

# Appendix G: Environmental Management Plan



**South African National Biodiversity Institute  
(SANBI)**

**DRAFT LIFECYCLE ENVIRONMENTAL MANAGEMENT  
PROGRAMME FOR THE PROPOSED INFRASTRUCTURE  
DEVELOPMENTS AT KIRSTENBOSCH NATIONAL BOTANICAL  
GARDENS (FARM NUMBER CA875-RE), CAPE TOWN, WESTERN  
CAPE.**

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**List of Appendices**

- Appendix A: Glossary
- Appendix B: Generic Method Statement
- Appendix C: Relevant Permits
- Appendix D: Role of the Environmental Control Officer (ECO)

**IMPORTANT NOTE:**  
**ALL READERS TO PLEASE FAMILIARISE THEMSELVES WITH THE RELEVANT TERMINOLOGY CONTAINED IN THE GLOSSARY (APPENDIX A) PRIOR TO READING THIS DOCUMENT.**



## **1. INTRODUCTION**

### **1.1 Project Description**

The South African National Biodiversity Institute (SANBI) hereafter known as the “applicant” proposes to redevelop and upgrade of a 2 500m<sup>2</sup> area of the developed portion of the cultivated gardens, including buildings and infrastructure within the Kirstenbosch National Botanical Garden for administrative purposes. These buildings include Fynbos Lodge, which is over 60 years old, as well as the prefabricated current Kirstenbosch Head Office & Administration Building and a small prefabricated IT building. The landscaping and parking areas associated with these existing buildings will also be altered in the redevelopment.

Due to the potential heritage value of Fynbos Lodge, no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations will take place in the interior of the building. The prefabricated buildings will be demolished and redeveloped.

The upper catchment of the Liesbeck River is located in very close proximity to the area which is proposed to be redeveloped. The river is currently undercutting and weakening the north bank closest to the existing Fynbos Lodge. Therefore the development proposal also includes the construction of gabions along the river bank to reinforce this area. The gabions will run for approximately 20-30 metres within the existing curvature of the river. The total volume of material within the Liesbeck River to be excavated to put the gabions in place will be approximately 135 m<sup>3</sup>.

Freshwater specialist input has been obtained in order to inform the redevelopment and ensure that the river is not impacted on in an unacceptable manner.

The EMP should adhere to the local authority by-law requirements as well as any other obligatory environmental and other legal requirements. These are detailed in Section 2 of this EMP.

This EMP is a practical and achievable program to ensure that environmental risks and opportunities (i.e. opportunities to provide environmentally friendly alternatives) are identified and addressed during the proposed development’s life cycle.

It is understood that the applicant or any future development entity (where transfer of ownership occurs) will be fully responsible for this EMP and its requirements including any environmental rehabilitation that may be needed. This is required in terms of Section 28 (Duty of Care and Remediation of Damage) of the National Environmental Management Act, (Act No. 107 of 1998), as amended.

### **1.2 Details of the Environmental Management Plan author & related experience**

This EMP was authored by Kirsty Robinson and reviewed by Adrian Sillito of SEC. Kirsty has an MPhil Degree in Climate Change and Sustainable Development. Adrian is a member of the South African branch of the International Association for Impact Assessment (IAIASA), is a certified environmental assessment practitioner (CEAPSA) and a Professional Natural Scientist (Pr.Sci.Nat.)

SEC has extensive experience in environmental assessment procedures and has completed several thousand environmental projects in most provinces of South Africa

since 1998. This impact assessment report is also guided by cradle-to-grave knowledge of related activities from EIA through to construction phase, Environmental Control Officer experience and site decommissioning.

### 1.3 Structure of this EMP

**Section 1** provides an introduction to the project and deals with the terms of reference for this EMP as well as identifies environmental risks and opportunities.

**Section 2** documents the environmental objectives, targets and measures for each environmental risk identified.

**Section 3** deals with the implementation of the EMP including the assignment of roles and responsibilities, visits by the ECO, documented procedures and handling of complaints related to the project.

**Appendix A** contains the Glossary.

**Appendix B** contains the generic Method Statement.

**Appendix C** contains relevant permits (outside of this NEMA application process) applicable to the proposed development.

**Appendix D** contains a detailed copy of the recommended Roles and Responsibilities of the Environmental Control Officer (ECO).

### 1.4 Development Consent Conditions

Please refer to **Appendix C**. The relevant project team members are to populate this appendix with the applicable development approvals, including but not limited to (where appropriate): working hours, hoarding, lane closures, discharge permits, etc.

### 1.5 Statutory Obligations

The applicant should incorporate the following statutory requirements as part of any contract documentation related to the construction, operation and decommissioning (if required) of the proposed development:

- The National Environmental Management Act, Act 107 of 1998, as amended (NEMA).
- National Environmental Management: Biodiversity Act, Act 10 of 2004, as amended.
- National Water Act, Act 36 of 1998, as amended.
- National Heritage Resources Act, Act 25 of 1999, as amended.
- National Environmental Management Waste Act, Act 59 of 2008.
- All relevant by laws of the Local Municipality.
- Relevant SANS codes.

- National Building Regulations and Building Standards Act, 1977 (Act no. 107 of 1977).
- Any other relevant guidelines, permit requirements and/or legislation.

### **1.6 Contract Obligations**

It is understood that all contract documentation related to the proposed activity will include the conditions of this EMP. It is important to note that the contract obligations must include the recording of any complaints on the project in the environmental register (defined below). Further, it is incumbent on the ECO to keep an accurate audit trail showing compliance with the EMP during the construction phase.

## 1.7 Environmental Risks

The following environmental risks have been identified based on the available information:

POTENTIAL IMPACT	EMP REFERENCE
<b>PRE –CONSTRUCTION PHASE</b>	
Bulk Services Identification.	Refer to Section 2.1.1
Permits.	Refer to Section 2.1.2
Training.	Refer to Section 2.1.3
Site Layout.	Refer to Section 2.1.4
Site Boundaries.	Refer to Section 2.1.5
“No-Go” Areas.	Refer to Section 2.1.6
Working Hours.	Refer to Section 2.1.7
<b>CONSTRUCTION PHASE</b>	
Social Considerations.	Refer to Section 2.2.1
Air Quality.	Refer to Section 2.2.2
Traffic Impacts.	Refer to Section 2.2.3
Noise and Vibration.	Refer to Section 2.2.4
Blasting/Drilling/Demolitions.	Refer to Section 2.2.5
Visual Impacts.	Refer to Section 2.2.6
Light Impacts.	Refer to Section 2.2.7
Appropriate Machinery.	Refer to Section 2.2.8
Use of Materials.	Refer to Section 2.2.9
Waste Management.	Refer to Section 2.2.10
Heritage Impacts.	Refer to Section 2.2.11
Botanical Impacts.	Refer to Section 2.2.12
Ground Water Quality.	Refer to Section 2.2.13
Storm Water Management.	Refer to Section 2.2.14
Freshwater Impacts.	Refer to Section 2.2.15
Asbestos Removal.	Refer to Section 2.2.16
Safety and First Aid.	Refer to Section 2.2.17
<b>POST-CONSTRUCTION PHASE</b>	
Final Site Clearing.	Refer to Section 2.3.1
Rehabilitation.	Refer to Section 2.3.2
<b>OPERATIONAL PHASE</b>	
Visual.	Refer to Section 2.4.1
Lighting.	Refer to Section 2.4.2
Botanical.	Refer to Section 2.4.3
Freshwater.	Refer to Section 2.4.4
<b>PRE-DECOMMISSIONING PHASE</b>	
Bulk Services Identification.	Refer to Section 2.5.1
Permits.	Refer to Section 2.5.2
Training.	Refer to Section 2.5.3
Site Layout.	Refer to Section 2.5.4
Site Boundaries.	Refer to Section 2.5.5
“No-Go” Areas.	Refer to Section 2.5.6
Working Hours.	Refer to Section 2.5.7
<b>DECOMMISSIONING PHASE</b>	
Social Considerations.	Refer to Section 2.6.1
Air Quality.	Refer to Section 2.6.2
Traffic Impacts.	Refer to Section 2.6.3

POTENTIAL IMPACT	EMP REFERENCE
Noise and Vibration.	Refer to Section 2.6.4
Blasting/Drilling/Demolitions.	Refer to Section 2.6.5
Visual Impacts.	Refer to Section 2.6.6
Light Impacts.	Refer to Section 2.6.7
Appropriate Machinery.	Refer to Section 2.6.8
Use of Materials.	Refer to Section 2.6.9
Waste Management.	Refer to Section 2.6.10
Botanical Impacts.	Refer to Section 2.6.11
Ground Water Quality.	Refer to Section 2.6.12
Storm Water Management.	Refer to Section 2.6.13
Freshwater Impacts.	Refer to Section 2.6.14
Safety and First Aid.	Refer to Section 2.6.15
POST-DECOMMISSIONING PHASE	
Final Site Clearing.	Refer to Section 2.7.1
Rehabilitation.	Refer to Section 2.7.2

## 1.8 Environmental Opportunities

It would be the responsibility of the applicant to implement the principles below to minimise environmental risks and maximise environmental opportunities as defined above.

Sustainable development can be summarised by an extract from the United Nations World Commission on Environment and Development and reads as follows:

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs... As such it requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all could reasonably aspire."* (Our Common Future, WCED, 1987)<sup>1</sup>.

The NEMA Principles state that sustainable development requires the consideration of all relevant factors including the following:

- *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- *that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
- *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
- *that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*

- *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
- *That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*

In this regard, **sustainable alternatives for each aspect of the proposed development** that are technologically and environmentally superior to “standard” alternatives should be promoted at all times which will assist in meeting compliance with the above Principles. All recommendations relating to the above and as contained in this EMP should therefore be implemented. These recommendations have been made by the various specialists consulted during the course of the EIA process, as well as by the EAP based on specialist knowledge of general environmental management during the course of construction, operation and decommissioning phase activities.

