be stripped and stockpiled separately to prevent removal and compaction by vehicles. It must be used for future rehabilitation purposes. 2. Topsoil shall be stockpiled in heaps not exceeding 2.0m in height and be protected from erosion. 3. Re-usable subsoil stripped from construction sites must be stockpiled separately and clearly identified as such. 4. Soil must not be stockpiled on drainage lines. 5. Deficiency of backfill material will not be made up by excavation within the remainder of the development area. Where backfill material is deficient, it must be made up by importation from an approved borrow pit.	Pre-Construction and Construction	Weekly	Contractor
Soil erosion	1. No excavation of aggregates will occur within 50 metres of the site boundary. 2. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilised. 3. Movement of equipment and earth-moving machinery to be restricted to designated roads. 4. Steep slopes to be avoided during planning and establishment of access roads. 5. Surface run-off hump should be made to direct water flow into vegetated surfaces. 6. Disturbed terrains should be tilled and re-seeded with local vegetation or re-vegetated. 7. Disturbed steep slopes should be supported with surface rock gladding or vegetation.	Pre-Construction and Construction Operational	Daily Weekly	Contractor

	8. Excavated areas will be backfilled to avoid unnecessary accumulation of surface water and high velocity overflow. 9. Occurrence of erosion should also be monitored during operational phase and corrective measures taken if necessary. 10. Adequate sedimentation control measures must be instituted at anu prominent drainage lines, water crossings and construction trenches. 11. Where possible construction activities must be positioned away from drainage lines and steep slopes. 12. Occurrence of soil erosion and silt generation has to be monitored during construction and operational phases and corrective measures taken if necessary. 13. The storm water from within the site need to be controlled by well-designed concrete drains and energy breakers.			
Pollution of soil	1. Avoid contamination of soil with oil, diesel, petrol, waste or any other foreign matter, which may impact on the capability of the soil as a growth medium. 2. All equipment to be inspected daily for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakages has been repaired. 3. Contaminated soil has to be: - Removed up to depth 300mm below the saturation mark and disposed at permitted landfill site. 4. The soil can be regenerated by using bio-remediation methods. 5. Hazardous substances to be stored on lined surfaces and be surrounded by terms or bund walls to prevent pollution. 6. Divert storm water from stockpiles and other sites sensitive to erosion.	Pre-Construction and Construction Operational	Daily Weekly	Contractor

Table 6: Management of construction impacts and general environmental pollution

Environmental Statement – Pollution Control				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Air pollution & generation of dust	1. Speed limit must be enforced in all areas to reduce the levels of dust pollution. 2. Air pollution caused during construction can be limited by using dust suppression methods such as water spraying. Water used for this purpose must be in quantities that will not result in the generation of run-off. 3. The contractor's representative or environmental officer must notify all people living within 100m of the construction site of the proposed activities. 4. In the event of serious levels of dust pollution, the implementation of constant dust monitoring by qualified consultants must be undertaken. 5. Vehicles used on, or entering the site must be serviced regularly to ensure that they do not emit excessive smoke or fumes. 6. No refuse waste is to be burned on the premises or on surrounding premises.	Pre-Construction and Construction	Daily	Contractor
Noise pollution	1. Noise control measures must be implemented. All noise levels must be controlled at the source. 2. All employees must be given the necessary ear protection gear if the noise levels exceed 55dB. 3. Interested & Affected Parties (I&AP's) must be informed about the possibility of impending excessive noise. 4. Generators and pumps must be housed in casings to help reduce any noise in operation. 5. No loud music or excessive noise generated by employees is allowed on site and in construction camps. 6. Loading bins should be rubberised to reduce rattling sound. 7. No unnecessary hooting of construction vehicles will be permitted. 8. No screaming and whistling at the public, by construction workers as they pass-by residential areas, will be permitted.	Construction	Daily	Contractor

