

# ENVIRONMENTAL MANAGEMENT PROGRAMME

## ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

### DRAFT BASIC ASSESSMENT REPORT FOR THE

### PROPOSED CONSTRUCTION OF A NEW BRIDGE IN BORAKALALO VILLAGE WITHIN THE NORTH-WEST PROVINCE

Prepared For  
Ramotshere Moiloa Local Municipality

Prepared by



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**PROJECT DETAIL**

<b>READ</b>	N/A
<b>TITLE</b>	Basic Assessment Report for the proposed construction of a new river bridge in the Borakalalo Village, North-West Province
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<b>CLIENT</b>	RAMOTSHERE MOILOA LOCAL MUNICIPALITY
<b>REPORT STATUS</b>	Draft Environmental Management Program
<b>DATE COMPILED</b>	July 2020

## DEFINITIONS

The definitions and interpretations in the main Contract document shall apply. The definitions contained within this section are for the benefit of this document for explanatory purposes only. In the event that any conflict occurs between the definitions contained herein and those contained within the main Construction contract document, those within the contract document shall prevail.

**Construction Activity:** A Construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the Construction process.

**Contractor:** Any legal entity or consortium contracted to undertake the activity associated with the construction of the Borakalalo bridge

**Environmental Control Officer (ECO):** The person to be appointed by the Contractor, with the approval of and the Engineer, to oversee monitoring, reviewing and verifying of compliance with the EMPr by the Contractor.

**Engineer:** Engineer refers to the person appointed by the Employer to act as the Engineer person or entity to oversee the implementation of the contract between the Contractor and for the purposes of the Contract.

**Environment:** Environment means the surroundings within which humans exist and that could be made up of:

- ✓ the land, water and atmosphere of the earth;
- ✓ micro-organisms, plant and animal life;
- ✓ The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental Aspect:** An environmental aspect is any component of a Contractor's Construction activity that is likely to interact with the environment, and cause harm to it.

**Environmental Impact:** An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of the proposed activity between the limits that define the site. An impact may be the direct or indirect consequence of the Activity.

**Environmental Impact Assessment (EIA):** The process of examining the environmental effects of a development. The assessment requires detailed/specialist studies of significant issues that have been identified

**Environmental Management Programme (EMPr):** A detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.

**Independent Environmental Consultant:** A suitably qualified and experienced Independent Environmental Consultant (IEC) appointed by the Contractor to perform the obligations specified in the Contract. The IEC shall provide reports to the Contractor and the Engineer.

**Interested and Affected Parties (I&APs):** People that are to be negatively affected by the Construction or gain from the Construction.

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*Acronym*

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CA	COMPETENT AUTHORITY
CBA	CRITICAL BIODIVERSITY AREA
CE	CONSULTING ENGINEER
CPV	CONCENTRATED PHOTOVOLTAIC
CR	CONTRATORS REPRESENTATIVES
CV	CURRICULUM VITAE
DEFF	DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES
DEDECT	DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENT, CONSERVATION AND TOURISM
DWS	DEPARTMENT OF WATER AND SANITATION
EA	ENVIRONMENTAL AUTHORISATION
EAP	ENVIRONMENTAL ASSESSMENT PRACTITIONER
ECO	ENVIRONMENTAL CONTROL OFFICER
EIA	ENVIRONMENTAL IMPACT ASSESSMENT
EMPr	ENVIRONMENTAL MANAGEMENT PROGRAMME
EMS	ENVIRONMENTAL MANAGEMENT SYSTEM
I&AP	INTERESTED AND AFFECTED PARTIES
IDP	INTEGRATED DEVELOPMENT PLAN
IEC	INDEPENDENT ENVIRONMENTAL CONSULTANT
IEO	INDEPENDENT EVALUATION OFFICE
KPIs	KEY PERFORMANCE INDICATORS
MSDS	MATERIAL SAFETY DATA SHEETS
NEMA	NATIONAL ENVIRONMENTAL MANAGEMENT ACT

NFEPA	NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREA
O&M	OPERATION AND MAINTENANCE
PGDS	PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY
PPP	PUBLIC PARTICIPATION PROCESS
SABS	SOUTH AFRICAN BUREAU OF STANDARDS
SAHRA	SOUTH AFRICAN HERITAGE RESOURCES AGENCY
SEA	STRATEGIC ENVIRONMENTAL ASSESSMENT
SDF	SPATIAL DEVELOPMENT FRAMEWORK
SHE	SAFETY, HEALTH AND ENVIRONMENT
SIP	STRATEGIC INFRASTRUCTURE PLAN
SM	SITE MANAGER
SMMEs	SMALL, MEDIUM AND MICRO-SIZED ENTERPRISES
STDs	SEXUALLY TRANSMITTED DISEASES
TOR	TERMS OF REFERENCE
WMP	WASTE MANAGEMENT PLAN

## **EXECUTIVE SUMMARY**

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The purpose of this Environmental Management Programme (Construction EMPr) is to set out environmental management measures for the construct a new bridge in the Borakalalo Village which falls within the jurisdiction of the Ramotshere Moiloa Local Municipality, North-West Province.

The proposed development will also include the upgrading of approximately 990 meters of approach roads on either side of the bridge. This road extends from 0.00km at a Side-junction to the Left with a surfaced local road before the sharp-bend (Clinic and Cemetery Road) in a North-Westerly direction, for 0.980km, to link to the surfaced roads. The road then follows a north-westerly direction for 0.430 km, past Clinic and bends slightly to the left, towards the stream where the new bridge is coming. It bends westward at 0.880km towards the other surfaced road at 0.990 km.

A Basic Assessment process was conducted whereby environmental aspects and impacts were identified and their significance assessed. This EMPr constitutes an Appendix to the Basic Assessment Report (BAR) to illustrate how the identified impacts should be managed.

Throughout the undertaking of the environmental studies, individual aspects were generally found to have had several environmental impacts. Measures to avoid or minimize the identified impacts are prescribed in this EMPr. Monitoring of the effect of the environmental management measures is required in terms of this EMPr.

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## 1 INTRODUCTION

Environmental Management Programme (EMPr) is implemented in order for environmental damage to be minimized, impacts need to be identified and mitigation measures defined, implemented and their effectiveness monitored. The purpose of this document is to describe how generally occurring negative environmental impacts during the life cycle of the proposed project will be managed, rehabilitated and monitored and how positive impacts maximized and describes the roles and responsibilities of the various role players. This document proposes generic mitigation measures to minimize and manage such impacts.

The provisions of this EMPr are binding on the Contractor during the life of the contract. They are to be read in conjunction with all the documents that encompass the suite of documents for this contract. In the event that any conflict occurs between the terms of this EMPr and the project specifications, the terms herein shall be subordinate. Any third party appointed by Contractor in terms of the design and construction must ensure compliance with the conditions of this EMPr.

The EMPr is a dynamic working document subject to similar influences and changes as are wrought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the environment authorities in writing for approval.

The EMPr identifies the following:

- ✓ Construction activities that could impact on the environment.
- ✓ Standards and guidelines that are required to be achieved in terms of environmental legislation.
- ✓ Specifications with which the Contractor shall comply in order to protect the environment from the identified impacts.
- ✓ Actions that shall be taken in the event of non-compliance.

