# ENVIRONMENTAL MANAGEMENT PLAN (EMP)

# PRE-CONSTRUCTION & CONSTRUCTION

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STRATEGIC ENVIRONMENTAL FOCUS

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## ABREVIATIONS

DEAT .....Department of Environmental Affairs and Tourism
DEA&DP .....Department of Environmental Affairs and Development Planning
DWAF .....Department of Water Affairs and Forestry
EA.....Environmental Authorisation
EAP ..... Environmental Assessment Practitioner
ECA .....Environmental Conservation Act
ECO.....Environmental Control Officer
EIA.....Environmental Impact Assessment
EMP.....Environmental Management Plan
HIA & SWMP .....Hydraulic Impact Assessment and Stormwater Master Plan
IEM ..... Environmental Management System
EO ..... Environmental Officer
ESO.....Environmental Site Officer
I&AP .....Interested and Affected Parties
IEM .....Integrated Environmental Management
NEMA .....National Environmental Management Act
TIA..... Traffic Impact Assessment

## DEFINITIONS

***Alien species*** - Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area.

***Alternative*** - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

***Auditing*** - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

***Biodiversity*** - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.

***Conservation*** - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

***Contamination*** - Polluting or making something impure.

***Corrective (or remedial) action*** - Response required to address an environmental problem that is in conflict with the requirements of the EMP. The need for corrective action may be determined through monitoring, audits or management review.

***Degradation*** - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

***Ecology*** - The scientific study of the relationship between living things (animals, plants and humans) and their environment.

***Ecosystem*** - The relationship and interaction between plants, animals and the non-living environment.

***Environment*** - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

***Environmental Impact Assessment (EIA) -*** An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

***Environmental policy*** - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

***Habitat*** - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

***Hazardous waste –*** Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

***Impact -*** A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

***Indigenous species -*** Plants and animals that are naturally found in an area.

***Infrastructure -*** The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

***Integrated -*** Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

***Integrated Environmental Management (IEM) -*** A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

***Land use -*** The use of land for human activities, e.g. residential, commercial, industrial use.

***Leaching –*** The removal of mineral compounds from ground particles by direct contact with a solvent.

***Mitigation*** - Measures designed to avoid, reduce or remedy adverse impacts

***Natural environment -*** Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

***Policy -*** A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

***Process -*** Development usually happens through a process - a number of planned steps or stages.

***Proponent –*** Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMP.

***Recycling*** - Collecting, cleaning and re-using materials.

***Resources -*** Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

***Stakeholders -*** A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

***Storm water management -*** Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

***Sustainable development -*** Development that is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

***Sustainability -*** Being able to meet the needs of present and future resources.

***Waste Management -*** Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

***Wetlands -*** An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

***Zoning -*** The control of land use by only allowing specific type development in fixed areas or zones

## REFERENCES

DEAT (1992) Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2004a) Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

CITY OF CAPE TOWN: ENVIRONMENTAL MANAGEMENT PROGRAMME (2002) Specification EM – 02/07: ENVIRONMENTAL MANAGEMENT, Ver 5 (03/2002).

Lochner, P. 2005.Guideline for Environmental Management Plans. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

National Environmental Management Act 107 of 1998 (NEMA).

## SECTION 1: INTRODUCTION AND BACKGROUND

### 1.1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd, as independent environmental managers and impact assessors, has been appointed by the **VDMV Property Group (Pty)** to update the approved Environmental Management Plan (EMP) for consideration by the decision making authority; the **Department of Environmental Affairs and Development Planning (DEA&DP)** in the Western Cape.

This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an EMP.

The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a results of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'); and
- the opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on

co-operative governance, public participation and sustainable development. The EIA Regulations that took effect in July 2006 regulate the procedures and criteria for the submission, processing, consideration and decision on applications for environmental authorisation of listed activities.

## 1.2 SCOPE

The general principles contained within this document apply to all **PRE-CONSTRUCTION AND CONSTRUCTION** activities.

### 1.2.1 Principles of this EMP

This EMP is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- Continuous improvement. The project proponent (or implementing organisation) must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMP to be successful and effective.
- Flexible and responsive. The implementation of the EMP must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMP is a dynamic "living" document and thus regular planned review and revision of the EMP must be carried out.
- Integration across operations. This EMP must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- Legislation. It is understood that any development project during its construction phase is a dynamic activity within a dynamic environment. The Developer, Engineer, Contractor and sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the ER, EO and ECO on a regular basis in this regard.

