ENVIRONMENTAL SCOPING ASSESSMENT

FOR THE PROPOSED CONSTRUCTION AND OPERATION OF AN ACCESS GRAVEL ROAD FROM MR124 (C43) OKATUMBA TO OTUANI VILLAGE (8KM), KUNENE REGION, NAMIBIA.

Environmental and Social Management Plan (ESMP)

MEFT APP-5496

Republic of Namibia
Ministry of Works and Transport

Proponent: Ministry of Works and Transport

6719, Bell Street, Snyman Circle, Ausspanplatz

Private Bag 13341

Windhoek, Namibia

THE PROPOSED CONSTRUCTION AND OPERATION OF AN 8KM ACCESS GRAVEL ROAD FROM MR124 (C43) OKATUMBA TO OTUANI VILLAGE (8KM), KUNENE REGION, NAMIBIA.

Document type: **Environmental Management Plan**
Document version: **Final for submission**
Application number: **5496**
Released: **April 2025**

Proponent	**Ministry of Works and Transport- Namibia** **Postal address:** Private Bag 13341, Windhoek, Namibia **Enquiries:** Rosalia Ashipala **Tel:** +264 61 208 8700 **E-Mail:** Rosalia.Ashipala@mwt.gov.na Signed……
Lead Consultant	**EnviroPlan Consulting Cc** **Postal address:** P O Box 81042, Olympia **Enquiries:** Talent Nyungu **Cell:** +264814087482 **E-Mail:** info@enviroplanconsult.com Signed ……
Date of release	04 April 2025
Author	Talent Nyungu
Reviewer	Tendai E Kasinganeti

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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
DR	District Road
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GHGs	Greenhouse Gasses
ISO	International Organization for Standardization
I&APs	Interested and Affected Parties
MWT	Ministry of Works and Transport
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
RA	Roads Authority
RE	Resident Engineer
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

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

The **'Proponent** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e., Ministry of Works and Transport- Namibia.

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

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

1. CHAPTER ONE: BACKGROUND

1.1. Overview

“Access roads are crucial for connecting remote areas, facilitating construction and other projects, and supporting economic activities by improving transportation, accessibility, and safety” A I. The Ministry of Works and Transport have identified needy to develop an access gravel road from Okatumba settlement off C43 Road to Otuani village. It is under Opuwo Rural constituency\s area of jurisdiction and approximately 8 km. The proposal intends to improve the accessibility to the existing health, socio and economic amenities. Opuwo Rural constituency sits on 25, 758 square kilometres of land and C43 road can be used to explore the Kaokoveld desert and has a population of 14 850. Economic activity in this area is centred on communal livestock farming, tourism and integrated wildlife management. Otuani is located approximately 60 km from Opuwo along the C43 road to Seisfonten. The village has been previously under privileged from network coverage, health and social welfare and development.

Otuani village has the potential of becoming the mining hub of the Kunene region with the plans to establish a copper processing plant. Other potential areas are tourist facilities, butchery and tannery factory, etc.

The proposed access road came into consideration after the Kunene regional council and raised concerns over the accessibility to newly established rural constituency office, Otuani clinic and primary school. This offer a very vital social and economic benefits to the community and the region of Kunene which some sources believes that it is side-lined when comes to development. Roads within the region are mostly gravel and fairly good. The idea/ proposal to establish a gravel access road from Okatumba to Otuani off C43 road was due to inaccessibility of the road during rainy seasons.

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

3: Mining and Quarrying Activities	**10: Infrastructure**
3.3 Resource extraction, manipulation, conservation and related activities	10.1 The construction of- (b) public roads

Furthermore, as per the requirements of the Environmental Management Act No. 7 of 2007, the proponent has appointed EnviroPlan Consulting cc to conduct an Environmental and Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed project. This has been followed by an application for an Environmental Clearance

Certificate (ECC) to the Ministry of Environment and Tourism (MET): Directorate of Environmental Affairs (DEA).

In this respect, this Environmental Management Plan (EMP) document forms part of the application to be made to the DEA's office for an Environmental Clearance Certificate (ECC) for the proposed construction, operation of a gravel access road and abstraction of road construction materials. The document is compiled in accordance with the guidelines and statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts assessment regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. The Environmental Consultant

Ministry of Works and Transport (MWT) has appointed Shashi Consulting Engineers as the engineer to design and supervise the proposed access road project (8km). Shashi subsequently appointed EnviroPlan Consulting CC (EnviroPlan hereafter), on behalf of MWT, as the independent environmental consultant conducting the Environmental Assessment (EA) for the proposed activity.

Talent Nyungu, a qualified Environmental Assessment Practitioner (EAP) conducted this EA process. The CVs of the consultants are attached as Appendix at the end of the scoping report.

1.3. Project Location

The proposed project will occur in Otuani a small village in Kunene region. It is under the Opuwo Rural constituency\s area of jurisdiction. All burrow pits to be identified and re habilitated will be within the rural constituency's area of influence. This constituency sits on 25, 758 square kilometres of land and has a population of 14 850. Economic activity in this area is centred on communal livestock farming and conservancies. Otuani is located approximately 65 km from Opuwo along the C43 road to Seisfontein. Almost the entire Kunene Region is characterized by Conservancies and Otuani village is within the Ombujokanguindi Conservancy.