## 1.1 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PROGRAMME

The objectives of the EMPr are to:

- ✓ Ensure that environmental concerns and impacts are taken into account during the project planning stages.
- ✓ Ensure that design alternatives are considered to minimise potential impacts on the environment.
- ✓ Ensure environmental compliance with the findings of the document during the construction and operational phase.
- ✓ Describe measures to mitigate and rehabilitate environmental degradation and pollution, resulting from the project.
- ✓ Define organisational and administrative arrangements for environmental management and monitoring of the various works contracts, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures.
- ✓ Facilitate discussions regarding potential environmental concerns, between the Contractor, the Consulting Engineer and Interested & Affected Parties (I&APs.)
- ✓ Define procedures for environmental control, in the event of pollution or similar events.
- ✓ Raise environmental awareness and promote cultural tolerance with affected communities.

## 1.2 BRIEF DESCRIPTION OF THE PROJECT

MaanoWashu SHEQ Trading was appointed xxx to conduct a Basic Assessment in order to obtain the necessary environmental authorisation for the proposed construct a new bridge in the Borakalalo Village which falls within the jurisdiction of the Ramotshere Moiloa Local Municipality, North-West Province.

For the purpose of this report, impacts and mitigations relating to the construction of mixed businesses will be discussed so as to act as a guideline that encourages sustainability and conservation of the environment for both the municipality and community member.

### 1.3 LOCATION

Borakalalo Village which falls within the jurisdiction of the Ramotshere Moiloa Local Municipality, North-West Province. The central coordinates for the sites are 25° 16' 39.8"S 25° 54' 58.0"E, (Figure 1-1).

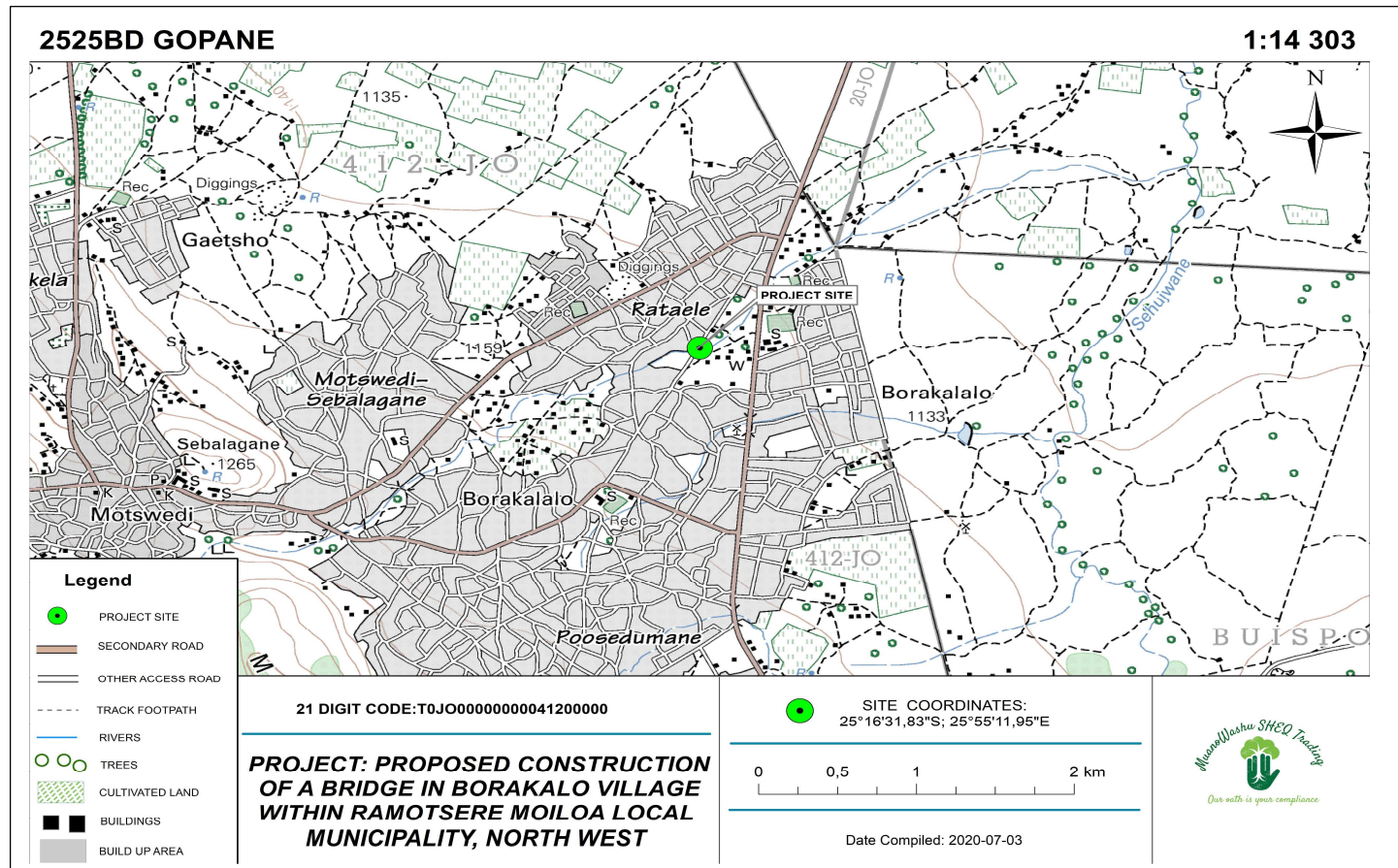


Figure 1-1: Locality Map

## 2 ADMINISTRATION OF ENVIRONMENTAL OBLIGATION

### 2.1 ADMINISTRATION

Before the Contractor begins any activity the ECO shall give to the Engineer a written statement (Method Statement), prepared on behalf of the Contractor, setting out the following where necessary:

- ✓ The type of construction activity.
- ✓ Locality where the activity will take place.
- ✓ Identification of the environmental aspects and impacts that might result from the activity.
- ✓ Methodology for impact prevention for each activity or aspect.
- ✓ Methodology for impact containment for each activity or aspect.
- ✓ Emergency/disaster incident and reaction procedures.
- ✓ Treatment and continued maintenance of impacted environment.

The Contractor may provide such information in advance of any or all Construction activities provided that new submissions shall be given to the Engineer whenever there is a change or variation to the original.

The Engineer may provide comment on the methodology and procedures proposed by the ECO, but she/he shall not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the Contractor shall demonstrate at inception and at least bi-annually once during the contract that the approved measures and procedures function properly.

### 2.2 GOOD HOUSEKEEPING

The Contractor shall undertake "good housekeeping" practices during construction process. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole.

Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and

preservation of the environment. Any site-specific measures should be highlighted by the ECO to the Contractor.

## 2.3 MANAGEMENT STRUCTURE

The Contractor must compile an organogram illustrating their environmental management structure as part of the EMS. This organogram shall depict the organizational structure of the Contractor, including the ECO and must contain supporting documentation to demonstrate the environmental responsibilities, accountability and liability of the Contractor's employees.

The Contractor should assign responsibilities for the following:

- ✓ Reporting structures.
- ✓ Actions to be taken to ensure compliance.
- ✓ Actions to be undertaken in the event of non-compliance.
- ✓ Overall design, development and implementation of the EMP.
- ✓ Documenting the environmental policy and strategy.
- ✓ Implementing the EMPr in all stages/phases of the project.
- ✓ All the aspects which require action under the other core elements and sub-elements of the EMPr.

All official communication and reporting lines including instructions, directives and information shall be channelled according to the organizations structure.

## 2.4 AUTHORITY CONSULTATION IN THE APPLICATION FOR AUTHORISATION

### 2.4.1 Authority Consultation in the Application for Authorization

The first step was to consult with the relevant authority with jurisdiction over the area of interest regarding what process to follow in order to comply with all necessary laws and regulations. The main purpose of this was to clarify the requirements of the regulations and procedures to be followed. Authority involvement undertaken during this exercise has included the following.