### 1.2.2 Site specific information

#### *1.2.2.1 Proposed activity and local context*

The site (ERF 3481 Brackenfell and ERF 35069 Bellville) is a narrow strip of land running along the western side of the R300 national road, in the Bottelary area of the City of Cape Town. Most of the surrounding land has already been developed for industrial purposes.

The Kuils River transverses the site and much of the land proposed for development falls within the flood plains of the river. Portions of the site fall below the (natural) 1:100 year floodlines of the river and the construction of fill platforms, to raise the building level above the 100 yr flood level, will be required. The development will entail the rezoning and subdivision of the site for light industrial purposes (Annexure 6). The development will include the following activities:

- Construction of fill platforms in order to raise certain low lying areas above the 1:100 year floodline;
- Installation of a pipeline system for the provision of potable water;
- Installation of an internal sewer system;
- Construction of an internal road system, including the construction of a new single-span bridge over the Kuils River;
- Installation of infrastructure for the provision of electrical power;
- Construction of an internal stormwater system and floodwater storage areas; and
- Allocation of a riverine buffer along the Kuils River.

The updated site layout plan (**Annexure 6**) indicates the allocation of land to erven, roads infrastructure and open green space (riverine buffer).

#### *1.2.2.2 Summary of impacts associated with the proposed activity*

The main impacts associated with the proposed development include the following:

- Erosion and bank destabilization of the Kuils River;
- Erosion of the floodplain;
- Loss of riparian vegetation and structures (such as wetlands); and
- Pollution of the river channel.

#### *1.2.2.3 VDMV's environmental management policy and/or commitments*

The proponent understands the importance of conserving the environment and will endeavor to apply all necessary mitigation measures to conserve and maintain sensitive areas and minimise environmental degradation.

### 1.2.3 Interpretations

The implementation of the EMP is not an additional or "add on" requirement. The EMP is legally binding through NEMA and the relevant EA. The proponent is to ensure that through the project tender process the EMP forms part of the Project Construction Contract Document to be incorporated in line with:

a) General project specifications; and
b) SANS 1200 A or SANS 1200 AA, as applicable.

### 1.2.4 Project phase

This EMP is specifically compiled for the period of time prior to commencement of and activities associated with construction of the above mentioned activity.

### 1.2.5 Role players and responsibility matrix

In order for the EMP to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must clearly understand their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication.

Potential role players or project teams will include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Engineers Representative (ER), Environmental Officers (EO), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

**Please note:** this EMP, including the list of role players, is subject to the inclusion of any conditions and recommendations set out by the DEA&DP in the environmental authorisation.

**Table 1: Functions and Responsibilities of the Project Team**

| KEY | FUNCTION | RESPONSIBILITY |
|---|---|---|
| **D** | **Developer** | Proponent ultimately accountable for ensuring compliance to the EMP and conditions contained in the EA. The ECO must be contracted by the developer (full time or part time depending on the size of the project) as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of EA, and the EMP for the project.<br>The developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the project team. |
| **CE** | **Consulting Engineer** | Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of PM on the proponent's behalf (See PM). |
| **PM** | **Project Manger** | The PM has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met. The CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMP in accordance with an agreed warning procedure. |
| **ER** | **Engineers Representative** | The consulting engineer's representative on site. Has the power/mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the EO or ECO. The ER oversees site works, liaison with Contractor and ECO. |
| **EO/EM** | **Environmental Officer /Environmental manager** | Appointed by the CE as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMP. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused i.e. in cases of extreme urgency and then only when the ER is absent.<br>The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. On certain types of projects, such as linear developments (fences, pipelines, etc), the EO must also be the liaison between the contractor and landowners.<br>The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with the EMP, and be responsible for providing reports and feedback on potential environmental problems associated with the development to the project team and ECO.<br>The EO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.<br>The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices. |

