



Appendix F:
Environmental Management Programme (EMPr)

THE PROPOSED RECONSTRUCTION OF THE SAND RIVER BRIDGE – MAIN ROAD MR00391, ST FRANCIS BAY, KOUGA MUNICIPALITY

DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

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DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

A. DECLARATION

I the undersigned in my capacity as designated below do hereby undertake to ensure that the conditions and recommendations in terms of this Environmental Management Programme (EMPr) for the Construction phase are implemented and assume full responsibility and accountability in all aspects thereof.

I further understand that officials from the Kouga Local Municipality and/or the Department of Economic Development, Environmental Affairs and Tourism and/or Department of Water Affairs may during any phase of the project, conduct an inspection of the development in order to ensure compliance with the conditions and recommendations as outlined in the EMPr.

CONTRACTOR

Company: _____

Name: _____

Designation: _____

Signature: _____

Date: _____

B. DEFINITIONS

"Mitigation measures": *Mitigation seeks to find better ways of doing things, by the implementation of practical measures to reduce, limit, and eliminate adverse impacts or enhance project benefits and protect public and individual rights.*

The EMPr also defines the arrangements that will be put in place to ensure that the mitigation measures are implemented by including recommendations of the roles and responsibilities of the project proponent, environmental management team and contractors.

Contaminated water means water contaminated by the project activities, e.g. concrete water and runoff from plant/ personnel wash areas; untreated effluent from waste water treatment facilities.

Contractor refers to the persons/company awarded the contract to undertake the proposed work. For the purposes of this EMPr, "Contractor" also refers to the person(s) undertaking any of the proposed activities whether awarded a contract or not.

Environment means the surroundings within which humans exist and that are made up of -

- i. the land, water and atmosphere of the earth;
- ii. micro-organisms, plant and animal life;
- iii. any part or combination of i) and ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

A **Method Statement** is a written submission setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer/Client/ECO when requesting the Method Statement, in such detail that the Engineer/Client/ECO is enabled to assess whether the Contractor's proposal is in accordance with the Specifications/EMPr and/or will produce results in accordance with the Specifications/EMPr.

Potentially hazardous substance is a substance that, in the reasonable opinion of the Engineer and/or relevant environmental authority, can have a deleterious effect on the environment. This judgement shall be made in context of substances listed as hazardous in the relevant SANS standards.

Reasonable means, unless the context indicates otherwise, reasonable in the opinion of the relevant environmental authority.

Solid waste means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

C. EXPERTISE OF PERSONS PREPARING THE EMPr

Firm: Terratest (Pty) Ltd

Name of EAP: Cherize Mattheus

Qualification: MSc (Zoology)

Position: Graduate Environmental Scientist

Name of EAP: Magnus van Rooyen *Pr.Sci.Nat.* (Registration No: 400335/11)

Qualification: MPhil (Environmental Management)

Position: Senior Environmental Scientist

Part 1:

1.1 GENERAL

Definition of an "**Environmental Management Plan**":

A plan or programme that seeks to achieve a required end state and describes how activities, which have or could, have an adverse impact on the environment will be mitigated, controlled, and monitored.

The EMPr addresses the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to achieve this, a number of environmental specifications/recommendations are made. These are aimed at ensuring that the contractor maintains adequate control over the project in order to:

- Minimise the extent of impact during construction.
- Ensure appropriate restoration of areas affected by construction.
- Prevent long term environmental degradation.

The contractor must be made aware of the environmental obligations that are stipulated in this document, and declares himself/herself to be conversant of all relevant environmental legislation. The contractor should also be aware that the Project Manager (PM)/Environmental Control Officer (ECO) will monitor the implementation of the procedures.

1.2 RELEVANT LEIGISLATION

This EMP should be read in the context of the following documents:

- a) Constitution of the Republic of South Africa Act (Act No. 108 of 1996)
- b) National Environmental Management Act, (Act No. 107 of 1998)
- c) National Environmental Management: Waste Act (Act No 59 of 2008)
- d) National Forest Act (Act No. 84 of 1998)
- e) National Water Act, (Act No. 36 of 1998)
- f) National Heritage Resources Act (Act No. 25 of 1999)
- g) Municipal Systems Act No. 32 of 2000
- h) Occupational Health and Safety Act No. 85 of 1993

Note that the EMPr is not intended to replace any of the above, but rather augment them.

1.3 LIMITATIONS AND BOUNDARY OF THE EMPr

This report is considered a **DRAFT** and **CONSTRUCTION** Environmental Management Programme 'EMPr', in light that it can only be considered FINAL when the competent authority has conveyed its decision in terms of the Alternative considered appropriate and has also indicated any additional conditional requirements that it deems desirable to be included within the EMP. Furthermore, based on the Recommendations put forward within the Final Basic Assessment Report for preference that the Go-Alternative be considered; the EMP has been drafted to specifically address the considered direct construction related impacts associated with same. As such it has not considered mitigation measures applicable to the No-Go Alternative.

Method statements to address potential impacts with sensitive aspects associated with consideration of the Go-Alternative were suggested to form part of this EMPr, however these will only become available once the necessary permissions have been issued by the authorities for the development and once a contractor has been appointed. The Draft EMPr has specifically addressed the CONSTRUCTION phase of the proposed development, as the proponent would only be able to compile and propose suitable operational management plans / method statements once the competent authority has conveyed its decision indicating its preferred alternative and specific conditional requirements linked thereto.