## 2.4.2 Relevant Legislation

Relevant administrative, legal and policy requirements which the developer will be responsible for carrying out

### **Co-operative governance (Constitution Act 108 Of 1996)**

The constitution states that: *'...everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that 1) prevent pollution and ecological degradation; 2) promote conservation; and 3) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development'*.

### **National Environmental Management Act (No. 107 of 1998)**

Any actions taken by the developer must be done in accordance with constitutional principles, the common law, the overarching policy principles set out in section 2 of NEMA and the principles applicable to environmental assessment.

- ✓ Development must be environmentally, socially and economically sustainable. Sustainable development requires the consideration of inter alia the following factors:
  - that pollution and degradation of the environment is avoided, or, where they cannot be altogether avoided, are minimised and remedied;
  - that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
  - that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
  - that the development, use and exploitation of renewable resources and the eco-systems of which they are part off do not exceed the level beyond which their integrity is jeopardised; and

- that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.
  - ✓ Environmental management must place people and their needs at the forefront of its concern, therefore any environmental impacts resulting from the development activities are not distributed in such a manner as to unfairly discriminate against any persons, particularly vulnerable and disadvantaged persons.
  - ✓ The developer is required to undertake Environmental Impact Assessments (EIA) for all projects listed in the EIA regulations in order to control activities which might have a detrimental effect on the environment. Such activities will only be permitted with written authorization from DREAD.
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### **National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)**

In terms of the Biodiversity Bill, the developer has a responsibility for:

- ✓ The conservation of endangered ecosystems and restriction of activities according to the categorization of the area (not just by listed activity as specified in the EIA regulations).
- ✓ Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity.
- ✓ Limit further loss of biodiversity and conserve endangered ecosystems.

### **National Water Act 36 of 1998**

#### **Section 19 of the National Water Act, (Act No. 36) of 1998**

States that: *Where an activity or process is or was performed or undertaken or any other situation exists which has caused or is likely to cause pollution of a water resource, all*



*responsible steps must be taken to prevent such pollution from occurring or to remedy the effects of the pollution and effects on the river bed or banks.*

- ✓ Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, or other conduit requires registration and licensing with DWS and monitoring of nearby surface and groundwater must be done.
- ✓ Licences are required for all water uses listed in Section 21 unless the water use is permissible in terms of schedule 1 to the Act, falls within the general authorizations in terms of Section 39 of the Act or is an “existing lawful water use”. The water uses that require registration and licensing include the following: taking water from a water resource; storing water; discharging waste or water containing waste into a water resource through a pipe, canal, sewer, and other conduit; disposing of waste in a manner which may detrimentally impact on a water resource.
- ✓ Further, Section 22.2 of the Water Act “A person who uses water (a) must use the water subject to any condition of the relevant authorization of that use; (b) is subject to any limitation, restriction or prohibition in terms of this Act or any other applicable law (c) in the case of the discharge or disposal of water or water containing waste contemplated in section 21(f),(g), (h) or (j) must comply with any applicable waste standards or management practices prescribed under section 26(l)(h) and (i), unless the conditions of the relevant authorization provide otherwise: (d) may not waste that water: and (e) must return any seepage, run-off or water containing waste which emanates from that use, to the water resource from which the water was taken, unless the responsible authority directs otherwise or the relevant authorization provides otherwise.

**General Authorizations in Terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998)**

- ✓ 4.12.(1) A person who disposes of wastewater in terms of this authorisation must submit a registration form obtained from the Department, for registration of the water use before the commencement of the disposal if more than 50m<sup>3</sup> of

domestic wastewater or biodegradable industrial wastewater is disposed of on any given day.

- ✓ 4.13. Wastewater storage dams and wastewater disposal sites must be located-
  - a) outside of a watercourse;
  - b) Above the 100 year flood line, or alternatively, more than 100 meters from the edge of a water resource or a borehole which is utilized for drinking water or stock watering; and
  - c) On land that is not, or does not overlie, a Major Aquifer (identification of a Major Aquifer will be provided by the Department upon written request).
- ✓ 4.14.(1) The registered user, with the exception of a local authority, must ensure the establishment of monitoring programmes to monitor the quantity and quality of the wastewater prior to storage or disposal, as follows-

#### **National Forests Act 84 of 1998**

##### *Protected trees*

The Minister may declare a tree, group of trees, woodland or a species of trees as protected. The Minister is required to publish a list of all species protected under this Act, an appropriate warning of the prohibitions set out and the consequences of its infringements, annually in the Government Gazette. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any *protected tree*, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister'.

#### **National Heritage Resources Act 25 of 1999**

- ✓ No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.
- ✓ No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.

- ✓ The protection of archaeological and paleontological sites and material is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the state. Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
- ✓ No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
- ✓ A permit will only be granted if SAHRA is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents and reached agreement with the affected communities regarding the future of such grave or burial ground.

## 2.5 ROLE AND RESPONSIBILITIES

### 2.5.1 Consulting Engineer

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified Engineers and other professionals who are competent to carry out these duties. The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as state in the Particular Conditions. The Employer undertakes not to impose further constraints on the Engineer's authority, except as agreed with the Contractor.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- a. Whenever carrying out duties or exercising authority, specified in or implied by the Contract, The Engineer shall be deemed to act for the Employer.
- b. The Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract.
- c. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances.

### 2.5.2 Independent Environmental Consultant (IEC)

The duties and powers of the IEC are:

- ✓ Ensure compliance with the environmental requirements of the EMPr.
- ✓ Ensure complete compliance with the EIA regulations for listed activities.
- ✓ Ensure compliance with the Environmental Management Impact System for non-listed activities.
- ✓ Ensure compliance with all conditions of the Record of Decisions.
- ✓ Complete the Environmental Compliance Checklist according to the site-specific investigation.
- ✓ Give site instructions to the Contractor when stated in the record of decision that the Contractor be monitored.

### 2.5.3 The Contractor

The Contractor is responsible for implementing the identified mitigation measures during the construction phase of the project and is answerable to the IEC for non-compliance with the EMPr.

The Contractor may appoint a Contractors Representative (CR) who could be the site agent, the site engineer, a dedicated environmental officer, independent consultant, or external auditor. However, the Contractor must ensure that the appointed CR is suitably qualified to perform the necessary tasks and is appointed at a suitable level to interact effectively with other site contractors, labourers and the public. Specific responsibilities of the CR are:

- ✓ Know the background of the project and monitor the implementation of the EMPr.

- ✓ Act as a guide and advisor to the Contactor on environmental issues.
- ✓ Ensure continuous auditing of the project for adherence to the EMPr, identification of problem areas and provision of action plans to avoid costly stoppages and/or further environmental damage.
- ✓ Ensure transparent and open communication for reporting significant environmental incidents to the relevant authorities.
- ✓ Ensure that all complaints and concerns from the public and other I&APs are resolved and addressed immediately.
- ✓ Establish a liaison, co-ordination and reporting framework involving I&APs.
- ✓ Ensure that any modifications to the document are communicated to the I&APs.

#### 2.5.4 Environmental Control Officer (ECO)

The ECO will oversee the Construction phase of the project on the ground, and ensure that all environmental specifications and EMPr requirements are met at all times. The ECO shall initially be a dedicated officer, tasked with ensuring environmental compliance with the EMPr. Should the ECO's workloads diminish over time and as the contract progresses, then the ECO could be permitted to take on non-environmentally related tasks on written approval of the Engineer.

The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr by the Contractor. The ECO's duties in this regard will include, *inter alia*, the following:

- ✓ Ensuring that all the environmental authorizations and permits required in terms of the applicable legislation have been obtained prior to Construction commencing.
- ✓ Monitoring and verifying that environmental impacts are kept to a minimum.
- ✓ Reviewing and approving Construction method statements with input from the independent environmental consultant and Engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr are adhered to.