| KEY | FUNCTION | RESPONSIBILITY |
|---|---|---|
| **ECO** | **Environmental Control Officer** | An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of EA's, and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team.<br>The ECO must be proactive and have access to specialist expertise as and when required, these include botanist's ecologists etc. Further the ECO must also have access to expertise such as game capture, snake catching, etc.<br>The ECO must conduct audits on compliance to relevant environmental legislation, conditions of EA, and the EMP for the project. The size and sensitivity of the development, based on the EIA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection must be undertaken).<br>The ECO must be the liaison between the relevant authorities and the project team. The ECO must communicate and inform the developer and consulting engineers of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out.<br>The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.<br>The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible.<br>On small projects, where no EO is appointed, the ECO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce. |
| **C** | **Contractor** | The principle contractor, hereafter known as the 'Contractor', is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA's, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP.<br>The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented. |
| **ESO** | **Environmental Site Officer** | The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor's management team.<br>Dependent on the size of the development the ESO must be on site one week prior to the commencement of construction. The ESO must ensure that he/she is involved at **all phases** of the constriction (from site clearance to rehabilitation). |
| **A** | **Lead Authority** | The authorities are the relevant environmental department that has issued the EA. The authorities are responsible for ensuring that the monitoring of the EMP and other authorisation documentation is carried out, this will be achieved by reviewing audit reports submitted by the ECO and conducting regular site visits. |
| **OA** | **Other Authority** | Other authorities are those that may be involved in the approval process of an EMP. Their involvement may include reviewing EMP's to ensure the accuracy of the information relevant to their specific mandate.<br>Other authorities may be involved in the development, review or implementation of an EMP. For example if a specific development requires a water use licence for the relevant national authority then that authority should review and comment on the content of the particular section pertaining to that mandate. |
| **EAP** | **Environmental Assessment Practitioner** | The definition of an environmental assessment practitioner in section 1 of NEMA is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations". |

### 1.2.6 Enforcement, monitoring and auditing

The independent ECO is responsible on projects approved under NEMA for regular audits on compliance to relevant environmental legislation, conditions of the EA, and the EMP for the project.

The ECO must conduct, at a frequency as determined by the Department and stipulated in the relevant EA for the project, independent environmental audits. The audits are to verify the projects compliance with the EMP and conditions of the EA.

Before any construction activities commence, the ECO must compile, for the approval by the Department, an audit checklist based on the contents of this EMP and conditions of the EA. The ECO must at the request of the Department forward audit reports to the Department at a frequency determined by the Department which must be stipulated in the EA.

Evidence of the following as **key performance indicators,** must be included in the audit reports where required:

1. Complaints received from landowners and actions taken.
2. Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
3. Incidents leading to litigation and legal contraventions.
4. Environmental damage that needs rehabilitation measures to be taken.

A copy of all ESO and EO monitoring reports, contractor method statements and pro forma documentation (see 1.2.11 & 1.2.12) must be held by the ESO and/or the EO on site and be made available to the Department and or the ECO upon request.

### 1.2.7 Non-Compliance

Fines

An Environmental Performance Guarantee of 5 % of monthly invoices from the principle contractor will be retained by the client. Re-imbursement of guarantees will be paid to the principle contractor yearly, or on completion and handover, or as per agreement between the contractor and the client and following review of compliance and issuing of a clearance certificate by the ECO.

Each non-conformance (in terms of this EMP) not addressed within 2 weeks of being reported in ECO audit reports, will constitute a fine.

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

a. within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the EMP confirmed and verified by the ECO;
b. environmental damage ensues due to non-compliance of EMP requirements;
c. the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time, and

d. The Contractor fails to respond adequately to complaints from the public in line with requirements of this EMP

### 1.2.8 Measurement and payment

It is understood that environmental requirements included in this EMP will entail costs over and above those of the civil requirements. These include provision for: mitigation and enhancement actions; training and environmental awareness requirements; monitoring; auditing; and corrective actions. The proponent must recognise this and make provision for it in the tender. Costing for management action should be done with inputs and advice from appropriate technical members of the project team and relevant EAP who have knowledge of the management actions being recommended as well as practical experience in implementing similar measures and techniques.

A lump sum must be allocated for the management of Environmental Specifications where it is not possible to cost requirements of the EMP.

### 1.2.9 General guidelines

The following measures provide guideline solutions to frequently anticipated issues on most development activities.

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds etc. is ultimately the responsibility of the applicant/developer. Section 28 of NEMA.
- The study area must be clearly defined, surveyed and fenced according to the project authorisation. All workforce members and other construction personnel are not to go beyond the fenced footprint. Landowners are not comfortable when strangers come on to their properties. They will look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to the Contractor.
- The Contractors must adhere to agreed and approved access points and haul roads.
- No camping is allowed on any private property.
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damage is to be repaired immediately and to the satisfaction of the owner.
- Relevant landowners and businesses must be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including this EMP.
- Proper planning of the construction process must be undertaken to allow for disruptions due to rain and very wet conditions.

