



**DEPARTMENT OF HUMAN SETTLEMENTS**

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**MARIANRIDGE  
DEVELOPMENT**

**HOUSING**

**Draft Environmental Management Programme**

Issue date: 3 September 2018

Revision No.: 1.0

Project No.:14972

<b>Date:</b>	3 September 2018
<b>Document Title:</b>	Construction of Marianridge Housing Development: Draft Environmental Management Programme
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# DEPARTMENT OF HUMAN SETTLEMENTS

## MARIANRIDGE HOUSING DEVELOPMENT REF. NO: TBA

### DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

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## ABBREVIATIONS

C	Contractor
CBD	Central Business District
DAFF	Department of Fisheries and Forestry
DEV	Developer
DWS	Department of Water and Sanitation
E	Engineer
EA	Environmental Authorisation (formerly known as RoD – Record of Decision)
ECO	Environmental Control Officer
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
I&AP's/IAPs	Interested and Affected Parties
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act
NFPA	National Fire Protection Association
PRASA	Passenger Rail Association of South Africa
SABS	South African Bureau of Standards
SANS	South African National Standards
SM	Site Manager

## **LIST OF TERMS USED**

### **Construction Phase:**

The activities pertaining to the preparation for and the physical construction of the proposed development.

### **Contractor (C):**

Persons/organisations contracted by the Developer to carry out parts of the work for the planned development. This includes the main contractor engaged and any additional sub-contractors appointed for the project.

### **Developer (DEV):**

The Developer is the Ethekwini Municipality: Human Settlements

### **Engineer (E):**

Person/organisation appointed by the Client to oversee the work of all consultants, sub-developers, contractors, residents and visitors.

### **Environment:**

The environment is defined in terms of the National Environmental Management Act, No 107 of 1998, as the surroundings within which humans exist and that are made up of – the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

### **Environmental Compliance Officer (ECO):**

Person/organisation appointed by the Developer who will provide direction to the Engineer concerning the activities within the Construction Zone, and who will be responsible for conducting the environmental audits of the project during the construction phase of the project according to the provisions of the Environmental Management Plan.

### **Environmental Management Programme (EMPr):**

The EMPr is a detailed plan for the implementation of the mitigation measures to minimise negative environmental impacts during the life-cycle of a project. The EMPr contributes to the preparation of the contract documentation by developing clauses to which the contractor must adhere for the protection of the environment. The EMPr specifies how the construction of the project is to be carried out and includes the actions required for the Post-Construction Phase to ensure that all the environmental impacts are managed for the duration of the project's life-cycle.

### **Neighbours:**

Considered to be the properties adjoining the proposed site.

### **Operational Phase (Post Construction):**

The period following the Construction Phase, during which the proposed development will be operational.

### **Pre-Construction Phase:**

The period prior to commencement of the Construction Phase, during which various activities associated with the preparation for the Construction Phase will be undertaken.

### **Site Preparation:**

This entails vegetation clearance or disturbance of ground to allow for construction to take place or material required for construction to be stored on site. Site preparation forms part of the construction phase. It excludes continued farming in the interim in an environmentally appropriate manner.

### **Rehabilitation:**

Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-

vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

**Site Manager:**

The person, representing the Contractor, responsible for all the Contractor's activities on the site including supervision of the construction staff and activities associated with the Construction Phase. The Site Manager will liaise with the Principal Agent in order to ensure that the project is conducted in accordance with the Environmental Management Plan.

# DEPARTMENT OF HUMAN SETTLEMENTS

## MARIANRIDGE HOUSING DEVELOPMENT REF. NO: TBA

### DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

#### 1 INTRODUCTION AND BACKGROUND

DOHS is proposing to undertake the Marianridge Housing Development. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld vegetation that has been identified on site. The site is located in an urban area and is surrounded by predominantly residential areas.

SiVEST SA (Pty) Ltd has been appointed by Oxygen Infrastructure Solutions, on behalf of the Department of Human Settlements (DOHS), to compile an Environmental Management Programme (EMPr) for the Marianridge Housing Development in line with the National Environmental Management Act, 1998 (Act 107 of 1998). The EMPr shall be deemed to have contractual standing on the developer and contractors onsite.

The EMPr serves as an environmental management tool by providing a structure plan of mitigation measures, which serves as a guide to assist in minimising the potential environmental impacts of the activities that may arise during the construction phase of this activity. During the construction phase, a copy of this EMP must be kept at the premises where the activity/activities will be undertaken.

This EMPr provides a set of guidelines for the environmental management of all works executed by the Developer, Engineer, Contractor and Sub-contractor/s to have a minimum impact on the environment in accordance with all relevant legislation, policies and standards. In this context, it should be viewed as a dynamic or "living" document which may require updating or revision during the life-cycle of the development to address new circumstances as the need arises. It is essentially, a written plan of how the environment is to be managed in practical and achievable terms.

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor and Sub-contractors. It is further assumed that compliance with the EMPr will be monitored and audited on a regular basis as set out in the EMPr and contractual clauses.

#### 2 DETAILS OF THE EAP

Name and contact details of the EAP who prepared this report:

**Table 1: Names and details of the expertise of each representative of the EAP involved in the preparation of this report**

<b>Business Name of EAP</b>	SiVEST SA (PTY) Ltd
<b>Physical Address</b>	4 Pencarrow Crescent, La Lucia Ridge Office Estate



<b>Postal Address</b>	PO Box 1899, Umhlanga Rocks
<b>Postal Code</b>	4320
<b>Telephone</b>	031 581 1500
<b>Fax</b>	031 566 2371
<b>Email</b>	<a href="mailto:michelleg@sivest.co.za">michelleg@sivest.co.za</a>

**Table 2: Names and details of the expertise of each representative of the EAP involved in the preparation of this report**

<b>Name of representative of the EAP</b>	<b>Educational Qualifications</b>	<b>Professional Affiliations</b>	<b>Experience (years)</b>
Michelle Nevette	MEnvMgt. (Environmental Management)	IAIA	19
Michelle Guy	MSc (Environmental Science)	IAIA	6

CV's of SiVEST personnel is attached in **Appendix 1**.