## 2 ENVIRONMENTAL OBJECTIVES, TARGETS AND MEASURES

### 2.1 PRE-CONSTRUCTION PHASE IMPACTS

#### 2.1.1 Bulk Services Identification

Objectives: To minimise any possible damage to existing bulk services as a result of pre-construction and construction related activities.

Targets: To comply with any local authority by-laws regarding bulk services and to avoid additional costs and potential project delays due to damage to these services

Measures:

- The location of existing bulk services must be determined prior to the commencement of the construction phase to prevent accidental damage to these facilities.
- If any bulk services are required to be relocated and/or rerouted then the appropriate permits/approvals must be sought.

#### 2.1.2 Permits

Objectives: To ensure that the necessary permits regarding any activities related to construction activities are in place prior to construction work starting.

Targets: To ensure that the construction works can proceed without possible delays and/or legal repercussions during construction works as a result of outstanding permits and/or non-compliance with permits.

Measures:

- All required permits applicable to the construction should be approved and obtained prior to the commencement of works.
- The client shall issue a list of applicable permitting conditions together with the respective permits/authorisations to the ECO prior to the start of construction works.

#### 2.1.3 Training

Objectives: To ensure that all staff working on site are adequately trained on the requirements of this EMP and are legally compliant with relevant legislation.

Targets: To ensure that the requirements of this EMP are understood and implemented by all staff (as and when required) on site.

Measures:

- The ECO will provide for site contractor management training sessions (if required), who will in turn ensure that all staff working on site are familiar with the workings and requirements of this EMP.
- An interpreter should be provided as required.

#### 2.1.4 **Site layout**

Objectives: To designate areas on site for various types of construction related activities.

Targets: To ensure an efficient and orderly layout that promotes safe access.

Measures:

- The location of the Contractor's camp, toilet facilities and storage areas must be agreed to by the ECO, Principal Agent and Contractor prior to the commencement of work at the site. The location of the above may not be within the areas of medium botanical sensitivity or within 10 metres of the Liesbeck River.
- A sketch diagram of the above is required by the ECO.
- These areas must all be kept tidy, sanitary and in good condition throughout the project.
- Litter and waste accumulation can be a significant problem and provision of adequate waste receptacles and use of these is a requirement.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.
- Soil erosion on site must be prevented at all times, namely pre, during and post construction.

#### 2.1.5 **Site Boundaries**

Objectives: To ensure that site boundaries are agreed to by the ECO, Principal Agent and Contractor prior to the start of the site operations.

Targets: To contain construction activities to the development site/s, prevent unauthorised access (pedestrian or vehicular) and to demarcate potentially sensitive areas particularly the areas of medium botanical sensitivity and the Liesbeck River directly adjacent to the site.

Measures:

- The Contractor must fence or demarcate the site boundaries at the very start of the project.
- The minimum area for the construction activities should be demarcated and access is to be strictly restricted to ensure that members of the public are not able to gain access other than via the designated, controlled access points.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.

#### 2.1.6 **"No-Go" Areas**

Objectives: To minimise any potential impacts to the identified sensitive areas on and around the site.

Targets: To prevent possible impacts to the identified sensitive areas on and adjacent to the site.

Measures:

- Sensitive areas particularly the Liesbeck River and the areas of medium botanical sensitivity must be demarcated in conjunction with the ECO prior to any work starting on site.
- The areas of medium botanical sensitivity outside of the construction area are to be treated as No-Go areas.

- The Liesbeck River is to be treated as a No-Go area and no construction phase activities, other than the installation of the gabions which should be strictly controlled, should be allowed within 10 metres of the River.
- Should additional working space be required at a later date, this must be agreed between the Principal Agent, Contractor, and ECO.
- Method statements should be submitted and approved where risks to the “No-Go” areas may occur.
- Authorisation from the Principal Agent must only be given once the potential impacts have been assessed by the ECO.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.

#### 2.1.7 **Working Hours**

Objectives: To designate working hours for construction related activities.

Targets: To ensure that the hours of operation shall be restricted to those stipulated by the local authority.

Measures:

- The contractor shall at all times ensure that working hours are restricted to those stipulated by the local authority.
- Modifications to the above may only take place through the local authority and the ECO must be notified in writing.
- All abutting neighbours (or as required) must be notified of the proposed construction phase activities at least two weeks before they commence.

## 2.2 CONSTRUCTION PHASE IMPACTS

This phase refers to the demolition of the existing prefabricated Kirstenbosch Head Office and IT buildings and the construction of the new administration building and parking area within the developed portion of Farm CA875-RE of the Kirstenbosch National Botanical Garden. According to the project manager, Amjad Hendricks (Aurecon), the length of the construction phase is anticipated to be approximately 18 months.

### 2.2.1 Social Considerations

Objective: To minimise social impacts (e.g. nuisance factors) related to the construction of the site through effective communications with abutting neighbours.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to site construction impacts.

Measures:

- All abutting neighbours (or as required) must be notified of the proposed construction phase activities at least two weeks before they commence.
- The Contractor must record and repair any damage that the construction works may cause to neighbouring areas.
- The ECO must be notified in writing of any incidents relating to the above.

### 2.2.2 Air Quality

Objectives: To minimise potential air quality impacts during construction related activities.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to air quality.

Measures:

- Wind-blown dust and sand may generate considerable negative impacts (e.g. reduced visibility for vehicles travelling along Rhodes Drive, nuisance to neighbours/adjacent erven and additional nutrient load into the Liesbeck River).
- The use of water bowsers and wetting down of loose soil areas is recommended for any particularly sandy areas.
- Erection of shade netting screens to prevent off-site movement of dust is required.
- The use of straw stabilisation or mulching of exposed sandy areas may also be considered in consultation with the ECO.
- Covering construction materials (sand) with weighted down shade cloth or similar material;
- Regular manual sweeping of the adjacent roads.
- Water for dust suppression is to be sourced from non-potable sources as far as possible, e.g. the contractor can erect a rainwater harvesting tank on the site; and/or if there is a settlement pond on the site for excess cement mixing water runoff, the top layer of mixing water – where the fines have settled out – can be utilised for dust suppression
- Compliance with the Air Pollution Control By-law number LA 12649 dated 4 February 2003 by not creating a dust nuisance to the public.

### 2.2.3 Traffic Control

Objectives: To ensure that traffic impacts as a result of the construction related activities are minimized.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to construction traffic. To ensure that the impacts on current traffic flows in the vicinity of the site are minimised and that complaints relating to traffic associated with the site's activities are minimised.

Measures:

- The contractor must provide a competent traffic marshal for situations where heavy construction traffic may impede normal traffic flows on Rhodes Drive adjacent to the site and the main internal access road within Kirstenbosch Garden itself.
- All vehicles will be legally compliant.
- All drivers will be competent and in possession of an appropriate valid driver's license.
- All vehicles travelling on or adjacent to the site will adhere to the specified speed limits.
- The movement of all vehicles will be controlled such that they remain on designated routes.
- No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.
- Should there be any abnormal traffic loads as a consequence of the construction phase activities, the local municipality and relevant traffic authorities should be notified.

### 2.2.4 Noise and Vibration

Objectives: To minimise any potential noise impacts related to the construction operations on site.

Targets: To ensure compliance with all legal requirements, including the local authority by-laws and any other statutory requirements relating to noise impacts.

Measures:

- Prior to the commencement of work on site, all on site personnel should undergo training or have an information session regarding appropriate noise levels on site.
- Noise generation is likely to be one of the biggest impacts at the site during the construction phase. Every attempt must be made to reduce noise levels and maintain appropriate directional and intensity settings to ensure minimum nuisance by the noise source.
- The Contractor must use appropriate, modern equipment, which produces the least noise.
- Any unavoidably noisy equipment must be identified and located in an area where it has least impact.
- The use of noise shielding screens should be considered by the project team as and when required and the operation of machinery should be restricted to as and when required.
- No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on the users of the Kirstenbosch National Botanical Garden and members of the public within range.
- The Contractor shall not use sound amplification equipment on site unless for the purposes of site safety and communications and in emergency situations.
- Construction activities shall be confined to the hours stipulated by the local authority.

- The Contractor will issue ear protection for any noise activities with a noise output of 60 dB or more.
- The Contractor must notify all adjacent property owners/occupants of the proposed development and that noise impacts above 60 dB may occur as a result of the above.
- No noise generating work is to be conducted outside of approved working hours unless in consultation with the local authority and advised to the adjacent property owners/occupants prior to works taking place.

#### 2.2.5 **Drilling/Demolitions**

Objectives: To minimise impacts associated with drilling/demolition on site during construction.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to drilling and/or demolitions in a built up area and to minimise nuisance impacts.

Measures:

- The following recommendations will be implemented in addition to normal health and safety requirements as stipulated in the Occupational Health and Safety Act, Act 85 of 1993.
- These activities will only take place via a competent and appropriately qualified and legally compliant Contractor.
- The Contractor shall take all necessary precautions to prevent damage to special features and the general environment, which includes the prevention of any fly rock.
- Environmental damage caused by the above activities shall be repaired and/or rehabilitated at the Contractor's expense to the satisfaction of the ECO and Principal Agent.
- None of the above activities may be carried out on Sundays or Public Holidays without the approval of all relevant authorities.
- Careful sealing off of the site and surrounding area will be carried out to ensure that all personnel are removed from the site and its immediate surrounds.
- Adequate notification and warning of blasting activities must be provided to all adjacent and or affected parties.

#### 2.2.6 **Visual**

Objectives: To minimise the visual impact of the development on the surrounding landscape during the construction phase.

Target: To ensure the minimum visual impact on the surrounding areas.

Measures:

- Visual screening should be erected at strategic points around the proposed development site during construction phase to minimize the visual impact and any potential nuisance impacts for motorists on the adjacent Rhodes Drive.
- Management of the placement of vehicles, construction camp and materials placed on site should be implemented. Vehicles can be parked in one specific area whilst materials placed on site can be placed in neat piles in specified sections of the site prior to use.
- Measures to manage litter and dust should be in place at all times.
- Fires and burning of waste on site should not be allowed.

- Neatness and tidiness on site at all times must be implemented throughout the lifecycle of the project.
- The placement of vehicles and materials on site must be managed at all times.