It is therefore recommended that once the applicable permissions have been received, and the necessary Construction and Operational method statements become available, that this DRAFT EMPr be amended and finalized, for resubmission by the proponent, and consent obtained from the competent authorities prior to construction related activities being permitted to commence.

1.4 OBJECTIVES OF THE CEMPr

The EMPr has the following goals:

- Identifying those construction activities that may have a detrimental impact on the environment;
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation;
- Establishing the reporting system to be undertaken during the construction.

The EMPr also serves to highlight specific requirements that will be monitored during the development and should the environmental impacts not have been satisfactory prevented or mitigated, corrective action will have to be taken. This document should, therefore, be seen as a guideline that will assist in minimising the potential environmental impacts of activities.

1.4.1 Introduction

This EMPr adopts a precautionary approach, or in the case of management recommendations, a philosophy of 'best practice'. Mitigation measures may then be of a more generic nature without compromising its importance to be implemented. Therefore the purpose of this EMPr is to draft and maintain a detailed management plan that, if put into practice, will effectively prevent/minimise environmental degradation.

1.4.2 The EMP in Context

This EMPr will form part of a project tender and contract. Pre-construction and construction phase mitigation guidelines and clauses should be written into the construction contract documents as specifications. These clauses should be in addition to the minimum requirements as set out in the SABS Standardised Specification for Civil Engineering Construction. The contents of this EMPr shall be deemed to be included in the rates tendered to execute and complete (including closure and rehabilitation works) the project.

1.4.3 Flexibility

The EMPr is a dynamic and flexible document subject to review and updating. During the implementation of a project there is always the possibility that unforeseen issues

could arise, this EMPr should therefore be revised where necessary to mitigate unanticipated impacts.

1.4.4 EMPr Implementation Period

The EMPr will focus on and operate during the construction period of the project.

An Operational EMPr agreed to by the proponent will be required to address the operational phase of the project. The proponent should obtain consent from the competent authorities for the Operation EMPr prior to the development commencing.

1.4.5 Feedback to Project Manager and ECO

Reporting to the PM and ECO should take place during site meetings. In the case of potential "fatal flaws"/crises developing due to implementation of the project, reporting must be done immediately and the potentially adverse activities immediately halted in order that corrective action can be taken. Reporting on the status of implementation of the EMPr and the results of the environmental monitoring programme must be recorded and summarised in a monthly report by the ECO and submitted to the PM and Contractor.

1.4.6 Failure to comply with EMPr

Outlined below are a number of steps, relating to increasing severity of environmental problems, which will be implemented. The principle is to keep as many issues within the first few steps as possible.

- **Step 1**

The ECO discusses the problem with the contractor and/or guilty party and they work out a solution together. The ECO records the discussion and the solution implemented.

- **Step 2**

The ECO or PM observes a more serious infringement and the Principal Agent notifies the guilty party in writing, with a deadline by which the problem must be rectified. All costs will be borne by the contractor.

- **Step 3**

The Principal Agent shall order the contractor to suspend part of or all the works. The suspension will be enforced until such time as the offending party(ies) procedure or equipment is corrected and/or remedial measures put in place if required. No extension of time will be granted for such delays and all cost will be borne by the contractor.

- **Step 4**

Breach of contract - One of the possible consequences of this is the removal of a contractor and/or equipment from the site and/or the termination of the contract, whether a construction contract or an employment contract. Such measures will not replace any legal proceedings that PM may institute against the contractor.

1.5 ROLES AND RESPONSIBILITY

The **Responsibilities** of the various parties include:

- An Environmental Site Officer (ECO), appointed will oversee the environmental aspects of the project in consultation with the Contractor.
- The Engineer will assist with the implementation of the CEMPr and ensure that sustainable environmental measures are implemented during the Construction phase.
- The Contractor will be responsible for the day-to-day implementation of the CEMPr.
- The ECO will implement an education programme for the Contractor and the staff immediately before the construction starts and as and when new staff or workers arrive on site.

1.5.1 Contractors

Method Statements - all method statements must be submitted in writing by the Contractor to the appointed ECO, Proponent and Engineers where agreement needs to be reached thereon prior to Construction commencing.

These include:

- information on the setting up and locality of construction camp,
- plant and equipment requirements and layout plans of where these will be placed, and designated transport areas;
- No-Go areas and the demarcation of same;
- Management of cleared surface areas for stormwater and erosion control,
- Use of Local Labour,
- Rehabilitation plans and other information relating to environmental implementation measures for mitigation
- Emergency spill contingency plans
- Clearing illegal dumped waste, disposal and construction waste management
- Batch mixing on site
- Storage of hazardous materials on site
- Dust and noise mitigation measures
- Fuel containment and re-fuelling of equipment and vehicles (if done on site)

- Public engagement and accommodation of Affected services/Land owners/Occupants

The method statements deemed reasonable and feasible must be completed and obtain formal signed agreement of same from both the proponent and project engineers; and any amendments required in terms of this EMPr must be made accordingly by the appointed ECO for submission and consent from the competent authority prior to construction commencing.

Environmental Awareness Training - The contractor is responsible for ensuring that the relevant environmental awareness training is carried out to all site staff and that the responsibilities of all parties are clearly outlined. The contractor must provide proof of this training to the ECO who will ensure that the Competent Authority is informed of this.