- All private and public manmade structures near the project site must be protected against damage at all times and any damage must be rectified immediately.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.
- A positive attitude towards Environmental Management by all site personnel must be motivated through regular and effective awareness and training sessions (see 1.2.10 below).
- Environmental Audits to be carried out during and upon completion of construction.

### 1.2.10 Awareness training

The ECO is responsible for ensuring everyone on site is given an environmental awareness induction session, which not only clearly defines what the environment is and gives specifics detailing the local environment but outlines the requirements of the EMP as a management tool to protect the environment.

Refresher courses must be conducted as and when required. The EO or ESO must ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working. Awareness posters and a hand out must be produced to create awareness throughout the site.

### 1.2.11 Contractor environmental Method Statements

Method Statements are written submissions to the Engineer by the Contractor, in collaboration with his/her ESO, in response to a request by the EO and or Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO and/or Engineer. The Method Statements contain the appropriate detail such that the EO and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMP. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement.
All Method Statements including those which may be required as ad hoc or emergency construction method statements must be submitted to the Engineer for approval prior to the commencement of the activity.

Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO and Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMP.

The *pro forma* Method Statements attached must be used and method statements for the following activities must be submitted to the EO, ECO and Engineer for approval before construction commences.

- Solid waste management
- Crew camps and construction lay down areas
- Workshop and maintenance/cleaning of plant
- Cement and concrete batching
- Dust control
- Hydrocarbon and emergency spills procedures
- Diesel tanks and refuelling procedures
- Sourcing, excavating, transporting and dumping of fill and spoil material
- Topsoil management
- Fire
- Rehabilitation of crew camp and other disturbed areas

### 1.2.12 Site documentation

The following is a list of documentation that must be held on site and must be made available to the ECO and/or Approving Authority on request.

- Copy of the EA issued by DEA&DP for the development
- Site daily diary /instruction book/ Incident reports
- Records of all remediation / rehabilitation activities
- Copies of EO reports (management and monitoring)
- Environmental Management Plan (EMP)
- Complaints register
- Method statements

### 1.2.13 Pro forma documentation

#### *1.2.13.1 Prior to the commencement of construction activities*

The following attached *pro forma* documentation is to be filled out and is binding to the EMP and project contract and includes, but is not limited to the following:

- Declaration of understanding by the Developer
- Declaration of understanding by the Engineer
- Declaration of understanding by the Contractor
- Method statements
- ECO / Engineer approval for method statements

*1.2.13.2 During construction activities*

The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMP and project contract. They include, but are not limited to, the following:

- Amended Method Statements
- ECO / Engineer approval for amended method statements
- Environmental incidents
- Records of all remediation / rehabilitation activities

### 1.2.14 National and Provincial Acts and Guidelines

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principals of this document.

**Advertising on Roads and Ribbon Development Act No. 24 of 1940**
Regulates the display of adverts at places visible from public roads. Also controls the depositing of machinery or refuse, and the construction or laying of structures, near public roads.
*Provincial Authorities*

**Animals Protection Act No. 71 of 1962**
Provides for the protection of animals.

**Atmospheric Pollution Prevention Act No. 45 of 1965**
Control of noxious and offensive gases, smoke, dust and vehicular emissions.
*DEAT: Regional Air Pollution Control Office*

**Environment Conservation Act No. 73 of 1989**
**National Environmental Management Act No. 107 of 1998**
Control/prevention of pollution; combating of noise; activities which may have a detrimental effect on the environment, preparation and contents of environmental impact reports.
*Department of Environmental Affairs and Tourism, Department of Water Affairs and Forestry, Directorate: Environmental Management of the Provincial Department of Environmental and Cultural Affairs and Sport, Local Authorities*

**Fencing Act No. 31 of 1963**
Clearing of bushes for border fencing, Access to property for fencing.
*Department of Agriculture*

**Hazardous Substances Act No. 15 of 1973**
Provides for the control of substances, which may cause injury or ill health to, or the death of human beings.
*National Department of Health. Local Authorities may be authorized*

**Health Act No. 63 of 1977**
Control of solid, liquid and gaseous wastes that may pose a health hazard.
*Department of Health and Local Authorities*

**National Building Regulations and Standards Act 103 of 1977 (SABS 0400)**

**National Heritage Resources Act No. 25 of 1999**

**National Road Traffic Act No. 93 of 1996**
Provides for road traffic matters which apply uniformly throughout South Africa.