### 2.2.7 **Light Pollution**

Objectives: To minimise light impacts associated with construction related activities.

Targets: To ensure that light pollution is minimised such that no complaints are received from the public.

Measures:

- All legal requirements will be complied with to ensure that impacts are minimised.
- Any lighting required by the Contractor shall be aimed at the area to be lit on site and the over spillage must be kept to a minimum.

### 2.2.8 **Appropriate Machinery**

Objectives: To minimise possible nuisance affects and environmental damage through the use of appropriate machinery during the construction works.

Targets: To ensure that impacts and damage to the environment are minimised via the responsible use of appropriate machinery on site.

Measures:

- The Contractor shall at all times carefully consider what machinery is appropriate to the task in the context of this EMP while minimising the extent of environmental impact.
- Construction machinery must be located away from identified sensitive areas, particularly the areas of medium botanical sensitivity and the Liesbeck River when parked for extended periods of time.
- A dedicated parking area must be defined with drip trays beneath any potentially leaking equipment and fuel/lubricant absorbing media (peat/moss type products) within these drip trays must be used to contain any spilled liquids.
- These materials must be replaced regularly to prevent over-saturation and potential spillage of free phase product. This material must be disposed of as hazardous waste and be collected by an approved Contractor/delivered to a suitable landfill site.
- Chain of custody documentation must be provided as proof of final end recipient.
- All spills are to be recorded in the Environmental Register, including any clean-up actions taken to remediate the spillage. Such actions are to be agreed with the ECO prior to taking place.

### 2.2.9 **Use of Materials**

Objectives: To minimise possible cumulative environmental damage through the unsustainable use of raw materials used during the construction phase.

Targets: To ensure that the use of construction materials is as far as practicably possible in accordance with the NEMA Principles for Sustainable Development.

Measures:

- The principle of “re-use and recycle” (i.e. try to use recycled construction materials) should be implemented as far as possible on site for all construction related activities.
- The provision of separate waste and recycling streams will assist in this regard.
- The Contractor shall at all times carefully consider the requirements of the NEMA Principles and take appropriate measures to implement such as far as practicably possible.

#### 2.2.10 **Waste Management**

Objectives: To minimise possible environmental damage through inappropriate waste management on site or related to the site.

Targets: To ensure that the handling of waste is in accordance with the statutory requirements of the local authority by-laws and the National Environmental Management Waste Act, Act 59 of 2008.

Measures:

##### 1) Liquid Waste:

- Liquid dispensing receptacles (e.g. lubricants, diesel, shutter oil etc.) must have drip trays beneath them/beneath the nozzle fixtures.
- A spill management protocol must be produced by the Contractor and approved by the ECO prior to works commencing on site.
- Material safety data sheets (MSDS) must be available on site where products are stored, so that in the event of an incident, the correct action can be taken.
- Depending on the types of materials stored on site, suitable product recovery materials (such as Spillsorb or Drizit products) must be readily available.
- A designated, bunded area is to be set aside for vehicle washing and maintenance (if required). Materials caught in this bunded area must be disposed of to a suitable waste site or as directed by the Principal Agent. Vehicles should ideally be washed at their storage yard as opposed to on site.
- Cement contaminated water must be fed to a container, neutralised and suitably disposed of (e.g. sent to a suitable landfill site). In the latter case, chain of custody documentation must be provided to ensure a suitable end recipient. The latter must be kept with the environmental register.
- The Contractor shall ensure that any wastewater generated during construction activities feeds to a suitable containment area such as a container or lined sedimentation pond prior to disposal. This pond or ponds must be allowed to dry out on a regular basis to allow for solid material removal. The wastewater must be disposed of in a suitable manner (possibly to the sewer system following local authority approval) and must not be directed to a storm water drain.
- No liquid waste is to be disposed of in the Liesbeck River adjacent to the site.

##### 2) Solid Waste:

- Waste must be categorised by the Contractor and disposed of in a suitable manner into separate waste streams (this includes general, hazardous and recyclable waste) only at authorised waste disposal facilities.
- The Contractor must provide an adequate number of waste receptacles for general waste at points around the construction site as well as for hazardous and recyclable waste.
- Waste is to be collected either by the Municipality or via a licensed waste disposal Contractor.

- The frequency of collections/emptying of waste receptacles will be of such a frequency that waste receptacles do not overflow.
- Particular care shall be taken with the disposal of materials that could be wind-borne or waterborne to ensure that the release of these materials is minimised (the latter is a requirement for hazardous waste).
- The use of netting covers or similar sealed containers must be implemented as and when required by the ECO.
- Areas demarcated for specific activities including food consumption must have suitable waste receptacles provided.
- Wherever possible recycling must be carried out.
- No dumping within the surrounding area, particularly within the areas of medium botanical sensitivity or the Liesbeck River area is to be permitted.
- No burning of solid waste is allowed.
- All material used by the Contractor during the construction phase shall be managed in such a way that it does not cause pollution, or that it minimises pollution. In the event of a spillage, the Contractor should have suitably trained personnel who can correctly clean up any spillage in an efficient and environmentally sound manner.

3) Hazardous Waste:

- During construction, material excavated should be screened or covered to prevent offsite movement (primarily windblown soil) and the surplus material should be removed from site to an approved disposal site.
- Storage areas that contain hazardous substances to be used during this phase must be covered and bunded with an approved impermeable liner or have some form of secondary containment.
- The Contractor shall keep MSDS on-site for all potentially hazardous materials used as well as any materials likely to be present in existing tanks and lines at the site.
- Suitably trained personnel shall be available on the site during working hours so that in the event of human exposure to any hazardous materials that the correct first aid actions are taken. This training should also include environmental spill containment procedures.
- Chain of Custody documentation must be provided for any hazardous substances disposed of as proof of end recipient and disposal at an authorised hazardous waste disposal facility.

4) Cement/concrete mixing areas:

Cement powder has a high alkalinity, which can contaminate and dramatically affect both soil and groundwater. Given the close proximity of the areas of medium botanical sensitivity and the sensitive Liesbeck River adjacent to the site, the following recommendations are made:

- Mixing areas must be defined on site and approved by the ECO.
- No mixing of cement is allowed on bare soil and a lined bund or bunded portable mixer must be used. The use of ready mix concrete must be considered.
- Cement bags must be disposed of in demarcated hazardous waste receptacles and the used bags disposed of via the hazardous substances waste stream.
- No empty or broken cement bags are to be left lying on the bare ground on site.
- Excess or spilled concrete must be disposed of to a suitable landfill site, with chain of custody documentation provided.

5) Ablution Facilities

- Chemical toilet facilities are to be supplied and managed by the Contractor. These are to be located away from the areas of medium botanical sensitivity and the Liesbeck River (ideally at least 30 metres away) in a specific area agreed to by the ECO prior to placement and to be used by all personnel.

- The ablution facilities must be regularly serviced.
- Contents may only be disposed of at an authorised facility to minimise risk of water resource pollution.
- The number of chemical/portable toilets required on site (i.e. the ratio of persons working on site to number of toilets) must be determined in conjunction with the local authority prior to works starting on site. This is typically one toilet per 15 workers.
- These toilets are to be secured by at least four separate cables or guy ropes to ensure that they are not knocked over or blown over by the wind.

#### 2.2.11 Heritage Impacts

Objectives: To minimise the impact of any damage to potential heritage remains.

Target: To ensure that any heritage remains that may potentially be uncovered during the excavations are not damaged or destroyed during the construction activities.

Measures:

- Should any heritage remains be uncovered during the demolition and construction phase, Heritage Western Cape and the South African Heritage Resources Agency should be contacted.
- The remains may not be removed from site by anyone other than a qualified archaeologist or a Heritage Western Cape representative.

#### 2.2.12 Botanical

Objectives: To minimise any potential botanical impacts arising out of improper management of the construction activities.

Targets: To ensure that the sensitive botanical areas on and beyond the site boundary are not negatively impacted during the construction phase.

Measures:

- All alien invasive vegetation (excluding the only mildly invasive stone pines *Pinus pinea* which are a feature of the area) within the study area should be felled and/or removed.
- The areas of medium botanical sensitivity should not be disturbed during construction.

#### 2.2.13 Ground Water Quality

Objectives: To minimise any potential impacts on the groundwater quality at and off site through indirect impacts.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to water quality.

Measures:

- Site staff shall not be permitted to use the Liesbeck River or any other open water body or natural water source adjacent to or within the designated construction site for the purposes of bathing, washing of clothing, or for any construction or related activities.
- Bowser water (or another source approved by the Principal Agent and ECO) should instead be used for all activities such as washing of equipment, dust suppression, concrete mixing, compaction, etc. with the latter taking place well outside the areas of

medium botanical sensitivity and the sensitive Liesbeck River and within a demarcated area approved by the ECO.

- As a general best practice guideline, the Water By-Law (PG 6378) issued by the City of Cape Town (2006) should be adhered to at all times. This documentation is available at the following website:

***[http://www.capetown.gov.za/en/Water/Documents/Water\\_By\\_Laws.pdf](http://www.capetown.gov.za/en/Water/Documents/Water_By_Laws.pdf)***

- Measures to control illegal dumping of construction waste must be implemented to prevent pollution to surface water run-off.

#### 2.2.14 **Storm water and Surface Water Quality**

Objectives: To minimise potential impacts arising out of improper management of storm water originating on site.

Targets: To ensure that storm water on site is managed according to the local authority by-laws and in accordance with any other statutory requirements and that no negative impacts occur to the storm water services around the site and the Liesbeck River.