1.5.2 Project Applicant

The appointment of any further specialists such as a palaeontologist (as deemed necessary) during the earth moving phase of the construction needs to be undertaken by the Municipality. The Municipality is also responsible for informing the Competent Authority regarding any site incidents or problems that may occur and is responsible for ensuring that these issues are addressed adequately.

Public Engagement - The Applicant ultimately is responsible to facilitate interaction between the project team with the Authorities as well as the general public relating to any communication with respect to the construction. Their responsibilities include:

- Informing the Authorities of the intent to commence with the construction activities.
- Informing the neighbours, landowners and relevant project team members of the intent to commence with the construction activities, and the provision of background information – specifically the duration of the project, working hours and the necessary contact details.
- Responding to all public complaints or queries whether such complaints are received by the other project team members.
- Respond to the media and preparation of media reports and other information should this become necessary.
- The Project Management Team will consist of the Department of Public Works (proponent), Project Manager: Engineering, Safety, Health and Environmental (SHE) Manager, Environmental Site Officer (ECO), Construction Contractor.

1.5.3 Site Engineer (SE)

The SE needs to ensure that the requirements as set out in the approved Final Construction EMPr are adhered to. The SE will work closely with the ECO to ensure

that they understand what the CEMPr requires of them and that they comply accordingly. The SE must also attend the monthly site meetings to report on their environmental performance. The SE will advise the project team on environmental issues within the defined work areas. The SE needs to ensure responsible waste management on site and in that identify the permitted sites for disposal of general and hazardous waste. The SE also needs to keep an up to date diary on activities on site. The SE needs to compile an environmental report upon completion of the Construction Phase.

The SE, together with the project manager, project applicant and ECO has the authority to stop work on site should, in his/her opinion, be a serious threat to, or impact on the natural and / or social environment caused directly from construction operations. This authority is limited to emergency situations.

Upon failure by the contractor to show adequate consideration to the environmental aspects of this contract, the SE may recommend that the contractor's representative or any employee(s) be removed from the site or work suspended until the matter is remedied. No extension of time will be considered in terms of such suspensions and all costs will be borne by the responsible contractor.

Supervision and monitoring are fundamental to the successful implementation of an EMP. Therefore it is vital that monitoring of the extent to which the mitigation measures of this EMP are adhered to by consultants and contractors takes place. All of the issues described and discussed in this document will require monitoring and it will ultimately be the responsibility of the Proponent / Project Engineers to ensure adequate implementation viz.:

- To undertake this monitoring according to the specifications of this EMPr.
- To draft and implement a monitoring programme to assess compliance with the EMP.
- To appoint an Environmental Control Officer (ECO) during the Construction Phase.
- Any problems that are identified or encountered must be reported to Project Managers so that appropriate action may be taken to rectify the situation.

1.5.4 Environmental Control Officer (ECO)

A suitably qualified environmental assessment practitioner must be appointed as an Environmental Site/Control Officer to monitor the activities on site on a monthly basis. The CEMP must be included on the agenda for discussion at the site meetings and all non and partial compliances addressed.

The ECO must ensure reasonable communication to the project team of any contractor non-compliances with the CEMP. The ECO will be on site once a month

(as a minimum or unless otherwise stated) to conduct environmental compliance audits and attend the monthly site meetings if necessary. The ECO must also advise the Municipality, site engineer and contractors on environmental issues. The ECO must recommend corrective action where there is non-compliance with the EMP. The ECO must issue a monthly report where activities are documented and environmental performance is noted (unless otherwise stated herein). The ECO must compile a final audit report prior to operation commencing.

The ECO, together with the project manager, project applicant and SE has the authority to stop work on site should, in his/her opinion, there be a serious threat to, or impact on the natural and or social environment caused directly from the construction operations. This authority is limited to prevent emergency situations from arising.

The ECO may recommend that the contractor's representative or any employee(s) be removed from the site or work suspended until the matter is remedied. No extension of time will be considered in terms of such suspensions and all costs will be borne by the responsible contractor.

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Part 2:

The Construction Management Programme forms part of the contract documentation. The plan must be read in conjunction with the contract documents including the relevant Bill of Quantities and Specifications; final Basic Assessment and Water Use application documentation and relevant authorisations (as applicable).

2.1 ENVIRONMENTAL AWARENESS TRAINING

- Awareness training for the Contractor's staff will be required and must be provided prior to work or specific activities commencing on site and as an ongoing programme through, for example, the audit reports.
- The Contractor must demonstrate appropriate training has been/is being provided to all permanent and temporary staff or sub-contractors through training records, which the ECO should use as the necessary records for auditing purposes.

2.2 USE OF LOCAL LABOUR AND LOCAL MATERIAL ACQUISITION

- Wherever possible, the Contractor should endeavour to use local labour and local suppliers, and records of attempts to do so should be kept.
- Wherever possible and practical, the Contractor should endeavour to source building materials from environmentally responsible and permitted sources, and records of attempts to do so should be kept.

2.3 WORKS IN VICINITY OF NO-GO AREAS AND 'SPECIAL OR SENSITIVE ENVIRONMENTS'

- The Construction Site shall be divided into Working Areas and 'No-Go' areas and shall be marked on appropriate plans for reference.
- No-Go sites shall include any 'Special or Sensitive Environments' and their buffers as identified prior to construction activities commencing and outside of the identified construction footprint, by the Contractor, Project Manager and ECO: eg. Known Heritage resources, the river, wetlands and floodplain, as well as drainage lines outside the "site".
- The 'No-Go' areas will be demarcated on site with fencing, hazard tape and the like, and the Contractor will ensure these areas are maintained as such for the duration of the works.
- No 'creep' of materials, stockpiles or activities into the 'No-Go' areas is permitted.