- ✓ Assisting the Contractor in finding environmentally responsible solutions to problems.
- ✓ Keeping accurate and detailed records of all activities on site.
- ✓ Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr and Contract specifications.
- ✓ Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel on site.
- ✓ Ensuring that activities on site comply with all relevant environmental legislation.
- ✓ Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMPr.
- ✓ Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.
- ✓ Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance.
- ✓ Reporting all incidences of non-compliance to the Engineer.

The ECO must have:

- ✓ a good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- ✓ the ability to conduct inspections and audits and to produce thorough and informative reports;
- ✓ the ability to manage public communication and complaints;
- ✓ the ability to think holistically about the structure, functioning and performance of environmental systems; and
- ✓ proven competence in the application of the following integrated environmental management tools:
  - EIAs
  - EMPr
  - Environmental auditing
  - Mitigation and optimization of impacts
  - Monitoring and evaluation of impacts

- EMSs

## 2.6 INCIDENT REPORTING AND REMEDY

If a leakage or spillage of hazardous substances occurs on site, the local emergency services must be immediately notified of the incident. The following information must be provided:

- ✓ the location;
- ✓ the nature of the load;
- ✓ the extent of the impact; and
- ✓ the status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire ect).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

## 2.7 PUBLIC COMMUNICATION AND LIAISON WITH INTERESTED AND AFFECTED PARTIES

Communication must include liaising with the local communities.

The Contractor shall comply with the requirements for public consultation as required by the Constitution Act, 1996 (Act No 108 of 1996) and the NEMA, 1998 (Act No 107 of 1998).

During the project, the Contractor shall be responsible for erecting information boards, in a language that is understood by most people around the project sites (English, Ndebele, Zulu etc.). The information board's position, quantity, design and dimensions need to be approved by the Engineer. The information boards shall contain relevant information regarding the activity and the relevant contact details to assist persons who wish to submit complaints regarding activity.

The Contractor shall ensure that a complaints register is kept on site. The register shall contain all contact details of the person who made the complaint and information regarding the complaint itself, the date of submission as well as responsible person who is dealing with complaint. The complaints register must be kept in accordance with the requirements of the ECO.

## 2.8 TRAINING

### a) Environmental Control Officer

The ECO must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

### b) Environmental Awareness Course

The Contractor shall ensure that its employees and any third party, who carries out all or part of the Contractor's obligations under the Contract, are adequately trained with regards to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations.

A training 'needs analysis' shall be conducted by the ECO to identify the appropriate environmental and health training programmers, and the appropriate target groups amongst the employees of the Contractor.

Environment and health awareness training programs should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmers shall contain the following information:

- ✿ The names, positions and responsibilities of personnel to be trained.
- ✿ The framework for appropriate training plans.
- ✿ The summarised content of each training course.
- ✿ A schedule for the presentation of the training courses.

The Contractor shall ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr. The training records shall verify each of the targeted personnel's training experience.



The Contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness and the content of the EMPr. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training shall, as a minimum, include the following:

- ✓ The importance of conformance with all environmental policies.
- ✓ The environmental impacts, actual or potential, of their work activities.
- ✓ The environmental benefits of improved personal performance.
- ✓ Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements.
- ✓ The potential consequences of departure from specified operating procedures;
- ✓ The mitigation measures required to be implemented when carrying out their work activities.
- ✓ Environmental legal requirements and obligations.
- ✓ The importance of not littering.
- ✓ The importance of using supplied toilet facilities.
- ✓ The need to use water sparingly.
- ✓ Details of and encouragement to minimize the production of waste and re-use, recover and recycle waste where possible.

In the case of permanent staff the Contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the Contractor shall inform the Engineer when and how it intends concluding its environmental training obligations.

### 3 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

**Table 3-1: Construction Environmental Specifications**

Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
<b>VEGETATION</b>			
<ul style="list-style-type: none"> <li>Disturbance of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental awareness and appropriate behaviour.</li> <li>Encourage visitors to keep to designated pathways.</li> <li>Site clearing will be limited to the construction sites only</li> <li>Erosion and invasive alien plants should be expected should improper mitigation measures be enforced.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that no unnecessary trampling of vegetation takes place.</li> </ul>	Monitoring will be conducted <b>weekly</b> during construction by the <b>principal contractor and/or ECO (where applicable)</b>

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	<p>Protected and threatened plants should not be cleared unless permit obtained from DAFF</p> <ul style="list-style-type: none"> <li>• No excessive clearing of vegetation will be required unless if vegetation makes it difficult to walk through and clearing is required to outline individual demarcated business site(s).</li> <li>• Peripheral impacts around the township on the surrounding vegetation of the area should be avoided and a monitoring programme should be implemented to</li> </ul>		

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	<p>ensure the impacts adequately managed</p> <ul style="list-style-type: none"> <li>• Cleared vegetation should be composted where possible to preserve nutrients in it and returned to the soil.</li> <li>• The cleared vegetation should be stockpiled and taken to the closest available landfill site.</li> <li>• Cleared vegetation should not be burned on site.</li> <li>• If applicable, the herbicides used to control the invasive plant species should be chosen in consultation with an ecologist, as some of the agents might be detrimental to the surrounding indigenous fauna and flora.</li> </ul>		

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	<ul style="list-style-type: none"> <li>• During the demarcation process, individuals are advised to use already existing footpaths as much as possible and use large trees as reference points to avoid further vegetation degradation and insertion of artificial reference points.</li> <li>• Section 28 of the NEMA, 1998 all invasive alien plants should be removed to adhere to the regulation</li> <li>• NB: A thorough IAPs management plan may be required to control the potential invasion of IAPs and also to prevent spread of IAP to neighbouring properties once the area is cleared for construction after the demarcation of the business sites.</li> </ul>		

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	<ul style="list-style-type: none"> <li>• Should any area beyond the boundaries of the proposed be affected by project activities, indigenous flora should be used to rehabilitate said affected areas.</li> <li>• Vegetation clearing to commence only after walk through has been conducted and necessary permits obtained if necessary to obtain permits.</li> <li>• Removal of vegetation to take place only within demarcated construction site. Non-essential removal of vegetation to be avoided</li> <li>• Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering,</li> </ul>		

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	<p>appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc.</p> <ul style="list-style-type: none"> <li>• No protected plant species (plant or animal) shall be further damaged or removed without appropriate permits from DAFF or LEDET.</li> <li>• ECO to provide supervision and oversight of vegetation clearing activities on the developmental footprint.</li> <li>• Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared. The site clearance must be limited to the project area, where possible some trees must left to be used for</li> </ul>		

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	<p>shade. Large indigenous trees occurring within the site must be avoided wherever practically possible.</p> <ul style="list-style-type: none"> <li>All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed.</li> <li>Temporary lay-down areas should be located within the development footprint or within areas that have been identified as being of low sensitivity. These areas should be rehabilitated after use.</li> </ul>		
<b>SOIL EROSION</b>			
<ul style="list-style-type: none"> <li>Erosion is anticipated to be minimal and mostly</li> </ul>	<ul style="list-style-type: none"> <li>Re-route and rehabilitate eroded sections.</li> <li>Revegetate disturbed areas</li> </ul>	<ul style="list-style-type: none"> <li>Monitor frequently used access paths.</li> </ul>	Monitoring will be conducted <b>weekly</b> during construction by the