Measures:

- Potentially contaminated runoff from the site should be prevented from directly entering the Liesbeck River.
- Construction activities should preferably be undertaken in the low rainfall months when the water quality impacts from the construction activities can be contained.
- All materials on the construction site should be properly stored and contained.
- An all-encompassing storm water management plan that does not allow for off-site migration of stormwater and/ or wash water must be implemented throughout the construction phase.
- The stormwater management plan must be compliant with the City of Cape Town's own Stormwater Management Policy (City of Cape Town, 2009) with regard to both water quality and water volumes.
- Soil erosion on site must be prevented at all times.
- Storm water must be managed in such a way that no overland flow is possible onto any area of the site which could contain potential contaminants (such as concrete mixing areas, material and hazardous storage areas from any adjacent area).
- No stormwater runoff shall be allowed into the Liesbeck River.
- If the storm water is of such a quality that suspended solids are present then detention ponds for removal of suspended solids must be considered.
- During construction, all material excavated must be protected, screened or covered to prevent off site movement (primarily windblown soil or surface runoff) and the surplus material must be re-used where possible or removed from site to a licensed local waste disposal site.
- All storm water channels around the outside of the site should be inspected regularly to ensure that they are not blocked and/or obstructed to ensure their efficient operation.
- Storm water runoff must be controlled to ensure that on-site activities do not result in off-site pollution.

#### 2.2.15 **Freshwater**

Objectives: To avoid/ minimise any potential impacts on the Liesbeck River and associated freshwater ecology downstream arising out of improper management of the construction activities.

Targets: To ensure that the Liesbeck River is not negatively impacted during the construction phase.

Measures:

- No construction activities should be undertaken within 10 metres of the outer edge of the Liesbeck River channel except when the river stabilisation work is being done.
- Danger tape should be used to demarcate no-go areas within the recommended 10 metre buffer.
- All equipment and materials storage areas should be located at a minimum distance of 10 metres from the riparian edge of the Liesbeck River.
- All rubble and other waste generated on the construction site should be removed from the site and disposed of at a recognised local waste management facility.
- The river corridor (including the recommended 10 metre buffer area) must be inspected by the site manager and cleared of all waste on a daily basis.
- The Environmental Compliance Officer (ECO) must check whether there is any waste along the river corridor during every site inspection.
- Proper management of waste materials is essential to minimize the risk of contamination.
- All environmentally hazardous materials including, but not limited to, bitumen, fuels, oils and cement slurry should be managed in such a way that they are not able to contaminate the river through direct spills or stormwater runoff.
- No bitumen, fuels, oils, cement, cement slurry, or any other environmentally hazardous materials should be stored within 10 metres of the riparian edge.
- Operators must manage and contain cement slurry, and remove and dispose of excess materials from the vicinity of the riparian corridor.
- All spills should be reported immediately and workers should be instructed to store, transport and use hazardous materials in ways that minimise the risk of spills.
- When the initial work within the Liesbeck River is undertaken (i.e. excavation of the river bed and bank), the work area should be isolated from the rest of the stream for the duration of this phase of work (e.g. using sandbags) and the isolated work area should be kept as dry as possible by pumping water out of this area.
- The sediment-laden water that is pumped from the isolated work area must not be discharged directly back into the river, but rather over land adjacent to the river where there can be some infiltration and settlement. This will reduce the sediment load in the water and the velocity at which the water enters the river.
- A temporary permeable barrier to trap sediments should be placed across the river immediately downstream of the work area (and downstream of the point at which the water that is pumped from the work area re-enters the river). This temporary barrier can be constructed using sand bags and/or gabion baskets, wrapped with geotextile fabric.
- The work that is required to be carried out in the river itself should be undertaken between the beginning of January and the end of March, during the low-flow season and when the spawning period for the Cape Galaxius fish species (spring to mid-summer) should be over.
- If any work is to be carried out in the river during spring or early summer, when Cape Galaxius are potentially spawning downstream of the site, then more stringent sediment control measures and more frequent monitoring by an ECO will be required.
- No construction material (e.g. rocks) or excavated spoil material should be stockpiled in the river channel, on the river banks or in the riparian zone of the river.
- All litter and other waste generated during installation (including wire off-cuts from the construction of the gabion baskets) should be immediately removed from the river channel and banks.
- Avoid the use of noisy machinery (as far as possible), minimize the amount of time spent working in the river, and only allow workers into the river when they need to be in there to complete specific tasks.

- The construction area and the section of the stream adjacent to and downstream of this should be inspected on a regular (at least weekly) basis by the ECO for signs of disturbance, sedimentation and pollution when the gabion installation work is being undertaken. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.
- If the ECO observes any incident while the gabions are being installed that results in a visually significant negative impact on the ecological condition of the river (or is informed of such an incident), a stop-works instruction should be issued, and the incident should be immediately reported to the Department of Water & Sanitation (DWS) (Compliance and Enforcement Unit) and to the City of Cape Town (Environmental Compliance Unit, Environmental Resource Management Department).
- Ensure that the mesh size of the baskets is small enough in relation to the size of the stones to be used in the baskets, so that stones do not wash out of the baskets and compromise the structural integrity of the stabilisation measures.
- Ensure that there is good supervision and quality control during the construction and installation of the gabion baskets.
- All recommended freshwater ecology mitigation measures for the general construction work on the site (as outlined above) should be properly implemented.

#### 2.2.16 **Asbestos Removal**

Objectives: To minimise any potential safety or health related incidents on site related to asbestos exposure.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to health and safety during asbestos removal.

Measures:

- Contractors and Principal Agent/s shall at all times comply with the relevant statutory requirements including the Occupational Health and Safety Act, Act 85 of 1993 and the Asbestos Regulations (2001).
- An employer shall, before any employee is exposed or may be exposed to asbestos dust, after consultation with the health and safety committee established for that section of the workplace, ensure that the employee is adequately and comprehensively informed and trained.
- All asbestos must be prevented from becoming air borne.
- All areas where asbestos removal work will be carried out should be sealed off and access should be restricted.
- Personal protective equipment and clothing, including single- use respirators must be worn at all times.
- Monitoring equipment must be worn to measure personal exposure to asbestos during the removal phase.

#### 2.2.17 **Safety and First Aid**

Objectives: To minimise any potential safety or health related incidents on site related to the construction phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to health and safety on a construction site.

Measures:

- Contractors and Principal Agent/s shall at all times comply with the relevant statutory requirements including the Occupational Health and Safety Act, Act 85 of 1993.
- All people working on site are responsible for their own safety on site.
- Personal protective equipment and clothing must be worn at all times on site.
- A comprehensive site specific first aid kit must be available on site at all times.
- At least one person trained in safety and first aid and familiar with the first aid equipment on site must be present on the site at all times.
- Emergency procedures including an evacuation plan must also be established prior to the start of construction operations on site and appended to this EMP.

## **2.3 POST CONSTRUCTION IMPACTS**

### **2.3.1 Final Site Clearing**

Objectives: To clear construction related materials from the site

Targets: To ensure that the site is totally clear of all construction related equipment, machinery and materials.

Measures:

- The Contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.
- All rubble and waste associated with the construction activities should be removed to an approved disposal site after the construction phase is complete.
- Burying or burning rubble or waste on the site is prohibited.
- The site is to be cleared of all litter.
- Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Principal Agent.

### **2.3.2 Rehabilitation**

Objectives: To rehabilitate any areas impacted by the construction activities.

Targets: To ensure that full rehabilitation of identified areas is effected prior to operation of the site.

Measures:

- The Contractor shall be responsible for rehabilitating (all areas disturbed during construction to the satisfaction of the Principal Agent and ECO.
- Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after construction is over.
- All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Principal Agent.

## **2.4 OPERATIONAL IMPACTS**

This phase refers to the day to day use and operation and use of the new upgraded and expanded administration building and parking areas.

### **2.4.1 Visual Impacts**

Objectives: To minimise the visual impact of the development on the surrounding landscape during the operational phase.

Target: To ensure the minimum visual impact on the surrounding areas.

Measures:

- Retention of wooded and vegetated areas around the new administration building.
- Appropriate hard and soft landscaping of the proposed parking development.

### **2.4.2 Light Pollution**

Objectives: To minimise light impacts associated with operational phase related activities.

Targets: To ensure that light pollution is minimised such that no complaints are received from the public.

Measures:

- All legal requirements will be complied with to ensure that impacts are minimised.
- No or very limited street/parking lighting should be used
- Street/parking lighting should be kept to low level lighting.
- External lighting on the administration building should be limited.

### **2.4.3 Botanical**

Objectives: To minimise any potential botanical impacts arising during the operational phase.

Targets: To ensure that the sensitive botanical areas on and beyond the site boundary are not negatively impacted during the operational phase.

Measures:

- The site and adjacent area should be monitored for alien invasive vegetation for one year after construction.

### **2.4.4 Freshwater**

Objectives: To avoid/ minimise any potential impacts on the Liesbeck River and associated freshwater ecology downstream during the operational phase of the new administration and parking areas.

Targets: To ensure that the Liesbeck River is not negatively impacted during the operational phase.

Measures:

- Ensure that the permeable paving is regularly brushed and vacuumed (at least twice a year) to ensure that it retains its permeability, and immediately replace any paving blocks that are cracked or broken.
- Include a litter trap and a sediment trap (sump) at the outlet of all stormwater drainage systems, and maintain these regularly.
- Ensure that the mesh size of the baskets is small enough in relation to the size of the stones to be used in the baskets, so that stones do not wash out of the baskets and compromise the structural integrity of the stabilisation measures.
- Conduct regular inspections and ongoing maintenance of the gabion baskets.
- Ensure that there is good supervision and quality control during the maintenance of the gabion baskets.

## **2.5 PRE-DECOMMISSIONING IMPACTS**

### **2.5.1 Bulk Services Identification**

Objectives: To minimise any possible damage to existing bulk services as a result of decommissioning related activities.

Targets: To comply with any local authority by-laws regarding bulk services and to avoid additional costs and potential project delays due to damage to these services

Measures:

- The location of existing bulk services must be determined prior to the commencement of the decommissioning phase to prevent accidental damage to these facilities.
- If any bulk services are required to be relocated and/or rerouted then the appropriate permits/approvals must be sought.

### **2.5.2 Permits**

Objectives: To ensure that the necessary permits regarding any activities related to decommissioning activities are in place prior to the decommissioning starting.

Targets: To ensure that the decommissioning works can proceed without possible delays and/or legal repercussions during decommissioning works as a result of outstanding permits and/or non-compliance with permits.