- The 'Special or Sensitive Sites' shall, in particular be protected from potential pollution risks, including runoff from the adjacent working areas, litter and so on.
- All site personnel shall be regularly made aware of the 'No-Go' areas including delivery drivers and the other 'temporary' personnel.

2.4 ACCESS TO PROPERTY & PROTECTION OF EXISTING SERVICES AND INFRASTRUCTURE

- All negotiations to access land/property to be completed prior to commencing activities and written records to be in place.
- The Contractor shall ensure existing services are not damaged or disturbed in accordance with any issued wayleaves or unless required by the contract and with the permission of the Project Manager.
- The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted. Such repairs shall be prioritized and completed as soon as possible.
- Due notice of activities commencing on site shall be given to the immediately adjacent/affected landowners, businesses and community to help reduce public nuisance and disruption.

2.5 ADDITIONAL METHOD STATEMENTS

- The Contractor shall prepare Method Statements for additional construction activities that do not currently appear in the FINAL EMP; these should be approved by the proponent, engineers and ECO prior to being implemented.

2.6 SITE PHOTOGRAPHS

- Detailed, electronic colour photographs of the Camp and other areas to be disturbed/temporarily used for construction activities (e.g. stockpile areas and spoil sites) shall be taken prior to any establishment taking place by the Contractor and provided to the ECO.

2.7 SITE CAMP

- The campsite selection should be carried out in consultation with the technical manager at the municipality and the ECO.
- The site must be selected with due regard to the environment. Due care should be taken to avoid areas where sensitive vegetation and habitats occur.
- When the site selection process has been completed, the Contractor will define the boundaries of the site and erect a fence with a controlled access around it if practical.
- All activities associated with the camp must be restricted to the demarcated area.

- It is the responsibility of the Contractor to ensure the safety of all personnel within the boundaries of the site. The Contractor should have an on-site contingency plan detailing measures to be observed in the case of a health, safety or environmental emergency. This should be handed to the Engineer a week prior to the commencement of the construction activities.
- The Contractor should ensure that the employees have a clear understanding of safety regulations and procedures.
- The site for the Contractor's Camp must be flat and be more than 50m any water bodies. The site should not facilitate uncontrolled stormwater runoff or result in soil erosion and/or the formation of dongas.
- The Camp must be sited in such a manner as to reduce the risk of causing public nuisance (directly or through blocking access to property) and it must not lead to any security implications.
- Where possible, existing degraded areas should be used for the Contractor's Camp, associated workshops and storage areas.
- The Contractor's Camp and the storage and works area must incorporate appropriate infrastructure and facilities to minimize any potential environmental impacts.
- The 'footprint' of the Contractor's Camp, workshops, storage and working areas is to be kept to a minimum at all times.

2.8 PLANT AND EQUIPMENT STORAGE FACILITIES

- At the end of the shift all plant should be driven or transported back to the campsite for proper and safe overnight storage.
- The Contractor should ensure that equipment left elsewhere is stored in a manner that will not impact negatively upon the environment.
- The plant should be regularly inspected for fuel and oil leaks that may be harmful to the environment, and/or aquatic life if washed into a stream or river.
- The Contractor must provide adequate and appropriate facilities for the storage of used oil for further recycling and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.

2.9 ABLUTION FACILITIES

- The Contractor shall provide proper and adequate sanitary facilities for all the site employees. Odours emanating from these facilities should be controlled within acceptable levels.
- Chemical toilets must be provided at a rate of 1 toilet per 15 workers. The Contractor must provide toilet paper and service the toilets on a daily basis in order to keep them in a clean and hygienic condition. The toilets must be placed in a sheltered place and should be locked after working hours if they are outside a camp area.
- All waste from toilets must be disposed of at a permitted waste water treatment works.

- Strictly NO emergency ablation activities will be permitted within or in immediate (buffer areas) vicinity of water bodies.

2.10 SITE CLEARING AND DISPOSAL OF ILLEGAL DUMPED WASTE AND AESTHETIC IMPACTS

- In terms of possible light pollution, particularly during authorized night work, the Contractor shall ensure that any lighting installed on site does not cause a reasonably avoidable disturbance to adjacent property owners or interfere with road traffic.
- The site shall be kept neat, clean and tidy at all times.
- Site preparation and clearing of illegally dumped building and general waste should be done so with consideration and cognizance that the top soil layer should ideally not be cleared as part thereof. All cleared waste needs to be appropriately transported and disposed of to registered landfill sites (No further stockpiling of cleared waste is permitted). Records of disposal and volume must be kept for ECO auditing purposes.
- Cleared and exposed areas (outside of the site) should be seeded with indigenous grasses immediately and suitable dust control measures put in place;

2.11 EXCAVATION, HAULING AND PLACEMENT

- Wherever practically possible, excavation activities shall be done manually.
- The Contractor shall take all reasonable measures to limit dust generation as a result of excavation, hauling and placement activities.
- Prevent water entering excavated areas.
- Be aware of unexpected contamination revealed during earthworks: work shall be stopped immediately and the Project Manager notified. Specialist advice should be sought as necessary for the disposal/removal of the contaminated material. Removal only to an appropriately licensed waste site.
- Be aware of unexpected cultural, historical and/or archaeological finds.
- Construction vehicles and plant to be in good working order.
- Manage earth moving plant and vehicles so as to reduce nuisance and disruption.
- Manage noise and dust generation in order to minimize these factors.