Please refer to the map overleaf (Fig 1) giving a locality layout of the site:

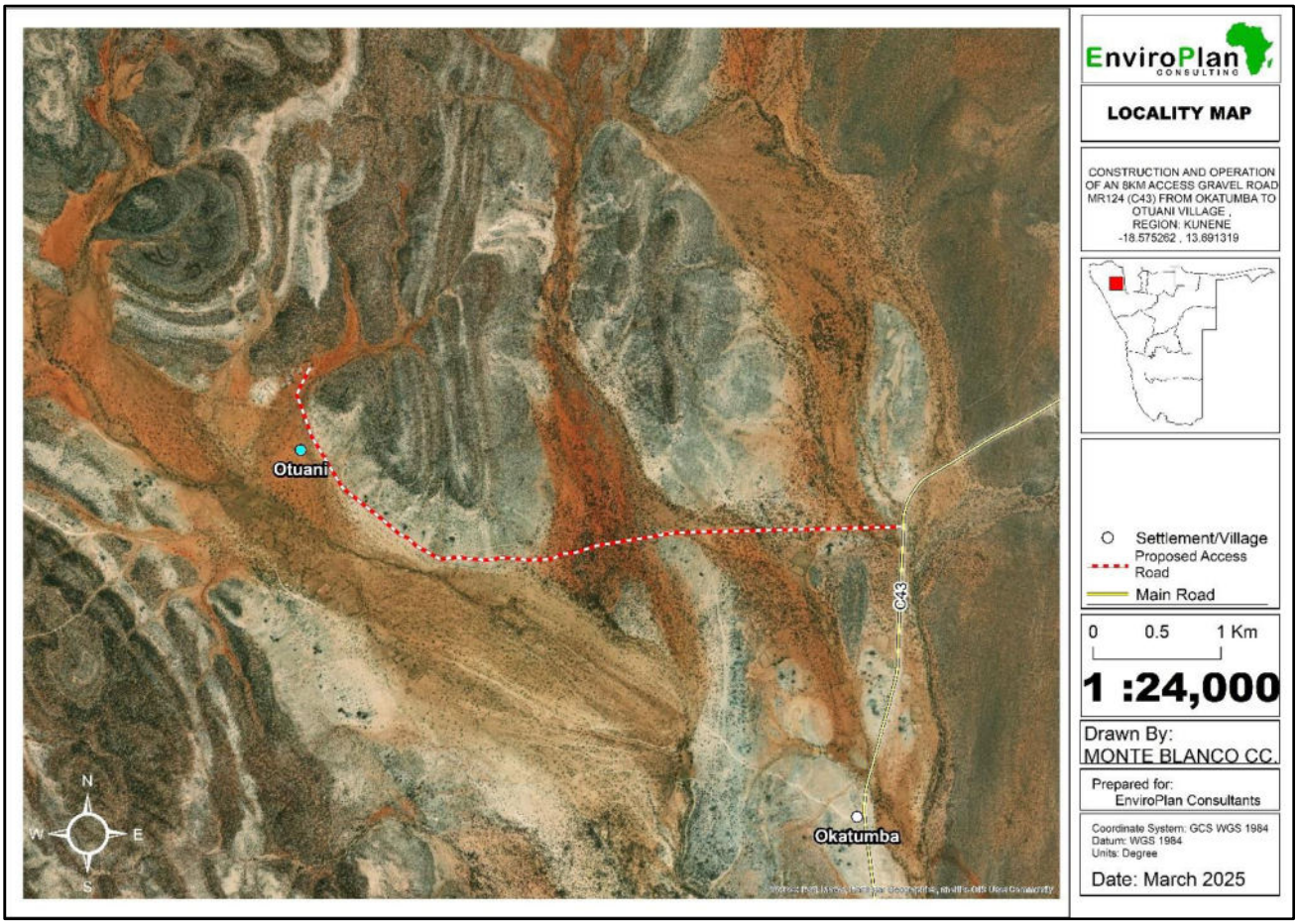

Figure 1: Access road off C43 proposed access gravel route Locality

Table 2: Project site coordinates (8km Access Road off C43 road Okatumba to Otuani village)

Point number	Latitude	Longitude
Starting point- Point 1	-18, 57291	13,72089
Point 2 - Proposed route	-18, 57304	13, 71242
Point 3 - Alternative route	-18, 57091	13, 71168
Point 4 - Alternative and proposed meet with existing track road	-18, 57332	13, 70496
Point 5 – Access to shopping Centre	-18, 56688	13, 67833
Point 6 – Opuwo rural constituency offices	-18, 56359	13, 67582
Point 7 – Primary school	-18, 56309	13 67851
Point 8 – Clinic	-18, 56179	13, 67921

1.4. Description of existing road

The earth track, approximately 6 kilometres long, extends from the C43 to the Otuani Settlement, providing a vital link between the settlement, nearby villages, and the regional road network. The track is predominantly composed of rock outcrops and loose rocks, with some sections consisting of soft sand, posing challenges to its stability and durability.

1.5. Materials Requirements

Construction materials for gravelling and construction will be obtained from existing borrow pits within the constituency. The consulting engineers will identify make sure the borrow pits will sustain the proposed activity. This will be done with the assistance of the Environmental consultant. The rehabilitation program will therefore be a mandate as soon as the proposed project is done. The abstraction of materials will be in a way that reduces the borrow pit slopes and allow for rehabilitation as well. A compliance inspection/ environmental audit will therefore be done prior to handover of the project to the project proponent.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the EMP is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in the project development and implementation. This section looks at the legislative framework within which the proposed project will operate under. The focus is on compliance with the legislation during the planning, construction and operational phases. All relevant legislation, policies and international statutes applying to the project are highlighted in Table 3 overleaf as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

The pursuit of sustainability by an Organisation is operationalised by a sound policy and legislative framework that gives operating parameters within its sphere of operation. In this section, relevant legal instruments, as well as their relevant provisions, are identified and analysed on their relevance to the proposed project. A concise explanation is given of the applicability of each of the identified pieces of legislation as well as how the Roads Authority is supposed to implement environmental compliance to the project.