### 3 DESCRIPTION OF THE ACTIVITY

Marianridge falls within the jurisdiction of eThekweni Municipality, inner-west region. Over the years, a number of sites have been identified in the Marianridge area for the development of the Marianridge Housing project.

Site selection for this project has been on-going with a number of properties undergoing screening assessments to determine their development potential. However, the majority of the sites have ultimately been identified as unfeasible for the development of the Marianridge Housing Development. This is for a number of reasons ranging from zoning, biodiversity constraints, current land-use constraints as well as excessive or prohibitive slopes.

Of the four remaining sites that were determined to be feasible for the housing development, three do not require Environmental Authorisation (as confirmed by EDTEA in correspondence dated 16 January 2018). The remaining site, ERF 8716 requires environmental approval as a result of an area of sensitive vegetation (Sandstone Sourveld) located on the north-eastern portion of the site. The remainder of the site, approximately 0.7 ha (55 units) will be developed in the interim pending the outcome of the Environmental Authorisation for the area classified as Sandstone Sourveld.

The following listed activities apply for the project:

**Table 3: Listed activities triggered**

<b>Listing Notice</b>	<b>Activity</b>	<b>Description</b>
GNR 327, April 2017 (Listing Notice 1)	<u>Activity 27</u> The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.
GNR 324, April 2017	<u>Activity 12</u>	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the

Listing Notice	Activity	Description
(Listing Notice 3)	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(xii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p>	<p>site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.</p>

The site is located in an urban area and is surrounded by predominantly residential areas. The usable land area of ERF 8716 will yield 55 residential units and the Sandstone Sourveld area will yield 90 residential units. Each block will be 5 units of double story, 2 bedroom dwellings. Internal services ie: Roads, Stormwater, Sanitation, Water, Electricity, will be constructed in terms of eThekweni Municipal Standards.

The development layout must comply with the Layout Plan, as approved in the Environmental Authorisation. Should the layout have changed, the updated layout must be submitted to the Department and approved prior to construction. The layout is attached in **Appendix 2**.

### 3.1 Site locality, description and sensitivity

The site is located in the southern part of the eThekweni Municipality, approximately 37km west of the Durban CBD. The main access to the development is from M1, onto the Milky Way.

The proposed development is located at the following coordinates:

- 29°51'42.05"S; 30°49'37.74"E.

A layout of the site and sensitivities is provided below:



### 3.1.3 Wetlands

A Wetland Delineation and Impact Assessment was undertaken in **September 2017** to determine if any watercourse or wetland areas would be affected by the proposed development.

The Wetland Assessment identified no wetland on site or within 30m of the site, however wetland was found within 500m of the site. Following consultation with DWS, it was identified that no activities were triggered with regards to the National Water Act (Act No. 36 of 1998) and therefore no Water Use License will be required.

### 3.1.4 Vegetation

A Vegetation Impact Assessment was undertaken in September 2017 by SiVEST SA (Pty) Ltd. Please note that the report was originally written for a number of sites that ultimately didn't require Environmental Authorisation. The report was then updated in 2018 to show information pertaining to ERF 8716 only (only the mapping illustrates other parcels which are not subject to a Basic Assessment application). The vegetation report identified that very little of the total combined area of ERF 8716 was found to be in an undisturbed state. Approximately 1ha of ERF 8716 was found to exhibit typical Sandstone Sourveld species composition.

ERF 8716 is degraded with low ecological value despite being mapped as DMOSS. This mapping could be based on vegetation that existed historically in the area or as a result of coarse desktop mapping programmes. As stated above, approximately 1 ha of the site exhibits characteristics of critically endangered KZN Sandstone Sourveld species composition. The remainder of the site is very disturbed due to historical platforming, illegal dumping, overgrazing and high levels of invasive alien species.

### 3.1.5 Cultural/Historical Environment

A Heritage Survey of the proposed site was undertaken by Umlando Consulting in August 2018. A desktop assessment was undertaken initially which identified that no national monuments, battlefields, or historical cemeteries were known to occur in the area. A study of the aerial photography from 1937 indicated that one settlement was identified within ERF 8716 which could possibly have human graves.

It was identified that ancestral offerings are being made in the Sandstone Sourveld area. The offering includes alcohol, sugar, coco-cola, iJuba and some food. This is considered a heritage resource. The specialist suggested that a notice be placed at the entrance to the property and should include a statement that SiVEST and/or the Ward Councillor should be contacted should the worshippers object to the development.

The heritage survey did not observe any archaeological sites, nor was the area paleontologically sensitive. There is a possibility of graves on ERF 8716 and permission is required for development. Prior to development, the area must be cleared and resurveyed. The area must still be monitored during construction should no graves be identified.

## 4 ENVIRONMENTAL MANAGEMENT PROGRAMME

### 4.1 Introduction

The Environmental Management Programme has been prepared in order to comply with the requirements as stipulated in the National Environmental Management Act (No. 107 of 1998).

This EMP includes:

- Final Site Layout (**Appendix 2**)

- A copy of EA (**Appendix 3**)
- Mitigation measures as contained in the Basic Assessment Report
- Recommendations and conclusions emanating from the specialist studies
- Mitigation measures for construction activities in close proximity to watercourses
- Measures to ensure pedestrian safety
- The location of construction camps

#### 4.2 Aim and Objectives of the EMPr

The aim of the EMPr is to:

- Identify those construction activities identified for the proposed development that may have a negative impact on the environment;
- Outline the mitigation measures that will need to be taken and the steps necessary for their implementation;
- Describe the reporting system to be undertaken during construction.

The objectives of the EMP are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential adverse impacts to minimal or insignificant levels.
- Provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site.
- Provide management structures that address the concerns and complaints of I&APs pertaining to the development.
- Ensure that the environmental specifications are identified, effective and contractually binding so as to enable compliance on site.