2.12 COFFER DAMS/ TEMPORARY STORMWATER FLOW STRUCTURES

- A Method Statement will be required where a coffer dam (or similar structure) is to be used to impede or divert stormwater within drainage lines and must be approved by the Project manager before construction commences.

- The affected area of the river bed and banks will need to be rehabilitated to the satisfaction of the Project Manager/ECO once construction of the bridge has been completed.

2.13 RETAINING WALLS AND GABIONS

- Rocks for use in any gabions shall not be obtained from any watercourses – all materials shall be obtained from an approved source.
- In the event materials are sourced from a borrow pit/quarry, it must be an appropriately licensed borrow pit or quarry.

2.14 FIRES AND COOKING FACILITIES

- No fires or open flames will be allowed, except if approved by the ECO or unless directly used for construction purposes (e.g. acetylene blowtorch). Any such fires shall be kept small and appropriate to their function.
- All SANS standards relating to fire precautions and fire control shall be complied with.
- The Contractor must supply properly prepared cooking facilities that are suitable for the environment and are not liable to cause the outbreak of fires.
- The Contractor must supply fire-fighting equipment at suitable locations.
- The Contractor shall take immediate and effective steps to extinguish any fire that may break out. All costs relating to damage caused by fire on site will be for the Contractor's cost.

2.15 RESPONSIBLE WATER USE AND CONTAMINATION PREVENTION

- The Contractor shall arrange for the necessary approvals/permits from the relevant authorities for the abstraction of water where this is not obtained from Municipal supplies.
- Promote responsible water use by personnel.
- Site staff must have access to safe drinking water.
- If water is stored on site, there must be a clear distinction between drinking water and multi-purpose water storage facilities.
- Wastewater that is contaminated with soaps, detergents and other undesirable materials, such as grease and oils, should be collected in conservancy tanks and disposed of safely in a wastewater treatment facility.
- Adequate sedimentation control measures must be implemented where excavations or disturbance of riverbanks or riverbeds and drainage lines of wetlands may take place in accordance with the CEMPr and the ECO.
- It is illegal to discharge water into a public stream if the quality does not conform with required health standards or without a license to do so from DWA.

- Run-off will be diverted to control ponds if necessary so that silt may settle and any pollutants trapped. Subsequently, any pollutants must be treated, or removed and disposed of at a permitted landfill site.
- All excavated materials where practically possible should be protected from the rain to prevent them being washed into stormwater channels.
- No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river.

2.16 SOIL EROSION & CONTAMINATION

- Topsoil must be stockpiled or stored separately from subsoil in a designated area avoiding sensitive areas such as river banks, wetlands, etc. The designated areas will be identified by the ECO in consultation with the Contractor. Topsoil will then be used in the rehabilitation of the site, post construction.
- Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.
- Appropriate soil erosion measures must be implemented and control procedures must be applied to all embankments that are disturbed and destabilized.
- No materials must be left on site nor dumped in any other place once work is completed.
- Any excess construction materials must either be:
 - taken to a site for stockpiling and future re-use,
 - used for localised rehabilitation, or
 - removed from site by the Contractor for recycling or disposed at a permitted landfill site.
- No soil erosion will be tolerated on or immediately adjacent to the development area: the Contractor will be responsible for protecting areas susceptible to erosion. Construction sites are to be cleared of vegetation as and when required in order to avoid undue soil erosion risks.
- Exposed surfaces to be re-vegetated (indigenous grasses) and stabilized as soon as possible to avoid soil erosion risks.
- Suitable measures (temporary or permanent) are to be installed to divert surface runoff from the stockpiles.
- Runoff shall not be diverted directly to the rivers without silt traps/silt settlement measures being provided.
- Any runnels or erosion channels that develop during and as a result of construction activities shall be backfilled and compacted and the areas restored to a proper condition.
- The Contractor shall reinstate areas damaged by erosion at his own cost.

- Measures to prevent spillage and leaks contaminating the surrounding area must be used, including ground protection, bunds, covers, splash trays, drip trays and using proper dispensing equipment.
- Any soil which becomes contaminated (e.g. by fuels, oils, lubricants, bitumen and so on) to be removed for disposal at an appropriately permitted landfills site.
- All equipment and vehicles to be kept in good working order and serviced regularly to reduce the risk of leaks and soil contamination.
- Bunded areas for static plant shall have a smooth impermeable surface with an earth bund and arrange such that the bunded area shall be sloped towards an oil trap or sump to enable incidental spillage to be removed. Any such spillage collected will be disposed at an appropriately permitted landfills site.

2.17 LOSS/DEGRADATION OF HABITATS

- No unauthorized harvesting of plants by personnel (e.g. for firewood) is permitted.
- Where the use of herbicides, pesticides and other poisonous substances has been specified, they should be stored in containers suitable for their contents and which are clearly labeled. They should only be used by trained personnel and only at times and in places where surface and groundwater are not placed at risk. Disposal must only be to appropriately licensed waste sites.
- Clearance of the construction areas shall be undertaken as and when necessary. The removal of vegetation should be avoided until such time as clearance is required to reduce the risk of soil erosion, establishment of alien vegetation and dust generation.
- No vegetation outside of the site extent is to be damaged.
- A vegetation specialist is to be appointed to rescue any potential bulbous species found along the servitude prior to clearing activities, applicable permits from DEDEAT should be obtained in advance.