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restricted during the construction phase.	<ul style="list-style-type: none"> <li>• Ensure minimal bare soil exposure</li> <li>• Do not allow surface water or storm water to be concentrated, or to flow down without erosion protection measures being in place.</li> <li>• Site drainage must be carefully planned to ensure effective drainage because of the 0.7% gradient.</li> <li>• Temporary erosion control plans should include: <ul style="list-style-type: none"> <li>• silt fencing</li> <li>• temporary silt trap basins</li> <li>• short term seeding or mulching of exposed soil areas</li> </ul> </li> <li>• Limitations on access for heavy machinery and the storage of materials to avoid soil compaction.</li> </ul>	<ul style="list-style-type: none"> <li>• No soil must be left exposed. It must be covered with mulch or vegetated.</li> <li>• Innovative design to reduce surface run-off and soil erosion.</li> <li>• Parking area and access paths properly demarcated and maintained.</li> </ul>	<b>principal contractor and/or ECO (where applicable)</b>

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	<ul style="list-style-type: none"> <li>• Permanent erosion control mitigation measures needed to prevent soil erosion include:</li> <li>• Ensure the amount of bare soil exposed, is minimized by staging earthworks in phases and leaving as much ground cover intact as possible during construction.</li> <li>• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion from activities within and adjacent to the construction camp and work areas.</li> <li>• Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the maintenance period to allow</li> </ul>		

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	<p>for sufficient rehabilitation growth.</p> <ul style="list-style-type: none"> <li>Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes or along pipeline routes without erosion protection measures being in place.</li> <li>Conservation of topsoil during construction should be prioritized on site and done as follows: <ul style="list-style-type: none"> <li>Topsoil should be handled twice only - once to strip and stockpile, and secondly to replace, level, shape and scarify.</li> <li>Stockpile topsoil separately from subsoil.</li> </ul> </li> </ul>		

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	<ul style="list-style-type: none"> <li>• Stockpile in an area that is protected from storm water runoff and wind.</li> <li>• Dust suppression and erosion management should be an integrated component of the construction approach.</li> <li>• A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.</li> <li>• Excess material from excavations together with construction rubble must be appropriately disposed of.</li> <li>• Suitable excavated material is to be stockpiled next to excavations for use as backfill. Areas to be backfilled</li> </ul>		

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	<p>must be cleared of all unsuitable material and debris.</p> <ul style="list-style-type: none"> <li>• Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent loss through runoff. The soil is to be used during rehabilitation or within the site.</li> <li>• All stockpiles must be restricted to designated areas.</li> <li>• Areas susceptible to erosion must be protected by installing the necessary temporary and/or permanent drainage works to prevent surface water from being concentrated in streams.</li> <li>• All roads and other hardened surfaces should have runoff control features which redirect water flow and</li> </ul>		

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	<p>dissipate any energy in the water which may pose an erosion risk.</p> <ul style="list-style-type: none"> <li>• Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance</li> <li>• Keep to existing roads, where practical, to minimise impact on undisturbed ground.</li> <li>• Stockpiles should not exceed 2m in height.</li> <li>• A cover of indigenous species should be established in disturbed areas in order to bind the soil and prevent erosion.</li> <li>• A stormwater and erosion control plan must be implemented across the entire development site to</li> </ul>		

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	<p>prevent and control erosion impact</p> <ul style="list-style-type: none"> <li>• Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion, only if natural seeding does not occur</li> <li>• Ensure stable slopes of stockpiles/excavations to minimise slumping</li> <li>• Keep to existing roads, where practical, to minimise impact on undisturbed ground</li> <li>• Minimise activity on steep slopes / the side of slopes</li> <li>• Rehabilitate construction sites by using indigenous grasses</li> <li>• If it is not possible to retain a good plant cover during construction, technologies should be employed to keep</li> </ul>		

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	<p>the soil covered by other means, i.e. straw, mulch, erosion control mats, etc., until a healthy plant cover is again established. Care should also be taken to control and contain storm water run-off.</p> <ul style="list-style-type: none"> <li>Formal runoff prevention to be implemented on steep slopes. These could be in the form of beams, netting, barriers constructed out of topsoil or flatter road surfaces</li> </ul>		
<b>FAUNA</b>			
<ul style="list-style-type: none"> <li>Disturbance of animal habitat, especially of breeding specimens, through increased human movement in the area.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental awareness and appropriate behaviour must be encouraged and enforced where necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Identify any animals which may require relocation (e.g. Pigeons, )</li> </ul>	<p>Monitoring will be conducted <b>monthly</b> during construction by</p>



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	<ul style="list-style-type: none"> <li>• Encourage visitors to keep to the designated pathways.</li> <li>• Noise levels need to be at minimal levels in order to prevent distress to wild animals</li> <li>• No animals may be killed, captured or hunted on site by construction workers.</li> <li>• No poison should be used to control any animals without the input of an ecologist/zoologist.</li> <li>• Any encountered animals should thus be captured, by the appropriate specialists, and relocated to similar appropriate habitat</li> </ul>		the <b>principal contractor and/or ECO (where applicable)</b>

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	<p>preferably 3-10 km away from surrounding.</p> <ul style="list-style-type: none"> <li>• All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting faunal species such as snakes</li> <li>• Any fauna threatened by the construction activities should be removed to safety by the ECO or appropriately qualified person, if it cannot self-migrate.</li> <li>• The habitat is home to snakes (species unidentified as yet) thus any captured species</li> </ul>		

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	<p>should be relocated to a suitable habitat preferably <math>\leq 10</math> km away from any residential areas</p> <ul style="list-style-type: none"> <li>• No construction activity should be allowed at the site between sunset and sunrise.</li> <li>• All construction vehicles should adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises.</li> <li>• All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical,</li> </ul>		

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	<ul style="list-style-type: none"> <li>fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. communities</li> </ul>		
<b>SOLID WASTE DISPOSAL</b>			
<ul style="list-style-type: none"> <li>Storage site for solid waste may cause visual impact if not properly situated or screened.</li> </ul>	<ul style="list-style-type: none"> <li>A system must be put in place to provide for the separation and sorting of organic and inorganic waste.</li> <li>Waste bins with lids and external closing mechanisms to be scavenger proof and to prevent their contents blowing out must be used.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of solid waste is critical, to ensure that secondary impacts do not occur.</li> <li>Ensure that solid waste storage area is fenced and that fence and gate are in a good state of repair.</li> </ul>	<p>Monitoring will be conducted <b>weekly</b> during construction by the <b>principal contractor, site officer and/or ECO (where applicable)</b></p>

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	<ul style="list-style-type: none"> <li>• Solid waste must be removed regularly to avoid odour problems developing.</li> <li>• Organic waste may be composted</li> <li>• Compost heap must be turned regularly to avoid fly breeding problems. The responsible person for this must be trained.</li> <li>• The inorganic materials will be taken to a dumpsite.</li> <li>• If inorganic solid waste is incinerated, the operator must be trained in responsible use. Burning should be done in a</li> </ul>		

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	<p>controlled environment in order to minimise flames from spreading</p> <ul style="list-style-type: none"> <li>• Building rubble and domestic waste should be removed on a regular basis to the closest landfill site.</li> <li>• Construction method and materials should be carefully considered in view of waste reduction, re-use, and recycling opportunities.</li> <li>• Construction contractors must provide specific detailed waste management plans to deal with all waste streams.</li> <li>• Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction</li> </ul>		

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	<p>waste (wood and metal scrap), and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control.</p> <ul style="list-style-type: none"> <li>• Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.).</li> <li>• Disposal of waste must be in accordance with relevant legislative requirements,</li> </ul>		

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	<p>including the use of licensed contractors.</p> <ul style="list-style-type: none"> <li>• Uncontaminated waste must be removed at least weekly for disposal; other wastes must be removed for recycling/disposal at an appropriate frequency.</li> <li>• Disposal of waste will be in accordance with relevant legislative requirements, including the use of licensed contractors.</li> <li>• Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area and clearly labelled.</li> <li>• Waste must be kept to a minimum and must be transported by approved</li> </ul>		



