# RECREATIONAL AND TOURIST DEVELOPMENT
# GANSPAN-PAN WETLAND RESERVE
# PHOKWANE LOCAL MUNICIPALITY
# NORTHERN CAPE PROVINCE

## ENVIRONMENTAL MANAGEMENT PROGRAMME

**DRAFT**

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# LIST OF ACRONYMS

| ACRONYM | MEANING |
|---|---|
| **AIS** | Alien and Invasive Species |
| **CARA** | Conservation of Agricultural Resources Act |
| **CITES** | Convention of International Trade in Endangered Species |
| **DAFF** | Department of Agriculture, Forestry and Fisheries |
| **DENC** | The Northern Cape Department of Environment and Nature Conservation |
| **DWS** | Department of Water and Sanitation |
| **EA** | Environmental Authorisation |
| **EAP** | Environmental Assessment Practitioner |
| **ECO** | Environmental Control Officer |
| **EIA** | Environmental Impact Assessment |
| **EIR** | Environmental Impact Report |
| **EMPr** | Environmental Management Programme |
| **EMS** | Environmental Management System |
| **EPWP** | Expanded Public Works Programme |
| **ESO** | Environmental Site Officer |
| **FBDM** | Frances Baard District Municipality |
| **GN** | Government Notice |
| **I&AP** | Interested and/or Affected Party |
| **IDP** | Integrated Development Plan |
| **KPIs** | Key Performance Indicators |
| **LSA** | Later Stone Age |
| **MS** | Middle Stone Age |
| **MSDS** | Material Safety Data Sheets |
| **NEMA** | National Environmental Management Act |
| **NEMBA** | National Environmental Management: Biodiversity Act |
| **NLC** | National Landcover |
| **PNCO** | Provincial Nature Conservation Ordinance |
| **SABS** | South African Bureau of Standards |
| **SAHRA** | South African Heritage Resources Agency |
| **SHE** | Safety, Health, and Environment |
| **SSC** | Species of Special Concern |
| **SDF** | Spatial Development Framework |
| **WULA** | Water Use Licence Application |

The contents of the EMPr, as it is defined the 2014 Environmental Impact Assessment (EIA) Regulations (as amended) published as Government Notice (GN) No R. 326 of 7 April 2017 in terms of Chapter 5 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended), must be consistent with requirements included in Appendix 4 of the Regulations.

| EMPr REQUIREMENTS ACCORDING TO APPENDIX 4 OF GNR 982 OF 2014, AS AMENDED IN GNR 326 OF 2017 | | SECTION OF REPORT |
|---|---|---|
| 1 | An EMPr must comply with section 24N of the Act and include-<br>a. Details of:<br>• the EAP who prepared the EMPr; and | Section 3.7 |
| | • the expertise of that EAP to prepare an EMPr, including a curriculum vitae. | Annexure 3 |
| | b. a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description; | Chapter 3 |
| | c. a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers; | Annexure 4 |
| | d. a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- | Chapter 4 |
| | • Planning and design | |
| | • Pre-construction activities | |
| | • Construction activities | |
| | • rehabilitation of the environment after construction and where applicable post closure; and | |
| | • where relevant, operational activities; | |
| | f. description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to - | Section 3.4 – Section 3.6, Chapter 4 and Chapter 5 |
| | • avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; | |
| | • comply with any prescribed environmental management standards or practices; | |
| | • comply with any applicable provisions of the Act regarding closure, where applicable; and | |
| | • comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable; | |
| | g. the method of monitoring the implementation of the impact management actions contemplated in paragraph (f); | Chapter 8 |
| | h. the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f); | |
| | i. an indication of the persons who will be responsible for the implementation of the impact management actions; | |
| | j. the time periods within which the impact management actions contemplated in paragraph (f) must be implemented; | Table 8.1 |
| | k. the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f); | |
| | l. a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations; | |
| | m. an environmental awareness plan describing the manner in which- | Annexures 1 and 2 |
| | • the applicant intends to inform his or her employees of any environmental risk which may result from their work; and | |
| | • risks must be dealt with in order to avoid pollution or the degradation of the environment. | |
| | n. any specific information that may be required by the competent authority. | No specific information has been requested from the DENC to date. |

# 1. INTRODUCTION

An Environmental Management Programme (EMPr) must consist of a set of mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The programme also includes the actions needed to implement these measures.

## 1.1. Environmental Management Programme (EMPr)

An EMPr is defined as, "*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced*". EMPrs are therefore an important tool in the sound environmental management of projects, provided the specifications are implemented and the user understands the reasons and need for their implementation. This EMPr has the following objectives:

- To highlight the requirements of all applicable legislation, policies and guidelines;
- To set out the mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the significance of the anticipated environmental impacts;
- To provide guidance regarding the necessary method statements which are to be developed by the construction contractor to meet the environmental specifications presented in this report (refer to Annexure 1 for an example of the method statement);
- To define the corrective action approach to be adopted in the event of non-compliance with the environmental specifications contained in this report; and
- To prevent long-term or permanent environmental degradation of the project site and surrounds.

There are essentially four broad categories of EMPrs: Design Phase, Construction Phase, Operational Phase and Decommissioning Phase. The objectives of these EMPrs are all the same in that they need to identify potential environmental risks and impacts of the proposed project, and develop measures to minimise, mitigate and manage the negative impacts while enhancing the beneficial ones. The difference between these EMPrs lies in the different mitigation measures required for the different stages of the project life cycle. The first three phases are discussed in more detail below.

## 1.2. Design Phase EMPr

The Design Phase EMPr is an integral component of the project life cycle and requires interaction between the design engineers and environmental consultants to ensure that the engineers are aware of the environmental constraints that must be considered and incorporated into the final design of the project. The format of this design EMPr is checklist in nature to ensure that all specifications are included in the design phase. The design EMPr phase requires ongoing and in-depth discussions between the final design team and the Environmental Control Officer (ECO). The engineer will have to cost for, and be available for, ongoing discussions with the environmental officer at all stages of final design. The majority of the work is undertaken at a desktop level and thus impacts are negligible and will not be discussed in further detail.

## 1.3. Construction Phase EMPr

The Construction Phase EMPr details the environmental management system/framework within which construction activities will be governed for the Construction Phase. The Construction EMPr consists of various actions, initiatives and systems that the contractor will have to ensure are in place and are undertaken. The Construction EMPr consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the appointed contractor. The Construction EMPr will need to be developed in parallel

with the Final Design Stages, and constructive input should be invited from the selected contractor. Sound environmental management is orientated around a pragmatic, unambiguous but enforceable set of guidelines and specifications, and for this reason it is imperative that the contractor, while being bound by the EMPr, fully understands it and has had input into its final development. For this reason, the final Construction EMPr will need to be signed off after input from the selected contractor prior to the initiation of construction activities.

## 1.4. Operational Phase EMPr

The Operational Phase EMPr provides specific guidance related to operational activities associated with a particular development. Operational EMPrs are sometimes referred to as Environmental Management Systems (EMS). Impacts during the operational phase of a development of this nature will be few in number and low in intensity. By taking pro-active measures during the construction phase, potential environmental impacts emanating during the operational phase will be minimised. Monitoring of certain issues such as the success of vegetation re-establishment and erosion control will be required to continue during operation. The final Operational Phase EMPr should be developed in conjunction with any other relevant stakeholders prior to the adoption thereof.

# 2. DEFINITIONS

For the purposes of this EMPr, the following definitions and abbreviations shall apply:

**Alien Vegetation:** Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable. This includes plant species identified as Alien and invasive species in the National environmental Management Biodiversity Act of 2004, Alien and Invasive Species Regulations, 2014.

**Cement laden water:** Means water containing cement or concrete arising from the contractor's activities.

**Contaminated water:** Means water contaminated by the contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

**Construction Camp:** Construction camp (site camps) refers to all storage and stockpile sites, site offices, container sites, workshops and testing facilities and other areas required undertaking construction activities.

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

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

**Environmental Aspect:** An environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment and pose a potential risk thereto.

**Environmental Authorisation (EA):** A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to construct the proposed infrastructure and the mitigating measures required to prevent or reduce the effects of environmental impacts during the project's lifespan.

**Environmental Control Officer (ECO):** A suitably qualified and experienced person or entity appointed for the construction works, to perform the obligations specified in the EA.

**Environmental Site Officer (ESO):** An ESO is the site-based designated person responsible for implementing the environmental provisions of the construction contract and is appointed by the service provider that carries-out construction activities.

**Environmental Impact:** An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

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

**Environmental Management Programme (EMPr):** An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.

**Environmental Management System (EMS):** A system enables companies, organizations and operations to systematically manage, prevent and reduce their environmental impacts (or footprint) and associated costs. In terms of ISO 14001 an EMS is defined as, "*that part of the overall management system includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.*"

**Environmental Policy:** A statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.

**External Auditor**: A suitably qualified and experienced independent environmental auditor.

**His:** Means his or her, as applicable.

**Interested and Affected Party (I&AP):** Refers to an I&AP party contemplated in section 24(4)(d) of the National Environmental Management Act - NEMA (1998, Act No. 107) and which, in terms of that section, includes –

a) *Any person, groups of persons, organisation interested in or affected by an activity, and;*
b) *Any organ of state that may have jurisdiction over any aspect of the activity.*

**Method Statement:** Is a written submission by the construction contractor to the ECO in response to the EMPr specifications, or to any request by the ECO, setting out the methods the contractor proposes using to carry out an activity. The Method Statement shall be in such detail that the ECO is able to assess whether the contractor's proposal is in accordance with the EMPr specifications.

**Mitigate:** The implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts of a particular action.

**No-Go Area:** Areas where construction activities are prohibited.

**Pollution:** According to the NEMA (Act No. 107 of 1998), pollution can be defined as, "*Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future*".

**Potentially hazardous substance:** Is a substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.

**Reasonable:** Means, unless the context indicates otherwise, reasonable in the opinion of the ECO, after he has consulted with relevant parties.

**Rehabilitation**: To re-establish or restore to a healthy, sustainable capacity or state.

**Silt laden water:** Means water containing sand and silt arising from the contractor's activities and/or as a result of natural run-off.

**Site:** The area in which construction is taking place.

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

**Species of Special Concern (SSC):** Species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild, Regionally Extinct, Near Threatened, Critically Rare, Rare and Declining.

**Threatened species:** Threatened species are defined as: a) species listed in the endangered or vulnerable categories in the revised South African Red Data Books or listed in the globally threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).

**Topsoil:** The top 100 mm of soil and may include top material e.g. vegetation and leaf litter.

# 3. BACKGROUND INFORMATION

## 3.1. Introduction

The Frances Baard District Municipality (FBDM) has proposed the development of a recreational and tourist area at the Ganspan-Pan Wetland Reserve (formerly the Ganspan Waterfowl Nature Reserve) situated on Holding 476 of Vaalharts Settlement B, located approximately 6.5 kilometres (km) west of Jan Kempdorp, within the Northern Cape Province. The proposed development is situated approximately 90 km north of Kimberley, located within the Phokwane Local Municipality, seated within the FBDM (Figure 3.1).