2.18 INVASIVE ALIEN VEGETATION

- The Contractor shall be responsible for the removal of alien vegetation within areas affected by the construction activities including cleared ground and topsoil stockpiles: this responsibility shall extend for the duration for the defects notification period.
- The eradication of alien plants must take place before the plants reach maturity. Methods to remove alien plants may involve hand removal, hoeing by hand or the application of herbicides (see below).
- Wherever, alien vegetation is cut or excavated, the cuttings must be gathered in heaps and not spread around before being removed from site to approved disposal sites.
- Where the use of herbicides, pesticides and other poisonous substances has been specified the Contractor will be required to prepare a Method Statement.

2.19 SOLID WASTE

- The Contractor shall provide waste bins for solid waste collection and storage. Such bins should be placed at designated areas within the site. The refuse collected from the site must be removed at least once a week or more frequently if required and disposed of at a local landfill site with the approval of the local authority and Engineer, or taken to a facility for recycling.
- Litter bins and containers for waste materials must be provided by the Contractor at all work and eating areas. Bins should be clearly marked, wind, rain and scavenger proof.
- All waste must be placed in the litter bins and containers. No waste may be left lying on the site. This includes the littering of cigarette stubs, wrappers, matches etc.
- Visible anti-litter signs must be displayed around the waste collection points and all employees must be encouraged to observe site rules pertaining to solid waste management practices. A concerted effort should be made to collect and dispose of materials suitable for recycling, separately from the other solid waste.
- No burning or burial of waste is permitted.
- Excess concrete, building rubble or other material must be stockpiled in areas designated specifically for this purpose and not spread indiscriminately over the construction site. Should the materials not be re-used on site, then it should be ultimately removed to a registered landfill site.
- The entire works area and all construction sites must be swept clean of all pieces of wire, metal, wood or other material foreign to the natural environment as part of the rehabilitation plan after construction.

2.20 HAZARDOUS MATERIALS

- No hazardous material must be disposed of in the veld or anyplace other than a registered landfill for hazardous materials.
- Hazardous materials should be stored under lock and key in designated areas with the necessary MSDS kept on site and appropriate posters properly displayed with the potential dangers of the materials. The containers should be tightly sealed and must not be used for anything other than the original purpose.
- All storage of hazardous materials must comply with legislation and regulations. The Contractor must maintain a hazardous material register.
- Where practical, all maintenance of equipment and vehicles shall be performed in a designated workshop only. Any maintenance required outside the workshop will require prior approval from the Project Manager.
- No contamination of the soil, vegetation or surface water from the workshop maintenance or storage areas is permitted.
- Measures to prevent spillage and leaks contaminating the surrounding area must be used, including ground protection, bunds, covers, splash trays, drip trays and the use of proper dispensing equipment.
- All static plant shall be located within a bunded area.

- Where required, vehicles/plant must be washed in designated wash areas where the greywater can be managed.
- Used oils and lubricants, spent filters, chemicals and similar waste products generated at the workshop are to be disposed of in appropriately licensed waste sites.
- Spillages and incidents associated with the workshop, equipment maintenance and storage areas must be addressed in a Site Pollution Incident Response Plan.

2.21 VEHICLES

- Vehicles may not park, or pull off the road anywhere other than designated areas / development areas. Existing Land Use activities with the area are not to be disrupted by irresponsible activities i.e. parking or blockage of retail parking areas;
- Vehicles must remain on demarcated roadways. Access routes to working areas, passing and turning areas will be identified by the ECO in consultation with the Contractor.
- Every care should be taken to avoid damaging vegetation or land when vehicles are in use.
- Fuel tanks, pumps, and all equipment using oil, diesel, etc. must have drip trays. The waste liquids taken from the trays must be taken for recycling or disposed of at a permitted landfill site.
- Only emergency repairs to vehicles and equipment may take place on site. Where emergency repairs take place it is the responsibility of the Contractor to ensure that all waste (e.g. spare parts and oils) are removed from site as soon as possible. All other repairs must take place at a yard off-site, where facilities are suitable and waste facilities are appropriate.
- Whenever practical, a tarpaulin or drip trays should be used beneath the vehicle or plant, prior to emergency repairs taking place, to protect the environment from contamination.
- Any soils contaminated by the Contractor must be removed or rehabilitated. If a significant amount of soil has to be removed, fresh soil must be imported and the site rehabilitated.

2.22 ACCESS ROADS, HAUL ROADS AND TRAFFIC CONTROL

- The Contractor shall comply with all applicable road safety and transport-related legislation and by-laws.
- The Contractor shall notify the appropriate authorities in advance where road restrictions, diversions and closures are required.
- Access/haul routes to the construction site and works area are to be approved by the Project Manager. Existing roads and tracks shall be utilized where possible. The movement of vehicles beyond the identified access and haul routes is to be restricted.
- All temporary access routes shall be rehabilitated to the satisfaction of the Project Manager at the end of the contract.