Measures:

- All required permits applicable to the decommissioning should be approved and obtained prior to the commencement of works.
- The client shall issue a list of applicable permitting conditions together with the respective permits/authorisations to the ECO prior to the start of decommissioning works.

### **2.5.3 Training**

Objectives: To ensure that all staff working on site are adequately trained on the requirements of this EMP and are legally compliant with relevant legislation.

Targets: To ensure that the requirements of this EMP are understood and implemented by all staff (as and when required) on site.

Measures:

- The ECO will provide for site contractor management training sessions (if required), who will in turn ensure that all staff working on site are familiar with the workings and requirements of this EMP.
- An interpreter should be provided as required.

### **2.5.4 Site layout**

Objectives: To designate areas on site for various types of decommissioning related activities.

Targets: To ensure an efficient and orderly layout that promotes safe access

Measures:

- The location of the Contractor's camp, toilet facilities and storage areas must be agreed to by the ECO, Principal Agent and Contractor prior to the commencement of decommissioning work at the site. The location of the above may not be within the areas of medium botanical sensitivity or within 10 metres of the Liesbeck River.
- A sketch diagram of the above is required by the ECO.
- These areas must all be kept tidy, sanitary and in good condition throughout the project.
- Litter and waste accumulation can be a significant problem and provision of adequate waste receptacles and use of these is a requirement.
- Any decommissioning activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.
- Soil erosion on site must be prevented at all times, namely pre, during and post decommissioning.

#### 2.5.5 **Site Boundaries**

Objectives: To ensure that site boundaries are agreed to by the ECO, Principal Agent and Contractor prior to the start of the site decommissioning.

Targets: To contain decommissioning activities to the development site/s, prevent unauthorised access (pedestrian or vehicular) and to demarcate potentially sensitive areas particularly the areas of medium botanical sensitivity and the Liesbeck River directly adjacent to the site.

Measures:

- The Contractor must fence or demarcate the site boundaries at the very start of the project.
- The minimum area for the decommissioning activities should be demarcated and access is to be strictly restricted to ensure that members of the public are not able to gain access other than via the designated, controlled access points.
- Any decommissioning activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.

#### 2.5.6 **“No-Go” Areas**

Objectives: To minimise any potential impacts to identified sensitive areas on and around the site.

Targets: To prevent possible impacts to any identified sensitive areas on and adjacent to the site.

Measures:

- Sensitive areas particularly areas of medium botanical sensitivity and the Liesbeck River must be demarcated in conjunction with the ECO prior to any work starting on site.
- The areas of medium botanical sensitivity outside of the decommissioning area are to be treated as No-Go areas.
- The Liesbeck River is to be treated as a No-Go area and no decommissioning phase activities should be allowed within 10 metres of the River.
- Should additional working space be required at a later date, this must be agreed between the Principal Agent, Contractor, and ECO.

- Method statements should be submitted and approved where risks to the “No-Go” areas may occur.
- Authorisation from the Principal Agent must only be given once the potential impacts have been assessed by the ECO.
- Any decommissioning phase activities taking place prior to the above will constitute a serious violation of this EMP and are liable to a fine as detailed within this EMP.

### 2.5.7 **Working Hours**

Objectives: To designate working hours for decommissioning related activities.

Targets: To ensure that the hours of operation shall be restricted to those stipulated by the local authority.

Measures:

- The contractor shall at all times ensure that working hours are restricted to those stipulated by the local authority.
- Modifications to the above may only take place through the local authority and the ECO must be notified in writing.
- All abutting neighbours (or as required) must be notified of the proposed decommissioning phase activities at least two weeks before they commence.

## 2.6 DECOMMISSIONING IMPACTS

This phase refers to the future decommissioning and demolition of the proposed Kirstenbosch administration building, the parking area and landscaped areas within the developed portion of Farm CA875-RE of the Kirstenbosch National Botanical Garden. This phase also refers to the decommissioning of the contractor camp.

**Please note:** As the Fynbos Lodge is considered to be a building of significant heritage status, it is not anticipated that this building will be decommissioned. As such, this section does not include measures for the decommissioning of the Fynbos Lodge or the bank stabilisation (gabions) within the Liesbeck River.

### 2.6.1 Social Considerations

**Objective:** To minimise social impacts (e.g. nuisance factors) related to the decommissioning of the site through effective communications with abutting neighbours.

**Targets:** To ensure compliance with the local authority by-laws and any other statutory requirements relating to site decommissioning impacts.

**Measures:**

- All abutting neighbours (or as required) must be notified of the proposed decommissioning phase activities at least two weeks before they commence.
- The Contractor must record and repair any damage that the decommissioning works may cause to neighbouring areas.
- The ECO must be notified in writing of any incidents relating to the above.

### 2.6.2 Air Quality

**Objectives:** To minimise potential air quality impacts during decommissioning related activities.

**Targets:** To ensure compliance with the local authority by-laws and any other statutory requirements relating to air quality.

**Measures:**

- Wind-blown dust and sand may generate considerable negative impacts (e.g. reduced visibility for vehicles travelling along Rhodes Drive, nuisance to neighbours/adjacent erven and additional nutrient load into the Liesbeck River).
- The use of water bowsers and wetting down of loose soil areas is recommended for any particularly sandy areas.
- Erection of shade netting screens to prevent off-site movement of dust is required.
- The use of straw stabilisation or mulching of exposed sandy areas may also be considered in consultation with the ECO.
- Regular manual sweeping of the adjacent roads.
- Water for dust suppression is to be sourced from non-potable sources as far as possible, e.g. the contractor can erect a rainwater harvesting tank on the site; and/or if there is a settlement pond on the site for excess cement mixing water runoff, the top layer of mixing water – where the fines have settled out – can be utilised for dust suppression

- Compliance with the Air Pollution Control By-law number LA 12649 dated 4 February 2003 by not creating a dust nuisance to the public.

### 2.6.3 Traffic Control

Objectives: To ensure that traffic impacts as a result of the decommissioning related activities are minimized.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to decommissioning related traffic. To ensure that the impacts on current traffic flows in the vicinity of the site are minimised and that complaints relating to traffic associated with the site's activities are minimised.

Measures:

- The contractor must provide a competent traffic marshal for situations where heavy decommissioning related traffic may impede normal traffic flows on Rhodes Drive adjacent to the site and the main internal access road within Kirstenbosch Garden itself.
- All vehicles will be legally compliant.
- All drivers will be competent and in possession of an appropriate valid driver's license.
- All vehicles travelling on or adjacent to the site will adhere to the specified speed limits.
- The movement of all vehicles will be controlled such that they remain on designated routes.
- No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.
- Should there be any abnormal traffic loads as a consequence of the decommissioning phase activities, the local municipality and relevant traffic authorities should be notified.

### 2.6.4 Noise and Vibration

Objectives: To minimise any potential noise impacts related to the decommissioning operations on site.

Targets: To ensure compliance with all legal requirements, including the local authority by-laws and any other statutory requirements relating to noise impacts.

Measures:

- Prior to the commencement of decommissioning work on site, all on site personnel should undergo training or have an information session regarding appropriate noise levels on site.
- Noise generation is likely to be one of the biggest impacts at the site during the decommissioning phase. Every attempt must be made to reduce noise levels and maintain appropriate directional and intensity settings to ensure minimum nuisance by the noise source.
- The Contractor must use appropriate, modern equipment, which produces the least noise.
- Any unavoidably noisy equipment must be identified and located in an area where it has least impact.
- The use of noise shielding screens should be considered by the project team as and when required and the operation of machinery should be restricted to as and when required.
- No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept

sufficiently low as to avoid any intrusion on the users of the Kirstenbosch National Botanical Garden and members of the public within range.

- The Contractor shall not use sound amplification equipment on site unless for the purposes of site safety and communications and in emergency situations.
- Decommissioning activities shall be confined to the hours stipulated by the local authority.
- The Contractor will issue ear protection for any noise activities with a noise output of 60 dB or more.
- The Contractor must notify all adjacent property owners/occupants of the proposed development and that noise impacts above 60 dB may occur as a result of the above.
- No noise generating work is to be conducted outside of approved working hours unless in consultation with the local authority and advised to the adjacent property owners/occupants prior to works taking place.

#### 2.6.5 **Drilling/Demolitions**

Objectives: To minimise impacts associated with drilling/demolition on site during decommissioning.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to drilling and/or demolitions in a built up area and to minimise nuisance impacts.

Measures:

- The following recommendations will be implemented in addition to normal health and safety requirements as stipulated in the Occupational Health and Safety Act, Act 85 of 1993.
- These activities will only take place via a competent and appropriately qualified and legally compliant Contractor.
- The Contractor shall take all necessary precautions to prevent damage to special features and the general environment, which includes the prevention of any fly rock.
- Environmental damage caused by the above activities shall be repaired and/or rehabilitated at the Contractor's expense to the satisfaction of the ECO and Principal Agent.
- None of the above activities may be carried out on Sundays or Public Holidays without the approval of all relevant authorities.
- Careful sealing off of the site and surrounding area will be carried out to ensure that all personnel are removed from the site and its immediate surrounds.
- Adequate notification and warning of blasting activities must be provided to all adjacent and or affected parties.

#### 2.6.6 **Visual**

Objectives: To minimise the visual impact of the development on the surrounding landscape during the decommissioning phase.

Target: To ensure the minimum visual impact on the surrounding areas.

Measures:

- Visual screening should be erected at strategic points around the proposed development site during decommissioning to minimize the visual impact and any potential nuisance impacts for motorists on the adjacent Rhodes Drive.

- Management of the placement of vehicles, Contractor camp and materials placed on site should be implemented. Vehicles can be parked in one specific area whilst materials placed on site can be placed in neat piles in specified sections of the site prior to use.
- Measures to manage litter and dust should be in place at all times.
- Fires and burning of waste on site should not be allowed.
- Neatness and tidiness on site at all times must be implemented throughout the lifecycle of the project.
- The placement of vehicles and materials on site must be managed at all times.

#### 2.6.7 **Light Pollution**

Objectives: To minimise light impacts associated with decommissioning related activities.

Targets: To ensure that light pollution is minimised such that no complaints are received from the public.