Table 3: Policies, legal and administrative regulations

Aspect	Legislation
The Constitution	Namibian Constitution First Amendment Act 34 of 1998
Archaeology	National Heritage Act 27 of 2004
	National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979
Environmental	Environmental Management Act 7 of 2007
	EIA Regulations GN 57/2007 (GG 3812)
	National Solid Waste Management Strategy
	Pollution and Waste Management Bill (draft)
	National Waste Management Policy
	Soil Conservation Act 76 of 1969
	Hazardous Substance Ordinance (No. 15 of 1973)
	Atmospheric Pollution Prevention Ordinance, 1976
	National Policy on Climate Change for Namibia, 2010
	National Biodiversity Strategy and Action Plan (NBSAP2)
Forestry	Forest Act 12 of 2001
Water	Water Act 54 of 1956

Aspect	Legislation
	Water Resources Management Act, 2013 (Act No. 11 of 2013)
Health and Safety	Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work'.
	Public Health and Environmental Act, 2015
Services and Infrastructure	Road Ordinance 1972 (Ordinance 17 0f 1972)

3. CHAPTER THREE: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

3.1. EMP Organisation, Responsibility And Authority

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

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

3.1.1. Site instruction entries

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

3.1.2. ECO diary entries

The purpose of these entries will be to record the comments of the ECO as they relate to activities on the site including infringements, possible changes to the EMP or work stop orders.

3.1.3. Method statements

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

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

- Construction procedures;
- Materials and equipment to be used;
- How and where materials will be sourced and stored;

- The containment of accidental leaks or spills;
- Timing and location of activities; and
- Any other information deemed necessary by the ESM.

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

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

(i) *Bunding*

Method of bunding for static plant and bulk fuel storage.

(ii) *Camp establishment and fencing*

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

(iii) *Concrete batching*

Location, layout and preparation of concrete batching facilities, including the methods employed for mixing of concrete including the management of runoff water from such areas.

(iv) *Bulk earthworks*

Location, layout, silt/sediment management and the management of runoff from bulk earthworks areas.

(v) *Demolition*

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

(vi) *Dust*

Dust control protocol.

(vii) *Fire and hazardous substances*

- *Handling and storage of hazardous wastes.*
- *Emergency spillage procedures and compounds to be used.*
- *Emergency procedures for accidental fire.*
- *Methods for the disposal of hazardous materials.*

(viii) *Fuels and fuel spills*

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

(ix) *Protection of archaeological resources*

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

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

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

(xi) *Rehabilitation*

Rehabilitation of disturbed areas and borrow pits after construction is complete.

(xii) *Settlement ponds and sumps*

Layout and preparation of settlement ponds and sumps.

(xiii) *Solid waste management*

Solid waste control and removal of waste from Site.

(xiv) *Sources of materials*

Details of materials imported to the Site (where applicable).

(xv) *Topsoil handling and stockpiling*

Details on stripping, handling and stockpiling of topsoil.

(xvi) *Wash areas*

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

(xvii) *Storm water management*

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

3.2. Environmental Education

Before any work is commenced on the Site, the entire Contractor's staff including foremen shall attend an environmental education talk, presented by the EC with the assistance of the Contractor. The Contractor shall liaise with the EC prior to the commencement date to fix a date and venue for the talk. The Contractor shall ensure that all the employees attend the talk.

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

3.3. Record Keeping

All records related to the implementation of this management plan (e.g., site instruction book, ECO diary, induction records, method statements) must be kept together in an office where it is safe and can

be retrieved easily. All relevant records should be kept for a minimum of two years after construction and should at any time be available for scrutiny by any relevant authority or stakeholder.

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

3.4. Environmental Completion Statement

An Environmental Completion Statement will be prepared by the EC for submission to the Department of Environmental Affairs (Ministry of Environment and Tourism) indicating completion of the project and compliance with the EMP and conditions. This statement will be prepared after the final audit and after the rehabilitation phase. Rehabilitation phase will consist of identifying polluted areas, gully reclamation and made sure all used borrow pits are domesticated.

A borrow pit rehabilitation plan focuses on restoring a disturbed area, like a pit dug for construction materials, to a stable, environmentally sound state, often involving erosion control, slope stabilization, and revegetation

3.4.1. Understanding the risks of borrow pits abandonment, Adopted from CSIAP and The World bank)

According to the World bank, small scale rural development projects such as rural road rehabilitation, small tank cascade restoration etc require significant quantities of earth and gravel. Often, this material is borrowed from the local environment with or without a valid clearance from the necessary authorities. Once the project is completed, these borrow pits are usually abandoned without proper closure, leaving open, water-filled, unattended pits that are associated with many risks.

Notable risk factors associated with abandoned borrow pits include:

(i) frequent sliding (especially in hilly areas),

(ii) loss of life and ecosystem services,

(iii) groundwater contamination,

(iv) increase in vector populations and associated illnesses and

(v) loss of arable land and flora and fauna.