*Department of Transport.*

**National Veldt and Forest Fires Act No.101 of 1998**
Fire Protection Associations. Building of fire breaks.
*Department of Water Affairs and Forestry*

**National Water Act No. 36 of 1998**
**Water Services Act No. 108 of 1997**
Diversion or impoundment of rivers. Conservation and use of water. Treatment and disposal of waste, wastewater and effluent. Pollution and pollution emergencies. Water Users & Associations. Dam safety. Registration of boreholes.
*Department of Water Affairs and Forestry*

**Occupational Health and Safety Act No. 85 of 1993**
Controls the exposure of employees and the public to dangerous and toxic substances or activities.
*Department of Labour*

**Road Transportation Act No. 74 of 1977**
*Department of Transport*

**World Heritage Resource Act No 49 of 1999**
Conservation of national heritage and archaeological material.
South African Heritage Resources Agency.
*National Council for Heritage*

## SECTION 2: CONSTRUCTION PHASE EMP - IMPLEMENTATION

### 2.1 PREAMBLE

The point of departure for this EMP is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore the purpose of an EMP is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMP is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances the approving authority may authorise the ECO to make such changes.

The following tables (see page 20) form the core mitigation measures appropriate to the pre-construction and construction phase. The tables present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and timeframes are clearly specified.

The ***'pre-construction'*** section of this EMP, refers to the period of time leading up to and prior to commencement of construction activities, and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified in the pre-construction phase.

The bulk of environmental impacts will have immediate effect during the ***'construction'*** phase (e.g. noise, dust, and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

The ***'construction'*** section refers to all construction and its operation-related activities that will occur within the approved area and access roads, until the project is completed. This 'construction' section is divided into three functional areas, namely "materials"; "plant"; and "construction". Each of these functional areas within the EMP contains specific mitigation requirements and requested contractor method statements stipulated where required.

### 2.2 STRUCTURE AND CONTENTS OF TABLES

The table consists of six parts as follows:

**Phase of development -** This row will identify either pre-construction (planning) or actual construction phase.

**Impact / issue -** This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.

**Mitigation Measure -** This column will include all the necessary mitigation measures for each impact/issue'.

**Management objectives -** This column will indicate what the management objectives to be achieved for each mitigation measure are.

**Measurable targets -** This column will indicate what evidence is to be used as an indication to whether or not the 'Management objectives' have been implemented and hence achieved.

**Frequency of action -** These columns provide time guidelines for the 'Responsible party' by which he/she is to action or manage the required mitigation.

**SPECIALIST RECOMMENDATIONS**

The last part of the table provides space for addition of specialist recommendations that need to be addressed during the pre-construction and construction phases.

| Phase of development | PRE-CONSTRUCTION |
|---|---|
| Impact / issue | GENERAL PLANNING (A) |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **A1 Project contract and programme**<br>i. The EMP must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract.<br>ii. A copy of this EMP must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMP. | • Contingencies for minimising negative impacts anticipated to occur during the construction phase<br>• Ensure environmental awareness and formalise environmental responsibilities and implementation | • Contract records<br>• Signed declaration pro forma's | - | |
| **A2 Appointments and duties of project team**<br>i. A document containing the contact details for the ECO, ER, EO, Contractor and ESO must be kept on site. This document must be made available to the approving authority on request.<br>ii. Before construction activities commence, role players must have a clear indication of to their role in the implementation of this EMP as indicated in 1.2.5 Table 1.<br>iii. Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. | • Contingencies for minimising negative impacts anticipated to occur during the construction phase | • Contract records<br>• Signed declaration pro forma's | - | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **A3 Method statements**<br>i. As required in 1.2.11, certain method statements must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the engineer and or ECO as applicable.<br>ii. Where applicable, the contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements. | • Contingencies for minimising negative impacts anticipated to occur during the construction phase | • Approved method statements and relevant pro forma documents<br>• Training records | As and when required | |
| **A4 Site demarcation and development**<br>i. The surveys for the overall project area and construction footprint as approved in the EA must be complete and clearly demarcated and fenced before the contractors set up their crew camps or begin construction.<br>ii. "No-go" areas such rocky outcrops, land not to be developed, topsoil stockpiles, wetlands, etc. must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities.<br>iii. All relevant 'general' and 'specific' conditions contained in the EA must be included in the space provided below and included as part of this EMP when the "declaration of understanding" is signed by the Developer, Engineer and Contractor. The proponent is to sign the space provided.<br>iv. All relevant licences or permits in terms of other legislation (such as the National Water Act, 1998 (Act No. 36 of 1998)) must be in place prior to the commencement of construction activities. | • Contingencies for minimising negative impacts anticipated to occur during the construction phase | • Demarcated area's<br>• Filled in section of this document | As and when required | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **A5 Emergencies, non-compliance and communication**<br>i. The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of natural water resources from spills; contamination of soils from spills; and fire.<br>ii. The contractor understands that failure to adhere to the requirements of the EMP will result in fines as stipulated in 1.2.8 'Tolerances', over and above the costs incurred for any remediation required as result of the specific non-compliance. | • Contingencies for minimising negative impacts anticipated to occur during the construction phase | • Method statements | As and when required | |