Measures:

- All legal requirements will be complied with to ensure that impacts are minimised.
- Any lighting required by the Contractor shall be aimed at the area to be lit on site and the over spillage must be kept to a minimum.

#### 2.6.8 **Appropriate Machinery**

Objectives: To minimise possible nuisance affects and environmental damage through the use of appropriate machinery during the decommissioning works.

Targets: To ensure that impacts and damage to the environment are minimised via the responsible use of appropriate machinery on site.

Measures:

- The Contractor shall at all times carefully consider what machinery is appropriate to the task in the context of this EMP while minimising the extent of environmental impact.
- Machinery must be located away from identified sensitive areas, particularly the areas of medium botanical sensitivity and the Liesbeck River when parked for extended periods of time.
- A dedicated parking area must be defined with drip trays beneath any potentially leaking equipment and fuel/lubricant absorbing media (peat/moss type products) within these drip trays must be used to contain any spilled liquids.
- These materials must be replaced regularly to prevent over-saturation and potential spillage of free phase product. This material must be disposed of as hazardous waste and be collected by an approved Contractor/delivered to a suitable landfill site.
- Chain of custody documentation must be provided as proof of final end recipient.
- All spills are to be recorded in the Environmental Register, including any clean-up actions taken to remediate the spillage. Such actions are to be agreed with the ECO prior to taking place.

#### 2.6.9 **Use of Materials**

Objectives: To minimise possible cumulative environmental damage through the unsustainable use of raw materials used during the decommissioning phase.

Targets: To ensure that the use of decommissioning related materials is as far as practicably possible in accordance with the NEMA Principles for Sustainable Development.

Measures:

- The principle of “re-use and recycle” (i.e. try to use recycled decommissioning materials) should be implemented as far as possible on site for all decommissioning related activities.
- The provision of separate waste and recycling streams will assist in this regard.
- The Contractor shall at all times carefully consider the requirements of the NEMA Principles and take appropriate measures to implement such as far as practicably possible.

#### 2.6.10 **Waste Management**

Objectives: To minimise possible environmental damage through inappropriate waste management on site or related to the site.

Targets: To ensure that the handling of waste is in accordance with the statutory requirements of the local authority by-laws and the National Environmental Management Waste Act, Act 59 of 2008.

Measures:

##### 6) Liquid Waste:

- Liquid dispensing receptacles (e.g. lubricants, diesel, shutter oil etc.) must have drip trays beneath them/beneath the nozzle fixtures.
- A spill management protocol must be produced by the Contractor and approved by the ECO prior to decommissioning works commencing on site.
- Material safety data sheets (MSDS) must be available on site where products are stored, so that in the event of an incident, the correct action can be taken.
- Depending on the types of materials stored on site, suitable product recovery materials (such as Spillsorb or Drizit products) must be readily available.
- A designated, bunded area is to be set aside for vehicle washing and maintenance (if required). Materials caught in this bunded area must be disposed of to a suitable waste site or as directed by the Principal Agent. Vehicles should ideally be washed at their storage yard as opposed to on site.
- Cement contaminated water must be fed to a container, neutralised and suitably disposed of (e.g. sent to a suitable landfill site). In the latter case, chain of custody documentation must be provided to ensure a suitable end recipient. The latter must be kept with the environmental register.
- The Contractor shall ensure that any wastewater generated during decommissioning activities feeds to a suitable containment area such as a container or lined sedimentation pond prior to disposal. This pond or ponds must be allowed to dry out on a regular basis to allow for solid material removal. The wastewater must be disposed of in a suitable manner (possibly to the sewer system following local authority approval) and must not be directed to a storm water drain.
- No liquid waste is to be disposed of in the Liesbeck River adjacent to the site.

##### 7) Solid Waste:

- Waste must be categorised by the Contractor and disposed of in a suitable manner into separate waste streams (this includes general, hazardous and recyclable waste) only at authorised waste disposal facilities.

- The Contractor must provide an adequate number of waste receptacles for general waste at points around the site as well as for hazardous and recyclable waste.
- Waste is to be collected either by the Municipality or via a licensed waste disposal Contractor.
- The frequency of collections/emptying of waste receptacles will be of such a frequency that waste receptacles do not overflow.
- Particular care shall be taken with the disposal of materials that could be wind-borne or waterborne to ensure that the release of these materials is minimised (the latter is a requirement for hazardous waste).
- The use of netting covers or similar sealed containers must be implemented as and when required by the ECO.
- Areas demarcated for specific activities including food consumption must have suitable waste receptacles provided.
- Wherever possible recycling must be carried out.
- No dumping within the surrounding area, particularly within the areas of medium botanical sensitivity and the Liesbeck River area is to be permitted.
- No burning of solid waste is allowed.
- All material used by the Contractor during the decommissioning phase shall be managed in such a way that it does not cause pollution, or that it minimises pollution. In the event of a spillage, the Contractor should have suitably trained personnel who can correctly clean up any spillage in an efficient and environmentally sound manner.

8) Hazardous Waste:

- During decommissioning activities, material excavated should be screened or covered to prevent offsite movement (primarily windblown soil) and the surplus material should be removed from site to an approved disposal site.
- Storage areas that contain hazardous substances to be used during this phase must be covered and bunded with an approved impermeable liner or have some form of secondary containment.
- The Contractor shall keep MSDS on-site for all potentially hazardous materials used as well as any materials likely to be present in existing tanks and lines at the site.
- Suitably trained personnel shall be available on the site during working hours so that in the event of human exposure to any hazardous materials that the correct first aid actions are taken. This training should also include environmental spill containment procedures.
- Chain of Custody documentation must be provided for any hazardous substances disposed of as proof of end recipient and disposal at an authorised hazardous waste disposal facility.

9) Cement/concrete mixing areas:

Cement powder has a high alkalinity, which can contaminate and dramatically affect both soil and groundwater. Given the close proximity of the areas of medium botanical sensitivity and the sensitive Liesbeck River adjacent to the site, the following recommendations are made:

- Mixing areas must be defined on site and approved by the ECO.
- No mixing of cement is allowed on bare soil and a lined bund or bunded portable mixer must be used. The use of ready mix concrete must be considered.
- Cement bags must be disposed of in demarcated hazardous waste receptacles and the used bags disposed of via the hazardous substances waste stream.
- No empty or broken cement bags are to be left lying on the bare ground on site.
- Excess or spilled concrete must be disposed of to a suitable landfill site, with chain of custody documentation provided.

#### 10) Ablution Facilities

- Chemical toilet facilities are to be supplied and managed by the Contractor. These are to be located away from the areas of medium botanical sensitivity and the sensitive Liesbeck River (ideally at least 30 metres away) in a specific area agreed to by the ECO prior to placement and to be used by all personnel.
- The ablution facilities must be regularly serviced.
- Contents may only be disposed of at an authorised facility to minimise risk of water resource pollution.
- The number of chemical/portable toilets required on site (i.e. the ratio of persons working on site to number of toilets) must be determined in conjunction with the local authority prior to works starting on site. This is typically one toilet per 15 workers.
- These toilets are to be secured by at least four separate cables or guy ropes to ensure that they are not knocked over or blown over by the wind.

#### 2.6.11 Botanical

Objectives: To minimise any potential botanical impacts arising out of improper management of the decommissioning activities.

Targets: To ensure that the sensitive botanical areas on and beyond the site boundary are not negatively impacted during the decommissioning phase.

Measures:

- All alien invasive vegetation (excluding the only mildly invasive stone pines *Pinus pinea* which are a feature of the area) within the study area should be felled and/or removed.
- The medium sensitivity areas should not be disturbed during decommissioning.

#### 2.6.12 Ground Water Quality

Objectives: To minimise any potential impacts on the groundwater quality at and off site through indirect impacts.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to water quality.

Measures:

- Site staff shall not be permitted to use the Liesbeck River or any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing, or for any decommissioning or related activities.
- Bowser water (or another source approved by the Principal Agent and ECO) should instead be used for all activities such as washing of equipment, dust suppression, concrete mixing, compaction, etc. with the latter taking place well outside the identified sensitive areas and within a demarcated area approved by the ECO.
- As a general best practice guideline, the Water By-Law (PG 6378) issued by the City of Cape Town (2006) should be adhered to at all times. This documentation is available at the following website:  
**[http://www.capetown.gov.za/en/Water/Documents/Water\\_By\\_Laws.pdf](http://www.capetown.gov.za/en/Water/Documents/Water_By_Laws.pdf)**
- Measures to control illegal dumping of decommissioning related waste must be implemented to prevent pollution to surface water run-off.

### 2.6.13 Storm water and Surface Water Quality

Objectives: To minimise potential impacts arising out of improper management of storm water originating on site.

Targets: To ensure that storm water on site is managed according to the local authority by-laws and in accordance with any other statutory requirements and that no negative impacts occur to the storm water services around the site and the Liesbeck River.

Measures:

- Potentially contaminated runoff from the site should be prevented from directly entering the Liesbeck River.
- Decommissioning activities should preferably be undertaken in the low rainfall months when the water quality impacts from the decommissioning activities can be contained.
- All materials on the site should be properly stored and contained.
- An all-encompassing storm water management plan that does not allow for off-site migration of stormwater and/ or wash water must be implemented throughout the decommissioning phase.
- The stormwater management plan must be compliant with the City of Cape Town's own Stormwater Management Policy (City of Cape Town, 2009) with regard to both water quality and water volumes.
- Soil erosion on site must be prevented at all times.
- Storm water must be managed in such a way that no overland flow is possible onto any area of the site which could contain potential contaminants (such as concrete mixing areas, material and hazardous storage areas from any adjacent area).
- No stormwater runoff shall be allowed into the Liesbeck River.
- If the storm water is of such a quality that suspended solids are present then detention ponds for removal of suspended solids must be considered.
- During decommissioning, all material excavated must be protected, screened or covered to prevent off site movement (primarily windblown soil or surface runoff) and the surplus material must be re-used where possible or removed from site to a licensed waste disposal site.
- All storm water channels around the outside of the site should be inspected regularly to ensure that they are not blocked and/or obstructed to ensure their efficient operation.
- Storm water runoff must be controlled to ensure that on-site activities do not result in off-site pollution.