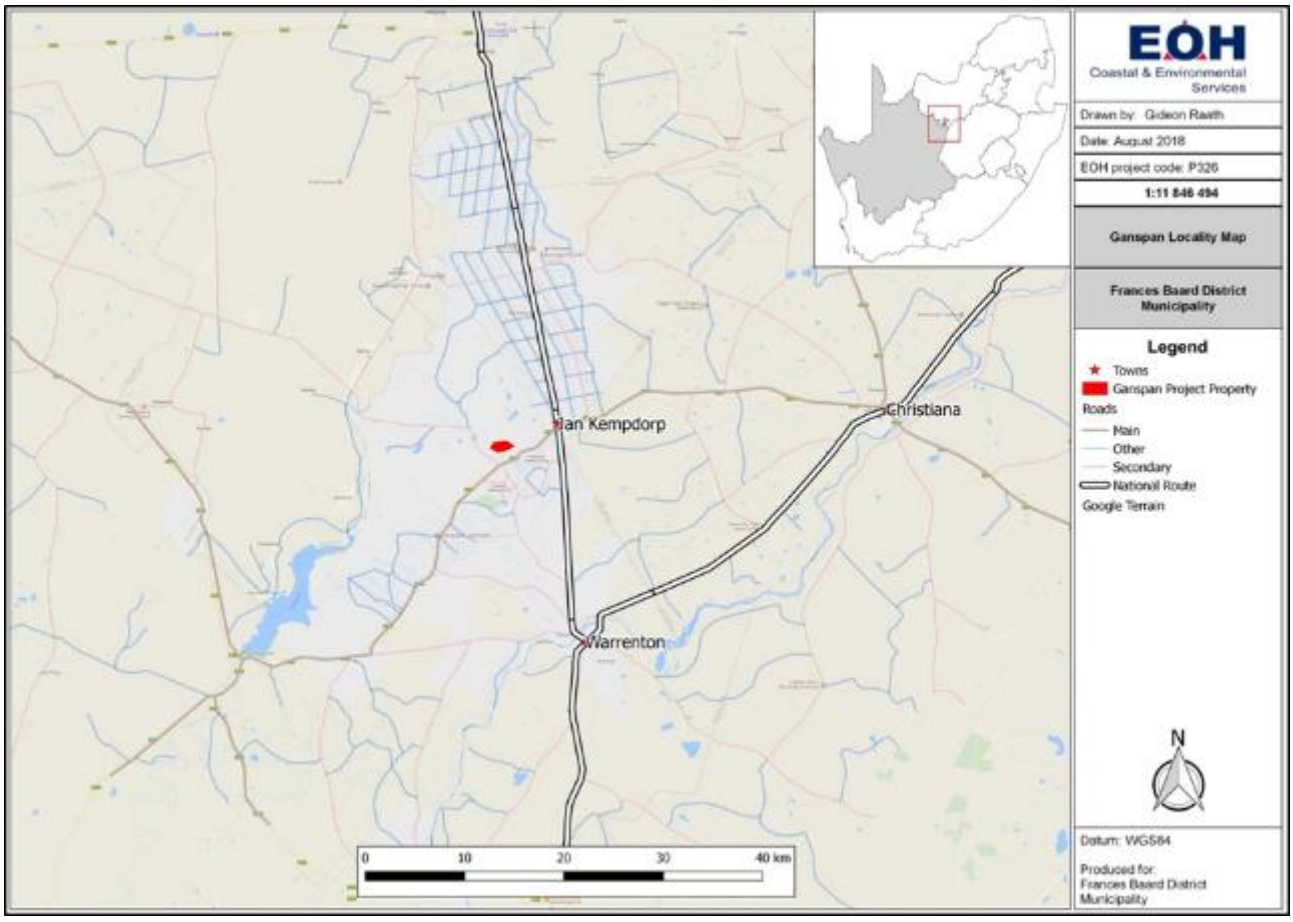


**Figure 3.1: Proposed Location for the Ganspan-Pan Wetland Reserve Upgrade.**

The project involves the development and upgrading of infrastructure in the Ganspan-Pan Wetland Reserve to restore the area as a safe, attractive and sustainable tourism attraction. The project will include the following activities:

- The development, upgrading and the restoration of viable tourism and recreational facilities such as:
  - Fishing;
  - Camping facilities;
  - Bird-viewing;
  - Braai and picnic spots;
  - Hiking and biking trails;
  - Children's playground;
  - Restaurant;
  - Self-catering chalets;
  - Jetties for boat launch sites;
  - Informal market area; and

- Multipurpose centre.
- Upgrading and development of access roads, security gates, parking and reception.

EOH Coastal & Environmental Services (EOH CES) were appointed by the FBDM to conduct the EIA process.

## 3.2. Project Location

The proposed development is situated approximately 90 km north of Kimberley, located within the Phokwane Local Municipality, seated within the FBDM of the Northern Cape Province (Figure 3.2). The proposed Ganspan-Pan Wetland Reserve is located within one property holding (Table 3.1). The National Landcover map of South Africa (NLC, 2014) classifies areas within the property as 'wetland', 'bare - none vegetated', 'low shrubland', 'grassland', 'water seasonal', 'woodland/open bush' and 'thicket/dense bush'. The majority of the property is permanent water and seasonal wetland areas.

**Table 3.1: Property Holdings Associated with the Proposed Development.**

| Property Name and Number | 21-digit SG Code | Ward | Municipality/ Province | Farm size (ha) |
|---|---|---|---|---|
| Holding 476 of Vaalharts Settlement B | C00700070000047600000 | 10 | Phokwane Local Municipality | 183.3294 |

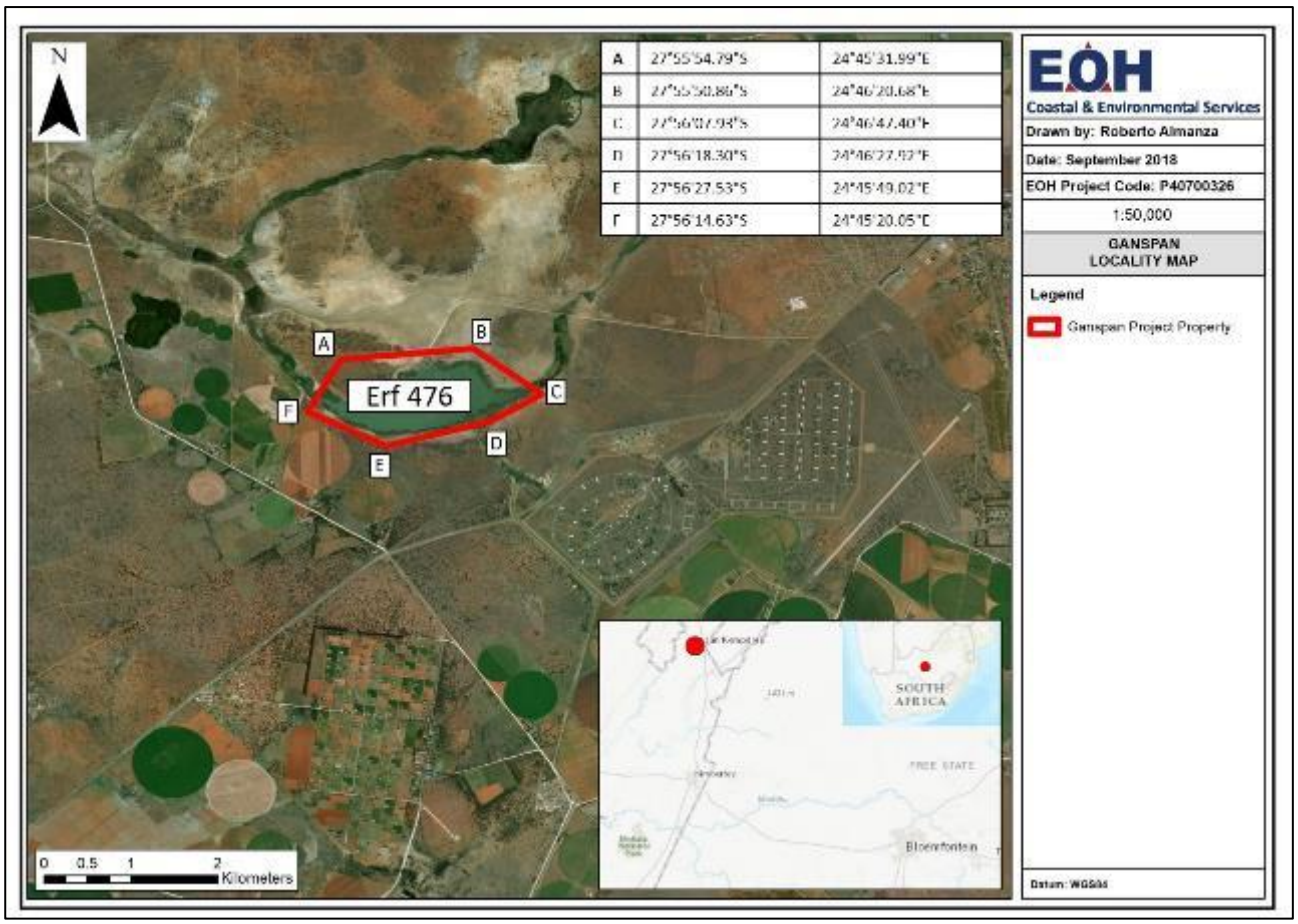


**Figure 3.2: Locality map of the proposed project property.**

## 3.3. Project Description and Scope

The purpose of the proposed Ganspan-Pan Wetland Reserve Upgrade is to develop a tourism destination that takes into consideration the social, economic and environmental aspects of the area and results in an accommodation and recreational area for local and foreign tourists. A framework design for the proposed development was initially established to define various land use precincts within the property (Figure 3.3a). The largest property precincts that will be developed within the property are the full title housing units, the village and amenities area and the chalets. The proposed project will also include the following general components (Figures 3.3b and 3.3c):

- Accommodation:
  - Self-catering chalets
  - Camping facilities
  - Reception
- Recreational facilities:
  - Restaurant
  - Multipurpose centre
  - Informal market area
  - Children's playground
  - Braai and picnic spots
  - Hiking and biking trails
  - Jetties for boat launches
  - Bird hides
- Supporting infrastructure:
  - Bulk infrastructure (e.g. water, sewerage, electricity etc.)
  - Upgrading and development of access roads
  - Security gates
  - Fencing
  - Parking

A more detailed design of the proposed upgrade has been developed based on the abovementioned concept together with various refinements and revisions that have been made following workshops held with various stakeholders. Please refer to the Environmental Impact Report (EIR) for additional information regarding the detailed project description.

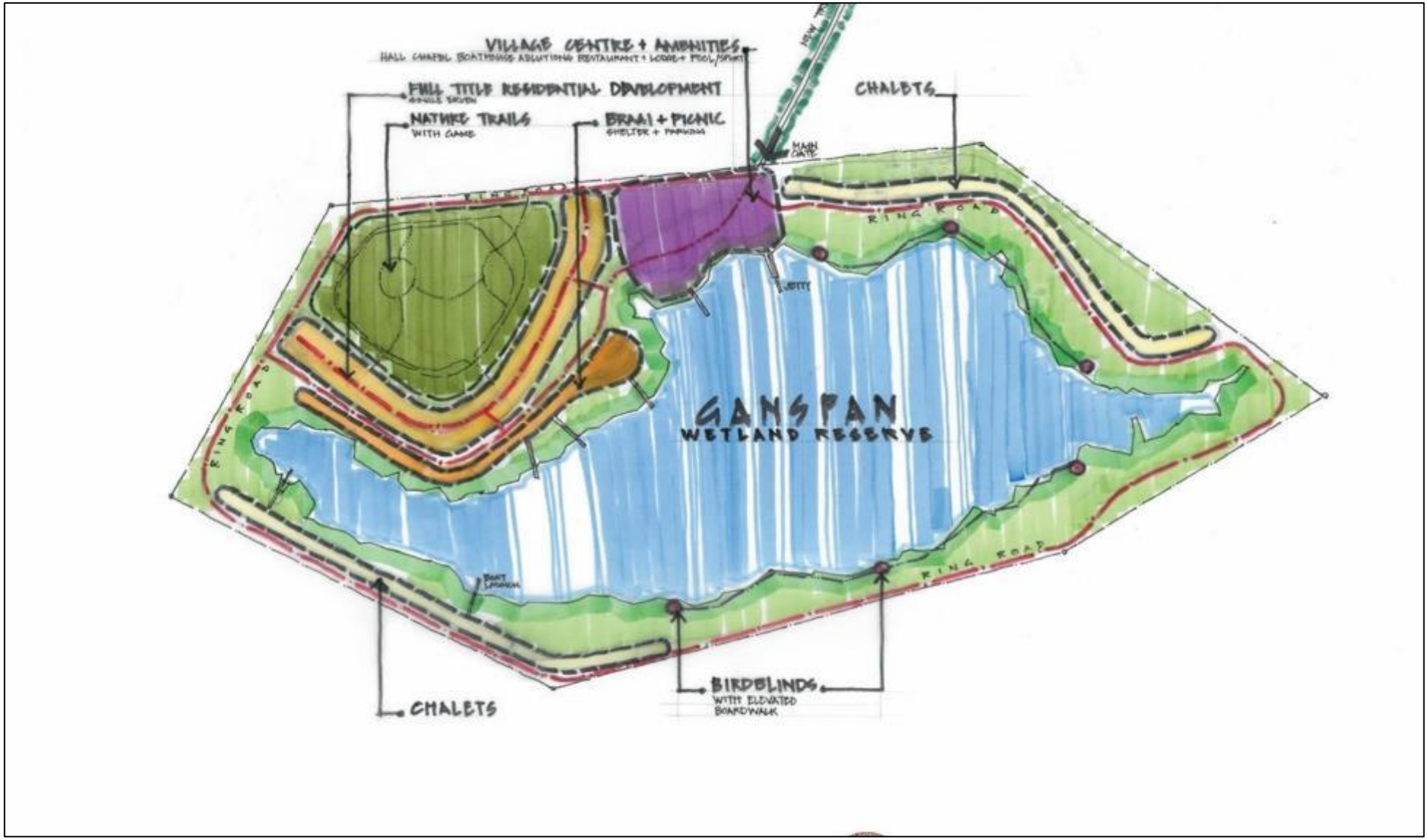


**Figure 3.3a: Conceptual design framework defining the land use precincts for the proposed development (from Urban-Econ, 2015).**