- Designated delivery areas should be established and personnel assigned to receive deliveries and direct delivery vehicles on and off site accordingly.
- All public roads shall be kept clear of mud and debris.
- Speed restrictions are to be in place and enforced on site and haul routes.
- Disruption to regular road users and adjacent property owners from delivery vehicles and other construction related traffic must be minimized.
- Damage to public roads not subject to the construction programme, as a result of the construction activities, shall be repaired to the satisfaction of the Project Manager.

2.23 AIR POLLUTION

- Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.
- Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or dust screens where sensitive receptors are located in close proximity to cleared works. Water used for this purpose must be used in quantities that must not result in the generation of run-off. An option is to use treated effluent for dust control purposes provided the effluent quality is of a good standard.
- The Contractor shall be responsible for the control of dust arising from the operations and activities on site.
- The risk of windblown erosion across the construction site must be reduced by all practical means. Stockpiles to be kept to the minimum practical height and where these will be in place for 6 months or more, the stockpile should be seeded. Regular watering of stockpiles should be instituted.
- Dust generation from excavations, exposed areas and haul roads must be minimised by damping down by water spraying.
- The excavation, handling and transport of erodible materials during high wind conditions should be avoided where practical to reduce dust generation, particularly where the wind direction will blow dust towards the adjacent residential areas.
- Vehicle speeds on site must be restricted to reduce the risk of dust generation.
- Construction vehicles and plant to be kept in good working order.
- Any complaints received by the Contractor regarding dust will be recorded and reported to the Project Manager. Actions taken to address such complaints shall be approved by the Project Manager.

2.24 MANAGING NOISE

- The Contractor shall keep noise levels within acceptable limits (as per government regulations) and activities shall, where possible, be confined to normal working hours.
- Construction activities required outside normal working hours must be approved by the Project manager, and where necessary, advance warning provided to adjacent residents.

- Noise that could cause a major disturbance should only be carried out during daylight hours and with advance warning provided as above.
- No amplified music shall be allowed at the site.
- Noisy construction plant is to be located as far as possible from residential areas: use noise screens as necessary.
- Any complaints received by the Contractor regarding noise will be recorded and reported to the Project Manager. Actions taken to address such complaints shall be approved by the Project Manager.
- Construction vehicles and plant to be in good working order.

2.25 GENERAL

- Noise control measures must be implemented. All noise must be controlled at source.
- All employees must be provided with the appropriate personal protective equipment.
- The Contractor must inform all adjacent landowners of after-hours construction and any other activities that could cause a nuisance.
- No loud music is allowed on site.
- No fires are allowed.
- No natural vegetation may be gathered, removed or destroyed in the course of the project, except where instructed by the Engineer and ECO.
- Erosion control measures must be implemented if the need arises.
- Special care must be taken when working in or near water courses to avoid physical damage. Pollution of water courses by any means must be avoided.
- No defacement of any natural or other features will be allowed; this includes markings for road works, unless markings are restricted to the road surface.
- The Contractor shall restrict his operation to within the site area unless otherwise authorized in advance by the Engineer in writing. Survey or other activities which, by their nature necessitate operating outside the confines of the site shall be conducted in a responsible manner.
- The Contractor's attention is drawn to Clause 4.1 of SABS 1200 A, which is applicable to the control of noise.
- The working area should be clearly demarcated and taped off. Clear instruction should be given to the site staff not to venture to areas which are outside these boundaries, unless instructed by the Engineer.

2.26 MANAGEMENT OF ARCHAEOLOGICAL AND PALAEOLOGICAL FINDS

Should any archaeological or paleontological remains be disturbed, exposed or uncovered during the construction phase, these shall be immediately be reported by the Contractor to the ECO and South African Heritage Resource Agency or Eastern Cape Provincial Heritage Resources Agency (043 – 642 2811).

- The Contractor shall notify the Project Manager if any previously unidentified graves or artefacts of archaeological, historical or cultural significance are uncovered during site clearance or construction activities
- Work shall be stopped immediately and appropriate assessment of the artefact or feature shall be undertaken on the guidance of SAHRA.
- Any sites of historical, archaeological or cultural importance are 'Sensitive Areas' and will be designated 'No-Go' areas.
- All heritage sites should be demarcated as "No Go Areas" and Construction activities should be strictly restricted to the development footprint only.
- Should any cultural or archaeological artefacts or evidence be discovered at any stage during construction then the relevant authority and experts must be alerted immediately and all necessary measures must be taken not to damage these, including halting construction.
- Upon completion of each section of work the site must be cleared of all equipment, debris and waste and reinstated as near as possible to the original state, or rehabilitated as ordered by the ECO and/or Engineer's Representative. This may include local grading of soil, re-vegetation, with indigenous grasses, and correction of drainage deficiencies to provide free drainage.
- Immediately after the demolition of the campsite, the Contractor shall restore the site to its original state, paying particular attention to its appearance relative to the general landscape as agreed with the Engineer's Representative.
- Any cut and fill areas must be restored and reshaped.
- It is imperative that any potential erosion problems are addressed. This may require subsequent site visits to monitor the efficacy of erosion control measures.
- The spread of alien vegetation must be minimized. Should there be alien vegetation removed, indigenous planting should replace this.
- Any unauthorized removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor.
- The costs of all ordered rehabilitation measures to any areas disturbed by the Contractor shall be borne by the Contractor.