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	<p>waste transporters to sites designated for their disposal.</p> <ul style="list-style-type: none"> <li>• No liquid waste, including grey water, may be discharged into any water body or drainage line. All sewage disposal to take place at a registered and operational wastewater treatment works. Slips of disposal to be retained as proof of responsible disposal</li> <li>• Ensure compliance with all national, regional and local legislation with regard to the storage, handling and disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. The onus is on the</li> <li>• Contractor to identify and interpret the applicable</li> </ul>		

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	<p>legislation. Hazardous waste to be disposed of at a registered landfill site.</p> <ul style="list-style-type: none"> <li>• Depending on the classification of the waste, a registered service provider with the necessary permits is to collect, transport and dispose of hazardous waste. Proof of appropriate disposal to be provided to the ECO.</li> <li>• Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste.</li> <li>• Waste disposal records must be available for review at any time.</li> <li>• SABS approved spill kits to be available and easily accessible.</li> </ul>		

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	<ul style="list-style-type: none"> <li>Regularly serviced chemical toilets facilities and septic tanks must be used to ensure appropriate control of sewage where applicable.</li> <li>Under no circumstances may waste be burnt on site.</li> <li>Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management.</li> <li>Implement an integrated waste management approach that is based on waste minimisation and incorporates reduction, recycling, re-use and disposal where appropriate.</li> <li>Upon the completion of construction, the area must be cleared of potentially polluting</li> </ul>		

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	<p>materials. Spoil stockpiles must also be removed and appropriately disposed of or the material re-used for an appropriate purpose.</p> <ul style="list-style-type: none"> <li>• Roads design to cater for refuse collection trucks</li> <li>• All material used during demarcation and waste thereof should be removed and any encountered waste should be removed</li> <li>• No construction waste should enter the surrounding environment</li> </ul>		
<b>GROUND AND SURFACE WATER POLLUTION</b>			
<ul style="list-style-type: none"> <li>• Hydrocarbon leakage from machinery and vehicles operating on site may</li> </ul>	<ul style="list-style-type: none"> <li>• All vehicles and machinery need to be well maintained and serviced</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance log needs to be kept on site for all machines and vehicles</li> </ul>	<p>Monitoring will be conducted <b>weekly</b> during construction by the <b>principal contractor</b></p>

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contaminate the ground and surface water	<ul style="list-style-type: none"> <li>• Drip trays should be used to avoid leakages and Spill kit to remedy the spillages</li> <li>• Construction vehicles should be serviced on a regular basis to prevent or minimize the risk of spills or leakages to contaminate water</li> <li>• Drip pans should be used during re-fuelling/servicing of construction vehicles. Used parts (eg: filters) should be contained and disposed of at a site licensed for dumping of waste products site to not contaminate water.</li> <li>• Drip pans can also be placed underneath stationary construction vehicles and</li> </ul>		and/or ECO (where applicable)

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	<p>equipment. The used or spilled oil should be taken to the nearest oil refiner or recycling plant for recycling.</p> <ul style="list-style-type: none"> <li>• The detection of any leakages or malfunctioning of the sanitation system should be reported and repaired immediately.</li> <li>• A stormwater and erosion control plan must be implemented across the entire development site to prevent and control erosion impacts</li> <li>• Construction vehicles must make use of designated access routes and should not be permitted to drive over the entire site, so as to minimize compaction impacts.</li> </ul>		

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	<ul style="list-style-type: none"> <li>• All construction vehicles will be properly maintained to prevent leaks.</li> <li>• Cement mixing must be confined to a designated area and must be done on an impervious surface.</li> <li>• Sanitation facilities should be well maintained and serviced, any breakages or leaks should be fixed immediately to prevent loss of containment.</li> <li>• As a first response, emergency spill kits on site are a necessity for handling any minor spills that may impact on the water resources for emergency response to any surface spills.</li> <li>• Any leaks from pipelines must be attended to immediately,</li> </ul>		

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	<p>the leak isolated, spill and contaminated materials recovered and the general area treated with an absorbing agent.</p> <ul style="list-style-type: none"> <li>• Sewer system should be monitored</li> </ul>		
<b>ARCHAEOLOGICAL</b>			
<ul style="list-style-type: none"> <li>• Discovery of sites of archaeological significance on the property.</li> </ul>	<ul style="list-style-type: none"> <li>• Do not damage any archaeologically significant sites as stipulated by the National Heritage Resources Act No 25 of 1999.</li> <li>• Should any previously undetected subterranean heritage remains be</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that no damage to archaeological remains takes place.</li> </ul>	<p>In the event where archaeological remains are exhumed during construction, all activities need to cease and an archaeologist and or representative from SAHRA will need to be called in to inspect the site</p>



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	<p>discovered on the terrain during construction, it must be reported to the Heritage Authority or the archaeologist, and may require further mitigation measures.</p> <ul style="list-style-type: none"> <li>• Appoint a qualified archaeologist</li> <li>• Areas required to be cleared during construction must be clearly marked in the field to avoid unnecessary disturbance of adjacent areas (which will not be surveyed in detail by a heritage specialist).</li> <li>• Familiarise all staff and contractors with procedures</li> </ul>		

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	<p>for dealing with heritage objects/sites</p> <ul style="list-style-type: none"> <li>Contractors employees and any contract staff must maintain, at all times, a high level of awareness of the possibility of discovering heritage sites</li> </ul>		
<b>VISUAL</b>			
<ul style="list-style-type: none"> <li>Construction equipment and machinery may cause visual impact</li> </ul>	<ul style="list-style-type: none"> <li>Non-reflective material will be used unless necessary.</li> <li>A net will be erected around the construction site in order to minimize any visual disturbance</li> <li>The construction site, material stores, stockpiles and lay-down area should be kept tidy.</li> </ul>	<ul style="list-style-type: none"> <li>Continuous monitoring</li> <li>Motorists will spend very little time in the region and they will focus only briefly on features in the construction site,</li> </ul>	<p>Monitoring will be conducted <b>monthly</b> during construction by the <b>principal contractor and/or ECO (where applicable)</b></p>

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	<ul style="list-style-type: none"> <li>• Measures to control wastes and litter should be included in the contract specification documents.</li> <li>• Wind-blown dust from stockpiles and construction activities, should be controlled. Reduce and control construction dust using approved dust suppression techniques.</li> <li>• Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.</li> <li>• Ensure that rubble, litter, and disused construction materials are managed and removed regularly.</li> <li>• Ensure that all infrastructure and the site and general</li> </ul>		

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	<p>surrounds are maintained in a neat a manner</p> <ul style="list-style-type: none"> <li>• As far as possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.</li> <li>• Rehabilitate all disturbed areas, construction areas, roads, and servitudes to acceptable visual standards.</li> <li>• Any additional external lighting of the facility will be limited.</li> <li>• The landscaping must be a combination of indigenous plants consisting of low ground covers, shrubs and lawn.</li> <li>• The landscaping must be a combination of indigenous</li> </ul>		

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	<p>plants consisting of low ground covers, shrubs and lawn.</p> <ul style="list-style-type: none"> <li>• It is encouraged that trees and shrubs be planted so as to reduce the visual impact on surrounding neighbours</li> <li>• The landscaping must be a combination of indigenous plants consisting of low ground covers, shrubs and lawn.</li> <li>• Choice of colour, lighting and positioning should be properly planned.</li> </ul>		
<b>ACCESS PATHS</b>			