**Figure 3.3b: Conceptual design number 12 of the proposed development (from Urban-Econ, 2015).**

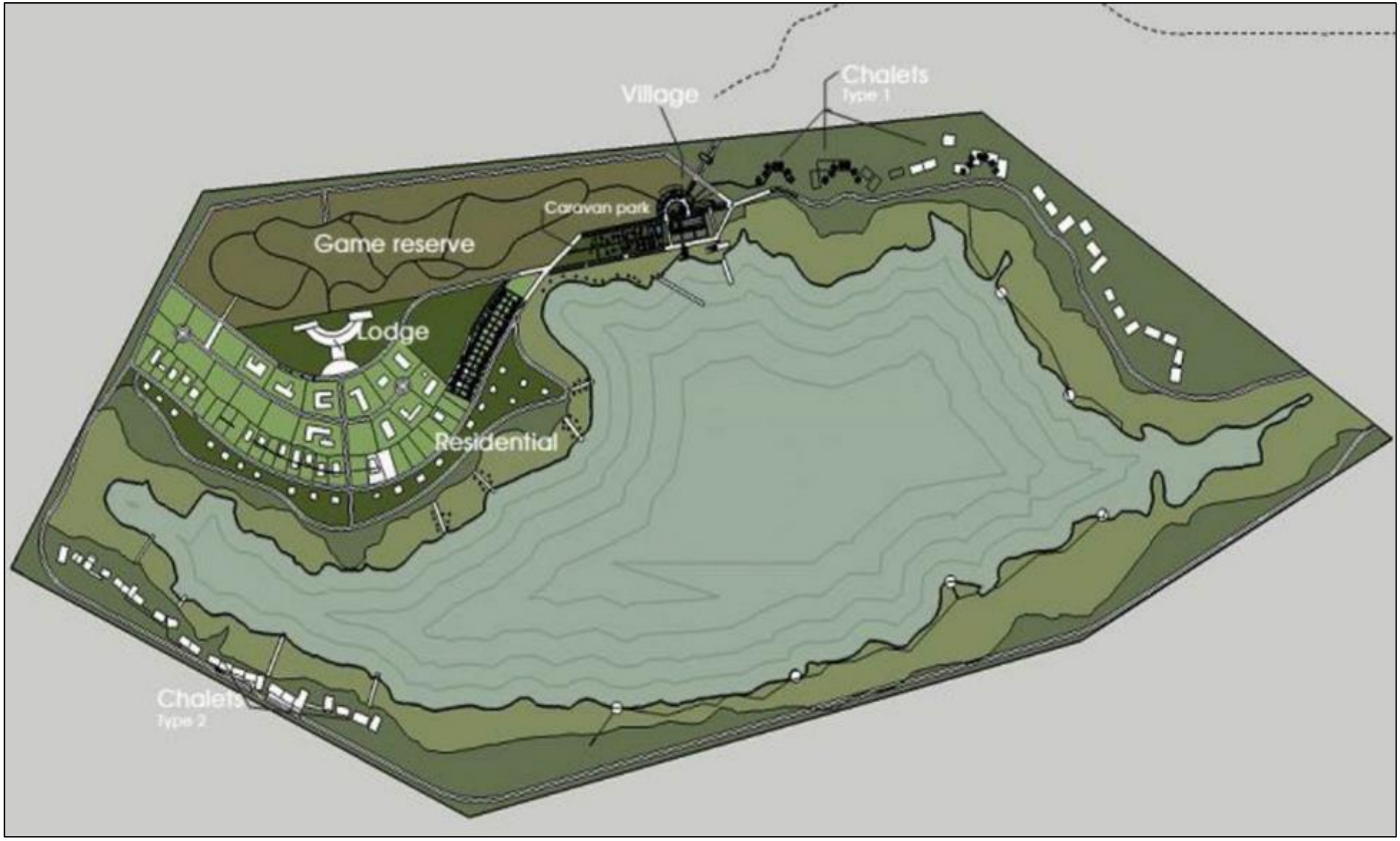


**Figure 3.3c: Proposed project design layout (from Urban-Econ, 2015).**

## 3.4. The Environmental Policy

The appointed contractor is required to compile an Environmental Policy which must consider at least the following:

- The contractor's mission, vision, core values and guiding principles;
- A commitment to compliance with relevant environmental laws, regulations, by-laws and other criteria to which the contractor subscribes.
- The obligation to prevent pollution and ecological degradation;
- The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.);
- The need for effective communication with Interested and Affected Parties (I&APs);
- The need for effective monitoring and evaluation of project activities so as to allow for continual improvement;
- Assurance that construction activities will be conducted in a manner that does not create a nuisance, risk or hazard to the natural or social environment;
- An emphasis that employee and public health and safety will be considered a priority; and
- A commitment by the contractor's senior management to monitor and evaluate their environmental performance.

The contractor personnel (contractor is defined as principal contractor, sub-contractors and any employees retained on this project) is required to be familiar with the environmental policy and all that it implies. They are to adopt and implement it accordingly throughout the course of the construction period. The policy must be communicated to all employees (and sub-contractors) and made available to the public, if requested.

## 3.5. Environmental Objectives and Targets

In order to meet the commitments and environmental specifications contained in this EMPr, the contractor shall develop appropriate environmental objectives and targets. The objectives and targets must conform to, and comply with, the following criteria:

- The objectives and targets shall constitute the overall goals for environmental performance identified in the environmental policy and EMPr;
- When establishing objectives and targets, the contractor shall take into account the identified environmental aspects and associated environmental impacts, as well as the relevant findings from environmental reviews and audits;
- The targets must be set to achieve objectives within a specified timeframe;
- Targets should be specific and measurable;
- When the objectives and targets are set, the contractor must establish measurable Key Performance Indicators (KPIs). The latter will be used by the contractor as the basis for an monitoring and evaluation programme to monitor environmental performance;
- Objectives and targets need to apply broadly across the contractor's operations, as well as to site-specific and individual aspects and activities; and
- Objectives and targets must be reviewed from time to time in view of changed operational circumstances and/or changes in legal requirements.

## 3.6. Environmental Legislation and Guidelines

The contractor must ensure that all South African legislation, and their relevant amendments, concerning the natural and built environment is strictly enforced. Such legislation must include, but is not limited to the:

- The Constitution of the Republic of South Africa Act No. 108 of 1996.
- National Environmental Management Act No. 107 of 1998.
- National Heritage Resources Act, No 25 of 1999.

- National Environmental Management: Biodiversity Act 10 of 2004.
- National Environmental Management: Air Quality Act 39 of 2004.
- National Environmental Management: Waste Management Act 59 of 2008.
- The Environment Conservation Act No 73 of 1989.
- National Water Act, No 36 of 1998.
- National Forest Act, No 84 of 1998.
- Occupational Health and Safety Act 85 of 1993.
- Provincial Nature Conservation Ordinance of 1974.
- Alien and Invasive Species (AIS) Regulations.
- All relevant provincial legislation, Municipal by-laws and ordinances.

The contractor and the FBDM will have to monitor and report on their compliance to the above at regular intervals throughout the project lifecycle.

### 3.7. Details of the Environmental Assessment Practitioner (EAP)

| | |
|---|---|
| EAP: | Mr Roberto Almanza |
| Company: | EOH Coastal & Environmental Services (EOH CES) |
| Physical Address: | 36 Pickering Street, Newton Park, Port Elizabeth, 6045 |
| Telephone: | +27 (41) 393 0700 |
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| Email: | r.almanza@cesnet.co.za |

CES was established in 1990 and is an independent specialist environmental consultancy with offices in Grahamstown and East London and satellite offices in Maputo, Mozambique and Port Elizabeth. Our principal area of expertise is in assessing the impacts of development on the natural, social and economic environments through, among other instruments, the environmental impact assessment process. CES has offices in Grahamstown, East London, Port Elizabeth, Cape Town, Johannesburg and Maputo, Mozambique. Our staff is usually comprised of between 25 to 30 consultants and 11 support staff. All our staff is well qualified in the biological, social and environmental sciences, and produce scientifically robust, defensible reports and EIAs.

**Mr Roberto Almanza**
*(Role: Report Production)*
Roberto obtained his BSc (Environmental Sciences) from Nelson Mandela Metropolitan University majoring in Geology and Geography and obtained his BSc Honours in Geology in 2012. Roberto then went on to complete his MSc (Geology) while working as a geology consultant on a number of exploration projects across South Africa. Roberto joined CES in 2015 and has managed several projects from Basic Assessments to Full Scoping and Environmental Impact Reports. He has also undertaken Environmental Auditing, Site Remediation, Water Use Applications and GIS mapping. Roberto now manages a number of projects from the CES Port Elizabeth office and is becoming involved in several waste-related studies, including waste assessments for large mining projects, contamination assessment and waste license auditing.

**Ms Amber Jackson**
*(Role: Report Review)* a.jackson@cesnet.co.za
Amber is a Principal Environmental Consultant and has been employed at CES for the last 8 years. She has an MPhil in Environmental Management and has a background in both Social and Ecological work. Her undergraduate degrees focused on Ecology, Conservation and Environment with particular reference to landscape effects on Herpetofauna, while her masters focused on the environmental management of social and ecological systems. With a dissertation in food security that investigated the complex food system of informal and formal distribution markets. During her time at CES Amber has worked extensively in Mozambique managing a number of Environmental and Social Impact Assessment to both national standards and international lenders standards (AfDB, EIB and IFC). Amongst which she has conducted large scale faunal impact assessments in the both South Africa and Mozambique.

# 4. IMPACT ASSESSMENT AND MITIGATION SUMMARY

This section provides an assessment of the pre-mitigation significance as well as the post-mitigation significance of the social and environmental impacts that may result from the major activities associated with the project's development.

## 4.1. Impact Management Outcomes

In order to identify the appropriate methods required to manage and mitigate environmental disturbance during the proposed development, the impacts and risks that need to be avoided must first be identified. This has been conducted via an EIA process and the details of the impacts and risks associated with the proposed development are included in the EIR. The aim of the EMPr is to ensure that the impacts which have been identified are properly mitigated to ensure that their significance is reduced (in the case of negative impacts) in order to protect the environment. The table below (Table 4.1) shows the significance of the impacts before and after mitigation is taken into account:

**Table 4.1: Summary of the significance of the impacts associated with the proposed development as well as their residual risk following the implementation of mitigation measures.**

| IMPACT | SIGNIFICANCE | RISIDUAL RISK |
|---|---|---|
| **BIODIVERSITY IMPACTS** | | |
| Loss of Natural Vegetation | **MODERATE –** | **LOW –** |
| Loss of Species of Conservation Concern | **MODERATE –** | **LOW –** |
| Invasion of Alien Species | **MODERATE –** | **LOW –** |
| Impacts resulting from Material Stockpiling | **MODERATE –** | **LOW –** |
| Impacts on Water Quality | **MODERATE –** | **LOW –** |
| Sedimentation and wetland pollution | **HIGH –** | **LOW –** |
| Rehabilitation of disturbed areas | **MODERATE –** | **LOW –** |
| **HERITAGE AND PALAEONTOLOGICAL IMPACTS** | | |
| Impacts to Stone Age Artefacts | **LOW –** | **LOW –** |
| Loss of Paleontological Resources | **MODERATE –** | **LOW +** |
| **AVIFAUNAL IMPACTS** | | |
| Loss of extent of terrestrial avifaunal habitat due to construction phase habitat clearing | **HIGH –** | **MODERATE –** |
| Disturbance of avifauna due to an increase in noise levels | **MODERATE –** | **LOW –** |
| Loss of Species of Conservation Concern | **MODERATE –** | **MODERATE –** |
| Disturbance and reduction of avifaunal species due to operational activities including visitors, boats and permanent inhabitants | **MODERATE –** | **LOW –** |
| Increase in pest Avifaunal Species during Operational Phase | **MODERATE –** | **LOW –** |
| Continued habitat loss, fragmentation and degradation | **HIGH –** | **HIGH –** |
| Increased conservation efforts due to availability of funding | MODERATE + | MODERATE + |
| **GENERAL AND OTHER IMPACTS** | | |
| Surface and Groundwater Pollution | **MODERATE –** | **LOW –** |
| Soil Erosion and Sedimentation | **MODERATE –** | **LOW –** |
| Solid Waste Pollution | **MODERATE –** | **LOW –** |
| Dust Pollution | **LOW –** | **LOW –** |
| Traffic | **LOW –** | **LOW –** |
| Noise Disturbance | **MODERATE –** | **LOW –** |
| Employment Creation and Economic Benefits | **LOW +** | MODERATE + |
| Tourism Benefits | **LOW +** | MODERATE + |

## 4.2. Impact Management Actions

The table below (Table 4.2) lists the impact management actions which need to be implemented in order to correctly mitigate the significance of the abovementioned impacts.