Construction and disturbances and waste disposal	1. Construction methods must be respectful of the environment; no unnecessary vegetation clearing, excavations or untidiness. 2. Concrete mixing will be done on pre-designed slabs underlined by PVC lining, or an area previously disturbed. Alternatively, maintain one mixing site and transport the concrete to the construction site. 3. Any concrete spillages must be cleaned immediately. 4. Littering on site and the surrounding areas is prohibited. Clearly marked litterbins must be provided on site. The contractor's representative must monitor the presence of litter on the work sites as well as the construction campsite. All bins must be cleaned. 5. Waste must be disposed, as soon as possible and not be allowed to stand on to decay, resulting in bad odours and attracting vermin. 6. Adequate sanitation and water supply must be installed for the construction personnel (authorisation from relevant authority may be required). 7. Stockpiles should be stored and/or disposed in accordance to the relevant policies, guidelines and standards. 8. Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. 9. Wind and animal proof bins must be provided at demarcated areas. 10. Waste must be disposed of at a licensed waste disposal site. 11. No waste, even biodegradable waste may be buried. 12. All waste removed from site must be disposed at the municipal/permitted waste disposal site. 13. The contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.	Pre-Construction and Construction	Daily	Contractor

	14. The contractor must clean up and restore all disturbed areas and implement rehabilitation measures where required by the RA and RE.			
Noise and dust	1. Dust and noise generation should be monitored during operational phase. 2. Excavation, handling and transporting of gravel must be minimised under high wind conditions. Dust suppression measures may be required, such as sprinkling the construction site with water to suppress the dust. 3. Dust protection masks must be provided to all staff members working in dust polluted environment. 4. All vehicles' speeds should be controlled to reduced dust production; hence appropriate road signs should be placed to control the traffic speed. 5. Ensure engines of construction machinery are fitted with mufflers. 6. Equipment and machinery operators should be equipped with ear protection equipment. 7. Operations should be strictly between 07h00 to 17h00 (unless official approval by RE and Local Authority has been provided).	Pre-Construction and Construction Operational	Daily Weekly	Contractor
Blasting and vibrations	1. Drilling and blasting should be carried out by experience, qualified and licensed personal. 2. Calculating the charge size and blast regime to optimize required excavation and fragmentation and thus keep air blast and ground vibration levels below pre-determined acceptable values. 3. Monitoring blast, ground vibration and human response to ensure that accepted levels are in fact acceptable and are being adhered to, and to modify the blasting design as required. 4. Pre-notification of affected persons of the intention to blast and the time of blast, preferably at the same time of day to remove the element of surprise. 5. Correct stemming of blast holes.	Operational	continuous	Contractor

Table 7: Management of impacts on surface and groundwater

Environmental Statement – Water Resources Protection				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Effect on Water quality	1. Adequate sedimentation control measures must be instituted at any prominent drainage lines, water crossings and construction trenches. 2. Where possible construction activities must be positioned away from drainage lines and areas with a perched water table. 3. All fuel, chemicals, oil, etc. must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods for storage and handling. 4. No washing and/or cleaning of clothes, eating utensils, tools or equipment allowed in water bodies. 5. Adequate sanitation for all personnel to be supplied on site. 6. No permanent stockpiling of any kind allowed within the 1:50 year flood line or within 10m of any water courses. 7. Machinery must be inspected and maintained on a daily basis to guard against possible leakages. 8. Refuelling of construction vehicles should be done at a designated area paved with concrete slabs to avoid soaking of oils into the ground. 9. Fuel storage facilities should be located away from the vicinity of the wetland and any water courses. 10. Used and empty drums, for oils, fuel, grease, etc., should be disposed of at a registered and licensed facility to avoid pollution and contamination of soil and water. 11. All mechanical equipment shall be serviced in accordance with recommended Service Manuals for the equipment. All on site staff to be trained in vehicle and plant maintenance for the plant for which they are primarily responsible. 12. Regular inspection of the fixed above ground container and the portable containers and refuelling areas ensures that the systems are performing as anticipated, and that the risk of the release of contaminants into the surrounding	All Phases	Daily	Contractor