The world bank therefore postulates the importance of identifying potential environmental risk factors posed by abandoned borrow pits to the local environment and people from project activities. As soon as sites for borrowing are identified, the most suitable form of site restoration need to be planned on order to close the pit/s properly.

OPTIONS AND RECOMMENDATIONS FOR REHABILITATION

The world bank in collaboration with CSIAP gives a guideline with options and recommendations on borrow pits rehabilitation. Many options have been identified for the rehabilitation of borrow pits around the world ranging from water retention ponds/lakes, borrow pit meadows, marshes to recreational areas. However, these require a more in-depth planning and designing of the borrow pits as well as technical interventions and after care and maintenance resulting in relatively high rehabilitation costs. These interventions are more likely in large scale development projects.

Applicability to the project: *The proposed project will make use of appointed Shashi consulting engineers to identify suitable borrow pits. The engineers will set a budget and costs of rehabilitation the borrow pits. Considering the proposed project scale, minimum / little environmental damage is likely to be encountered. There are several known borrow pits around the constituency and most of are active and currently being used to rehabilitate the C43 road.*

The world bank published that when a project produced a large scale borrow pits, it can be turned into fish ponds, man-made lakes, reservoirs e.t.c. Therefore, for relatively small-scale development projects it is recommended to rehabilitate the borrow area to resemble its original state to the extent possible. Where possible, options provided above can be incorporated.

Main steps to follow when identifying a borrow pit

1. Identify the borrow site/s for gravel and earth and obtain clearance from site engineer
2. At the start of borrowing, topsoil should be carefully removed and stored on the edges of the borrow area.
3. On completion of borrowing, the pit should be filled with spoil/soil/dredged matter followed by the reinstatement of the top soil that has been stored.
4. Filling of the pit should either achieve (a) original ground level or (b) new level as depicted in the diagram, agreed with the site engineer
5. This will be followed by compaction and in-situ and laboratory testing to achieve the original geotechnical ground condition

In addition to the topsoil that was removed from the pit surface, dredge material and other topsoil that is removed from the project site (close by) can also be used to fill the borrow pit.

Figure 2 overleaf provides a best practice diagram for progressive rehabilitation of a shallow borrow pit, that is done while the borrowing is ongoing. Once borrow material removal is completed from one area, the topsoil and any other fill material is reintroduced so that vegetation can start

recolonizing. This will also reduce erosion issues and stabilizing pit embankment. If this method is adopted, it will also reduce the rehabilitation effort required at the end.

Figure 3 shows rehabilitated borrow pits – some into recreational gardens and others into gently undulating landscapes.

Figure 2: Borrow pits filled and rehabilitated

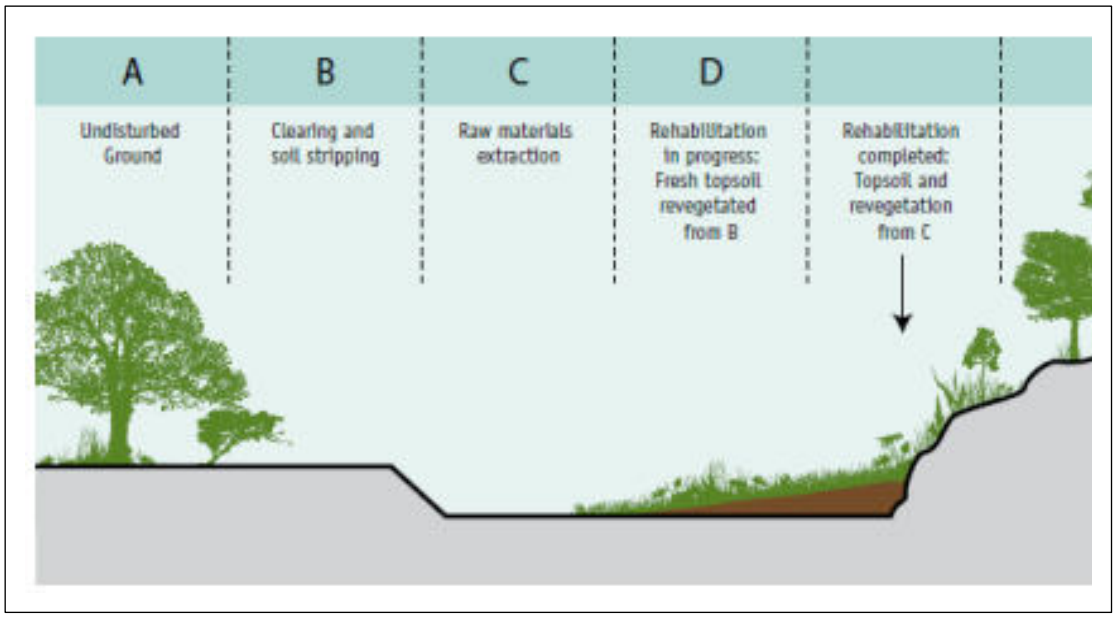

Figure 3: Progressive rehabilitation to maximize visual amenity. Sourced from Code of Practice for Small Quarries, Department of Primary Industries, Australia 2010

Attention should also be directed to the area surrounding the pit including the access paths of the machinery as the vegetation in these areas will also be disturbed. These areas should also be properly rehabilitated (by levelling and revegetating) so that it does not give rise to erosion issues and water stagnation.