**Table 4.2: Summary of the mitigation measures (impact management actions) as outlined in the EIR.**

| IMPACT | MITIGATION MEASURES |
|---|---|
| **BIODIVERSITY IMPACTS** | |
| Loss of Natural Vegetation | • The construction footprint must be surveyed and demarcated prior to construction commencing;<br>• No construction activities will be allowed outside the demarcated footprint;<br>• Clearing of vegetation should avoid thornveld areas wherever possible; and<br>• Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and vegetation must be undertaken. |
| Loss of Species of Conservation Concern | • All areas that will be impacted must be ground-truthed and demarcated by a suitably qualified specialist (botanical/faunal) prior to vegetation and topsoil removal in order to locate and rescue any SCC within the area and relocate them;<br>• Search and rescue must be undertaken by a professional and qualified specialist;<br>• The contractor's staff must not poach or trap wild animals; and<br>• The contractor's staff must not harvest any natural vegetation. |
| Invasion of Alien Species | • An Alien Vegetation Management Plan must be implemented during the construction and operational phase to reduce the establishment and spread of undesirable alien plant species; and<br>• Alien plants must be removed through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance to the NEMBA: Alien Invasive Species Regulations. |
| Impacts resulting from Material Stockpiling | • As far as possible no construction material or other stock piles should be stored within 50 m of the wetland; and<br>• Stockpiles within 50 m of the wetland must be monitored for erosion and mobilisation of materials towards wetland. If this is noted by an ECO, suitable cut-off drains or berms must be placed between the stockpile area and the wetland. |
| Impacts on Water Quality | • No machinery must be parked overnight within 50 m of the wetland;<br>• All stationary machinery must be equipped with a drip tray to retain any oil leaks;<br>• Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp and not within 50 m of the wetland;<br>• Emergency plans must be in place in case of spillages;<br>• No ablution facilities should, as far as possible, be located within 50 m of the wetland;<br>• Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution;<br>• Concrete mixing should not take place within 50 m of the wetland; and<br>• All concrete mixing must occur on impermeable surfaces. |
| Sedimentation and wetland pollution | • The construction footprint and route for construction vehicles must be clearly demarcated. Vehicles and machinery should not encroach into areas outside the planned project footprint;<br>• All wetland vegetation removal must take place under supervision of a qualified Environmental Control Officer (ECO);<br>• Stormwater management structures must be monitored and maintained throughout the operation phase;<br>• All sewage infrastructures in the residential area, lodge and chalets must be regularly serviced and maintained; and<br>• Any leaks must be repaired immediately. |
| Rehabilitation of disturbed areas | • All cleared areas must be continuously rehabilitated with indigenous vegetation post-establishment. |
| **HERITAGE AND PALAEONTOLOGICAL IMPACTS** | |
| Impacts to Stone Age Artefacts | • Locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work;<br>• An ECO must be appointed to conduct regular examination of trenches and excavations. |
| Loss of Paleontological Resources | • Excavations must be monitored, either by a palaeontologist or by an ECO trained by and in correspondence with a palaeontologist. This should be discussed between the palaeontologist, ECO and site engineer prior to the commencement of work. |

| IMPACT | MITIGATION MEASURES |
|---|---|
| **AVIFAUNAL IMPACTS** | |
| Loss of extent of terrestrial avifaunal habitat due to construction phase habitat clearing | • Design development footprint to avoid highly sensitive avifaunal habitat where practical;<br>• Minimise the number of roads required to access the project area, thereby avoiding unnecessary loss of faunal habitat;<br>• Wherever possible clearing of vegetation should be undertaken in winter months, when birds are not nesting and breeding;<br>• It is possible that some of the large trees in the area could provide nesting opportunities for birds, these areas should be marked, and construction/clearing should only commence in the vicinity of the nesting site after the fledgling has left the nest;<br>• All clearing activities must deploy search and rescue teams in front of clearing machinery to assist in avoiding or relocating nesting avifaunal species out of the clearing path and relocating them to the game reserve;<br>• Residents, staff and visitors must not be allowed to capture, poison or hunt birds on site;<br>• Do not perform activities that may damage the instream aquatic habitat (e.g. the use of a bulldozer within fringe habitat);<br>• Any contractor employed for development work must ensure that no avifaunal species are disturbed, trapped, hunted or killed by them and their team during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance;<br>• The width of the road should be kept to a minimum and should be left unsurfaced (gravel) to reduce contaminated (i.e. hydrocarbons) stormwater runoff into wetland habitat;<br>• Feeding of birds should not be allowed (all areas);<br>• Construct bird hides during the dry season;<br>• Minimise development in thornveld vegetation where possible;<br>• Walkways must be elevated where possible;<br>• All visitors should keep to designated walkways and should not be allowed to venture outside of these areas;<br>• Limit construction activities to daytime (8am-5pm);<br>• Noise should be kept to a minimum;<br>• Should night-lighting be required (e.g. for security purposes) these should be of the low UV emitting types, such as most LEDs, which attract significantly less insects and use down-lighting to reduce light spill;<br>• Domestic waste should not be stored on site and should be removed from the study area as soon as possible; temporary waste storage must be covered;<br>• Preferably no domestic pets should be allowed within the reserve. Should this be unfeasible, all domestic pets (dogs and cats) must be sterilised and all domestic cats must wear a collar with a bell;<br>• No livestock grazing must take place in the reserve;<br>• Ensure that the correct permits are in place when moving or stocking live fish or removing any indigenous faunal species from site;<br>• Ensure dust is controlled through speed limits and wetting roads;<br>• Maximum speed limits are 60km/h on tar roads, 40km/h on gravel roads and an average of 20km/h when game viewing;<br>• Habitats not impacted on by the development footprint must be restored;<br>• Bird hides must include signs for: no noise, quiet and posters of birds likely to be seen from the hide;<br>• The reserve must promote the use of paddle boats, kayaks, canoes, kickboats etc. and must restrict the use of motorboats. Should motor boats be required, only low powered motor boats should be allowed, and speed must be limited to ensure no wake is created; and<br>• Consider having exclusion zones where no angling or powerboats are allowed. For example, in front of bird hides and within 30 m of bird hides or walkway view-points. |
| Disturbance of avifauna due to an increase in noise levels | |
| Loss of Species of Conservation Concern | |
| Disturbance and reduction of avifaunal species due to operational activities including visitors, boats and permanent inhabitants | |
| Increase in pest Avifaunal Species during Operational Phase | |
| Continued habitat loss, fragmentation and degradation | |
| **GENERAL AND OTHER IMPACTS** | |

| IMPACT | MITIGATION MEASURES |
|---|---|
| Surface and Groundwater Pollution | • Construction vehicles and equipment should be maintained and daily checks should be done for leaks;<br>• Spill kits and drip trays must be readily available;<br>• Should fuel or chemicals be stored, this must be kept in a bunded area;<br>• It is recommended that ready mixed cement is used. If cement is mixed on site then this must be done on an impermeable surface and dust generated from this activity must be controlled;<br>• it is recommended that snow netting is erected around the river banks and treated as a 'no-go' area; and<br>• Servicing of machinery and vehicles must occur off site unless this is done in a bunded area. |
| Soil Erosion and Sedimentation | • Vegetation clearing must be kept to a minimum;<br>• Where possible, areas must be rehabilitated with indigenous vegetation;<br>• Temporary stabilization measures (e.g. silt traps) should be implemented until vegetation is fully rehabilitated;<br>• Appropriate erosion control measures must be implemented to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken;<br>• Care must be taken to ensure that runoff is well dispersed so as to limit erosion; and<br>• A site-specific stormwater management plan should be designed to eliminate the potential of surface erosion. |
| Solid Waste Pollution | • Construction material should be reused or recycled where possible;<br>• Waste that cannot be reused or recycled should be disposed of in the correct manner at the nearest registered waste disposal site;<br>• Any hazardous materials (e.g. paint, fuel, oil) must be disposed of immediately and in the correct manner;<br>• General good housekeeping should be practiced on site;<br>• While transporting the waste, care should be taken as to not spill waste en route to the landfill site;<br>• If rubble is stored on site it should be stored on designated portions of land, preferably in areas deemed to already be ecologically degraded. Designated areas for storage of rubble should be set aside at the onset of construction;<br>• Litter must be controlled during construction e.g. adequate bins must be made available on site at all times. These must be made scavenger proof and must be emptied on a regular basis; and<br>• Construction materials stored at the camp site must be secured (i.e. plastics must be covered to prevent being blown off site). Skips must be regularly emptied and must be covered. |
| Dust Pollution | • Construction should preferably cease during period of high winds;<br>• Exposed soil surfaces should be wet down where required to avoid dust emissions; and<br>• Vehicles transporting construction material such as building sands should remain at a speed limit of 30km/h and if required cover their loads with a tarpaulin to avoid dust emissions. |
| Traffic | • Appropriate warning signs must be erected at and before the entrance to the site, in accordance with the requirements of the District Road Engineer;<br>• Any damage caused to public roads by vehicles related to the proposed development must be repaired immediately to the satisfaction of the District Roads Engineer;<br>• Vehicles must be roadworthy and serviced and must abide by the standard traffic laws;<br>• Any Abnormal Loads must be approved with the traffic authorities and must comply with any conditions imposed by the authorities;<br>• The contractor must employ flag staff in order to prevent on-site accidents;<br>• Speed limits on site must not exceed 30km/h and the speed limits along the public roads must be adhered to at all times; and<br>• Manage the travelling times of the delivery trucks so as to allow them to depart and arrive at spaced out time intervals, thus reducing the intensity of traffic and avoiding the formation of convoys of heavy vehicles. |
| Noise Disturbance | • All construction vehicles and equipment to be properly serviced in order to meet the necessary noise level requirements;<br>• Restriction of work to daylight hours where possible;<br>• Restriction of any unnecessary noise e.g. portable radios, vehicle radios, whistles etc.; |

| IMPACT | MITIGATION MEASURES |
|---|---|
| | • Construction employees should not be housed on site;<br>• Machinery should be fitted with the required mufflers, and notice given to surrounding residents prior to the commencement of construction; and<br>• Adhering to the municipal by-laws regarding noise. |
| Employment Creation and Economic Benefits | • As far as possible, local labour should be used during construction; and<br>• Purchase materials locally, where possible, in order to support the local communities. |
| Tourism Benefits | • Ensure that the tourism potential of the area is fully realised; and<br>• Encourage local and national tourism by means of a suitable marketing strategy. |

### 4.3. Mitigation Measures included in the EIR

The identification and significance of identified project related impacts (before and after mitigation) is presented in the EIR. This EMPr, presents the preliminary actions, specifications and management commitments that need to be adhered to in order to mitigate or enhance the impacts of significance.

These are detailed in the sections that follow.

**Pre-Construction:**

- The contractor is encouraged to use an existing fully serviced site in an already disturbed area for construction camp purposes;
- All protected flora species of conservation concern must not be disturbed or removed prior to permit approval from relevant National and Provincial authorities;
- A water quality baseline must be developed;
- All no-development areas must be suitably demarcated prior to the commencement of construction;
- Service delivery (water, electricity, sewage and waste) must be secured prior to construction commencing. No septic tanks are allowed within the reserve; and
- No water should be removed from the pan for construction or operation without DWS approval (licence).