	environment is minimised. Inspections and checks of the containers and refuelling area shall be undertaken every three months. Records of the checks and inspections shall be kept and made available to Environment on demand. 13. All above ground containers shall be inspected for leaks and general condition. All pipe work that carried diesel fuel oil will also be inspected for leaks and general condition. 14. An inventory reconciliation of diesel fuel oil needs to be maintained for the entire site.			
Effect on water course and Mitigation of Flooding	1. There are numerous box culverts already available. These culverts would need upgrading, an increase of their capacity, provision of additional structures in line with the applicable return period, major or minor repairs, lengthening or replacement works, whichever is applicable to the specific drainage structures. 2. Construction of required additional box culverts (minimum 900mm×600mm) with cast in situ concrete floor slabs, concrete walls and precast concrete beams or cast in situ concrete deck slabs. 3. Occurrence of soil erosion and silt generation has to be monitored during construction and operational phases and corrective measures taken if necessary.	Construction Operation	Daily Annually	Contractor RA
Effect on groundwater	1. Prevent spillages of any grease, oils, chemical or fuel product. Use drip trays during maintenance of vehicles and machinery. 2. The vehicles maintenance area must be equipped with a concrete floor surface to prevent soil pollution. 3. All areas used for storage and cleaning of machinery or equipment and vehicles must be bunded with prescribed height, and covered with an impermeable floor surface. 4. Polluted soil should be collected and stored into containers and disposed of at appropriate and licensed dumping sites. 5. Collected waste fuels and oils or waste water contaminated with oils must be stored in containers and disposed of at licensed and appropriate dumping sites.	Pre-Construction and Construction	Daily	Contractor

Table 8: Management of heritage sites and socio-economic issues

Environmental Statement – Human Well-being				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Heritage sites	1. Work in areas where artefacts are found must cease immediately. The excavation must be examined by an archaeologist as soon as possible.	All Phases	Continuous	Contractor
Socio-economic	1. Local residents are to benefit from employment opportunities.	All Phases	Continuous	Contractor

Table 9: Management of visual impacts

Environmental Statement – Aesthetics				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Planning and design	1. The alignment is selected from three alternatives so as to minimise the land occupation, air pollution and noise impacts on residences/businesses to avoid unfavourable geological conditions and cultural relics. 2. Alignment of structures should be compatible with the natural contours. 3. Built structures should not break the horizon, when possible. 4. Make use of existing access roads where possible.	Planning Construction	Continuous Continuous	Contractor
Construction aspects	1. The contractor must ensure that the site is kept tidy at all times, that sufficient refuse bins are provided, and that they are emptied regularly. 2. Refuse or building rubble generated on the premises must not be deposited on adjacent properties, road verges or open spaces. It must be contained on site, then removed and disposed of at an approved dumping site at least every two weeks. 3. Disturbed and open areas must be rehabilitated and re-vegetated as soon as possible after construction. 4. When construction is taking place within 200m of a densely populated area, the construction site must be enclosed by a dark green or black shade	Construction	Daily	Contractor

	cloth of no less than 2m high, to prevent any visual intrusion. 5. Rehabilitate all disturbed areas, especially borrow pits.			

Table 10: Site clean-up and rehabilitation

Environmental Statement – Care for nature				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Rehabilitation of environmental damage	1. Ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. 2. Upon completion of the project, the Contractor will ensure that any/all temporary access roads, quarry pits and borrow pits are returned to a state no worse than prior to construction commencing, where possible. 3. Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas will be levelled and cleaned of any foreign material. 4. Fully rehabilitate all disturbed areas, especially borrow pits and protect them from erosion. 5. Slopes must be designed according to predefined specifications, aimed at the prevention of soil erosion, of efficient storm water control, of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes. 6. In general, no slopes steeper than 1:3 (V: H) must be allowed or as directed by the RA's Manuals. 7. Cut slopes must not be steeper than 1:2 (V: H) and rounded off on the top edge or as directed by the RA's Manuals. 8. Bulk and fine shaping must be executed according to design, aimed at the prevention of soil erosion, of efficient storm water control, of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes.	Post Construction	After Construction	Contractor