#### 4.3 Layout of the EMP

The Environmental Management Plan identifies the five phases of development as:

- Preconstruction Planning Phase Activities (Section 7)
- Site Establishment and Setup Phase Activities (Section 8)
- Construction Phase Activities (Section 9)
- Post-Construction Phase Activities (Section 10)
- Compliance Monitoring (Section 11)

The generic and specific provisions are included together under each phase for each environmental consideration. The generic provisions are the general environmental issues, procedures and controls that can be applied to the project and site as a whole. The specific provisions are those environmental issues, procedures and controls that are relevant to a particular section of the site. It should be understood that the EMP is considered an evolving document and may be amended at any time by the relevant authorities (Department of Economic Development, Tourism and Environmental Affairs).

## 5 LEGAL AND OTHER REQUIREMENTS

### 5.1 Compliance with Applicable Laws

The supreme law of the land is “The Constitution of the Republic of South Africa”, which states: *“Every person shall have the right to an environment which is not detrimental to his or her health or well being”*. Laws applicable to the protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to:

- Animals Protection Act , Act No. 71 of 1962

- Atmospheric Pollution Prevention Act, No. 45 of 1965
- Conservation of Agricultural Resources Act, No. 43 of 1983
- Environment Conservation Act, No. 73 of 1989
- Environmental Planning Act, Act No. 88 of 1967
- Forest Act, No. 122 of 1984
- Forest and Veld Conservation Act, Act No. 13 of 1941
- Hazardous Substances Act, No. 15 of 1973
- Land Survey Act, No. 9 of 1921
- Minerals Act, No. 50 of 1991
- National Environmental Management: Waste Act, Act No. 59 of 2008
- The National Heritage Resources Act of 1999
- National Water Act, Act No. 36 of 1998
- Occupational Health and Safety Act, Act No. 85 of 1993
- Provincial and Local Government Ordinances and Bylaws
- Soil Conservation Act, Act No. 76 of 1969
- Water Services Act, Act No. 108 of 1997

The EMPr forms part of the Contract Documentation and is thus a legally binding document. In terms of this Act, an individual responsible for environmental damage must pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle.

## 5.2 Compliance with the Environmental Management Programme

A copy of the EMPr must be kept on site during the construction period at all times. The EMP will be made binding on all contractors operating on the site and will be included within the Contractual Clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance with the Environmental Authorisation issued by EDTEA. It should be noted that in terms of Section 28 of the National Environmental Management Act (NEMA) Act No. 107 of 1998, those responsible for Environmental Damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage. (The polluter pays principle).

In terms of the Environmental Authorisation (EA), non-compliance of the EA may result in criminal prosecution or other actions provided for in the National Environmental Management Act (No. 107 of 1998) (as amended) and associated regulations. Any non-compliance must result in an immediate stop to works being issued. The contractor and developer will be held liable for any damage and consequent rehabilitation to environmentally sensitive areas outside the site boundary. In the event of any dispute concerning the significance of a particular impact, the opinion of EDTEA in respect of its significance will prevail.

National government, provincial government, local authorities or committees appointed in terms of the conditions of the EA or any other public authority shall not be held responsible for any damages or losses suffered by the authorisation holder or successor in title in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance by the authorisation holder with the conditions of authorisation as set out in this document or any subsequent document emanating from these conditions of authorisation.

The Developer is deemed not to have complied with the EMP if:

- If environmental damage ensues due to negligence;
- They fail to respond adequately to complaints from the public.

The Contractor is deemed not to have complied with the EMP if:

- If environmental damage ensues due to negligence;
- The contractor fails to comply with corrective or other instructions issued by the Principal Agent within a specified time,
- The Contractor fails to respond adequately to complaints from the public.

## **6 DUTIES OF ROLE PLAYERS**

### **6.1 Developer (DEV)**

- Complies with all applicable legislation and is conversant with the requirements of the EA and Environmental Management Programme (EMPr);
- Assesses all activities requiring special attention as specified and/or requested by the E and/or ECO for the duration of the Contract;
- Ensures that the Contractor conducts all activities in a manner that minimises disturbance to directly affected residents and the public in general, as advised by the E and/or ECO;
- May, on the recommendation of the E and/or ECO, order the Contractor to suspend any or all works on site if the Contractor or his subcontractor/ supplier fail to comply with the said environmental specifications.

### **6.2 Engineer (E)**

- Complies with all applicable legislation and is conversant with the requirements of the Environmental Management Plan (EMP);
- Arranges information meetings for and consults with I&AP's about the impending construction activities;
- Maintains a register of complaints and queries by members of the public at the site office. This register is forwarded to the ECO a bi-monthly basis.
- Enforces and monitors compliance the requirements of the EMP on site;
- Assesses the Contractor's environmental performance in consultation with the ECO;
- Documents in conjunction with the Contractor, the state of the site prior to construction activities commencing.

### **6.3 Environmental Control Officer (ECO)**

- Briefs the Contractor about the requirements of the Environmental Specification and/ or Environmental Management Plan, as applicable;
- Advises the E and/or DEV about the interpretation, implementation and enforcement of the Environmental Specification and other related environmental matters;
- Monitors and report on the performance of the contractor/project in terms of environmental compliance with the EMP to the E and Developer;
- Provides technical advice relating to environmental issues to the E and/or DEV/C;

### **6.4 Contractor (C)**

- Complies with all applicable legislation, is conversant with the requirements of the Environmental Management Plan, and briefs staff about the requirements of same;
- Ensures any sub-contractors/ suppliers who are utilised within the context of the contract comply with the environmental requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf;
- Supplies method statements for all activities requiring special attention as specified and/or requested by the E or ECO during the duration of the Contract;
- Provides environmental awareness training to staff;
- Bears the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions;

- Conducts all activities in a manner that minimises disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment.
- Ensures that the E is timeously informed of any foreseeable activities that will require input from the ECO.

## **7 PRE-CONSTRUCTION PLANNING PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

Pre-Construction Planning EMPr activities are those relating to obtaining the necessary permits or approvals and management plans prior to the start of the Construction Phase.