**Construction Phase:**

- An ECO must be employed to ensure that the construction activities remain within the designated area and that no unauthorised activities occur;
- The ECO should submit monthly site audits detailing the project's compliance with the EMPr;
- An efficient stormwater management system must be implemented during construction;
- Workers must be educated on environmental management aspects; and
- All listed alien and invasive plant species must be eradicated according to NEMBA.

**Operational Phase:**

- Water efficient systems, such as dual-flush toilets and water-efficient taps should be implemented to ensure that water is used sparingly;
- Waste removal must be properly managed at all times,
- All listed alien and invasive plant species must be monitored according to NEMBA.
- Post construction monitoring must occur for 12 months after completion of the site, at quarterly intervals, to ensure that the site is revegetated; and
- Water quality monitoring must be undertaken on a monthly basis and any indication of water pollution immediately reported to the DENC and the DWS.

### 4.4. Authority and Specialist Recommended Mitigation Measures

No specific recommendations have been made by the DENC or any other competent authority to

date however, all recommendations made by the DENC and/or other organs of state will be included in the Final EMPr. The following recommendations stemming from the specialist studies undertaken for the EIR must also be adhered to:

**Recommendations by the Biodiversity Specialist:**

- The layout and design of the development MUST incorporate the following green corridors as well as the recommended management requirements for each corridor as defined in that report.
- Plant Permits must be obtained from DENC for the following Species of Special Concern (SSC) identified onsite:

| Species | Vegetation community | Threat status |
|---|---|---|
| *Aloe grandidentata* | Dense thornveld; Open savanna | Protected (PNCO) |
| *Boscia albitrunca* | Dense thornveld | Protected tree (DAFF) |
| *Euphorbia sp.* | Dense thornveld | Protected (PNCO) |

- Any SSC found must be immediately relocated to areas close by, but beyond the proposed development footprint.
- The appointed qualified ECO must be immediately notified if any SSC is identified during construction (clearing phase).
- All mitigation measures indicated in the specialist's report must be included into the EMPr (*please refer to the mitigation measures included in Table 4.2 above*).
- The following Management Plans must be developed prior to clearing, during construction and operations of the proposed development. These management plans must incorporated into the final Construction EMPr:
  - Rehabilitation Management Plan
  - Alien Vegetation Management Plan
  - Wetland Management Plan (please refer to the Biodiversity Specialist's report)
  - Conservation Management Plan

Please note that the abovementioned plans would need to be developed prior to the commencement of construction and on approval by the DENC.

**Recommendations by the Heritage Specialist:**

The larger landscape around the project area indicate a rich heritage horizon encompassing Stone Age and Colonial / Historical Period archaeology primarily related to the development of intensive farming operations around Vaalharts as well as the Diamond Mining industry of the past century and resulting ruralisation and industrialization. Locally, portions of the target property– and particularly areas subject to this assessment have been altered extensively by past and more recent development of recreational facilities along the Ganspan Pan. Cognizance should nonetheless be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines and in pristine areas. The following recommendations are made based on general observations in the proposed Ganspan-Pan Wetland Reserve Development area:

- A Paleontological Desktop Assessment has been commissioned for the project. Should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should be carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.
- Single Middle Stone Age (MS) and possible Later Stone Age (LSA) lithics, including formal tools such as broken points, scrapers and a blade as well as an upper grindstone / conical stone were noted in the project area on previously altered and disturbed surfaces. The transformed nature of the local landscape has resulted in a loss of primary context and by implication, the scientific value of the artefacts. However, it is recommended that any development activities be monitored in order to avoid the destruction of previously undetected Stone Age occurrences.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project.

Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

In addition to these site-specific recommendations, careful cognizance should be taken of the following:

- As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.
- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material occur in the larger landscape, such resources should be regarded as potentially sensitive in terms of possible subsurface deposits.

**Recommendations by the Palaeontological Specialist:**

- It may be necessary to request a Phase 1 Palaeontological Impact Assessment: Field study to locate fossiliferous outcrops as the palaeontological sensitivity is HIGH and a Phase 2 Palaeontological Mitigation which is generally required if the Phase 1 Palaeontological Assessment identified a fossiliferous formation or surface fossils or if fossils are found during construction. The Protocol for Chance Find and Management Plan is included in the Palaeontological Specialist Assessment.
- The following should be conserved: if any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.
- The Environmental Control Officer must familiarise him- or herself with the formation present and its fossils and obtain training pre-construction (one day).
- For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation. It is recommended that the EMPr be updated to include the involvement of a palaeontologist (pre-construction training of ECO) and the ECO must visit and survey site after blasting and excavating or drilling.

**Recommendations by the Avifaunal Specialist:**

- The road that crosses the inlet river/wetland in the south of the site should either stop before the wetland and not continue around the pan or should be elevated over the wetland and appropriate WULA must be acquired prior to construction.
- A bird monitoring programme must be drafted and implemented for the proposed development.
- A conservation fee must be built into the entrance fee and residents' rates and placed into a separate account and must only be used for conservation and rehabilitation of the Ganspan Wetland Reserve.
- The reserve must promote the use of paddle boats, kayaks, canoes, kickboats etc. and must restrict the use of motorboats. Should motor boats be required, only low powered motor boats should be allowed, and speed must be limited to ensure no wake is created; and
- The bird monitoring must delineate exclusion zones where no angling or boats are allowed. For example, in front of bird hides and within 30 m of bird hides or walkway view-points

# 5. ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

An environmental management system (EMS) enables companies, organizations and operations to systematically manage, prevent and reduce their environmental impacts (or footprint) and associated costs. In terms of ISO 14001, an EMS is defined as, "*that part of the overall management system includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy*." This chapter of the EMPr outlines the EMS for the proposed development and is subdivided according to the three notable phases of the development namely, the pre-construction phase, the construction phase and the operational phase.

## 5.1. Method Statements

Before the contractor begins each construction activity, the contractor shall give to the ECO and engineer a written method statement setting out the following:

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

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the ECO and/or engineer whenever there is a change or variation to the original.

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

## 5.2. Performance Monitoring and Record Keeping

The engineer and the ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report. These reports shall be made available to the authorities when requested.

The contractor shall ensure that an electronic filing system identifying all documentation related to the EMPr is established.

A list of reports likely to be generated during all phases of the Project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Environmental Management Programme;
- Final design documents and diagrams issued to and by the contractor;
- All communications detailing changes of design/scope that may have environmental implications;
- Complaints register;

- Medical reports;
- Incident and accident reports;
- Emergency preparedness protocol;
- Copies of all relevant environmental legislation;
- All relevant permits;
- All method statements from the contractor for all phases of the project.

## 5.3. Document Control

The contractor and resident engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution;
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the independent external auditor.

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed development as detailed in the EIR. The EMPr is a “live document”, and if continuously reviewed and managed correctly can result in successful construction and operation of the proposed development.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these. Further guidance should also be taken on any conditions contained in the Environmental Authorisation, if the project is granted approval, and that these conditions must be incorporated into the final EMPr.

## 5.4. Roles and Responsibilities

### 5.4.1. The Frances Baard District Municipality

The FBDM is the responsible entity for monitoring the implementation of the EMPr and compliance with the authorisation. However, if the company appoints a contractor to implement the project and hence implement the proposed mitigation measures documented in this EMPr on their behalf, then the successful contractor’s responsibilities are outlined as per the section that follows. The FBDM will still remain responsible for ensuring that the appointed contractor is held liable for any non-compliances with the conditions as set out in the EA and/or the approved EMPr.

The FBDM will be responsible for appointing a suitable service provider to conduct surface water quality monitoring during the construction and operational phases. In addition, the FBDM will be responsible for ensuring that the proposed development aligns itself with the national development tools for employment, such as the Expanded Public Works Programme (EPWP), during the construction and operational phases and also aligns itself with the tourism objectives as per the Integrated Development Plan (IDP) and Spatial Development Framework (SDF) for the area.

### 5.4.2. Contractor

The successful contractor shall:

- Be responsible for the finalisation of the EMPr in terms of methodologies which are required to be implemented to achieve the environmental specifications contained herein and the relevant requirements contained in the EA;
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of the developer and the EA;
- Ensure that all third parties who carry out all or part of the contractor's obligations under the contract comply with the requirements of this EMPr; and
- Ensure that the appointments of the ECO are subject to the approval of the developer.

### 5.4.3. Environmental Control Officer (ECO)

For the purposes of implementing the conditions contained herein, the contractor shall appoint an ECO for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMPr as well as the EA are complied with during the construction period. The ECO will be responsible for issuing instructions to the contractor and where environmental considerations call for action to be taken. The ECO shall submit regular (monthly) written reports to the FBDM and the competent authority (DENC) as required.

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

- Confirming that all the EAs and permits required in terms of the applicable legislation have been obtained prior to construction commencing;
- Monitoring and verifying that the EMPr, EA and contract are adhered to at all times and taking action if specifications are not followed;
- Monitoring and verifying that environmental impacts are kept to a minimum;
- Reviewing and approving construction method statements with input from the ESO and engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr and EA are adhered to;
- Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr, EA and contract;
- Monitoring the undertaking by the contractor of environmental awareness training for all new personnel on site;
- Ensuring that activities on site comply with all relevant environmental legislation;
- Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMPr and/or environmental authorisation;
- Undertaking a continual internal review of the EMPr and submitting any changes for client and authority review and approval as applicable;
- Checking the register of complaints kept on site and maintained by the ESO and ensuring that the correct actions are/were taken in response to these complaints;
- Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance;
- Conducting monthly environmental performance audits in respect of the activities undertaken relating to the project. The ECO shall also submit compliance audit reports to the DENC, in accordance with the requirements of the environmental authorisation. Such reports shall be reviewed by the FBDM, prior to submission;
- Keeping a photographic record of progress on site from an environmental perspective. This can be conducted in conjunction with the ESO as the ESO will be the person that will be onsite at all times and can therefore take photographic records on a daily basis. The ECO would need to check and ensure that the ESO understands the task at hand;

- Recommending additional environmental protection measures, should this be necessary; and
- Providing report back on any environmental issues at site meetings.

The ECO must have:

- A good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- The ability to conduct inspections and audits and to produce thorough, readable and informative reports;
- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- Proven competence in the application of the following integrated environmental management tools:
  - Environmental impact assessment;
  - Environmental management plans/programmes;
  - Environmental auditing;
  - Mitigation and optimisation of impacts;
  - Monitoring and evaluation of impacts; and
  - Environmental management systems.

The ECO must be fully conversant with the contents of the EIR, this EMPr, the EA and all relevant environmental legislation for the project. The FBDM shall have the authority to replace the ECO if, in their opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMPr or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

### 5.4.4. Environmental Site Officer (ESO)

The contractor shall appoint a nominated representative of the contractor as the ESO for the contract. The ESO will be site-based and shall be the responsible person for implementing the environmental provisions of the construction contract. There shall be an approved ESO on the site at all times. It may be necessary to have more than one ESO. The ESO's duties will include, *inter alia*, the following:

- Ensuring that all the EAs and permits required in terms of the applicable legislation have been obtained prior to construction commencing;
- Reviewing and approving construction method statements with input from the ECO and engineer, where necessary, in order to ensure that the environmental specifications contained within the construction contract are adhered to;
- Assisting the contractor in finding environmentally responsible solutions to problems;
- Keeping accurate and detailed records of all activities on site;
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints;
- Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance; and
- Reporting all incidences of non-compliance to the ECO and contractor.

The ESO shall submit regular written reports to the ECO, but not less frequently than once a month. The ESO must have:

- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and

- The ESO must be fully conversant with the EIR and EMPr for the proposed development and all relevant environmental legislation; and lastly
- The ESO must have received professional training, including training in the skills necessary to be able to amicably and diplomatically deal with the public as outlined in bullet point one above.

The ECO shall be in the position to determine whether or not the ESO has adequately demonstrated his/her capabilities to carry-out the tasks at hand and in a professional manner. The ECO shall therefore have the authority to instruct the contractor to replace the ESO if, in the ECO's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the construction contract. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe. The ECO shall visit the development site and in addition to the responsibilities listed in this section, review the performance of the ESO and submit regular performance reviews to the FBDM or their engineering representative.