	9. On all man-made slopes, the following rehabilitation methods must be applied or as directed by the RA's Manuals: - Replacing and redistribution of stripped topsoil to a minimum depth of 200mm. - Ripping at 300mm but not more than 400mm apart and parallel to contours, through the placed topsoil, to a depth of 100mm at least, into the sub base soil below. - Sowing of specified grass seed mixture and fertilizer, if required.			
Compliance	1. RE to audit rehabilitation. 2. The Contractor must implement Progressing Rehabilitation of the site and not wait until the end of the project.	All Phases	Continuous	Contractor & RE

Table 11: Management of traffic disruption impacts

Environmental Statement – Promoting Road Safety at All Times				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Construction aspects	1. Traffic management systems must be put in place to control traffic during construction. 2. Appropriate danger signs, safe speed limits, and other precautionary measures should be placed at strategic locations along the main bypasses and other roads that will be used during construction and operations. 3. During construction, the speed limit will be below 60km/h for all vehicles. Speed limits must be enforced in all areas, including public roads and private property to avoid potential accidents. 4. The contractor will place flagmen at strategic locations, to control traffic along the main by-passes and other roads used during the construction and operations. 5. Regular road users of the main by-passes and other roads used during the construction and operations should be notified at least seven (7) days in advance, by placing notifications on the media and erecting proper signage along the Roads, to alert the road users of construction activities that are likely to disrupt traffic.	Construction	Continuous	Contractor

	6. Controlled accesses will be constructed to manage the movement of vehicles and public in and out of the development site.			
Operational aspects	1. Traffic management systems must be put in place to control traffic in order to allow a recommended maximum speed safely. 2. The maximum speed limit for T0805 Road as per RA guidelines be 60km/h.	Operations	Once off	Contractor

Table 12: Management of fire hazards, safety and security

Environmental Statement – Safety First				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Fire precautions	1. Take adequate precautions to ensure that fires are not started as a result of Works on site: the Contractor will be held liable for any damage to property adjoining the Site as a result of any fire caused by one of his employees. 2. Establish and maintain fire breaks around the Work Sites if as and when specified by the Project Management Team and as required by applicable legislation and the local authority. 3. Do not permit any fires or open flames, especially during the dry season. A minimum requirement for construction in a high fire risk area is a water truck, with a minimum capacity of 5000 litres, equipped with pump and hose (minimum length 30m), which must be permanently on site, where veld fire is at risk. 4. Ensure that the Work Site, the contractor's camp and all living quarters are equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site. Take immediate steps to extinguish any fire, which may break out on the construction site. 5. No open fires are permitted on site, except in designated cooking area where adequate precautions need to be taken to prevent the spread of fire. Restrict contained fires for heating and cooking (i.e., in a fire drum) to designated areas on site.	Construction	Daily	Contractor

	6. Prevent employees from creating fires randomly outside designated areas.			
Security	1. The contractor's representative or environmental officer must inform all adjacent land owners of any after-hour construction activities and any other activity that could cause a nuisance. Normal working hours are between 07h00 and 17h00 Monday to Friday. Arrangements are to be made with the Local Authority for after-hours work. 2. Staff members residing in the construction camp will not be allowed to cause a nuisance to any neighbouring properties. In the event of a complaint received from the adjacent land owners, the privilege to reside on the property might be cancelled immediately. 3. Permanent security services should be provided during operations to maintain law and order on site and surrounding areas.	Construction	Daily	Contractor
Safety	1. Best practice methods must always be employed and appropriate regulations adhered to. 2. The borrow pits and quarries must be fenced off with livestock-proof fence to stop both livestock and people entering the sites without permission. 3. No open trenches are permitted without the use of demarcation tape. 4. There must be a first aid facility onsite. 5. Regular auditing of safety requirements must be undertaken in order to monitor and control the problems before they become unmanageable. 6. Workers' rights to refuse work in unsafe condition must be respected. 7. A record must be kept of all incidents on site. 8. Personnel must be trained in basic site safety procedures (safety talks). 9. Secure storage of materials on site particularly hazardous materials, e.g., chemicals and fuels. 10. Adequate signage on and off the site about potential hazards must be provided. 11. Members of the general public must not be allowed near the construction site. 12. Do not store any fuel or chemicals under trees.	Construction	Daily	Contractor