### 2.6.14 Freshwater

Objectives: To avoid/ minimise any potential impacts on the Liesbeck River and associated freshwater ecology downstream arising out of improper management of the decommissioning activities.

Targets: To ensure that the Liesbeck River is not negatively impacted during the decommissioning phase.

Measures:

- No decommissioning related activities should be undertaken within 10 metres of the outer edge of the river channel.
- Danger tape should be used to demarcate no-go areas within the recommended 10 metre buffer.
- All equipment and materials storage areas should be located at a minimum distance of 10 metres from the riparian edge of the Liesbeck River.

- All rubble and other waste generated on the site should be removed from the site and disposed of at a recognised waste management facility.
- The river corridor (including the recommended 10 metre buffer area) must be inspected by the site manager and cleared of all waste on a daily basis.
- The Environmental Compliance Officer (ECO) must check whether there is any waste along the river corridor during every site inspection.
- Proper management of waste materials is essential to minimize the risk of contamination.
- All environmentally hazardous materials including, but not limited to, bitumen, fuels and oils should be managed in such a way that they are not able to contaminate the river through direct spills or stormwater runoff.
- No bitumen, fuels, oils or any other environmentally hazardous materials should be stored within 10 metres of the riparian edge.
- All spills should be reported immediately and workers should be instructed to store, transport and use hazardous materials in ways that minimise the risk of spills.

#### 2.6.15 **Safety and First Aid**

Objectives: To minimise any potential safety or health related incidents on site related to the decommissioning phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to health and safety on the site.

Measures:

- Contractors and Principal Agent/s shall at all times comply with the relevant statutory requirements including the Occupational Health and Safety Act, Act 85 of 1993.
- All people working on site are responsible for their own safety on site.
- Personal protective equipment and clothing must be worn at all times on site.
- A comprehensive site specific first aid kit must be available on site at all times.
- At least one person trained in safety and first aid and familiar with the first aid equipment on site must be present on the site at all times.
- Emergency procedures including an evacuation plan must also be established prior to the start of decommissioning operations on site and appended to this EMP.

## **2.7 POST DECOMMISSIONING IMPACTS**

### **2.7.1 Final Site Clearing**

Objectives: To clear decommissioning related materials from the site

Targets: To ensure that the site is totally clear of all decommissioning related equipment, machinery and materials.

Measures:

- The Contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.
- All rubble and waste associated with the decommissioning activities should be removed to an approved disposal site after the decommissioning phase is complete.
- Burying or burning rubble or waste on the site is prohibited.
- The site is to be cleared of all litter.
- Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Principal Agent.

### **2.7.2 Rehabilitation**

Objectives: To rehabilitate any areas impacted by the decommissioning activities.

Targets: To ensure that full rehabilitation of identified areas.

Measures:

- The Contractor shall be responsible for rehabilitating (all areas disturbed during decommissioning activities to the satisfaction of the Principal Agent and ECO.
- Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after decommissioning is over.
- All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Principal Agent.

### 3 IMPLEMENTATION OF THE EMP

#### 3.1 Roles and Responsibilities

- (a) Environmental register - an environmental register must be provided by the Principal Agent and kept on-site at all times as well as being freely accessible to all project team members. The register will provide a record of all actual environmental incidents that occur as a result of the on-site activity. This may include information related to such aspects as poor waste management, dust generation and complaints from adjacent neighbours and any other environmental incidents. It must also contain information relating to action taken/mitigation measures employed. Any party on-site may complete the register; however, it is envisaged that the Principal Agent, Contractor and ECO will be the main contributors. The Principal Agent must ensure that the Contractor implements recommendations made by the ECO within an agreed and reasonable time frame.
- (b) Environmental Control Officer (“ECO”) – the ECO must be appointed prior to commencement of operations. The ECO will advise the Principal Agent and Contractor of any environmentally related issues during each phase of the development. The role of the ECO is defined more fully in **Appendix D**.
- The responsibilities of the ECO will include *monitoring* of compliance with the EMP by the Contractor.
  - The ECO has the authority to recommend the cessation of works or any portion of the activity to the Principal Agent. This will be triggered if in his/her opinion the activity has caused or will imminently cause significant damage and/or harm to the environment or is in contravention of the relevant environmental legislation/permits/authorisations applicable to the site and/or activity/ies.
  - If the Contractor fails to show adequate consideration to the EMP or the recommendations of the ECO, then the ECO may recommend to the Principal Agent, that the Contractor’s representative or any employee/s responsible for not showing adequate consideration to the EMP are removed from the site. Alternatively, the ECO may recommend that all work on site be suspended until the matter is remedied. All costs will be carried by the Contractor.
  - Should modifications to this document be required, these must be agreed to by all parties concerned.
- (c) The Client – the client is responsible for employing the Principal Agent, Contractor and Engineer for the duration of the contract. They in turn will employ the ECO. The client will also ensure, as a signatory to the EMP, that the Principal Agent and Contractor fulfil their obligations in terms of this EMP.
- (d) The Principal Agent – the Principal Agent is appointed by the client and is responsible to the client for ensuring that the contract is carried out to completion on time, in budget and that the Contractor fulfils their obligations in terms of the EMP. The Principal Agent and ECO are expected to develop a close working relationship and to communicate frequently. The Principal Agent must be recognised as the senior authority on site and all communications and instructions between the ECO and the Contractor must occur via the Principal Agent. The Principal Agent is also responsible for deducting environmental penalties from the Contractor. The Principal Agent must ensure that the Contractor has a copy of this EMP and all approved Method Statements and that the Contractor is familiar with the relevant documentation.

- (e) The Contractor – the Contractor will adhere to the conditions of this EMP and ensure that all of its sub-Contractors, employees, suppliers, agents and so forth, for whom the Contractor is fully responsible for their actions on site, are fully aware of this EMP, its requirements and the consequences of any breach of the requirements of this EMP. The Contractor is fully responsible for *implementing* the EMP. The Contractor will ensure that works on site are conducted in an environmentally responsible manner and in accordance with the requirements of this EMP.
- (f) Council Representative – will be an appropriately qualified environmental officer of the City of Cape Town. This representative will monitor compliance of this EMP by the client through the ECO.
- (g) Problematic Issues – should problematic issues arise, as identified by the ECO, the ECO has the authority to call a special meeting with the Principal Agent to address and rectify the matter.

### **3.2 Frequency of Visits by the ECO**

- a) The frequency of visits by the ECO must be agreed with the Principal Agent, but as an initial starting point, it is recommended that the ECO as a minimum, visit the site once a week, up until the construction phase is complete or as required.
- b) The ECO should conduct on-going Basic Environmental Awareness Training sessions with the Contractor's representative prior to any work taking place. The Contractors are required to provide a facility and interpreter (if required).
- c) An initial meeting with the ECO, local authority representative, Principal Agent and Contractor must be held to familiarise each of the parties with each other, the site, the EMP and to confirm communication methods.
- d) The frequency of subsequent meetings and ECO visits must be agreed, depending on the performance of the Contractor. If required the Principal Agent may introduce some form of penalty system if compliance with the EMP proves problematic.
- e) A brief summary of the findings and any recommendations made by the ECO per visit should be emailed to all parties including the Principal Agent, Contractor and the City of Cape Town's Environmental Resource Management Department. This report should also include photographs for additional information.

### **3.3 Documented procedures**

Method Statements (a template for these purposes is appended to this EMP) will be required for activities that may result in significant impacts according to the ECO.

These must address the following aspects:

- What – a brief description of the work to be undertaken;
- How – a detailed description of the process of work, methods and materials;
- Where – a description of the location of the work (if applicable); and
- When – the sequencing of actions with commencement and completion date estimates.

All Method Statements (MS) must be in place at least 5 working days prior to the relevant activities taking place and must be approved by the ECO and Principal Agent prior to being implemented. The following MS must as a minimum be made available to address the following impacts:

- Freshwater Management;
- Botanical Management;
- Stormwater Management;
- Waste Management;
- Traffic Management; and
- “No-Go” Areas Management.

### **3.4 Handling of Complaints Related to the Project**

All forms of complaint must be forwarded to the site Principal Agent and ECO in writing. These must be entered into the environmental register and all responses and actions taken to address these must also be recorded. All issues raised must be addressed. It is important that the complainant feels that their concerns have been listened to and that appropriate action (within reason) has been taken to address these.

### **3.5 Conduct of Employees on Site**

The following restrictions will be placed on all staff operating on the site in general:

- Adherence to relevant health and safety standards and municipal by-laws;
- Use of appropriate Personal Protective Equipment (PPE) at all times;
- No alcohol or illegal substance use may occur on site;
- No illegal disposal of rubble;
- No littering of the site or surrounding areas;
- No collection of firewood;
- No interference with any fauna or flora particularly that belonging to the adjacent Liesbeck River;
- No use of toilet facilities other than the chemical toilets provided on site;
- No lighting of open fires; and
- No burning of any waste on site.

### **3.6 Matters Pertaining to Non-Conformance on Site**

“Non-conformances” would occur when there are deviations from any of the requirements of this EMP. This may also include non-compliance with the relevant environmental regulations.

The Contractor is responsible for reporting non-conformance with the EMP, to the ECO. The applicant and Contractor, in consultation with the ECO must, thereafter, undertake the following activities:

- Investigate and identify the cause of non-conformance;
- Report matters of non-conformance to the local municipality (within a suitable timeframe, dependant on the severity of the incident);
- Implement suitable corrective action as well as prevent recurrence of the problem.
- Assign responsibility for corrective and preventative action.

- Any corrective action taken to eliminate the cause/s of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

### Records

The Contractor must maintain and update the environmental register at all times regarding non-conformance issues. The record shall specifically contain and list the instances of non-conformances found in the EMP, the date of their occurrence, date of corrective action, and date of completion of preventive action. In addition, matters of non-conformance and corrective action must be included within the audit reports. Records must be legible, identifiable, protected and easily retrieved for review.