# 6. CONSTRUCTION PHASE EMPR

## 6.1. Clearing of the Site

In all areas where the contractor intends to, or is required to, clear the natural vegetation and soil, either within the construction area, or at designated or instructed areas outside the construction area, a plan of action shall first be submitted to the engineer for his approval.

The EMPr shall contain a photographic record and change/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of natural vegetation within the development boundaries for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the construction area, or at designated or instructed areas outside the construction area. This responsibility shall extend until expiry of the defects notification period.

## 6.2. Site Access and Demarcation

The location, layout and method of establishment of the construction camp including the following must be clearly indicated and demarcated prior to construction activity commencing:

- All contractor's buildings, and/or offices
- Lay down areas
- Vehicle wash areas (if any)
- Workshops and drip trays
- Fuel storage areas (including filling and dispensing from storage tanks)
- Cement/concrete mixing areas (including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete)
- Other infrastructure required for the running of the project
- Road construction forewarning signs and detour signage if necessary

Details, including a drawing, showing where and how the access points and routes will be located and managed must be submitted to the ECO and developer that are supported by the following management requirements:

- On the site and within such distance of the site as may be stated, the contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site.
- On gravel or earth roads on site and within 500m of the site, the vehicles of the contractor and his suppliers shall not exceed a speed of 45 km/h or as directed by the ECO.
- The contractor shall supply the ECO with a Method Statement detailing the location and management of all access points and roads.

The contractor shall erect and maintain permanent and/or temporary fences of the type and in the locations directed by the ECO. Such fences shall, if so specified, be erected before undertaking designated activities. Certain areas within or next to the Site shall be "no go" areas. The contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or materials enter the "no go" areas at any time.

The following site-specific criteria must be taken into account when designating access roads and laydown areas:

- 'No development' areas include areas of high sensitivity indicated by the biodiversity and avifaunal specialists (refer to Annexure 4).
- Conditional sensitivity areas (moderate and high sensitivity areas) are areas where construction is conditional on the fulfilment of certain aspect-specific requirements. For example, conditional sensitivity areas include areas of moderate sensitivity identified by the avifaunal specialist and ecologically sensitive areas such as watercourses, wetlands and thicket vegetation.
- Low Sensitivity areas are areas where construction may take place without hindrance.

The specialist studies have restricted development in the Thornveld vegetation. The Ecological study has declared the area a 'no development' area based on it being an important corridor for fauna to access water from the pan. The avifaunal assessment has also rated it as having a high sensitivity.

### 6.3. Materials Handling, Use and Storage

- The contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including identified "no go" areas) required to comply with the EMPr.
- The contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the EMPr.
- Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit.
- The contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.
- All manufactured and/ or imported material shall be stored within the contractor's camp, and, if so required by the EMPr, out of the rain.
- All lay down areas outside of the construction camp shall be subject to the ECO's approval.
- Imported gravel, fill, soil and sand materials shall be free of weeds, alien invasive seed matter, plant material, litter and contaminants and shall be obtained from sources approved by the ECO.

### 6.4. Stockpiling

- Any stockpiling of gravel, cut, fill or any other material including spoil shall be in areas approved by the ECO within the defined working area.
- The contractor shall ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the contractor shall spray it with Dustex or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil shall not be covered with plastic.
- No stockpiling of any material shall be allowed within 20 m of any "no go" area.

### 6.5. Solid Waste Management

- No on-site burning, burying or dumping of any waste materials, litter or refuse shall occur.
- The contractor shall provide vermin and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times.
- Bins shall not be allowed to become overfull and shall be emptied at least once a day.
- The waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the ECO has approved.
- Recyclable waste shall be disposed of into separate skips/bins and removed off-site for recycling.
- All solid waste shall be disposed of off-site at an approved registered landfill site. The contractor shall supply the ECO with the appropriate disposal certificates.

## 6.6. Water Use

- All sources of water for construction purposes must be approved by the ECO in writing before any such sources can be used to obtain water.
- Water may not be sourced from a river, natural watercourse or from a borehole without the appropriate authorisation from the Department of Water and Sanitation (DWS).
- Where possible all wash water will be recycled for use, as wash water again or for dust suppression where applicable.

## 6.7. Contaminated Water

- Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained and that the water table and surface water is not endangered. Water containing such pollutants as chemicals, washing detergents, sewerage, fuels, paints and solvents and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to runoff from fuel depots/workshops/truck washing areas.
- Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The contractor shall notify the ECO immediately of any pollution incidents on Site.

## 6.8. Hazardous Substances

- The transportation and handling of hazardous substances must comply with the provisions of the Hazardous Substances Act (Act No.187 of 1993) and associated regulations as well as SABS 0228 and SABS 0229.
- The contractor shall also comply with all other applicable regional and local legislation and regulations with regard to the transport, use and disposal of hazardous substances. Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation.
- The contractor shall be responsible for the training and education of all personnel on site who will be handling hazardous materials about their proper use, handling and disposal.
- If potentially hazardous substances are to be stored or used on site, the contractor shall submit a Method Statement to the ECO detailing the substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

## 6.9. Cement and Mixing of Concrete

- The proposed location of cement mixing areas (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the site layout plan and approved by the ECO.
- All wastewater generated from the operation and cleaning of concrete mixing equipment and other sources of concrete shall be passed through a concrete wastewater settlement system. The water from this system shall not be allowed to flow into any “no go” area or water course but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste.
- The contractor shall ensure that minimal water is used for washing of concrete and cement mixing equipment.
- Used cement bags shall be temporarily stored in separate weatherproof bins on site to prevent the generation of wind-blown cement dust and the bags from blowing away. These used cement bags must then be correctly disposed of as hazardous waste.
- During construction, the contractor must ensure that concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste and that all surplus aggregate is removed.

## 6.10. Fuel (petrol and diesel) and Oil

### 6.10.1. Fuel Storage

- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination into nearby rivers, wetlands or drainage lines. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. These sites must be re-vegetated after construction has been completed. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any drainage line or waterbody.
- The location of the fuel storage area will be approved by the ECO and will be situated at least 20 m away from any “no go” areas. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 shall be prominently displayed in and around the fuel storage area. There shall be adequate fire-fighting equipment at the fuel storage area.
- The contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times. The capacity of the tank shall be clearly displayed and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1. Fuel storage tanks shall have a capacity not exceeding 9 000 litres and shall be kept on site only for as long as fuel is needed for construction activities, on completion of which they shall be removed.
- Tanks on site shall not be linked or joined via any pipe work, but shall remain as separate entities. The tanks shall be situated on a smooth impermeable base with a bund. The volume inside the bund shall be 110% of the total capacity of the largest storage tank. The base may be constructed of concrete, or of plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The impermeable lining shall extend to the crest of the bund. The floor of the bund shall be sloped to enable any spilled fuel and/or fuel-contaminated water to be removed. Appropriate material approved by the ECO that absorbs / breaks-down or encapsulates minor hydrocarbon spillage and which is effective in water shall be installed in the sump.
- The tanks and bunded areas shall be covered by a roofed structure, taken off site to a disposal site approved by the ECO, and the material that absorbs / breaks-down or encapsulates minor hydrocarbon spillage shall be replenished.
- Only empty and externally clean tanks may be stored on the bare ground. Empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.
- Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents. The dispensing mechanism for the fuel storage tanks shall be stored in a waterproof container when not in use.
- As part of the required site layout for the construction camp, a plan shall be submitted to the ECO detailing the design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks and for the type of absorbing / breaking-down or encapsulating material to be used.

### 6.10.2. Refuelling

- Where reasonably practical, the plant shall be refuelled at a designated re-fuelling area/depot or at a workshop as applicable. If this is not reasonably practical, then the surface under the refuelling area shall be protected and appropriately bunded against pollution to the reasonable satisfaction of the ECO prior to any refuelling activities.
- If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The contractor shall ensure that the appropriate fire-fighting equipment is present during refuelling operations.
- The contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 ℓ of

hydrocarbon liquid spill. Prior to any refuelling or maintenance activities, the ECO must approve this material.

### 6.10.3. Used oil and hydrocarbon contaminated materials

- Used oil shall be stored at a central location on site prior to removal off site for disposal at an approved disposal or recycling site.
- Old oil filters and oil, petrol and diesel-soaked material shall be treated as hazardous waste. The contractor shall remove all oil, petrol, and diesel-soaked sand immediately and shall dispose of it as hazardous waste or treat it on site with material that breaks-down or encapsulates such spillages as approved by the ECO.

## 6.11. Ablution Facilities

- Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided. The contractor shall provide the necessary ablution facilities for all his personnel prior to the commencement of work and shall ensure that his personnel make use of the facilities.
- Toilet facilities shall be supplied by the contractor for the workers at a ratio of at least 1 toilet per 20 workers in areas approved by the ECO. Every 1-man urinal will be taken as supplying the equivalent of 5 men in addition to the 20 men per toilet on site. No toilets will be erected within 20 m of any “no go” areas. Toilets shall be situated within 200m of any area where work is taking place in numbers sufficient to meet the ratio depicted above for the workers in the area. Mobile toilets (e.g. trailer mounted) should be considered for sites, where workers may be expected to cover large distances every day.
- The facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided. Temporary / portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause, to the satisfaction of the ECO.
- Discharge into the environment and burial of waste is strictly prohibited. The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site. Toilets shall be emptied before the contractors’ holidays or any other temporary site closure.

## 6.12. Eating Areas

- The contractor shall designate eating area(s), subject to the approval of the ECO. No cooking is allowed outside of the contractor’s camp area on site.
- At meal times all workers must eat in designated eating areas. These areas shall have shade for the workers. The eating areas may be in existing structures or in temporary / transportable structures that shall be well constructed using wood or metal for the frame and screened on the top and sides with shade cloth/canvas or other material to the satisfaction of the ECO. These areas shall be well demarcated and in locations approved by the ECO and shall not be within 20 m of any “no go” areas, on or adjacent to the site.
- Sufficient bins shall be present in these areas. All disposable food packaging must be disposed of in the bins after every meal.
- The area must be cleaned after every meal.
- The feeding or leaving of food for animals is strictly prohibited.

## 6.13. Site Structures

- All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. The type and colour of roofing and cladding materials to the contractor's temporary structures shall be selected to reduce reflection.

- The contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

### 6.14. Lights

- The contractor shall ensure that any lighting installed on the site for his activities does not cause a reasonably avoidable disturbance to the naturally-occurring fauna.

### 6.15. Noise

- The contractor shall take precautions to minimise noise generated on site (e.g. install and maintain silencers on machinery).
- The contractor shall comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act.
- Appropriate directional and intensity settings are to be maintained on all hooters and sirens.
- Work will be limited to daylight hours – between 6am and 6pm
- No amplified music shall be allowed on site. The contractor shall not use sound amplification equipment on Site unless in emergency situations.

### 6.16. Dust Control

- The contractor shall be responsible for the continued control of dust arising from his operations. The contractor shall take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the ECO. Appropriate dust suppression measures include: spraying or dampening with water, using a commercial dust binder (such as Hydropam or Dustex), rotovating straw bales, planting of open cleared space and the scheduling of dust-generating activities. If the conditions are such that the contractor cannot satisfactorily dampen the dust, then the ECO may halt operations until such time as the conditions are more suitable for lower dust generating construction.
- Damping of all gravel haul and access roads (if constructed) with water must be ongoing and special attention must be given to roads close to residential areas. Should dust still be a problem on any specific road, the allowable speed will be reduced to 20km/h. If dust is still a problem the road should be treated with a commercial dust binder, as required, to form a cohesive layer that will control the dust on the road.
- Areas that are to have the topsoil stripped for construction purposes must be limited and only stripped when work is about to take place.
- Other activities and situations that may result in a dust nuisance include: site clearance and other earth moving operations, open cleared space, stockpiles of topsoil or sand and activities associated with concrete mixing.
- The appropriate health and safety equipment (e.g. dust masks) must be worn by workers during the phases of dust-producing construction activity.
- During periods of strong winds, construction work which tends to produce large amounts of dust should be paused until such a time that the wind subsides.

### 6.17. Fire Control

- The contractor shall take all the necessary precautions to ensure that fires are not started as a result of his activities on site.
- No open fires shall be permitted on the site.
- Smoking shall not be permitted in those areas where there is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to support the rapid spreading of an initial flame.