Important points

- Borrow pits should be properly sited, planned and designed by professionals, with provision of appropriate safety measures. The location of the borrow pit has to be planned in consultation with the local authorities and the community.
- Operators, host community and the government agency must agree and enforce reclamation of borrow pits soon after use. Reclaiming a borrow pit should be as important as opening a borrow pit, towards sustainable engineering and environment.
- If new ponding/wetland area is created as a result of rehabilitation of the borrow site, this should be done in with technical advice from an engineering and environmental expert to ensure that this water body is in line with existing natural environment and does not lead to drainage issues, steep slopes leading to potential accidents, vector breeding sites and garbage dumping sites.

3.5. Roles And Responsibilities

3.5.1. Duties and Powers of the Environmental Consultant (EC)

The Environmental Consultant is ultimately responsible for:

- The environmental and social consultant will be responsible for the periodic monitoring and evaluation of EMP implementation.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications via the RE.
- Auditing the implementation of the EMP and EMP compliance on a monthly basis.
- Undertaking a continual review of the EMP and recommending additions and/or changes to the document.
- The management and continuous monitoring of the implementation of the EMP on a daily basis will be the responsibility of the Resident Engineer.

3.5.2. Duties and Powers of the Resident Engineer

The Resident Engineer is ultimately responsible for:

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

3.5.3. Duties and Powers of the Environmental Control Officer

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

The ECO's duties will include the following:

- Assisting the RE in ensuring that the necessary environmental authorisations and permits have been obtained.
- Maintaining open and direct lines of communication between the RE, Employer, Contractor, and interested and affected parties with regard to environmental matters.
- Facilitating all communication between the local community and the contractor.
- Regular site inspections of all construction areas with regard to compliance with the EMP.
- Monitoring and verifying adherence to the EMP by verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMP via the RE.

3.5.4. Duties of the Contractor

The contractor shall be responsible for the implementation of the EMP and the action plan, onsite monitoring and evaluation of the EMP through the following;
On the on-set of the project, the contractor through an Environmental Officer shall:

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

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

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

As a minimum, training should include:

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

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

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

All method statements must take environmental requirements into account.

3.6. Financing Of Environmental Control

Financing of the environmental requirements as outlined in this document, apart from the appointment of the ESM and specialists, is the sole responsibility of the Contractor appointed by the project proponent.

Therefore, it is accepted that the cost incurred for implementing this EMP by the Contractor would be allocated for in the tender document. Any responsibilities not defined in this document or where any uncertainties arise in this matter will be the responsibility of the project proponent.

3.7. Amendments Of The EMP

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

3.8. Procedures for non-compliance

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

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

- The RE shall consult the environmental consultant and if agreed, issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the ECO.
- The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor shall provide the RE with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the ECO.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the RE shall impose a monetary penalty based on the conditions of contract.
- In the case of the Contractor being unable to remedy the situation due to permanent environmental damage already incurred, the RE shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the RE shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion etc, between any parties in regard to or arising out of interpretation of the conditions of the EMP, disagreement regarding the implementation or method of implementation of conditions of the EMP etc., any party shall be entitled to require that the issue be referred to independent specialists for determination.
- The RE 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.

3.9. Fines and Penalties

The following fines and penalties are in place for transgressions listed below. It will be issued after the procedure in Section 7.6 has been duly followed and only in severe cases and after repeated non-compliance. The graveness of the transgression is justified by each specific penalty.

FINES

Fines may be issued per incident at the discretion of the RE. Such fines will be issued in addition to any remedial costs incurred as a result of noncompliance with the EMP. The RE will inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from the Contract.

Fines for the activities detailed below, will be imposed by the RE on the Contractor and/or his Subcontractors.

Any persons, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a “no-go” area.	N$2,000
Any vehicle guilty of reckless driving on and in the vicinity of the site, including excessive speeds.	N$1,000
Any vehicle being driven and items of plant or materials being parked or stored outside the demarcated boundaries of the site.	N$2,000
Persons repeatedly walking outside the demarcated boundaries of the site.	N$1,000
Persistent and un-repaired spilling of hazardous materials and materials causing pollution.	N$3,000
Persistent littering on site.	N$500
Individuals repeatedly not making use of the designated toilet facilities.	N$200
Disposal of waste other than agreed on in the waste management plan.	N$5,000
Deliberate lighting of illegal fires on site (e.g. outside of the designated camp site).	N$2,000

For each subsequent similar offence, the fine may, at the discretion of the RE, be doubled in value.

The RE shall be the judge as to what constitutes a transgression in terms of this document.

PENALTIES

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.

The 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;
- Safety of contractor personnel and public being compromised due to negligence;
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time;
- the Contractor fails to respond adequately to complaints from the public; and
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The RE will be responsible for a report on the non-repairable damage and / or non-compliance with visual and other evidence as well as issuing the penalty to the contractor with the report attached.

A copy must be handed to the ECO.

Table 4:The following penalties are 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 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 to a maximum of N$5,000 shall 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 restoration operation plus N$2,000.
Damage to sensitive environment:	A penalty equivalent in value to the cost of restoration operation plus 20%.
Damage to cultural sites:	A penalty to a maximum of N$100,000 shall be paid for any damage to any cultural historical site.
Damage to natural fauna:	A penalty to a maximum of N$2,000 for damages to any natural occurring animal.
Accident due to safety negligence:	A penalty to a maximum of N$50,000 for injuries to personnel or public.