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<ul style="list-style-type: none"> <li>Eroding access paths</li> </ul>	<ul style="list-style-type: none"> <li>Maintain and stabilise access paths.</li> <li>Restrict access leading to the construction site</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that a plan has been prepared for access path maintenance.</li> <li>Infrastructure and possible screening mechanisms.</li> </ul>	<p>Monitoring will be conducted <b>weekly</b> during construction by the <b>principal contractor and/or ECO (where applicable)</b></p>
<ul style="list-style-type: none"> <li>Erosion of the existing access</li> <li>Erosion of access paths</li> </ul>	<ul style="list-style-type: none"> <li>Minimize unnecessary travelling on site</li> <li>Maintain access paths.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor access paths on site</li> </ul>	
<b>NOISE</b>			
<ul style="list-style-type: none"> <li>Loitering and noise by construction labourers</li> <li>Noise from construction machinery and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Use low decibel machinery.</li> <li>Construction vehicles, machinery and equipment must be well serviced so that they do not produce excessive noise.</li> <li>Construction should only take place during daylight hours. No</li> </ul>	<ul style="list-style-type: none"> <li>The contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the</li> </ul>	<p>Monitoring must be conducted <b>daily</b> during construction by the <b>site officer</b></p>

Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>construction on Sundays and public holidays.</p> <ul style="list-style-type: none"> <li>• Construction personnel must comply with speed restrictions of 30-40 km per hour within the site boundaries and on the access road to reduce the generation of noise.</li> <li>• Contractors must comply with Provincial noise regulations.</li> <li>• The construction machinery must be fitted with noise mufflers and be maintained properly.</li> <li>• Exhaust systems construction machinery must be maintained properly.</li> <li>• Personal Protective</li> </ul>	<p>contractor or his Sub-Contractors.</p> <ul style="list-style-type: none"> <li>• Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order</li> <li>• Should the vehicles or equipment not be in good working order, the contractor may be instructed to remove the offending vehicle or machinery from site;</li> </ul>	

Identified or Potential			
Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>Equipment to all persons working in areas where high levels of noise can be expected.</p> <ul style="list-style-type: none"> <li>• Major noise generating activities can be restricted to between 06h00 and 18h00 on Monday to Friday, and 06h00-13h00 on Saturdays and Sundays.</li> <li>• Placement of noise generating activities can be planned as far away as possible from affected areas and/or persons.</li> <li>• Ensure that all staff on the proposed activity is provided with “noise sensitivity” training to ensure noise generation is limited.</li> <li>• The efficiency of noise mitigation measures should</li> </ul>		



Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>be assessed on a regular basis.</p> <ul style="list-style-type: none"> <li>• No amplified music should be allowed on the site.</li> <li>• Good public relations are essential. The information provided to stakeholders should be factual and not set unrealistic expectations.</li> <li>• A clear line of communication should be in place where complaints can be lodged and response can be provided on.</li> <li>• A clear commitment should be made on accommodating the local communities in preventing noise as far as possible.</li> <li>• Should any valid complaints regarding noise be received from the adjacent community / staff, a baseline noise assessment and subsequent</li> </ul>		

Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>noise monitoring should be conducted if the noise is likely to be repeated.</p> <ul style="list-style-type: none"> <li>• Limit vehicle movement to daylight hours.</li> <li>• Ensure that vehicles are fitted with noise reduction measures such as mufflers, etc. where necessary.</li> <li>• Ensure that vehicles on the site are serviced on a regular basis to ensure that noise suppression mechanisms are effective.</li> <li>• Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise.</li> <li>• All vehicles should be switched off when not in use.</li> </ul> <p>Construction</p>		

<b>Identified or Potential</b>			
<b>Environmental Impacts Requiring Mitigation</b>	<b>Mitigation Measures</b>	<b>Monitoring Actions and Methods</b>	<b>Duration and responsible person</b>
	<ul style="list-style-type: none"> <li>• Appropriate directional and intensity settings are to be maintained on all hooters and sirens.</li> <li>• Excessively noisy machinery must only be used during regular operating hours and not after hours where possible.</li> <li>• A noise prevention barrier should be erected in areas where noise can travel to sensitive receptors. This barrier should be placed as close to the noise generating activity as possible.</li> <li>• All construction equipment and machinery should be serviced on a regular basis.</li> <li>• All construction equipment and machinery should be fitted with noise reduction</li> </ul>		

Identified or Potential			
Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>technology to prevent noise generation as far as possible.</p> <ul style="list-style-type: none"> <li>• All construction activities should be limited to daylight hours alone. Generally, work should not be allowed on Sundays and Public Holidays.</li> <li>• All noise generating activities/installations should be planned and placed as far away from sensitive receptors as possible.</li> <li>• Should this not be possible, noise barriers should be installed at various positions around these noise generators.</li> <li>• All equipment should be switched off when not in use.</li> <li>• No workers should be allowed to stay on the site.</li> <li>• Site workers must comply</li> </ul>		

Identified or Potential			
Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>with the Provincial Noise Regulations.</p> <ul style="list-style-type: none"> <li>• Appropriate directional and intensity settings are to be maintained on all hooters and sirens. and</li> <li>• Excessively noisy machinery must only be used during regular operating hours and not after hours</li> <li>• Limit particularly noisy operations to normal working and daylight hours unless otherwise agreed with the local authorities.</li> <li>• Maintain construction equipment and vehicles in good working order to prevent unnecessary noise.</li> <li>• Investigate and respond to complaints about excessive noise.</li> </ul>		

Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
<ul style="list-style-type: none"> <li>Air Quality</li> </ul>	<ul style="list-style-type: none"> <li>Dust minimisation and control measures should be implemented on the construction site at regular intervals. This could include irrigation by water tankers</li> <li>Vegetation clearing should only take place immediately prior to the commencement of construction activities in an area, in order to minimise the amount of exposed soil on the site.</li> <li>Stock piles and spoil heaps must be covered with tarpaulins or straw to prevent fugitive dust.</li> <li>All construction vehicles must be appropriately maintained</li> </ul>	<p>Ensure that dust minimisation and control measures are implemented</p>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Continuous</li> </ul>

Identified or Potential Environmental Impacts Requiring Mitigation	Mitigation Measures	Monitoring Actions and Methods	Duration and responsible person
	<p>to minimise exhaust emissions</p> <ul style="list-style-type: none"> <li>• Control of areas generating dust particles. Such areas should be regularly cleaned or sprinkled with water to reduce dust. The areas can be enclosed to mitigate effects of wind</li> <li>• Workers should be trained to understand the hazards that may be generated in such work environments</li> </ul>		

## 4 RESTORATION ENVIRONMENTAL MANAGEMENT PLAN

### 4.1 Restoration

Any bare ground within the site layout boundaries including its access paths will have to be rehabilitated at the project proponent's expense, such as re-vegetating bare ground.

### 4.2 Revegetation

Re-vegetation of disturbed areas consists of the following steps:

1. Spreading of stored topsoil i.e. that which has been removed from the site for the purposes of construction.
2. Planting of indigenous plant species, using a combination of grass species and other species.
3. Watering of newly planted plants. The amount and duration of watering will be dependent on the season in which the plants are planted.
4. Regular audits and maintenance programmers to ensure that plants are growing and serving the purpose for which they were planted (i.e. to prevent erosion).

Rehabilitation should be advised by a suitably qualified person to assess the needs for the area.

### 4.3 Site Rehabilitation

The Contractor shall be responsible for rehabilitating any areas cleared or disturbed for the purposes of the demarcation of mixed business sites at the completion of the project. He will also be responsible for repairing any damage to fences and other infrastructure as a result of activity.