- The contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The contractor shall forward the name of the Fire Officer to the ECO for his approval within 7 days of being on site.
- The contractor shall ensure that there is basic fire-fighting equipment available on site at all times. This shall include at least rubber beaters when working in urban open spaces and natural areas, and at least one fire extinguisher of the appropriate type when welding or other “hot” activities are undertaken.
- The contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

### 6.18. Protection of Natural Features

- The contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations or trees) situated in or around the site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the ECO.
- The contractor shall not permit his employees to make use of any natural water sources for the purposes of swimming, personal washing and the washing of machinery or clothes.

### 6.19. Protection of Flora and Fauna

- All clearing activities must deploy search and rescue teams in-front of clearing machinery to assist in relocating slower moving faunal species e.g. tortoises.
- Protected plant species must be removed from the designated construction footprint and relocated to adjacent areas of similar habitat that will not be affected by construction and used in landscaping once construction is complete.
- Except to the extent necessary for the carrying out of the works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted.
- The removal and stockpiling of topsoil must also be carried out in accordance with the EMPr.
- Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on site.
- The use of chemicals of all forms must be carefully controlled and monitored to avoid contamination of areas.
- The environmental education programme must explain to staff why species of concern are ecologically significance.

### 6.20. Vegetation Clearance

- Vegetation clearing and trampling must be avoided in areas demarcated as no-go areas.
- Temporary infrastructure such as the site camp, lay down areas and storage areas must be placed outside the 32m buffer from the wetland.
- Vegetation clearing must occur in parallel with the construction progress to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the wetland.
- The contractor must work according to a plan, which demarcates areas to be cleared. The plan must be part of the Project Layout Plan developed in the Site Design Phase.
- The minimum amount of vegetation clearance must take place.
- All plants not interfering with construction must be left undisturbed.
- Collection or wilful damage to any plants outside of the areas demarcated for clearing is not allowed.
- No breaking of branches on indigenous trees, outside of the demarcated areas, will be allowed without prior approval from the ECO.

## 6.21. Alien Vegetation Clearance

- The construction phase must employ eradication programmes to remove existing invasive species as well as the removal of any new invasive species, especially those categorized as 1, 2 and 3 on the NEMBA list. This must be undertaken in accordance with the site-specific Alien Plant Management Plan;
- Long-term operational eradication programs to eradicate invasive species must be implemented if possible.

## 6.22. Revegetation

- All areas disturbed during construction shall be reinstated to a state that approximates or betters the state that they were in before construction.
- Cut and fill areas must be restored and reshaped.
- Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.
- The revegetation programme must take cognisance of the climatic and seasonal conditions with the most favourable period being in spring and early summer.
- The rehabilitated areas will be weeded by the nominated rehabilitation contractor for a period of 1 year.
- Species indigenous and or endemic to the area, and suitable for rehabilitation, must be identified and used in preference to exotic species.
- The transplanting of indigenous species within the study area must be done.
- It is also advised that the Environmental Control Officer, to be appointed during the construction phase, must have a good understanding of the local flora. The ECO must be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas, using species selected by an appropriate botanist. All alien plant re-growth must be monitored and should it occur these plants must be eradicated.

## 6.23. Topsoil Management

- Topsoil can only be stripped from the areas as indicated below:
  - Any area which is to be used for temporary storage of materials
  - Areas which could be polluted by any aspect of the construction activity and;
  - Areas designated for the dumping of soil.
- Stripping of topsoil will be undertaken in such a manner as to minimise erosion by wind or runoff.
- Outside of the development footprint, topsoil will be stripped to a depth not exceeding 150mm from the original ground level.
- Areas from which the topsoil is to be removed will be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
- The contractor shall ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.
- Soils should be exposed for the minimum time possible once cleared.
- Topsoil will be temporarily stockpiled, separately from (clay) subsoil and rocky materials in areas designated by the ECO.
- Stockpiles will either be vegetated with indigenous grasses or covered by a suitable fabric to prevent erosion and invasion of weeds. Stockpiled topsoil will not be compacted.

## 6.24. Stormwater Management

- Stormwater should be managed using suitable structures such as swales, gabions and rock rip-wrap so that any run-off from the development site is attenuated prior to discharge.
- Silt and sedimentation should be kept to a minimum, through the use of the above-mentioned structures by also ensuring that all structures don’t create any form of erosion.

- Natural run-off must be diverted to the nearest stormwater drains.

### 6.25. Erosion and Sedimentation Control

- The contractor shall take all reasonable measures to limit erosion and sedimentation due to construction activities and shall, in addition, comply with such detailed measures as may be required by the EMP.
- Revegetate areas that have been disturbed as soon as possible.
- Cut and fill slopes must be made stable and be revegetated as soon as possible during the construction phase.
- Newly formed terraces within the facility must be vegetated in order to stabilise the soil.
- Where erosion and/or sedimentation, whether on or off the site, occurs despite the contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the ECO. Where erosion and/or sedimentation occur due to the fault of the contractor, rectification shall be carried out to the reasonable requirements of the ECO and at the expense of the contractor.

### 6.26. Aesthetics

- The contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

### 6.27. Community Relations

- If required, the contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the ECO.
- The contractor shall keep a "Complaints Register" on site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved. The ECO shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.
- Construction materials and other purchases relating to the project should be done, where possible, within the nearby community and at local shops.

### 6.28. Temporary Site Closure

If the Site is closed for a period exceeding 5 days, the contractor's SHE Officer in consultation with the ECO shall carry out the following checklist procedure and ensure that the following conditions pertain and report on compliance with this clause:

#### 6.28.1. Fuels / flammables / hazardous materials stores

- Fuel stores are as low in volume as practicable.
- There are no leaks.
- The outlet is secure and locked.
- The bund is empty.
- Fire extinguishers are serviced and accessible.
- The area is secure from accidental damage through vehicle collision and the like.
- Emergency and contact numbers are available and displayed.
- There is adequate ventilation in enclosed spaces.

#### 6.28.2. Safety

- Site safety checks have been carried out in accordance with the Occupational Health and Safety Act (No. 85 of 1993) prior to site closure.

- An inspection schedule and log for use by security or contracts staff is developed.
- All trenches and manholes are secured.
- Applicable notice boards are in place and secured.
- Emergency and Management contact details are prominently displayed.
- Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel.
- Night hazards such as reflectors, lighting, traffic signage etc. have been checked.
- Fire hazards identified and the local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpiles are wedged / secured.
- Scaffolds are secure.
- Structures vulnerable to high winds are secure.

### 6.28.3. Erosion

- Wind and dust mitigation measures such as straw, brush packs, irrigation etc. is in place.
- Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows.
- Re-vegetated areas have a watering schedule and the supply to such areas is secured.
- There are sufficient detention ponds or channels in place.

### 6.28.4. Water contamination and pollution

- Hazardous fuel stores are secure.
- Cement and materials stores are secure.
- Toilets are empty and secured.
- Refuse bins are empty and secured.
- Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage.
- Drip trays are empty & secure.

## 6.29. Excavation, Hauling and Placement of Spoil

- The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated.
- Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his “good housekeeping”, particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.

## 6.30. Construction Activities and Equipment

- Construction will be restricted to normal daytime working hours (07:00 – 18:00);
- No construction activities will take place during weekday evenings and night-time (after 18:00), on Saturdays after midday (12:00) and the entire day on Sundays;
- All noise-making equipment shall be turned off when not in use;
- All equipment shall be kept in good working order;
- All equipment shall be operated within specifications and capacity (i.e. do not overload machines);
- Compliance with the appropriate legislation with respect to noise is mandatory;
- The contractor will familiarise himself with, and adhere to, any local bylaws and regulations regarding the generation of noise;

- Construction staff should be given “noise sensitivity” training;
- The contractor will endeavour to keep noise generating activities associated with construction activities to a minimum;
- Modern low noise emission vehicles and equipment shall be favoured on site. The details of all construction machinery and vehicles must be determined prior to construction in order to identify potentially noisy machinery and to seek possible alternatives. These details will include the manufacturer, type and noise emission data of each machinery/vehicle and how many will be used at any time. Note that manufacturers of modern vehicles and machinery provided for the international market are obliged to provide noise emission data. Where this information is not available, noise measurements must be conducted prior to use of such machinery or vehicles;
- A well planned and co-ordinated “fast track” procedure is implemented to complete the total construction process in the area in the shortest possible time.

# 7. OPERATIONAL PHASE EMPR

## 7.1. Water Use

- All sources of water for operational purposes must be approved by the ECO in writing before any such sources can be used to obtain water.
- Where possible all wash water will be recycled for use, as wash water again or for dust suppression where applicable.
- Water efficient systems, such as dual-flush toilets and water-efficient taps must be used in order to save water.

## 7.2. Contaminated Water

- Potential pollutants of any kind, and in any form, shall be kept, stored, and used in such a manner that any escape can be contained and that the water table and surface water is not endangered. Water containing such pollutants as chemicals, washing detergents, sewerage, fuels, paints and solvents and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling.

## 7.3. Health and Safety

- All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993);
- All necessary occupational certificates and inspections must be complied with to the approval of an appointed Health and Safety Officer;
- The FBDM or persons in control of the facility must train safety representatives, managers and workers in workplace safety.

## 7.4. Emergency Protocol

- An emergency response protocol (for construction and operation) should be drawn up, to the approval of the ECO, prior to construction and operation taking place;
- All pollution incidents must be reported immediately to the Authorities;
- Record(s) of environmental related incidents should be maintained and communicated to the ECO.

### 7.4.1. Fire control

- The FBDM shall take all the necessary precautions to ensure that fires are not started as a result of his activities on site.
- No open fires shall be permitted on the site.
- Smoking shall not be permitted in those areas where there is a fire hazard.
- The FBDM shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed.
- The FBDM shall ensure that there is basic fire-fighting equipment available on site at all times.
- The FBDM shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

### 7.4.2. Accidental leaks and spillages

- The FBDM shall ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which shall include notifying the relevant authorities.

- The FBDM shall ensure that all the necessary materials and equipment for dealing with spills and leaks are available on site at all times.
- In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured. The FBDM shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 ℓ of hydrocarbon liquid spill.
- Any spills must be cleared and the contaminated soil/sludge disposed of in an appropriate manner or at a licensed hazardous waste disposal site.

### 7.5. Protection of Natural Features

- The FBDM shall not deface, paint, damage or mark any natural features (e.g. rock formations or trees) situated in or around the site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the FBDM in contravention of this clause shall be restored / rehabilitated to the satisfaction of the ECO.

### 7.6. Aesthetics

- The FBDM shall take reasonable measures to ensure that operational activities do not have an unreasonable impact on the aesthetics of the area.

### 7.7. Effluent Handling/ Storm Water Management

- Stormwater must be managed using suitable structures. Silt and sedimentation must be kept to a minimum, through the use of the above-mentioned structures by also ensuring that all structures don't create any form of erosion.
- Natural run-off must be diverted to the nearest stormwater drains.
- The clean (e.g. surface runoff from the driveway) and dirty (e.g. contaminated water from the forecourt and filling points) water systems must be separated to prevent contaminated run-off from entering the surface water, groundwater and soil;
- All surface spillages must be contained on-site through channels and trenches and diverted to an appropriate oil or water separator system of sufficient capacity;
- No fuels or oils must be allowed to be discharged directly into stormwater pipes or drains and sewage manholes or pipes;
- All waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and/or fuel disposal or storage containers should under no circumstances be emptied and dumped to the surrounding area. Outflow must be directed to the municipal sewer system.

### 7.8. Ablution Facilities

- Fixed ablution facilities will be utilised during the operational phase. The FBDM must ensure that these are correctly maintained and cleaned on a regular basis.
- Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided.
- The facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided.
- Discharge into the environment and burial of waste is strictly prohibited.

### 7.9. Eating Areas

- Designated eating areas must be provided for the workers involved in the operation as well as for patrons visiting the site.
- Sufficient bins shall be present in these areas. All disposable food packaging must be disposed of in the bins after every meal.

- The area must be cleaned after every meal.
- The feeding or leaving of food for animals is strictly prohibited.