### **7.1 Permits /Licenses / Approvals**

- The EMPr must be approved by the Department prior to commencement of construction.
- A written notice must be given to this Department fourteen (14) days prior to the commencement of construction. The notice must include site preparation activities as well as a date on which it is anticipated that the activity will commence. The notice must cite the reference number.
- A copy of the environmental authorisation (**Appendix 3**) must be kept by the authorisation holder and made available to any official of the Department on request.
- The development layout must comply with the Layout Plan, as approved in the Environmental Authorisation. Should the layout have changed, the updated layout must be submitted to the Department and approved prior to construction.
- To ensure that the protected plants survive, a Translocation Plan must be compiled by a botanist or horticulturalist. The protected plants would require permits for their removal and translocation.
- There is the possibility of graves being present on site. The site must be resurveyed after clearing prior to construction commencing. Should human graves be identified then Amafa KZN and SAPS need to be informed immediately. The area will need to be cordoned off with at least a 10m buffer. The process of grave removal is complex and involves consultation, advertisements, several permits and reburial.

### **7.2 Source of materials**

- Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners, water etc), and submit these to the Engineer for approval prior to commencement of any work.
- Where possible, a signed document from the supplier of natural materials should be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation.
- Where materials are borrowed (mined), proof must be provided of authorisation to utilise these materials from the landowner / material rights owner and the Department of Minerals and Energy.

## **8 SITE ESTABLISHMENT AND SETUP PHASE**

### **8.1 Demarcation of construction footprint**

- The construction footprint of each phase must be fenced off with wooden boarding or shade cloth and wooden poles.
- The working areas must be clearly demarcated and all construction work must be kept within the demarcated area.
- The working area must be cordoned off to the public to prevent injury.



- Adequate and proper signage must be erected along the affected roads and within the construction site to warn both pedestrians and motorists of earthworks and any other potential safety hazards.

## **8.2 Establishment of site/construction camp**

- The construction camp(s) must be located in a disturbed area and must be screened off during the entire construction phase.
- The construction camps must not impact on any adjacent properties and must be located 50m away from any watercourse areas or stormwater drains, however must still be easily accessible.
- The camp site must be located within the construction area.
- The camp should be established on level ground.
- The Project Engineer shall in conjunction with the Contractor and Environmental Control Officer, identify the most suitable location for the construction camp(s).
- When locating the construction camp and equipment yard, watercourses and areas susceptible to soil erosion and/or water contamination must be avoided.
- If the contractor chooses to locate the camp site on private land, he must get prior permission from both the engineer and the landowner.
- Further considerations for the construction of the camp include the avoidance of cut and fill wherever possible during the setup of the construction camp. The size of the camp should be kept to a minimum. Parking for staff and visitors needs to be adequately provided.

## **8.3 Ablutions**

- The Contractor shall make adequate provision for temporary chemical toilets for the use of their employees during the Construction Phase. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced. They shall be positioned in an appropriate place.
- There must be no on-site sanitation in the form of pit latrines, septic tanks or similar.
- An adequate number of self-contained chemical toilets must be established on site – at least one toilet for every 15 workers.
- The location of the toilet facilities shall be agreed to prior to the commencement of construction and shall be agreed in conjunction with the ECO, Engineer and contractor.
- The location and use of the toilets must be such that it cause no pollution of water nor poses health hazards.
- The ablation facilities must be cleaned regularly and any waste must be disposed of at a registered waste site.
- Chemical ablation facilities must not be placed closer than 50m from the edge of a water course, wetland or similar. Toilets must be situated out of the 1:100 year flood line of any watercourse.
- Chemical toilets must be removed from the site when the construction phase is completed.

## **8.4 Stormwater, Erosion and Soil Management**

- The Contractor must ensure that wind screening and stormwater management controls are undertaken to prevent soil loss during site establishment.
- Clearing activities should only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected clearing activities should be put on hold.
- The contractor must attend to drainage of the camp site to avoid standing water (ponding) and/or rill erosion.
- The time that stripped areas are exposed must be minimized wherever possible. Care must be taken to ensure that lead times are not excessive.
- Procedures that are in place to conserve topsoil during the construction phase are to be applied during the site establishment phase. i.e. topsoil is to be conserved while providing access to the site and setting up the camp.

- The Contractor must strip and stockpile all soil within the works area for possible subsequent use. Stockpiled soil must not be in excess of 2m in height, and must be protected from wind and rain with the use of tarpaulins where necessary. The area stripped of soil is to be surfaced, and it is unlikely that the stripped soil will be required for rehabilitation purposes.
- Excavated topsoil and subsoil must be stored in piles out of wetland areas and drainage lines and their associated buffer zones and must be at least 50m away from any watercourse.

## **8.5 Establishment of equipment lay-down and storage areas**

- Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general onsite topography and water erosion potential of the soil (e.g. no closer than 50m to a water course or wetland, preferably an already transformed area, demarcated areas, the use of bunds, and the use of berms for erosion control).
- An impervious hardened surface should be constructed on which equipment and/or hazardous substances can be stored/handled/used. The surface should be graded to the centre so that spillage may be collected and satisfactorily disposed of.
- Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by children and animals.
- Fire prevention facilities must be present at all storage facilities.
- Hazardous storage and refuelling areas must be bunded prior to their use on site during the construction period. The bund wall must be high enough to contain at least 150% of any stored volume.
- These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.
- Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.
- Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.
- Drip trays should be utilised at all dispensing areas or a biddum and stone-chip hazardous materials filling and handling area should be established adjacent to the bund.
- An appropriate number of 44-gallon drums must be kept on site to collect potential and contaminated soil.

## **8.6 Cultural Heritage Environment**

- The site must be resurveyed to confirm the presence of graves after clearing but prior to construction.
- Before construction starts, all staff need to know what possible archaeological or historical objects of value may resemble and to notify the Engineer/Contractor should such an item be unearthed. Proof that this information session was conducted must be attached to the relevant audit report and included in the Environmental File
- Should human graves be identified then Amafa KZN and SAPS need to be informed immediately. The area will need to be cordoned off with at least a 10m buffer. The process of grave removal is complex and involves consultation, advertisements, several permits and reburial. No structure older than sixty years or parts thereof are allowed to be demolished, altered or extended without a permit from Amafa.