4. CHAPTER FOUR: ENVIRONMENTAL MANAGEMENT PLAN

4.1. Planning and Design Phase

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
High unemployment rates.	'Outsiders' are often given the employment opportunities.	During drafting of tender documents, the consultant shall include provisions designed to maximise the use of local labour. All unskilled labour shall be sourced from local communities. Specific recruitment procedures shall be spelled out.	Ensure that contractors that tender make provision for detailed recruitment plan in their tender application	Engineering Consultant in partnership with the constituency councillor will determine employment considerations.
	Gender inequality.	At least 25% of recruits must be women.		
Health and social pathology.	• Increased prostitution and associated social pathologies and health risks • Sex workers are hired from the local communities by the construction team.	• Prior to commencing construction, the risk of an increase in the spread of HIV/AIDS should be explained to regional health authorities and partners be identified amongst all stakeholders to formulate a joint programme to limit the spread of HIV during the construction period. • Particular provisions shall be worked into the tender documents for the contractor to approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS education programmes periodically on site.	Ensure that contractors that tender make provision for the co-opting of an HIV/AIDS health officer from the regional health office in their tender application	Consulting engineer in partnership with National and Regional HIV task forces and NGO's working in the field
	• Health and safety risks to the workers and public due to uncontrolled access to the public during construction • Unsafe traffic conditions	Prior to construction all construction workers should undergo environmental induction.	Ensure that contractors that tender make provision for environmental induction in their tender applications	EC

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	• The lack of personal protective clothing, etc.			
Hazardous road conditions	• Obstacles in road as a result of construction activity. • Changes in design speeds • Road detours	Design an information campaign to sensitise the general community with regard to the increased design speeds along the road and general road works.	Ensure that contractors that tender make provision for an information campaign in their tender application	EC
Conflict	• Nuisances caused by the building contractor • Lack of communication between contractor and community	• A meeting should be arranged with the local community once the contractor has been appointed. • The contractor shall appoint an ECO from the construction team to take responsibility for the implementation of all provisions of this EMP.	Ensure that contractors that tender make provision for the appointment of an ECO in their tender application Arrange a meeting once contractor has been appointed	CE, EC, ECO
Cultural decay	• The existing culture is likely to be affected by the incoming of people from different cultural groups	• The contractor must make sure that he hires locals on non-skilled jobs, and all skilled personnel from other cultural background must attend inception/ ground breaking meeting with the traditional leaders	Ensure that all skilled personnel from outside Okangundumba district are well- versed with the local norms, beliefs and culture	CE,EC,ECO

4.2. Construction phase

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

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		• Ensure that relevant stakeholders are adequately informed throughout construction and that there is effective communication with and feedback to the RE and client. • The contractor shall appoint a person from the construction team to take responsibility for the implementation of all provisions of this EMP.	Meetings and communication.	RE, EC and Contractor.
	Delayed construction, which has cost implications and causes low user satisfaction.	Programme delays into the schedule and communicate this to the community.	• RE and Contractor to constantly monitor delays and adapt programme accordingly. • Constantly update communities on delays and latest schedules.	RE and Contractor.
	Poaching and trapping	No poaching or trapping will be allowed and is a criminal offence.	RE , EC and Contractor to monitor	Contractor.
Dangerous work area	Existence of dangerous/hazardous work areas	• The work areas must be set out and isolated and demarcated by means of danger tape on a daily basis. The demarcated work area	• Inspections for approval.	RE and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		may only contain materials, equipment, and personnel required to execute the work. • Once the work for the day is completed, the demarcated area must be cleaned of any spilled materials and waste products. This must be disposed of in the allocated containers. • If the work area is dangerous or sensitive, the danger tape should stay in place until work is complete or not sensitive anymore.	• Record excavation/backfill schedule in the site instruction records.	
Threats to the health and safety of construction workers.	• Insufficient provision of safety equipment • Negligent behaviour	• The contractor must adhere to the regulations pertaining to health and safety, including the provision of protective clothing, failing which the contract may be suspended with immediate effect. • Failure to remedy such lack of provision may result in the immediate cancellation of the contract according to the clauses stipulated in the Specific and General Conditions of Contract. • The contractor should comply with all relevant labour laws as stipulated by the Labour Act. • First aid kits to be readily available in case of injuries	Regular visual inspection and records kept of safety equipment and materials issued.	RE and Contractor.
		Dust protection masks shall be provided to staff members if they complain about dust.	Regular inspections and attendance to work complains.	RE, EC and Contractor.
		Workers in the vicinity of sources of high noise should wear necessary protection gear.	Regular Inspection	RE, EC and Contractor.

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

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
	• Sex workers are hired from the local communities by the construction team.		Record visitors in a site-visit book	
	• Health and safety risks to the workers and public due to uncontrolled access to the public during construction • Unsafe traffic conditions, the lack of personal protective clothing, etc.	Specify health and safety risk avoidance measures.	Daily monitoring by contractor	Contractor
Alcohol abuse.	Use of alcohol on construction site.	At no stage may a construction worker be allowed on site under the influence of alcohol.	• Daily monitoring by contractor. • Spot checks.	RE and Contractor
Lack of privacy.	Intrude on neighbouring properties.	Under no circumstance are workers allowed to intrude on neighbouring properties.	Regular monitoring by RE.	RE and Contractor
CONSTRUCTION AREA				