### Fine and Penalties relating to non-conformance/contraventions

The Contractor must comply with the environmental requirements of the requirements of this EMP on an on-going basis and any failure on his part to do so will entitle the ECO and Principal Agent to impose a fine subject to the details set out below. Money from fines/penalties will be managed and allocated at the discretion of the Principal Agent.

#### *1) Spot fines*

Spot fines will be issued per incident in addition to any remedial costs incurred as a result of non-conformance with the EMP, at the discretion of the Principal Agent and ECO. The ECO may *recommend* the imposition of fines and penalties but the Principal Agent will be responsible for imposing such fines or penalties against the account of the Contractor. Fines may be imposed on the Contractor for contraventions of the EMP by individuals or operators employed by the Contractor and/or any sub-Contractors. The Principal Agent will inform the Contractor of the EMP contravention and the amount of the fine. These monies will be recovered by the Principal Agent from the Contractor.

Failure by the Contractor to pay fines imposed by the Principal Agent within 14 days of the fine being imposed may result in a "Stop Works" order being issued by the Principal Agent until the matter is resolved. Any costs incurred as a result of the "Stop Works" order will be for the account of the Contractor.

The following spot fines are recommended for contraventions (plus any rehabilitation costs if applicable):

- a. Any individual/s littering on site: R50 on first offence and R250 on further offences.
- b. Any individual/s burning waste on site: R250 on first offence and R1 000 on further offences.
- c. Any individual/s dumping waste on site: R250 on first offence and R1 000 on further offences.
- d. Any violation of a Method Statement: R250 for first offence and R1 500 on further offences.
- e. Any individual causing avoidable disturbance to fauna and flora on site: R250 on first offence and R1 000 on further offences.

## 2) *Penalty fines*

Penalty fines will be implemented where the Contractor repeatedly fails to comply with the specifications of this EMP the Contractor will be liable to pay a penalty fine over and above any other contractual consequence.

The following penalty fines (per repeat offence) are recommended for transgressions:

- a. On-going littering on site: R2 500 plus any rehabilitation costs, if applicable.
- b. On-going dumping of any waste on site: R10 000 plus any rehabilitation costs, if applicable.
- c. On-going burning of any waste on site: R10 000 plus any rehabilitation costs, if applicable.
- d. On-going transgression of a Method Statement: R10 000 plus any rehabilitation costs, if applicable.
- e. On-going disturbance to Fauna and Flora on site: R5 000 plus any rehabilitation costs, if applicable.

## 3) *Other fines*

- a. Any individual/s causing damage to identified sensitive natural areas: R5 000 plus any rehabilitation costs.
- b. Any individual/s causing damage to identified sensitive heritage areas: R5 000 plus any rehabilitation costs.
- c. Any individual/s causing irreparable damage to the environment: R10 000.
- d. Injuring or killing of any wildlife: R5 000 plus any rehabilitation costs, if applicable.

The above recommended fines are applicable and relevant to the construction and decommissioning phase of this EMP and as such do not exempt the client from other legal obligations such as *Section 24(h)* National Environmental Management Second Amendment Act, Act No. 107 of 1998, which states that it is “*an offence for any person to contravene conditions applicable to any environmental authorization granted for a listed activity. A person convicted of an offence is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding ten years, or to both such fine and such imprisonment*”

## 4) *Donation of fines*

The funds collected by the Principal Agent through fining should be donated to a local, environmentally orientated organization or charity of the Principal Agent's choice. Proof of deposit of these funds must accompany the ECO closure report once the construction phase has been completed.

An Environmental Management Plan constitutes a *Condition* applicable to an *Environmental Authorisation* and any transgression would thus trigger *Section 24(h)* of the above-mentioned Act. The exact penalty and fines will be decided on, subsequent to consultation with DEA and the local municipality. All staff working on-site must be made aware of the penalties and fines associated with non-conformance. The Principal Agent will be responsible for ensuring that the penalty system is maintained and enforced. Should disputes arise between the client,

Engineer, Contractor or ECO with respect to the above then the matter will be referred to arbitration.

A handwritten signature in black ink that reads "A. J. Sillito". The letters are cursive and somewhat stylized.

**A J SILLITO**  
*Pr. Sci. Nat., CEAPSA*

***EMP APPENDIX A  
GLOSSARY***

## TERMS USED IN THIS EMP

The term '**client**' means the owner of the asset to be procured or project product, and representative of the end users of the asset.

The term '**construction**' means all organised activities concerned with demolition, building, landscaping, maintenance, civil engineering, process engineering, heavy engineering and mining.

The term '**consultant**' means a professional person or organisation that contracts with a customer to provide design, management or other services.

The term '**contractor**' means an organisation that contracts with a Principal to carry out the work under the contract, including construction and related services, to deliver an asset or construction product.

The term '**decommission**' means to take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.

The term '**design**' means the process (and product) of converting a brief into design details ready for documentation, including concept design and design development, and then documentation or detailing of the technical and other requirements for the project in a written form that details the project product sufficiently for it to be constructed or otherwise provided.

The term '**environmental opportunity**' means a potential for beneficial environmental impacts (such as an improvement in air or water quality through environmentally friendly technology alternatives).

The term '**environmental risk**' means a potential for adverse environmental impacts (such as pollution of a water source during construction activities).

The term '**management**' means the planning and interactive controlling of human and material resources to achieve time, cost, quality, performance, functional and scope requirements. It involves the anticipation of changes due to changing circumstances and the making of other changes to minimise adverse effects.

The term '**procurement**' means the collection of activities performed by and for an agency to acquire services and products, including assets, beginning with the identification/detailing of service requirements and concluding with the acceptance (and where applicable, disposal) of the services and products.

The term '**project**' means an undertaking with a defined beginning and objective by which completion is identified. Project delivery may be completed using one contract or a number of contracts.

The term '**service provider**' means a contractor, subcontractor, supplier, consultant (including an agency) and sub-consultant (contracting with a consultant), and their service providers, that contract with a customer to carrying out assets construction, provide other products (including goods) and/or provide services.

The term '**subcontractor**' means an organisation that contracts with a contractor as the customer to carry out construction and related services, and/or provide other products.

The term '**supplier**' means an organisation that contracts with a contractor/Principal to supply a product and/or service.

***EMP APPENDIX B  
GENERIC METHOD STATEMENT***

# METHOD STATEMENT FOR THE:

.....  
This method statement is to be completed by the Contractor (in consultation with the Principal Agent and ECO) at least 5 working days prior to the proposed commencement date of the said work and represents a binding agreement to the Method Statement by all site Contractors and sub-Contractors involved in the work for which the Method Statement is submitted.

**DATE OF SUBMISSION:**.....

**LEAD CONTRACTOR:**.....

**OTHER CONTRACTORS AND/OR SUB-CONTRACTORS:**.....

A) Describe in detail **what** work is to be undertaken?

b) Describe in detail **where** on the site the works are to be undertaken and the **extent**? Provide sketch plan and grid block reference.



Camp site demarcation:
Toilet facilities:
Litter:
Security:
Plant/machinery (operation, servicing, management, storage, refuelling etc.):
Emergencies and fire:
Hazardous materials (handling, management, storage etc.):
Have all personnel involved been through an environmental induction course?
Petrochemical spill remediation and containment measures:
Other:

DECLARATIONS BY PARTIES

1) CONTRACTOR

I UNDERSTAND THE CONTENTS OF THE METHOD STATEMENT AND THE SCOPE OF THE WORKS REQUIRED OF ME. I FURTHER UNDERSTAND THAT THE METHOD STATEMENT MAY BE AMENDED ON APPLICATION TO THE ABOVE SIGNATORIES, AND THAT THE ENVIRONMENTAL CONTROL OFFICER WILL AUDIT MY COMPLIANCE WITH THE CONTENTS OF THIS METHOD STATEMENT.

\_\_\_\_\_ (PRINT NAME)  
\_\_\_\_\_ (SIGNED) DATED: \_\_\_\_\_

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

THE WORK DESCRIBED IN THIS METHOD STATEMENT, IF CARRIED OUT ACCORDING TO THE METHODOLOGY DESCRIBED, IS SATISFACTORILY MITIGATED TO PREVENT AVOIDABLE ENVIRONMENTAL HARM.

\_\_\_\_\_ (PRINT NAME)  
\_\_\_\_\_ (SIGNED) DATED: \_\_\_\_\_

3) PRINCIPAL AGENT

THE WORK DESCRIBED IN THIS METHOD STATEMENT, IF CARRIED OUT ACCORDING TO THE METHODOLOGY DESCRIBED, IS SATISFACTORILY MITIGATED TO PREVENT AVOIDABLE ENVIRONMENTAL HARM.

\_\_\_\_\_ (PRINT NAME)  
\_\_\_\_\_ (SIGNED) DATED: \_\_\_\_\_

***EMP APPENDIX C  
RELEVANT PERMITS  
(to be provided by the contractor)***

***EMP APPENDIX D  
ROLE OF THE ECO***

### **DUTIES OF THE ECO**

1. The identification of potential environmental impacts, prior to the onset of the project.
2. Ensuring that the EMP conditions are adhered to at all times and taking action (via the engineer) where the specifications are not being followed.
3. Ensuring that environmental impacts are kept to a minimum.
4. Reviewing and approving method statements in consultation with the Principal Agent.
5. Advising the engineer and contractor on environmental issues and assisting in developing environmentally responsible solutions to problems.
6. Reporting to the client and Principal Agent on a regular basis and advising of any environmental impacts.
7. Attending site meetings (when necessary) and giving a report back on the environmental issues at these meetings and other meetings that may be called regarding environmental matters.
8. Inspecting the site and surrounding areas regularly.
9. Establishing and monitoring an on-going environmental awareness program in conjunction with the contractor.
10. Requesting the removal of person(s) and/or equipment not complying with the specifications.
11. Keeping both a written and photographic record of progress on site from an environmental perspective, and an ad hoc record of all incidents or events on site with environmental ramifications. These records should be dated and accurately catalogued.
12. Undertaking continual internal review of the EMP and submitting a report at the end of the project.
13. The ECO will submit all written instructions and verbal requests to the contractor via the engineer.