- The onus is on the Contractor to assess the potential risks to the environment as a result of the project. For example, accidental spillage of materials may pollute the soil or any water body.
- The Contractor must draw up a suitable emergency plan to contain such pollution. The emergency plans and procedures must be taught to all the workers on site, so that everyone is prepared to cope with an emergency. This must include contact names and numbers of emergency services and the responsible agent. This must be submitted to the Engineer's Representative for the attention of the ECO during the first week of construction.
- Appropriate equipment must be available to immediately carry out the emergency plans.

- Soils, water bodies and their catchments shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, washwater, organic materials and bituminous/tar products.
- The Contractor shall develop a Site Pollution Incident Response Plan, including provision for managing spills and preventing pollution entering the drainage lines in particular.
- The Contractor shall ensure all personnel are aware of the incident procedures and know how to use equipment provided to contain spills and other incidents.
- The Contractor shall assemble and clearly display a list of the relevant emergency telephone contact numbers for staff (in English, Afrikaans and in Xhosa).
- In the event of any spillage where down-stream impacts are noted, the Contractor shall be liable to arrange for professional service providers to assist with rehabilitation and remediation, as required by the Project Manager.
- A Complaints and Incident Register will be maintained by the Contractor.
- These photographs will assist with determining the level of rehabilitation required once construction has been completed.

- The Contractor shall be responsible for the protection of the public and public property from any dangers associated with the construction activities, and for the safe and easy passage of pedestrians and traffic in areas affected by the construction activities.
- Any works/activities which may pose a hazard to humans and/or domestic animals are to be protected or cordoned off and, if appropriate, warning signage erected.
- Appropriate security is to be provided at the site to protect equipment and provide for a safe construction site.
- The Contractor must ensure that any personal and/or potential affected persons must be provided with suitable Health and Safety provisions in keeping the minimum requirements as outlined by the Occupational Health and Safety Act in order for any construction to be conducted in a safe manner.
- Any damage caused as a result of the construction activities shall be repaired to the satisfaction of the Project Manager.

Part 3:

3. RECORD KEEPING

All records related to the implementation of this EMP (site instruction book, diaries, method statements) must be kept together in a safe office on site and be readily available during audits. Copies of these records should be made by the contractor for the ECO for submission to the relevant authorities if so requested.

3.1 AUDITING

- On a monthly basis environmental audits (by an experienced environmental officer) should be carried out to ascertain and verify the Contractor's level of compliance with the requirements of the EMPr.
- It is a requirement that the Contractor keeps concise records of mitigatory measures undertaken at each site to minimize environmental impacts.
- Any emergency situations that impact upon the environment should be recorded by the Contractor together with the action that was taken to rehabilitate and remediate the site. The Contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents that impact upon the environment.
- Any public complaints regarding the environment must be recorded and discussed with the ECO to determine an appropriate course of action.
- The Contractor will be responsible for ensuring that all procedures required to rehabilitate the site are implemented. The Contractor will be responsible for all costs incurred in the rehabilitation of the site.
- If third parties are called to the site to perform clean up and rehabilitation procedures, the Contractor will be responsible for all costs.
- A Closure Audit should be undertaken by the ECO within 30 days of the contractor having left the site.
- A Rehabilitation Audit to follow 30 days after the Closure Audit.
- Sufficient provisions need to be made available by the Proponent for subsequent audits to be undertaken by the ECO to address any further Closure or Rehabilitation audit issues that may have been identified. The contractor will be permitted a maximum of 30 days to remedy any non-conformances identified in an initial Closure or Rehabilitation Audit, before further penalties are imposed.
- All monthly audit reports and specifically the final Closure and Rehabilitation audit reports are to be submitted by the proponent to the PM and Contractor within 30 days of being conducted.

3.2 ENVIRONMENTAL REPORT

The monthly environmental audit report for the construction phase is to be compiled by the ECO and submitted to the project team within 14 days of any audit having been conducted such that reasonable opportunity is given to the contractor to address any non-compliances prior to the next monthly audit. The Environmental Report is to include all documentation (photographs, data, communication, site audits) collated during the construction phase.

3.3 PENALTIES

Penalties will be imposed for contravention of the EMPr, as follows:

- A fine of R1 000 per day will be imposed should the Contractor fail to remove waste from the site upon completion of a section of work, or within 24 hours of a written instruction to do so by the ECO or Engineer's Representative, until the section of site has been cleared and/or rehabilitated.
- A fine of R2 000 will be imposed for each mature tree damaged or defaced without prior permission (e.g. authorities where necessary or ECO).
- A fine of R3 000 will be imposed for each incident involving damaging or polluting wetlands, rivers and surrounding areas.
- Imposed fines will be deducted from the Contractor's monthly payment certificates.
- Additional fines may be issued per incident at the discretion of the ECO/Engineer. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specifications. The Engineer will inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from monies due under the Contract.
- For each subsequent similar offence the fine may, at the discretion of the ECO, be doubled in value to a maximum value of R50 000.

3.4 FAILURE TO COMPLY

- Should the ECO/Engineer not be satisfied with the precautions taken by the Contractor to prevent damage and contamination as listed above, he may, at his discretion, stop the Contractor working in the area affected until the situation has been rectified. No claim for losses incurred will be considered as a result of such action being taken by the ECO/Engineer.
- Failure to show adequate consideration to the environmental aspects of this Contract will be a sufficient cause for the Engineer to have the Contractor's Representative or any other Contractor's employee(s) removed from the site in terms of the General Conditions of Contract.