	13. Do not permit any smoking within 10m of any fuel or chemical storage area, or refuelling area. 14. The contractor must keep a first aid kit and the telephone numbers of local emergency services in prominent positions at the staff quarters and the site office. All personnel must be made aware of these locations. 15. The contractor on site during the construction phase must provide safety and security arrangements that should ensure that: - The handling of equipment and material is supervised. - Construction vehicles are maintained and controlled by competent personnel. - All excavated areas are clearly marked and that barrier tape is placed around them.			

Table 13: Management of site camp and personnel

Environmental Statement – Safe Guarding Workers				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Social disturbances	1. Prior to establishing the site camp, the contractor shall produce a plan showing the positions of all structures, lay-down yards and other infrastructure for approval by the RE. 2. Fires, for the purpose of cooking and smoking, will only be allowed in facilities, equipment or areas specially constructed for these purposes. If required by applicable legislation, a firebreak shall be cleared around the perimeter of the camp and office sites. 3. Construction workers should respect community members. They should be warned not to insult the public and also be prohibited to befriend local women, especially those who are married. 4. Construction & maintenance activities must be of such a nature as not to disturb the livelihood of adjacent property owners. 5. A designated place for food preparation and eating must be established at the construction site.	Construction	Daily	Contractor RE

	6. Dry chemical toilets (men and women separately) must be made available at a ratio of 1 toilet per 10 staff, within the campsite perimeter and must be cleaned and serviced as regulated. 7. Workers movements must be limited to the construction area only and must enforced in terms of the contracts of appointment. 8. Any complaints must be addressed accordingly with the Contractor and record thereof must be kept and communicated to the RE. 9. The RE must ensure that measures are in place to prevent/mitigate disruption of services as a result of construction. 10. Residents have to be notified 7 days in advance of disruptions to services. 11. A resident security guard should be deployed at the campsite for access control, security enforcement and monitoring.			

Table 14: Compliance with the environmental clearance and monitoring

Environmental Statement				
Environmental Aspect/Impact	**Mitigation**	**Phase**	**Monitoring**	**Responsibility**
Compliance to EMP and authorisation	1. RE staff to be designated in order to initiate the RE and Contractor as well as personnel on the subject of the EMP and authorisation and compliance thereto.	Pre-Construction	RE staff designated	RE
Monitoring	1. Monitoring for any environmental impacts during all phases is recommended until a satisfactory standard of compliance is attained.	All Phases	Continuous	RE

11. SPECIFIC BORROW PITS REHABILITATION MEASURES

There is no 'one-type-fits-all' solution. Therefore, despite general rehabilitation options being prescribed below, a careful selection and application of the rehabilitation options, considering the individual circumstances, is required. The RA's standards for borrow pits rehabilitation should also be implemented.

Implementing the mitigation measures will ensure a safe environment for both wild and domestic animals and inhabitants of the adjacent land ensuring a stable bio-physical environment, where natural processes can re-establish.