### 7.10. Site Structures

- All site components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. The type and colour of roofing and cladding materials to the structure shall be selected to reduce reflection.
- The FBDM shall supply and maintain adequate and suitable areas for the storage of materials. The areas that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

### 7.11. Lights

- The FBDM shall ensure that any lighting installed on the site for his activities does not cause a reasonably avoidable disturbance to the naturally occurring fauna.

### 7.12. Noise

- Precautions to minimise noise generated on site (e.g. install and maintain silencers on machinery) will be implemented.
- The FBDM shall comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act.
- No amplified music shall be allowed on site. The FBDM shall not use sound amplification equipment on Site unless in emergency situations.

# 8. MONITORING AND EVALUATION

The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. The overall monitoring and auditing of the site will be the responsibility of the ECO, however the developer must provide the necessary environmental control and audit measures and integrate these through their Environmental Management Systems. The monitoring protocol which must be adhered to for the proposed development is included below (Table 8.1).

In addition to the monitoring provisions included in Table 8.1, the following monitoring protocol should be included at a minimum:

- An invasive species monitoring, control and eradication plan for land/activities under the control of the proponent should be developed as part of the Construction EMPr plan in accordance with CARA;
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project;
- A bird monitoring programme must be drafted and implemented for the proposed development;
- Post construction monitoring must occur for 12 months after completion of the site, at quarterly intervals, to ensure that the site is revegetated; and
- Water quality monitoring must be undertaken on a monthly basis and any indication of water pollution immediately reported to the DENC and the DWS.

The operational phase of the proposed development is predicted to continue into perpetuity. It is recommended that an ECO is appointed to conduct quarterly monitoring for the first year following the completion of construction to ensure that the revegetation of the disturbed areas has been completed successfully. In addition, the ECO must monitor the water quality of the wetland and must make recommendations to the FBDM for the improvement of the water quality in the area. Following this, the FBDM should undertake internal monitoring on an annual basis.

The following plans for management and monitoring have been proposed for this project:

- Chance Find Procedure for heritage, archaeological and palaeontological remains
- Permits for removal and/or transplant of SCC
- Search and Rescue Procedure
- Conservation Management Plan
- Wetland Management Plan
- Alien Vegetation Management Plan
- Rehabilitation Management Plan
- Bird Monitoring Programme
- Water Quality Baseline
- Stormwater Management Plan
- Waste Management Plan

Table 8.1 below lists the impact management actions (mitigation measures) for the proposed development. Each impact management action must undergo a monitoring method (e.g. visual inspections), at a specific frequency (e.g. daily), by a specific role player (e.g. the ECO), at a particular phase or at particular phases of the development (e.g. construction) and will need to be reported via a specific reporting mechanism (e.g. an ECO audit report). Certain mitigation measures will only be relevant during certain phases of the development, while others will remain applicable in perpetuity. In some cases, the FBDM will be required to appoint an external service provider to oversee the management actions where the FBDM is the responsible entity (e.g. water quality monitoring).

**Table 8.1: Monitoring of the implementation of the impact management actions.**

| Impact Management Action | Monitoring Method | Monitoring Frequency | Responsible Entity | Time Period for Monitoring | Mechanism and Reporting of Monitoring Compliance |
|---|---|---|---|---|---|
| **BIODIVERSITY IMPACTS** | | | | | |
| Mitigation of the Loss of Natural Vegetation | Visual Inspections | Daily | ESO | Pre-construction and throughout construction | Daily ESO check-sheets and monthly ECO reports |
| | | Monthly | ECO | | |
| Mitigation of the Loss of Species of Conservation Concern | Visual Inspections | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of the Invasion of Alien Species | Visual Inspections | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of the Impacts resulting from Material Stockpiling | Visual Inspection (with Water Quality Sampling if deemed necessary) | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of the Impacts on Water Quality | Water Quality Sampling | Monthly (Construction) And Biannually (Operation) | FBDM | Pre-construction, throughout construction and during operation depending of the trend of the results | Submission of test results to the DENC and the DWS and monthly ECO reports |
| Mitigation of Sedimentation and Wetland Pollution (construction) | Water Quality Sampling | | | | |
| Mitigation of Sedimentation and Wetland Pollution (Operation) | Water Quality Sampling | | | | |
| Rehabilitation of Disturbed Areas | Visual Inspections | Daily | ESO | Ongoing as construction of various areas is completed | Daily ESO check-sheets |
| | | Post-Construction | ECO | Conclusion of the construction phase | Post-Construction Closure report |
| **HERITAGE AND PALAEONTOLOGICAL IMPACTS** | | | | | |
| Mitigation of the Impacts to Stone Age Artefacts | Visual Inspections | Daily | ESO | Pre-construction and throughout construction | Daily ESO check-sheets and monthly ECO reports |
| | | Monthly | ECO | | |
| Mitigation of the Loss of Paleontological Resources | Visual Inspections | Daily | ESO | | |
| | | Monthly | ECO | | |
| **AVIFAUNAL IMPACTS** | | | | | |
| Mitigation of the Loss of extent of terrestrial avifaunal habitat due to construction phase habitat clearing | Visual Inspections | Quarterly (Construction) Annually (Operation) | Avifaunal Specialist | Construction and operational phases | Quarterly Bird Monitoring Reports |
| Mitigation of the disturbance of avifauna due to an increase in noise levels | Visual Inspections | | | | |
| Mitigation of the Loss of Species of Conservation Concern | Visual Inspections | | | | |

| Impact Management Action | Monitoring Method | Monitoring Frequency | Responsible Entity | Time Period for Monitoring | Mechanism and Reporting of Monitoring Compliance |
|---|---|---|---|---|---|
| Mitigation of the disturbance and reduction of avifaunal species due to operational activities including visitors, boats and permanent inhabitants | Visual Inspections | | | | |
| Reducing the increase in pest Avifaunal Species during Operational Phase | Visual Inspections | | | | |
| Increased conservation efforts due to availability of funding | Maintain a record of income utilised for conservation | | | | |
| **GENERAL AND OTHER IMPACTS** | | | | | |
| Mitigation of Surface and Groundwater Pollution | Water Quality Sampling | Monthly (Construction) And Biannually (Operation) | FBDM | Pre-construction, throughout construction and during operation depending of the trend of the results | Submission of test results to the DENC and the DWS and monthly ECO reports |
| Mitigation of Soil Erosion and Sedimentation | Visual Inspections | Daily | ESO | Pre-construction and throughout construction | Daily ESO check-sheets and monthly ECO reports |
| | | Monthly | ECO | | |
| Mitigation of Solid Waste Pollution | Visual Inspections and Waste Inventories | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of Dust Pollution | Maintain a record of complaints | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of Traffic | Maintain a record of complaints | Daily | ESO | | |
| | | Monthly | ECO | | |
| Mitigation of Noise Disturbance | Maintain a record of complaints | Daily | ESO | | |
| | | Monthly | ECO | | |
| Employment Creation and Economic Benefits | Maintain a record of employment | Annually | FBDM | Construction and operational phases | Employment reports (e.g. EPWP) |
| Tourism Benefits | Maintain a record of income as well as tourism statistics | Annually | FBDM | Operational phase | FBDM IDP/SDF |

# 9. ENVIRONMENTAL AWARENESS TRAINING

## 9.1. Introduction

Contractors shall ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations. Training shall be conducted by an independent person where necessary, alternatively by the ECO and/or ESO. Environment and health awareness training programmes should be targeted at two distinct levels of employment, i.e. management and labour. Environmental awareness training programmes shall contain the following information:

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

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

## 9.2. Environmental Awareness Requirements

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

- The importance of conformance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.
- Environmental legal requirements and obligations.
- Details regarding protected floral/faunal species and the procedures to be followed should these be encountered during the construction of the development.
- The importance of not littering.
- The importance of using supplied toilet facilities.
- The need to use water sparingly.
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. An environmental training and awareness course has been provided in Annexure 2.

## 9.3. Environmental Awareness Training

Environmental awareness training courses shall be run for all personnel on site (See Annexure 2 for a proposed Basic Environmental Education Course). Two types of courses shall be run, one for the contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the contractor.

All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the ECO.

The size of each session shall be limited to 30 people. The contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site.

Notwithstanding the specific provisions of this clause it is incumbent upon the contractor to convey the sentiments of the EMPr to all personnel and subcontractors involved with the project.

### 9.3.1. Training course for management and foremen

- The environmental awareness training course for management shall include all management staff and foremen. The course, which will be presented by the ECO, will be of approximately one-hour duration.
- The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

### 9.3.2. Training course for site staff and labour

- The environmental awareness training course for site staff and labour shall be presented by the contractor's SHE Officer from material provided by the ECO unless otherwise required by the Project Specification. The course will be approximately one-hour long.
- The course shall be run not more than 7 days after commencement of work on site with sufficient sessions to accommodate all available personnel. Subsequent courses shall be held as and when required.

### 9.3.3. Construction personnel information posters

- The contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with the Environmental EMP. Construction personnel information posters shall be laminated and erected in all eating areas, workshops and site offices. The contractor shall ensure that the construction personnel information posters are not damaged in any way, and shall replace them if any part becomes illegible.
- Examples of these posters will be supplied to the contractor by the ECO in electronic format.

# ANNEXURE 1: METHOD STATEMENTS

Method statements need to be compiled by the Contractor for approval by the ECO. For the purposes of the environmental specification, a method statement is defined as a written submission by the Contractor to the ECO setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, in such detail that the ECO is enabled to assess whether the Contractor's proposal is in accordance with the EMPr and / or will produce results in accordance with EMPr.

The method statement shall cover applicable details with regard to:

- Construction procedures,
- Materials and equipment to be used,
- Getting the equipment to and from site,
- How the equipment/ material will be moved while on site,
- How and where material will be stored,
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- Timing and location of activities,
- Compliance/ non-compliance with the Specifications, and
- Any other information deemed necessary by the Engineer.

The Contractor shall abide by these approved method statements, and any activity covered by a method statement shall not commence until the ECO has approved the method statement. The method statement shall be submitted to the ECO not less than 20 days prior to the intended date of commencement of the activity, or as directed by the ECO.

# METHOD STATEMENT

**CONTRACT**:…….... **DATE**:……

**PROPOSED ACTIVITY** (give title of method statement and reference number from the EMPr):

| |
|---|
| |

**WHAT WORK IS TO BE UNDERTAKEN** (give a brief description of the works):

| |
|---|
| |

**WHERE ARE THE WORKS TO BE UNDERTAKEN** (where possible, provide an annotated plan and a full description of the extent of the works):

| | |
|---|---|
| Start Date: | End Date: |

**START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:**

**HOW ARE THE WORKS TO BE UNDERTAKEN** (provide as much detail as possible, including annotated sketches and plans where possible):

| |
|---|
| |

* Note: please attach extra pages if more space is required

***DECLARATIONS***

**1) ENVIRONMENTAL CONTROL OFFICER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____ _____

(Signed) (Print name)

Dated:._____

**2) PERSON UNDERTAKING THE WORKS**

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

# ANNEXURE 2: BASIC ENVIRONMENTAL EDUCATION COURSE


http://www.webweaver.nu/clipart/environmental.shtml

## Reasons why should we look after the environment

- We have a right to a clean environment
- A clean environment is essential to healthy living
- All our basic needs come from the environment
- A contract has been signed – development vs the environment
- Penalties / fines could be issued

## How to look after the environment

- Report issues
- Teamwork
- Follow the set rules and guidelines (EA, EMPr, Method statements etc.)
- Conserve, reuse and recycle

## Tips and Guidelines

- Workers and equipment should not be allowed outside demarcated areas
- No swimming or polluting of water bodies allowed
- No damage / disturbance to vegetation or water bodies without consent / permits
- No disturbance allowed in no-go areas
- No hunting of animals
- Report all fires
- No burning or burying of waste
- No smoking near hazardous materials
- Training on fire fighting equipment
- Hazardous materials to be stored in designated and bunded areas
- Spill kits and drip trays a must
- Report all spills
- Control dust and Noise
- Maintain construction vehicles
- Availability and maintenance of sanitation facilities

## Tips and Guidelines

- Only eat is designated areas
- Do not litter
- Vehicles to remain on approved tracks and adhere to speed limit
- Ensure emergency phone numbers are available
- Ensure PPE is worn
- Report fires, leaks and injuries
- Ask if unsure

# ANNEXURE 3: CVS OF PROJECT TEAM

Please refer to the CVs in the Environmental Impact Report.

# ANNEXURE 4: SENSITIVITY MAP