| | | | |
|---|---|---|---|
| **Phase of development** | **GENERAL PLANNING** | **EA reference number** | |
| **Impact / issue** | **EA Conditions (B)** | **Proponents signature** | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| | • | • | | |
| | • | • | | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| | • | • | | |
| | • | • | | |
| | • | • | | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| | • | • | | |
| | • | • | | |
| | • | • | | |

| Phase of development | CONSTRUCTION |
|---|---|
| Impact / issue | Materials (C) |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **Handling** | | | | |
| **C1 Stockpiles**<br>i. All stockpiled material must be easily accessible without any environmental damage.<br>ii. All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised.<br>iii. The stockpiles may only be placed within the demarcated areas the location of which must be approved by the ECO.<br>iv. The contractor must avoid vegetated areas that will not be cleared.<br>v. Storm water runoff from the stockpile sites and other related areas must be directed into the storm water system with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments.<br>vi. Stockpiles are to be stabilised if signs of erosion are visible.<br>vii. Soils from different horizons must be stock piled such that topsoil stockpiles do not get contaminated by sub-soil material.<br>viii. Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the ECO.<br>ix. No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles.<br>x. Topsoil stockpiles must be clearly demarcated as no-go areas.<br>xi. Stock piles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition. | • Minimise scaring of the soil surface and land features<br>• Minimise disturbance and loss of soil<br>• Minimise construction footprint<br>• Minimise sedimentation of nearby drainage lines<br>• Maintain the integrity of topsoil's for landscaping and rehabilitation<br>• Containment of invasive plant growth<br>• Minimise contamination of storm water run-off | • No visible erosion scars once construction is completed<br>• The footprint has not exceeded the agreed site in terms of EA etc.<br>• Minimal invasive weed growth<br>• No signs of sedimentation and erosion | Daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| xii. If extra materials are brought onto site for use in the construction of the required fill platforms, this material must be inert (non-reactive, non-leaching and non-toxic) and must not contain topsoil that might contain the seeds of alien plant species. | | | | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **C2 Oil and chemicals**<br>i. The contractor must provide method statements for the "handling & storage of oils and chemicals", "fire", and "emergency spills procedures".<br>ii. These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks<br>iii. Drip trays (minimum of 10cm deep) must be placed under all vehicles and/or machinery (eg generators) that stand for more than 24 hours. Vehicles and/or machinery suspected of leaking must not be left unattended, drip trays must be utilised.<br>iv. The surface area of the drip trays will be dependent on the vehicle and/or machine and must be large enough to catch any hydrocarbons that may leak from the vehicle and/or machine while standing.<br>v. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle and/or machine. The drip tray must be able to contain the volume of oil in the vehicle and/or machine.<br>vi. Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly).<br>vii. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material). | • Prevention of pollution of the environment<br>• Minimise chances of transgression of the acts controlling pollution | • No pollution of the environment<br>• No litigation due to transgression of pollution control acts<br>• No complaints from I & AP's<br>• Method statements | Daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **C3 Cement**<br>i. The contractors must provide and maintain a method statement for "cement and concrete batching". The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant.<br>ii. The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into soils, streams, wetlands and natural vegetation.<br>iii. Cleaning of cement mixing and handling equipment must be done using proper cleaning trays.<br>iv. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility.<br>v. Any spillage that may occur must be investigated and immediate remedial action must be taken.<br>vi. The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site.<br>*vii.* Cement batching areas must be located in consultation with the ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc. | • Minimise the possibility of cement residue entering into the surrounding environment<br>• Minimise pollution of soil, surface and ground water resources | • No evidence of contaminated soil on the construction site<br>• No evidence of contaminated water resources<br>• Method statement | Monitored daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **C4 DANGEROUS AND TOXIC MATERIALS**<br>**(Provision of storage facilities)**<br>i. Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas.<br>ii. Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction.<br>iii. In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs and Forestry (DWAF) must be informed immediately.<br>iv. Storage areas must display the required safety signs depicting "no smoking", No Naked lights" and "Danger" containers must be clearly marked to indicate contents as well as safety requirements.<br>v. The contractor must supply a method statement for the storage of hazardous materials at tender stage.<br>vi. Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required. | • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments<br>• Minimise chances of transgression of the acts controlling pollution | • No visible signs of pollution<br>• No litigation due to transgression of pollution control acts | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **C5 Bulk storage of fuels and oils**<br>i. The contractors must provide and maintain a method statement for "Diesel tanks and refuelling procedures".<br>ii. Bulk fuel storage tanks on the site must be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve.<br>iii. A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres.<br>iv. Environmental Authorisation is required for volumes greater than 30 000 litres<br>v. Bulk fuel storage tanks must be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e. they must be located away from water courses).<br>vi. Bulk fuel storage tanks must be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised.<br>vii. Bulk fuel storage areas should be covered during the rainy season. | • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments<br>• Minimise chances of transgression of the acts controlling pollution | • No visible signs of pollution<br>• No litigation due to transgression of pollution control acts<br>• Method statement | Once off, as required | |
| **C6 Use of dangerous and toxic materials**<br>i. The contractor must keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur.<br>ii. The contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval by the appointed EO.<br>iii. A record must be kept of all spills and the corrective action taken. | • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments<br>• Minimise chances of transgression of the acts controlling pollution | • No pollution of the environment<br>• No litigation due to transgression of pollution control acts | As required | |