## 8.7 Environmental awareness

- All staff and contractor(s)/subcontractors/suppliers/service providers must be provided with environmental awareness training, occupational safety, and/or legal information training on the approved EMPr and environmental authorization. The training shall ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and the training must take into account language and literacy requirements as well as measures to determine the effectiveness of training. Proof of this training must be included in the environmental file.
- The contractor must ensure that formal environmental induction of the appointed construction personnel will take place through a presentation to staff on environmental awareness.
- The contractor must ensure that environmental site procedures relevant to the project must be communicated to staff on a weekly basis – method statements can be used as part of awareness training material.
- The contractor must ensure that environmental matters will be discussed during toolbox talks.
- The Contractor must ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and have a basic level of environmental awareness training.
- The need for a 'clean site' policy must be explained to the construction workers.

## 8.8 Worker conduct on site

A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules:

- No alcohol / drugs to be present on site.
- Prevent excessive noise.
- Construction staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility are forbidden).
- No fires to be permitted on site.
- Trespassing on private / commercial properties adjoining the site is forbidden.
- No hunting of animals or birds is allowed on site or in the surrounding area.
- Other than pre-approved security staff, no workers shall be permitted to live on the construction site.
- Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks.
- No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.

# 9 CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS

Construction EMPr activities are those relating to the Construction Phase as defined. The contractor is responsible for the implementation of activities within this phase.

## 9.1 Environmental management file

- An environmental management file shall be opened and maintained on site. The file must always be up-to-date with the following documentation:
  - Copy of Environmental Authorisation
  - Copy of EMPr
  - Copy of Approved Layout

- Monthly Environmental Audits Reports
- Personnel Register
- Complaints Register
- Correspondence with ECO
- Correspondence with I&APs/stakeholders/surrounding areas
- Proof of Waste Disposal
- Proof of chemical toilet cleaning
- Proof of raw material sourcing
- Proof of environmental training (including cultural)

## 9.2 Stockpile management

- Stockpiling of soil or any other materials used during the construction phase must not be allowed on or near slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface runoff.
- Dust emissions from soil stockpiles can occur during the loading of piles, when wind disturbs the stockpile surface, and during reclamation.
- Stockpiles must be covered with hessian sheets or alternatively enclosed with a shade cloth windbreak. Both of these techniques aim to reduce wind speed at the surface of the stockpile, in turn reducing the potential for dust scour and entrainment.
- The applicant must establish additional suitable mitigation measures to prevent the erosion of stockpiles.
- Stockpiles must not exceed 2 m in height.

## 9.3 Maintenance of access and haulage roads

- Vehicles and plant tyres must be washed prior to leaving respective construction nodes, and prohibited from transporting excess mud onto tar roads.
- Movement of construction vehicles potentially impacting on urban infrastructure must be mitigated through the use of appropriate warning signs, and not entering or leaving the site during peak traffic hours.
- Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damages as soon as these develop.
- Unnecessary compaction of soils by heavy vehicles must be avoided. Construction vehicles must be restricted to demarcated access, haulage routes and turning areas.
- Machine / vehicle operators should receive clear instructions to remain within demarcated access routes. Movement of heavy-duty vehicles and vehicles not connected with work in progress must be restricted to the construction zone in order to control related impacts such as compaction of soil, damage to vegetation and noise pollution.

## 9.4 Ablutions

- Weekly servicing of the chemical toilets on site needs to be practiced by the supplier and service records are to be submitted to the ECO on a monthly basis. Toilets on site need to be kept in a clean and hygienic state.
- Chemical ablation facilities must be cleaned regularly, with associated waste disposed of at a registered site. Proof of chemical toilet cleaning and waste disposal must be kept in the environmental file.
- Contractors must ensure that no spillage occurs when chemical toilets are cleaned and that the contents are properly stored and removed off-site.

## 9.5 Air pollution

- Ensure compliance with the Atmospheric Pollution Prevention Act and the Air Quality Bill.
- Dust generating construction activities should be avoided during strong winds.

- Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed.
- Suitable dust suppression measures must be implemented if dust levels rise above acceptable levels, either water or commercial dust suppressants.
- Servicing of vehicles must occur off site to limit gaseous emissions.
- Speed limits must be implemented in all areas of the site and be adhered to.
- Soil loads in transit should be kept covered or wetted.
- Stockpiles of soil should be kept covered or have suitable dust palliative applied such as water or commercial dust suppressants.
- Burning of waste is forbidden.
- Where blasting is required, blast mats are to be used to reduce fly-rock and subsequent dust in sections of the pipeline route that are in close proximity to other land uses.

## 9.6 Noise pollution

- Noisy activities must be kept to a minimum and conducted simultaneously at the start of construction if possible.
- Machinery and vehicles must be kept in a good working order for the duration of the project to minimize noise nuisance to neighbours.
- A complaints register should be kept on site at all times.
- Construction staff should be provided with training regarding noise prevention and anti-social behaviour/conduct.
- Blast events must be controlled as required by the relevant legislation, and undertaken by a professional team.
- Surrounding residents should be warned of particularly noisy activities by way of flyers or letters.

## 9.7 Wetlands and Watercourses

No wetland was identified on site, however should surrounding wetland be impacted on, the following general mitigation measures apply:

- No development is permitted or allowed within any watercourse, wetland, river or stream; except for where approved to accommodate the activity as per layout plan.
- Downstream flow rates will be maintained and measures will be taken to minimise raised sediment loadings in the rivers
- No refuelling/washing of vehicles or machinery to occur within 30m of the watercourse
- No excavated material or fill material must be stored within the watercourse or within 15m of the watercourse
- Roads to be kept free from deposits to prevent silt/oil from entering watercourses.
- Measures to contain the water containing waste and safe disposal thereof must be implemented.
- Water containing waste must not contaminate stormwater and must not be discharged into the natural environment for attenuation.
- Should there be the need to utilize construction machinery within watercourse areas and their associated buffer zones, written approval must be obtained from DWA prior to the machinery being utilized.