There are various rehabilitation options available for borrow pits according to the material available for rehabilitation and the severity classification. Thus, wherever possible, the following rehabilitation options should be implemented:

1. The borrow pit floor will be levelled and no topographical high points will be present on the floor;
2. No walls or steps will be present in or around the borrow pit;
3. The borrow pit floor will be free of any spoils, large rocks or any form of construction waste – this material shall be deposited at the bottom of high walls and will thus be covered with material when cutting the slopes;
4. The slopes will have a gradient not steeper than 1:3 and will be graded or bladed;
5. Should dead vegetation be available, it will be distributed evenly on the slopes to prevent wind and water erosion;
6. Overburden, top-soil and any other material, which was removed when the borrow pit was opened and stockpiled on the outer sides of the borrow pit, will be distributed on the slopes and floor of the borrow pit with a maximum thickness of 300mm;
7. Finishing of the slopes should be done in concentric circles, starting from the borrow pit floor and moving upwards towards ground level to prevent initial erosion induced by water and wind;
8. Remaining material (overburden and topsoil) will be shaped as a berm with a maximum slope 1:3, with a distance of at least 3.0m from the edge of the borrow pit and not closer than 9.0m to any structures (roads, buildings, etc.) – the berm will not be higher than 1.0m;
9. All alien vegetation has been removed from the floor, the slopes and berms of the borrow pit – to date the only method of eliminating alien vegetation (excluding the use of toxins) is to burn it; this shall be done within the borrow pit and remaining material shall be deposited at the bottom of high walls and will thus be covered with material when cutting the slopes.
10. When determined to be necessary, the borrow pit will be fenced off:
    a) With barbed wire and galvanized steel poles, minimum height 1.2m,
    b) With one access to the pit, which will be controlled by a gate of the same material as the fence, the gate will be lockable and access granted to the land owner only, if possible.
    c) With the fence being constructed at least 5.0m from the edge of the borrow pit, enclosing the entire borrow pit.

12. PUBLIC CONSULTATION PROCESS

The Public Participation Process (PPP) engaged the Interested and Affected Parties (I&Aps) for the upgrading of T0805 Road to LVS standards in Katima Mulilo, Zambezi Region to gather their expectations, needs, address concerns and collect inputs. This document is a record of the consultative meetings in the Katima Mulilo that took place from 12-15 August 2024 with the I&APs) for the upgrading and rehabilitation of roads in Katima Mulilo and Zambezi Region including T0805 Road.

12.1 Methodology of Public Meeting Invitations

Members of the public and other I&APs in Katima Mulilo and the surrounding areas were invited to attend public meetings and register as I&APs through the following channels.

- Newspaper Adverts in two newspapers (The Namibian and New Era on July 22nd & 29th, 2024).
- A2 site notices were placed along the roads schedules for upgrading and rehabilitation.
- Public Meetings & Stakeholder Consultation were scheduled from **Monday, 12 August 2024** to **Thursday, 15 August 2024** and was held as follow:
- Please be advised that T0805 Road does not have a site notice due to its location within the national park.

Table 15: Schedule of the meetings

DATE & TIME	STAKEHOLDER	VENUE
Monday, 12 August 2024, 14h00 to 16h30	Mafwe Traditional Authorities	Mafwe Traditional Authorities
Tuesday, 13 August 2024, 09h00 to 12h30	Businesses / Communities / Civil Society / Public Transport Providers & Users / Road Users	Katima Mulilo Chamber Hall
Tuesday, 13 August 2024, 09h00 to 11h30	Zambezi Regional Council & Katima Mulilo Town Council	Zambezi Regional Council Boardroom
Tuesday, 13 August 2024, 11h30 to 12h30	Mafwe Sub-Traditional Authorities	Mafwe Sub-Traditional Authorities
Wednesday, 14 August 2024, 09h00 to 12h30	Residents / Road Users / Pedestrians	Katima Mulilo Chamber Hall
Wednesday, 14 August 2024, 14h00 to 15h00	Chefuzwe Community Members	Chefuzwe Community Gathering Spot
Wednesday, 14 August 2024, 15h00 to 16h00	Mafuta Community Members / Community Development Committee (VDC) for the Constituency.	Mafuta Community Gathering Spot
Wednesday, 14 August 2024, 16h00 to 17h30	Karavan-West Informal Settlement (RA Access Road)	At a communal meeting area along the road.
Thursday, 15 August 2024, 10h00 to 11h00	Mayeyi Traditional Authorities	Mayeyi Traditional Authorities
Thursday, 15 August 2024, 14h00 to 16h00	Sangwali Community Members	Judea Lyabboloma Constituency Office Gathering Spot

The proof of consultation is attached as an Annexure.