All equipment and excess aggregate, stone, gravel, concrete, etc. shall be removed from the site upon completion of work. No discarded materials shall be buried. Locally indigenous vegetation, only, shall be used for rehabilitation. The Contractor and Project Manager should agree for how long the Contractor will be responsible for erosion control.

The Contractor shall be responsible for the elimination of alien plants and weeds in the areas disturbed by construction for the duration of the contract, and the first month thereafter, after which time the project proponent will be responsible.

### 4.4 Access Roads

The existing access roads will be used to access the sites. The parking area will be decided upon by the project manager on site. The project proponent will be responsible for rehabilitation on any disturbed areas.

## 5 COMPREHENSIVE WASTE MANAGEMENT PLAN

This document describes the strategy for the comprehensive management of solid waste.



This document, developed by Muanowashu SHEQ Trading, is the official Comprehensive Waste Management Plan. This document aims to reduce both the generation and the environmental impact of waste.

## 5.1 OBJECTIVE AND SCOPE

This waste management plan represents a statement of intent by the project proponent and outlines the developer's commitment to addressing the potentially negative environmental impacts associated with the project. This plan therefore addresses the activities necessitated for the proper and efficient management of waste throughout the project.

The management plan achieves this by presenting management guidelines and specifications to guide the operational phases of the development.

## 5.2 WASTE MANAGEMENT PLAN DEVELOPMENT

The waste management plan provides a framework to ensure that:

- 💡 Management of waste is put into effect during the operation of the project;
- 💡 Roles and responsibilities are identified.

This Comprehensive Waste Management Plan is designed to ensure that:

- 💡 *During operation:* all constraints, restrictions and actions required to minimise impacts of operation are assessed, developed, implemented and monitored for all areas.
- 💡 *During the life of project:* The project proponent intends to enhance positive impacts and ensure mitigation for negative impacts. An important component of this is monitoring, evaluation and communicating findings; and to ensure that the management plan is continually improved and updated, where and if necessary.

This management plan forms part of the project proponents overall environmental management system, and will be reviewed internally and updated periodically.

## 5.3 POLICIES, LEGISLATION AND STANDARDS

The project proponent must ensure that all South African legislation concerning the natural environment, pollution and the built environment is strictly enforced. Such legislation must include, but is not limited to the:

- ✓ Constitution of the Republic of South Africa Act No. 108 of 1996.
- ✓ National Waste Management Act (1999)
- ✓ National Water Act No. 36 of 1998.
- ✓ National Biodiversity Act (Act 10 of 2004)
- ✓ National Veld and Forest Fires Act, 1998 (Act 101 of 1998)
- ✓ National Heritage Resources Act, 1999
- ✓ National Environmental Management Act No. 107 of 1998.

#### 5.4 ENVIRONMENTAL POLICY

The project proponent is committed to achieving compatibility between economic development and the maintenance of the environment. It therefore seeks to ensure that, throughout the construction phase, the labourers will give proper consideration and care of the flora, fauna, air, land and water, and to the community which may be affected by these activities.

To fulfil this commitment, the project proponent will observe all environmental laws and, consistent with the principles of sustainable development, will:

- 💡 Integrate environmental factors into operational decisions and processes, such as the guidelines set out in the Operational Management Plan (Section B of table 7.1 below).
- 💡 Assess the potential environmental effects of its activities, and regularly monitor and audit its environmental performance.
- 💡 Seek to continually improve its environmental performance, including reducing the effect of pollution, developing opportunities for recycling, and using energy, water and other resources more efficiently.
- 💡 Progressively rehabilitate the environment affected by removal of plants for construction (Table 7.1 below).
- 💡 Promote environmental awareness among company personnel and contractors to increase understanding of environmental matters

## 6 SOLID WASTE MANAGEMENT

### 6.1 TYPE OF WASTE PRODUCED

The type of waste produced from the construction site is categorised 'General Waste' and 'Hazardous Waste' (National Waste Management Strategy', 1999). General waste is subdivided into paper, metals, glass, plastic, organic and inert materials (such as builder's rubble and garden refuse).

Due to its composition and characteristics general waste does not pose a significant threat to public health or the environment, if managed properly. Hazardous waste is categorised according to the nine classes and four hazardous ratings, as described in the DWAF Minimum Requirements documents (Second Edition). These will include substances such as detergents or washing-up liquids etc. The majority of the waste, however, produced will be of the 'general waste' category.

### 6.2 FORMAT OF THE WASTE MANAGEMENT PLAN

The Waste Management Plan is presented below (Table 6-1). The table presents possible negative environmental impacts that may be relevant to the construction and operational. The table sets out specific "management statements of intent" (or proposed mitigation measures) that identify how the labourers will manage specific waste-associated impacts that will arise as a result of the operation of the development.

### 6.3 ENVIRONMENTAL IMPACTS

Identified environmental issues resulting from the production of waste are summarized below. The mitigation measures (Table 6-1), relevant to these issues, present specifications on how to manage these impacts.

#### 6.3.1 Restoration and rehabilitation: waste

The general waste classification generated with such a development is general waste. Potential negative impacts to soil and ground and surface water could occur, therefore this needs to be cleared and disposed of adequately.

### 6.3.2 Operation Phase: Process Waste

Considering that this EMP is for planning purposes, it is however anticipated that the waste that will be generated during the operational phase will be classified as general waste.

**Table 6-1: Waste disposal Issues: Activities and associated environmental impacts for the key issue of waste control. The statement of intent describes the management intervention required to lower the significance of the impact.**

<b>A. RESTORATION AND REHABILITATION: WASTE</b>			
<b>Activity</b>	<b>Potential Impacts/ Environmental Issue(s)</b>	<b>Mitigation measures / Statement of Intent (Actions)</b>	<b>Responsibility and duration</b>
Waste (general waste, which includes waste generated during the construction)	<ul style="list-style-type: none"> <li>• Pollution of soil and water.</li> <li>• Health threats arising</li> <li>• Visual impacts of solid waste.</li> </ul>	<ul style="list-style-type: none"> <li>• Refuse bin will be places on site</li> <li>• Only trained and competent individual will be allowed to operate any equipment</li> <li>• Site Rehabilitation.</li> </ul>	Contractor (weekly)

## 7 CONTINUOUS IMPROVEMENT

Continuous improvement will form a key component of the EMPr. Documents associated with the EMPr will be regularly reviewed and updated. Patrons will be provided with a comments book in order to ensure a high standard level is maintained.

## 8 AUDITING AND REVIEW

Audits of the construction site and personnel must be undertaken over the construction period. The purpose of the audits will be to assess compliance with the conditions of the EMPr.

The findings will be recorded and items requiring action will be identified from the recommendations made. Comments received from visiting patrons will also provide input in this regard. The implementation of these actions will be assessed in the following audit.

## 9 COMPLIANCE AND PENALTIES

The Contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings or as necessary.

The following violations, and any others determined during the course of work, shall be penalised per event:

- ✓ Hazardous chemical/oil spill and/or dumping in non-approved sites.
- ✓ Uncontrolled/unmanaged erosion.
- ✓ Pollution of water sources.
- ✓ Unnecessary removal or damage to trees.
- ✓ Trespassing to adjacent properties without the necessary permission.

The Engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

In addition to penalties, the Engineer has the power to remove from site any person who is in contravention of the EMP, and if necessary, the Engineer can suspend part of or all of the works, as required.

## 10 CONCLUSION

The project will not have a detrimental impact/s or even continuous environmental impacts on condition mentioned in this report, if the mitigation measures and recommendations of this EMP is adhered to.

Even though demarcation of sites only involves the planning phase, the operational and construction phases have been discussed in great detail in order to encourage environmental conservation and sustainability.