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
Disorderly and unwanted settlement in the road reserve	Informal market stalls providing services to construction workers	• In consultation with the regional council and traditional authorities, to determine the conditions for of market stalls next to the road and at lay-byes. • No settlement will be allowed.	Set conditions for market stalls Regular inspection of site	Contractor
Construction site	Visual nuisance of the construction activities.	• The boundaries of the construction area shall be demarcated prior to any work commencing on the site • The construction area should be clearly marked.	RE and Contractor should agree on demarcation lines.	RE, EC and Contractor.
	Improper conduct on construction site.	• The construction area should adhere to the following requirements: • Access should be controlled and only workers allowed within the boundaries of the campsite: o Records should be kept and all visitors should sign in and sign out of a visitor's logbook • The contractor should in no way permit or allow prostitution to take place at the construction area.	Regular visual and record inspection by the RE.	RE, EC and Contractor.
Campsite Establishment				
Negative impact on the social and	Establishment of campsite.	• One campsite should be established for all construction activity • The contractor must negotiate the use of existing facilities before considering entering new terrain.	Contractor and RE should agree on a satisfactory area.	Contractor with approval of the Client, EC and RE

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
ecological environment.		• The contractor must receive approval to use a facility or land in writing. This approval must state the remuneration and conditions of use. • Devise a layout for the site so that internal circulation of workers and vehicles in relation to the various construction functions is optimised.		
	Conduct on campsite.	• No one is allowed to reside on the campsite, save for construction personnel. • The campsite may act as a facility for the storage of construction material, temporary stockpile sites, and fuel installations etc, required by the Contractor or subcontractors and suppliers. • Materials must be stored in a separate closed-off premise that is sufficiently prepared to protect the environment for pollution, such as impermeable floors, closed containers and a security fence.	Daily monitoring by contractor.	Contractor.
	Stockpiling materials on site.	• Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site. • Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills.	• Daily monitoring by contractor. • Regular visual and records inspection by the RE.	RE and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		• Stockpiles must be of a safe height of less than 2m high and 45° slope angle. Cement stacks must not be higher than 1.5m. • Protect all fluids containers from low temperatures to avoid leaks and pollution.	Regular visual and records inspection by the RE.	RE and Contractor.
BIOPHYSICAL ENVIRONMENT				
Drainage issues.	Surface run-off.	Surface protection work is recommended on the river bed.	Daily inspection of the surface protection work.	EC, Contractor.
Soil pollution	Garbage, cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material.	• Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils (see waste management heading). • In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste.	Daily monitoring and regular visual inspection by contractor.	EC, Contractor
	Soil pollution by fuel leaks	If fuel is stored at the construction camp, fuel tanks must be properly bunded. The volume of the bunded area must be sufficient to hold 1.5 times the capacity of the storage tanks. The floor of the bunded area must be impermeable and the sides high enough to achieve the 1.5 times holding capacity.	Daily monitoring by Contractor and regular visual inspection by RE	EC, Contractor
		Drip trays should be available for all equipment that is intended to be used during construction. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned every morning and the spillage handled as hazardous waste.	Daily monitoring and regular visual inspection by contractor.	EC, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
	Soil pollution by cement mixed on the ground.	Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose.	Daily monitoring by Contractor and regular visual inspection by RE	EC, Contractor
	Cleaning of equipment.	All cleaning of equipment should take place within the construction site and the water from washing operation should be collected in a tank and disposed of in agreed manner.	Daily monitoring by Contractor.	EC, Contractor
	Heavy vehicles/ movement of vehicles across site.	The movement of vehicles to and across the site should be controlled. Construction material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil.	Daily visual inspection and monitoring by Contractor.	EC, Contractor
BORROWPIT SITES	Sand mining/ road material mining	• The contractor in consultation with the environmental consultant and/or RE shall visit all potential excavation sites prior to excavation. The engineers and surveyors must then draft a plan for approval before commencement of excavations. This plan must indicate the required resources and sensitive areas that may not be mined (indication of the mature trees). • No removal of trees with a stem diameter of 200mm or more. Protect clusters of trees and individual trees with a space buffer of at least 5m. • The top 150mm of topsoil must be stored separately for use to rehabilitate the borrow pit. • The removal of material at excavation sites shall be focused where the least significant vegetation exists.	Contractor and environmental consultant to visit all potential excavation sites.	EC, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		• The contractor shall liaise with the applicable local authorities regarding the location of excavation sites, leveraging existing data, geological analysis, and local knowledge will ensure a comprehensive and efficient identification of suitable material sources for the project • No borrow pit may be excavated from any sensitive or open space areas.		
WATER CONSERVATION				
Irresponsible use of water.	Water wastage due to careless practices during construction.	• Establish a water plan which, should include at least the following: o A description of: ▪ The source of the water ▪ Where and how the water will be stored ▪ How the water will be distributed/utilised o Describe measures that will be taken to conserve water at each of the above-mentioned phases • Educate the work force on sustainable and effective use of water, e.g. clean equipment in containers. • No member of the construction team is allowed to wash clothes OR vehicles on the construction site.	Daily inspections and condition reports.	RE, EC and contractor.