The minutes that follow focus on questions, comments, queries by Interested and Affected Parties as well as responses from the Consulting Team.

Table 16: Chamber Hall (Business/Communities/ Civil Society/Public Transport Provision & Users/Road Users) Meeting Minutes

Minutes **Katima Mulilo Chamber Hall** **Comments for the ongoing Environmental Impact Assessment for the Construction of access roads in and around Katima Mulilo, Zambezi Region** **Date: Tuesday, 13 August 2024** **Time: 09h00 – 12h30**		
Interested and affected parties	**Issues raised**	**Recommendations**
• Businesses / Communities / Civil Society / Public Transport Providers & Users / Road Users	• What happens to those that are along the RA Road. - Answered: There will be an on-site meeting with KMTC and this will all be discussed. • We are paying the town council for services but don't have erf numbers or any form of ownership. • Do we have a choice to choose where we live? - Answered: There will be an on-site meeting with KMTC and this will all be discussed. • Will the Weighbridge be moved? - Answered: No, the weighbridge will not be moved. • We request that we do not get relocated to a far place as we have kids that are going to school and that will be affected. • Newspaper adverts were not clear about the venue and time slots for these meetings.	• That people living along the RA Road not be relocated to a far location which is far from the services. • For Town Council to intervene and provide clarity on relocation and compensation since we have been living along this road since 2013.
Vote of Thanks by the RKPC Team		
Presentation & Conclusion done by: Ms. Delisia Gowases		

Table 17: Zambezi Regional Council Conference Room Meeting Minutes

Minutes **Zambezi Regional Council Conference Room** **Comments for the ongoing Environmental Impact Assessment for the Construction of access roads in and around Katima Mulilo, Zambezi Region** **Date: Tuesday, 13 August 2024** **Time: 09h00 – 11h30**		
Interested and affected parties	**Issues raised**	**Recommendations**
• Zambezi Regional council • Katima Mulilo Town Council	• Honourable Chairperson of the Zambezi Regional Council raised concerns that there were 2 roads left out, which were identified by the Regional Council as high priority roads. 1. Kulumba to Mulumbe Road; 2. Chefu to Angola Border • Mr. Mubita, the Chief Development Planner at the Zambezi Regional Council, questioned the importance of Soweto Street, stating that the road next to NBC should be considered. - This was discussed and concluded in the Meeting that Soweto Street is a higher priority. • Mr. Mubita, raised a concern that we should not promise community members that all roads will have Street Lighting (as per the engineering report) and once construction starts, there are no street lighting.	• The Honourable Chairperson of the Zambezi Regional Council recommended the following: 1. That the Kulumba to Mulumbe Road be done along with Chefuzwe and Mafuta road, as this was a concern raised by the residing community members. 2. That the Chefu to Angola Border post road be prioritised and constructed ahead of the Susuwe to Bico Border post, as this road will provide much need export and transportation of goods to Angola, directly from the Zambezi Region. 3. That the Hage Geingob & Sam Nujoma Roads within Katima Mulilo, be

	• The Honourable Governor of the Zambezi Regional Council asked how long will the LVS standard last? He continued stating that some roads have all these promises, and once constructed only last up to one year and they are in bad shape. - Responded that we will ask the Engineer to write-up a report on the quality of LVS Standard and the type of material used, as well as the longevity and durability of the road. • The Honourable Governor also raised a concern to the Katima Mulilo Town Council representatives, stating that there are houses planned, where the current stadium is. - KMTC representatives confirmed that there is another road planned for that area, which will be constructed once the housing construction commences.	rehabilitated to dual standard roads, as the town is picking up on traffic. • Mr. Mubita, recommended that the Street Lighting be limited to intersections and where there are a number of residents (hence not along the whole road of Mafuta & Chefuzwe) and not along Susuwe to Bico Border Post at all. • Lastly the Honourable Governor also suggested that Hage Geingob Road, which is running through the CBD be upgraded to Dual Carriage Way, to cater for the number of Cars within Katima Mulilo.
Vote of Thanks by the RKPC Team		
Presentation & Conclusion done by: Mr. Lasco Husselmann		