## 9.8 Vegetation

- Indigenous vegetation outside of the development footprint must be demarcated and protected by preventing access of construction vehicles and personnel into these areas.
- A permit must be obtained from Ezemvelo KZN Wildlife should indigenous and provincially protected species need to be relocated or removed. To ensure that the plants survive, a Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive.

- Removal should occur with due care during the dormant growth period months. A translocation plan must be prepared by a qualified botanist (or similarly qualified individual) and followed.
- Vegetation removal from steep areas must be kept to a minimum.
- Invasive alien vegetation must be removed from the site. Areas that are devoid of vegetation due to the removal of invasive alien vegetation must be rehabilitated with locally appropriate indigenous vegetation.
- On completion of the activity, the disturbed sites must be rehabilitated and natural indigenous vegetation must be replanted on the disturbed site by using local grasses or tree suited to the surrounding landscape.

## 9.9 Soil Erosion

- Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.
- If possible, construction activities should be scheduled to minimise the duration of exposure to bare soils on site, especially steep slopes. The full length of works shall NOT be stripped of vegetation prior to commencing other activities.
- Soil must be exposed for the minimum time possible once cleared, such that the timing of clearance is coordinate with the onset of construction. This will prevent wind and water erosion.
- Excavated topsoil and subsoil must be stored
  - In piles out of wetland areas and drainage lines and their associated buffer zones;
  - At least 50m away from any watercourse
- The unnecessary removal of groundcover vegetation from slopes must be prevented, especially on steep slopes.
- Following the clearing of an area, the surfaces of all exposed slopes must be roughened to retain water and increase infiltration (especially important during the wet season).
- All embankments that are expected to be exposed during the 'rainy' months should either be armoured with fascine like structures or top soiled and grassed immediately with strip sods established at regular intervals (50-100cm) down the bank with hydroseeding between the strip sods. As embankments generally comprise subsoils, top soiling must take place before the vegetation of the slope as described in the preceding sentence.
- All builder's rubble and large rocks should be removed from the fill embankments. The builder's rubble should be disposed of appropriately.
- All terraces and platforms must have a slight back-fall to divert runoff away from the fill embankments.
- Avoid excessively steep cuttings and embankments.
- The planned formal/permanent stormwater management measures for the platforms should be established immediately after the establishment of the platforms. Runoff diverted from the platforms should be discharged into the formal stormwater system.
- To provide additional erosion protection, small temporary berms should be established on the lip/edge of these platforms during the construction phase to intercept runoff and divert it away from the fill embankments. The temporary berms should be constructed of impermeable soils or sandbags.
- Earthen and/or sand bag berms should be utilised to slow down runoff and promote infiltration below embankments steeper than 1:3. The berm wall must have no leaks or gaps and must retain all runoff generated from upslope. Subsoil from cut material may be used for the construction of the berms.
- Toes of extensive fill embankments should be "fenced" with 75 diameter gum poles, protruding 0,5m above ground at 2,0m centres with hessian, shade cloth or geofabric attached and buried 300mm below ground surface, to act as silt-traps.
- All roads, paths and stormwater infrastructure should be protected from sedimentation from adjacent exposed surfaces by sandbags. The sandbags should be regularly checked and maintained.

- The bedrock on site appears to generally dip in an easterly direction. Easterly - facing cut slopes should thus be restricted in extent and additional measures might be required to ensure the stability of these cuttings.
- Re-vegetation of the site and areas outside the site should be undertaken immediately after the completion of an activity in that area.

### **9.10 Stormwater Control**

- Good site drainage, including provision of stormwater control facilities such as retention structures, interceptors, subsoil drainage and similar such measures, is strongly advised to reduce concentrated overland flows.
- Discharge of any attenuated runoff must not be concentrated.
- Discharge points may be into wetland buffers but must not be into the wetlands.
- Attenuation tanks or attenuation dams must be used where stormwater run-off volumes generated are considered too excessive to be discharged directly into the drainage line.
- Drainage must be controlled to ensure that runoff from the development will not culminate in off-site pollution or cause water damage to properties further down from the site.
- Any damage caused by runoff must be appropriately repaired and/or rehabilitated at the cost of the authorisation holder.
- All stormwater infrastructure and structures for underground stormwater pipes, attenuation tanks, small channels, manholes and kerb inlets must be sized, positioned and designed according to the eThekweni Municipality: Design Manual “Guidelines and Policies for the Design of Stormwater Drainage and Stormwater Management Systems”
- Clearing activities should only be undertaken during agreed working times and permitted weather conditions. If heavy rains and/or strong winds are expected clearing activities should be put on hold.
- Roughen the surface of all exposed slopes to retain water, increases infiltration and facilitate re-vegetation.
- Re-vegetation of the site and areas outside of the site should be undertaken immediately after the completion of an activity in that area.
- Effort must be made to ensure that the stormwater system including pipes, drains, headwalls and Reno-mattresses are not silted up during the construction phase.
- After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gully’s must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until grass has re-colonised the rehabilitated area.
- Stormwater management must be implemented/undertaken prior to the commencement of major earthworks which also includes site preparation activities.
- In order to reduce erosion, and maintain the value of wetlands on site, stormwater runoff must be attenuated before being discharged into the stormwater drains and the root/immediate cause of erosion must be dealt with immediately.
- A wetland specialist must be consulted with regard to any discharge/drainage of stormwater into watercourse areas.
- Erosion protection measures must be implemented at all stormwater outlets.
- The stormwater from developed areas must not cause soil saturation, erosion and sloughing of areas
- Any washwater i.e. water containing waste generated during construction and operational phases must not be discharged into the natural environment. Measures to contain the wastewater and to safely disposed of it must be implemented.
- Wastewater and the sewage network system must be kept separate from stormwater.
- All outlets and detention ponds must be located outside of the wetland and associated buffer areas.
- After construction, the site must be contoured to ensure free flow of run-off and to prevent ponding of water.