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

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		• At the end of construction all alien vegetation that has established should be eradicated.		
WASTE MANAGEMENT:				
Construction waste.	Incorrect or infrequent disposal of building rubble.	Construction waste should be stored in skips and should regularly be removed off the site for disposal at an applicable municipal waste disposal site.	Regular inspection on site.	RE, EC and contractor.
	Construction waste blown by wind (e.g., cement bags).	Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste.	Daily inspection and clean up.	RE, EC and contractor.
Increased general waste.	Domestic waste from construction team.	• Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. • The various waste types shall be disposed of at appropriate municipal and recycling facilities. • Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. • Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility.	Daily inspection and clean up.	RE, EC and contractor.
Domestic waste.	Domestic waste from construction team.	• The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the construction site and not at the campsite. • Sufficient waste bins should be supplied.	Daily inspection and clean up.	RE, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
		Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week.	Regular inspection.	RE, EC and contractor.
Hazardous waste.	Accidental / negligent spillages from equipment working on site.	• Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. • Contact Wesco Group to salvage the spilled materials (see Appendix A for the contact details).	Daily inspection and clean up.	RE, EC and contractor.
	Storage of hazardous 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 only accessible by the site foreman. Wesco Group should be approached to collect these wastes periodically or as needed.	Daily inspection and clean up.	RE, EC and contractor.
Ablution waste.	Construction team.	• Only portable chemical toilets will be used on site and at the campsite. Under no circumstances may the waste from these toilets be dumped in the veld. The waste should be removed at least once a week to the nearest municipal sewage site. Alternatively, it may be pumped out into sealable containers and stored until it can be removed by truck. If stored, the containers should be kept out of direct sunlight and should not be stored for longer than a month. People responsible for cleaning these toilets should be provided with latex gloves and masks. • Spillage or leakage to be cleaned-up and fixed immediately.	Daily inspections and clean-up.	RE, EC and contractor.
DUST CONTROL:				

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
Dust generation.	Dust proliferation due to fines content of soil.	• Soil stacks should be placed downwind from the main activity areas and from the road detour. • All construction areas and soil stacks should be regularly wetted.	Visual monitoring for dust nuisance and safety	RE, EC and contractor.
NOISE CONTROL:				
Noise generation.	Noise from vehicles and construction activities.	• All machinery should be calibrated and maintained regularly. • Construction activities should be discontinued during night-time hours (18h00 to 07h00) and over week-ends.	• Daily monitoring. • Complaints from neighbours. • Records of how these have been addressed.	RE, EC and contractor.

4.3. Post-Construction Phase

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Hazardous unattended construction site	Temporary structures, equipment, materials, waste and facilities used for construction activities.	Clear and clean the construction site to the satisfaction of the RE.	Inspection of the site by the RE	RE, EC
Unsightly borrow areas	• Unstable slopes of unrehabilitated borrow pit.	Shape all sides of the borrow pit to 30° to horizontal. Rip the terrain and access routes and replace the stored topsoil evenly over the terrain.	Inspection by RE , EC after rehabilitation.	Contractor, EC and Engineer.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	• Loose sediment washed away from unstable slopes.			

5. CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Arising from the analysis by the consultants, the proposed road construction activities bring negative and positive impacts to the proposed project site and nearby environs. Therefore, the project proponent and the Project Manager should effectively implement the contents of this EMP and consult the Environment Consultant regularly for sustainable project implementation. The consultant noted that Otuani village has dynamic cultural values and believes which all non-residents skilled personnel must be familiarized to before being accommodated to the proposed project.

5.2. Recommendations

In order to alleviate any negative impacts that may emanate from the road project, the contractor and the proponent (Ministry of works and transport) should follow recommendations as follows:

5.2.1. Environmental Management Plan Recommendations

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

5.3. External Auditing

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

An audit of the environmental management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards. Audits should be conducted during the construction and post construction phase of the facility to ensure adherence to the management measures contained in the EMP. All burrow pits used should under go a documented rehabilitation programme by the contractor and the project proponent.

5.4. Recommendation to MEFT

Having looked at the potential impacts of the proposed project development, the risks associated with the development and the mitigation measures contained in this EMP, EnviroPlan Consulting cc hereby recommends that the Ministry of Environment, Forestry and Tourism: Department of

Environmental Affairs (MEFT:DEA) approve the proposed planning, design and upgrade of the proposed 8km access gravel road and issue an Environmental Clearance Certificate (ECC) on condition that the proponent will ensure complete compliance to the developed Environmental and Management Plan (EMP).

6. ENVIRONMENTAL MONITORING AND REPORTING

EC: ENVIRONMENTAL MONITORING REPORT

Report No:…… Date:……

Method Statements	Contractor:	Date received:

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

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

Issue	Observation	Remedial action	Compliance
1.21 Concrete batching restricted to area of low environmental sensitivity?			
1.22 All wastewater from concrete mixing area disposed of via wastewater management system?			
1.23 Concrete mixing area kept neat and clean?			
1.24 Suitable screening and containment of cement silos?			
1.25 All visible remains of excess concrete removed on completion of concrete work?			
1.26 No pollution from drilling operations?			
1.27 Location and rescue of plants undertaken by suitably qualified contractor?			
1.28 Rescued plants moved to nursery if direct transplantation not possible?			
1.29 After vegetation clearance, all unstable areas			

Issue	Observation	Remedial action	Compliance
are properly stabilised?			
1.30 Cleared vegetation properly disposed of?			
1.31 All wastes removed from cleared area and disposed of?			
1.32 Mulched vegetation stored in bags?			
1.33 Fertilisers containing phosphates not used?			
1.34 No planting undertaken where construction works have not yet been finished?			
1.35 No unauthorised traffic on revegetated areas?			
2 Materials			
2.1 Construction materials adequately secured to ensure safe deliveries?			

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

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

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

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

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