Table 18: Mafwe Traditional Authority Meeting Minutes

Minutes **Mafwe Traditional Authority** **Comments for the ongoing Environmental Impact Assessment for the Construction of access roads in and around Katima Mulilo, Zambezi Region** **Date: Monday, 12 August 2024** **Time: 14h00 – 16h30**		
Interested and affected parties	**Issues raised**	**Recommendations**
• Mafwe Traditional Authority	• Majority of the people living in this area have not gone to secondary schools and most of them are school dropouts. • This sort of developments brings people from other regions, as far as from Grootfontein or northern towns to dig trenches and that is not good. • The Regional Council brings this sort of developments all the time to the Traditional Authority but we do not see it taking place.	• We would like to request that the project employs this school dropouts. • When you give a chance to this School Dropouts, we will reduce significantly on the criminal activities. As they will be busy working. • We hope that this development takes place and does not lie dormant like most of the projects introduced to us. • We are grateful for this development and approve the proposal.
Vote of Thanks by the RKPC Team		
Presentation & Conclusion done by: Mr. Lasco Husselmann & Ms. Delisia Gowases, **Translation done by:** Mr. Cletius Mubita Handing over of gift (Cooldrinks) to the Traditional Councillors and thanking them for their time.		

Table 19: Chamber Hall (Residents/Road Users/Pedestrians) Meeting Minutes

Minutes **Katima Mulilo Chamber Halls** **Comments for the ongoing Environmental Impact Assessment for the Construction of access roads in and around Katima Mulilo, Zambezi Region** **Date: Wednesday, 14 August 2024** **Time: 09h00 – 12h30**		
Interested and affected parties	**Issues raised**	**Recommendations**
• Residents / Road Users / Pedestrians	- N/A	• N/A
No one showed up to the meeting		

The public consultation process involving the Zambezi Regional Council, Mayeyi Traditional Authority, Mafwe Traditional Authority and all Interested and Affected Parties (I&APs) was conducted with notable engagement and collaboration. The inclusive dialogue led to the successful approval of the project by all Interested and Affected Parties (I&APs), reflecting a shared commitment to addressing community needs and aspirations. The process enabled a thorough review and integration of diverse perspectives, culminating in a set of recommendations and notes that were raised by Councillors, community members, and other concerned parties. These insights have been meticulously documented and will be instrumental in guiding the project's implementation to ensure that it aligns with the collective vision and enhances community well-being. The collaborative effort underscores the importance of ongoing dialogue and cooperation in achieving sustainable and beneficial outcomes for all involved.

13. CONCLUSION

The Environmental Management Plan (EMP) will form basic tool for reducing the magnitude of impacts and suggesting practical measures to attain this. It is also used to measure compliance by the RE. It is this tool that gives guidance during monitoring, auditing and taking corrective actions during its implementation, thereby ensuring continuous monitoring of the environment. This EMP was developed after an environmental assessment. Conditions of the authorisation from the Competent Authority should be incorporated and implemented in complement to this EMP.

Key sustainability principles to be emphasized include:

- Development must not irreversibly degrade the natural, built, socio-economic and governance resources on which it is based.
- Current actions should not cause irreversible damage to natural and other resources, as this potentially prevents the realization of future sustainable options.
- Where there is uncertainty about the impact of activities on the environment, caution should be in favour of the environment.
- Land use and environmental planning need to be integrated.
- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

This EMP should be implemented throughout the project life-cycle, e.g., during pre-construction, construction, operation and decommissioning, in order to minimise negative impacts and enhance positive ones. This EMP is an effective and a practical working document that sets out the requirements and the goals required in mitigation.