### **9.11 General and Hazardous Substances and Materials**

- Handling, storage and disposal of excess or containers of potentially hazardous materials shall be in accordance with the requirements of current Regulations and Acts in force. Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity.
- Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented.
- Every precaution must be taken to ensure that any chemicals or hazardous substances do not contaminate the soil or groundwater on site. For this purpose the Contractor must:
  - Ensure that potentially harmful materials are properly stored in a dry, secure environment, with concrete or sealed flooring. The Contractor must ensure that materials storage facilities are cleaned/maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil or surface water. The management of such storage facilities and means of securing them shall be agreed.
  - Ensure that hazardous substances must be stored in the construction camp under lock and key;
  - Ensure that storage and utilization of potentially hazardous materials such as diesel, petrol, oils and/or lubricants do not result in any form of soil and water contamination.
  - Control the use and storage of fuels and chemicals that could potentially leach into the ground. Adequate spillage containment measures shall be implemented, such as cut off drains, etc
  - Ensure that chemical storage areas must be protected by bunded areas of a volume equal to 150% of the volume of the container storing the substance. Bunded areas must be constructed of concrete blocks lined with suitably dense plastic sheeting.
  - Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity.
  - Any petrochemical spill must be stored in skips and taken to a hazardous landfill site. Safe disposal certificates must be submitted to the Assistant Manager of the Compliance Monitoring division of EDTEA.
  - Fuel and oil storage tanks and drums, including internal installations and waste oil tanks, must be situated on an impermeable base within an oil-tight bund.
  - Any oils, fuels and spilled substance must be removed weekly and recycled or disposed of at a licensed waste disposal facility able to accommodate such waste. Proof of waste disposal must be kept in the environmental file; and
  - Ensure that the mixing /decanting of all chemicals and hazardous materials should take place on a tray or impermeable surface.
  - Chemical/hazardous waste generated during mixing/decanting should then be disposed of at a registered landfill site.
  - Ensure that the storage of petrol and diesel must not cause a risk to surrounding environment and monthly checks must be undertaken.
  - Ensure that potentially harmful materials are properly stored in a dry, secure environment, with concrete or sealed flooring. The Contractor must ensure that materials storage facilities are cleaned / maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil or surface water. The management of such storage facilities and means of securing them shall be agreed.
  - Municipal water or another source approved by the Engineer should be used for all activities such as washing or equipment or disposal of any type of waste, dust suppression, concrete mixing and compacting.
- In the event of a spillage/incident that cannot be contained and which poses a potential threat to the local environment, the following Departments must be informed of the incident within 48 hours and in accordance with Section 30 of the National Environmental Management Act, Act 107 of 1998:
  - The Local Authority, eThekweni Municipality;
  - Department of Water and Sanitation (DWS)



- Department of Economic Development, Tourism and Environmental Affairs (Pollution and Waste Component, eThekweni District, Private Bag X54321, Durban, 4000);
- The local Fire Department; and
- Any other mandated authority.
- Should there be any soil and groundwater contamination, the Control Environmental Officer: Pollution and Waste Component as per contact details specified above must be informed within five (05) working days.
- In the event of this occurring, the necessary clean up measures must be undertaken immediately.
  - Any soil/groundwater contaminated during construction must be removed, stored in sealed container and disposed thereof at a licensed facility. Proof of safe disposal must be kept in the environmental file.
  - Appoint appropriate contractors to remove any residue from spillages from site.
  - Ensure that used oils/lubricants are not disposed of on/near the site, but at a permitted landfill and that contractors purchasing these materials understand the liability under which they must operate. The Environmental Control Officer will be responsible for reporting the storage/use of any other potentially harmful materials to the relevant authority.
- Should any sewer infrastructure be routed through existing stormwater culverts the following must be adhered to:
  - Mitigation measures must be put in place to ensure quick detection and repair of leakages or breakages in the pipe system.
  - Leakages must be contained in the immediate vicinity of the pipeline and must not be allowed to enter the stormwater system.

## 9.12 Waste management

- For the purposes of this EMP, waste includes all construction rubble, debris and refuse (e.g. food waste, garbage, rubbish, etc.), including hazardous waste (e.g. oils).
- Bins and/or skips need to be supplied on site for disposal of waste within the construction camp. The bins must have liner bags for easy control and safe disposal of waste. There must be recycling of waste practiced with separate drums provided for paper and cardboard; glass; plastics; metals and organic waste.
- The Contractor must ensure that all litter is collected from the work and camp areas daily.
- Construction rubble needs to be disposed of at a registered landfill site. Construction rubble must be disposed of in a pre-agreed demarcated spoil dumps that have been approved by the Engineer and ECO, or at a registered disposal site.
- Bins and/or skips must be emptied regularly and waste must be disposed of at a registered landfill site. Waybills for all such disposals are to be kept by the Contractor for review by the Engineer/ECO. This is required for all waste disposed of.
- A registered chemical waste company is to be used to remove waste from the chemical toilets on site.
- The excavation and use of rubbish pits on site is forbidden.
- The burning of waste is forbidden.
- The area demarcated for the sorting and disposal of waste needs to be fenced off. The provision of separate skips for different waste types (i.e. "household" type refuse; building rubble) needs to be provided.
- Hazardous waste such as fuel, oils and chemicals must be disposed of at a licensed hazardous waste disposal site with proof of disposal kept in the environmental file.

## 9.13 Social impact to the adjacent landowners

- The regular and ongoing communication between the ECO, Contractor, Engineer and the IAPs is important for the duration of the contract and would have been started during the Site Establishment/pre-Construction Phase. The Engineer and Contractor are responsible for on-going communication with the IAPs. A Complaint's register must be kept at the site office. This must be in a duplicate format, with numbered pages. The IAPs need to be made aware of the register and the methods of communication available to them. The Contractor

needs to appoint a staff member(s) to act as liaison officer for formal consultation with I & AP's in order to handle questions and explain the construction process and what it will entail. This register is to be tabled during monthly site meetings. Any queries or complaints that arise need to be handled by following a set protocol.

- There are a number of areas that need to be monitored in this respect:
  - The disruption and safety of access for the local residents must be minimized at all costs and have the Project Engineer's permission.
  - The Contractor is to inform the neighbours in writing of disruptive activities at least 24 hours beforehand.
  - It is important that the Contractor's activities and movement of staff are restricted to the designated construction areas.
  - Notice of particularly noisy activities such as jackhammers, blasting, drilling must be given to residents adjacent to the construction site at least 24 hours prior to the activity taking place.
  - Noisy activities must be restricted to the times given in the project specification or General Conditions of Contract.

#### **9.14 Fire control**

- All fire requirements must be carried out as contained in the National Building Regulations SABS 0400 and the safety code of the N.F.P.A.
- The Contractor must take all reasonable and active steps to avoid increasing the risk of fire through their activities on site. The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Fire Services. The Contractor must ensure that all the correct fire-fighting equipment is available on site and within easy access.
- No fires for heating or cooking must be permitted.
- The disposal of any matter by burning is prohibited.

#### **9.15 Rehabilitation of sensitive areas**

- Rehabilitation of all sensitive areas must be undertaken in accordance with the approved EMPr.
- Rehabilitation must commence at the earliest time as prescribed by the ECO.
- The contractor must undertake any maintenance that may be required as a result of erosion control measures not functioning correctly, and where vegetation has not taken to reseed these areas to prevent further environmental degradation

#### **9.16 Geotechnical**

- It should be noted that it is possible that localised, potentially unstable areas can become exposed during development, i.e. during earthworks. It is important to allow for onsite inspections and evaluations by an experienced engineering geologist/geotechnical engineer so that stability problems can be timeously identified and remedied.

### **10 POST-CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

This relates to the activities that occur once the construction is completed and the site rehabilitated. It is important that a meeting is held on site between the Engineer, ECO, the Contractor, and if necessary the EDTEA to approve all the remediation measures and to ensure that the site has been restored to a condition that is approved by the ECO and Engineer.

#### **10.1 Removal of the construction camp**

- All structures comprising the construction camp are to be removed from site.

- The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc, and these should be cleaned up.
- All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top-soiled and re-vegetated if appropriate.
- The Contractor must arrange the cancellation of all temporary services.

## **10.2 Waste Disposal**

- The developer and contractor must ensure that no construction material foreign to the site, including construction debris, is left unattended after construction activities have ceased/completed
- All construction materials including rubble, cement bags, chemicals, fuels and oils must be safely stored in appropriate containers and disposed of at a license waste facility in accordance with the approved EMPr.
- No remaining rubble is to be buried on site.
- The site is to be free of litter and surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Project Engineer.

## **10.3 Alien control and eradication**

- All alien vegetation that has colonised the fill embankments or any other areas within the construction site must be removed. The contractor should consult the ECO regarding the method of removal.
- Indigenous landscaping and rehabilitation of all affected areas must be carried out once construction is complete.
- The contractor must also ensure that all alien invasive vegetation has been removed.

## **10.4 Stormwater and erosion control measures**

- All stormwater discharge points on site should be checked for any sign of erosion or failure that should be rectified immediately.
- All re-vegetation should be checked and finalised. Any erosion or point where vegetation has not taken properly must be corrected immediately.
- Any erosion scars found on site during monitoring and maintenance inspections should be rehabilitated immediately. Once rehabilitated the affected areas must be monitored for an appropriate amount of time to ensure no further erosion risks.

## **10.5 Rehabilitation**

- The applicant is responsible for compliance with the provision for Duty of Care and Remediation of Damage in accordance with Section 28 of the NEMA. Determination of damage vests with EDTEA.
- All damaged areas shall be rehabilitated upon completion of the contract
- Rehabilitation must take place in a phased approach as soon as possible.
- Re-vegetation of the disturbed areas is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.
- Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.
- Planting of indigenous tree species and or fruit bearing trees in areas not to be built upon must be encouraged.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- The site must be checked for erosion damage and rehabilitation must be undertaken immediately. Erosion rills and gully's must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until grass has re-colonised the rehabilitated area.

- Effort must be made to ensure that the stormwater system including pipes, drains, headwalls and Reno-mattresses are not silted up during the construction phase and post construction phases.
- The contractor must undertake any maintenance that may be required as a result of erosion control measures not functioning correctly, and where vegetation has not taken to reseed these areas to prevent further environmental degradation
- A meeting is to be held on site between the Engineer, ECO and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer. A representative of EDTEA must be present at the final meeting or when the site is handed over on completion of construction.

## **11 COMPLIANCE MONITORING**

The developer will undertake to appoint an Environmental Consultant to monitor the performance of the contractor and developer in ensuring that the conditions and measures within the EMP are adhered to.

### **11.1 Construction Phase**

- The Site Manager, who must report to the ECO, must monitor the Construction Phase of the project to ensure compliance with the Environmental Management Programme.
- The ECO must undertake the auditing of the Construction Phase and must audit the activities once a month, and will conduct a final close out audit once the construction activities have ceased onsite and the construction camp cleared. The final close out audit/post construction environmental audit must be submitted to the Department within 60 days from the date that the construction is complete.
- The ECO in conjunction with the Site Manager must keep a record of the checking of compliance with the EMP.
- This Environmental Management Programme will be included in the contract documentation of all contractors who will work on the site.

## **12 AMENDMENTS TO THE EMP**

The Environmental Control Officer (ECO) has the right to request (in writing) a method statement to be compiled by the contractor in cases where the Construction EMP may not adequately address the issue or nature of the activity/site warrants the need thereof. The method statement must be approved in writing by the ECO prior to carrying out the activity.

Any major issues not covered in the EMP as submitted as well as any layout changes, will be addressed as an addendum to the EMP and must be submitted for approval prior to implementation.

Authorised officials of the Department reserve the right to review the approved EMP during the construction and operational phases of the above-mentioned activity and amend/add any condition as it is deemed necessary. Authorised officials also reserve the right to inspect the project during both construction and operational phase of development.



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