| Phase of development | CONSTRUCTION |
|---|---|
| Impact / issue | PLANT (D) |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D1 Eating areas and camp followers**<br>i. The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas".<br>ii. The Contractor must, in conjunction with the EO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis.<br>iii. No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO and ECO.<br>iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.<br>v. Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractors discretion facilities can be made available within the designated eating area.<br>vi. Litter (even if originating outside the camp) and concrete bags etc. must be picked up daily and put into suitably closed bins. | • Control potential influx of vermin and flies<br>• Neat work place and hygienic environment<br>• Minimise negative social impacts to local residents and businesses | • No visual sign of vermin and flies<br>• No complaints from I & AP's | Once off, monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D2 Toilets and ablution facilities**<br>i. The contractor is responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet must be provided per 15 persons.<br>ii. Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type. The contractor must keep the toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times. Toilet paper dispensers must be provided in all toilets.<br>iii. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the EO or ECO.<br>iv. The contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays.<br>v. Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times. | • Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat<br>• Minimise potential of diseases on site<br>• Minimise potential to pollute soils, water resources and natural habitats | • Workforce use toilets provided<br>• No complaints received from I & AP's as well as members of the workforce<br>• No visible or measurable signs pollution of the environment (soils, ground and surface water) | As and when required | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D3 Waste management**<br>i. The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes.<br>ii. Waste must be separated into recyclable and non-recyclable waste, and must be separated as follows:<br>· Hazardous waste: including (but not limited to) old oil, paint, etc,<br>· General waste: including (but not limited to) construction rubble,<br>· Reusable construction material.<br>· Recyclable waste must preferably be deposited in separate bins. The contractor is advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. and "Consol" collect glass for recycling.<br>iii. Any illegal dumping of waste must not be tolerated, this action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on; proof of legal dumping must be able to be produced on request.<br>iv. Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot gain access. Weekly litter collection must be conducted for the whole site.<br>v. Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder's wastes generated on the site.<br>vi. Subcontractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. Proof of this undertaking must be issued to the ECO.<br>vii. All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to provide proof of such to the EO and ECO.<br>viii. Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.<br>ix. Skip facilities must be provided at convenient and regular locations (as determined by the ESO or ECO) to contain refuse from campsite bins, rubble and other construction material. Skips should be positioned at least 100 m away from the river channel. | • Sustainable management of waste by recycling<br>• To keep the site neat and tidy<br>• Minimise litigation and complaints by I&AP's<br>• Reduce visual impact<br>• Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment<br>• Minimise potential to pollute soils, water resources and natural habitats | • Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site<br>• Site is neat and tidy<br>• No complaints from surrounding residents and businesses<br>• Sufficient containers available on site<br>• No visible or measurable signs of pollution of the environment (soils, ground and surface water)<br>• Method statement | Daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D4 Dust**<br>i. The contractors must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage.<br>ii. Potable water must not be used as a means of dust suppression, and alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression.<br>iii. The construction camp must be watered during dry and windy conditions to control dust fallout.<br>iv. Dust production must be controlled by regular watering of roads and works area, should the need arise. NB: Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust.<br>v. In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression.<br>vi. At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project.<br>vii. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to.<br>viii. Excessive dust conditions must be reported to the ECO.<br>ix. All forms of dust pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965) | • Reduce dust fall out<br>• Reduce visual impact<br>• Minimise loss of valuable soil material | • No visible signs of dust<br>• No complaints from interested and Affected parties<br>• No incidences reported to ECO<br>• No visible evidence of dust contamination on the surrounding environment<br>• Method statement<br>• Baseline targets not exceeded during regular monitoring of dust counts | Monitored daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D5 Workshop equipment, maintenance and storage**<br>i. The contractors must provide and maintain a method statement for "workshop maintenance and cleaning of plant".<br>ii. All maintenance and washing of vehicles and equipment must take place in the workshop area that is equipped with a bund wall and grease trap oil separator. During servicing of vehicles or equipment, a suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are done outside the workshop area. Leaking equipment must be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste must be collected and removed to a registered waste site.<br>iii. Workshop areas must be monitored for oil and fuel spills and such spills must be cleaned and remediated to the satisfaction of the ECO. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. SUNSORB<br>iv. A method statement is required from the Contractor, tendering for the project to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage.<br>v. The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.<br>i. The following must be applied:<br>• All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bio-remediation can be done. (Bio-remediation should only be an option if an EA has been issued)<br>• A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.<br>• All spills of hazardous substances must be reported to the ECO.<br>• The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). | • Prevent pollution of the environment<br>• Minimise chance of transgression of the acts controlling pollution<br>• Disposal of hazardous substances in an appropriate manner | • No pollution of the environment<br>• No litigation due to transgression of pollution control acts<br>• Method statement | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **D6 Noise**<br>i. Prior to the commencement of any construction activities, a baseline ambient noise survey must be carried out. Equivalent continuous rating levels must be recorded for day-time (06:00 to 22:00) and night-time (22:00 to 06:00). These records must be kept on site.<br>ii. In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as "disturbing". Noise levels during construction must therefore be kept within 7dB of the baseline data.<br>iii. Regular monitoring of noise levels must conducted during construction and the records kept on site.<br>iv. All construction vehicles must be in a good working order to reduce possible noise pollution.<br>v. Work hours during the construction phase (07h00 – 18h00) must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the EO.<br>vi. Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement.<br>vii. Noisy activities must take place only during working hours. The EO must inform the residents of houses and businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors, bulk demolitions, etc. | • Maintain noise levels below "disturbing" as defined in the National Noise Regulations<br>• Minimise the nuisance factor of the development | • No complaints from surrounding landowners or I&AP's | As and when required | |

| Phase of development | CONSTRUCTION |
|---|---|
| Impact / issue | Construction (E) |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E1 Crew camps**<br>i. The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas".<br>ii. Accommodation for members of the workforce is not permitted on site unless authorisation has been given in terms of the Environmental Authorisation issued for the site.<br>iii. Dedicated wash areas must be situated away from watercourses and areas of shallow groundwater and in consultation with the ECO.<br>iv. The contractor's camp must be monitored for dust fallout and dust suppression applied as required. This may include the laying of gravel. The use of grey water can be considered as an option if the required permits have been acquired.<br>v. The contractor's camp, offices and storage facilities must be located within the site boundaries. No person must be allowed to stay on neighbouring sites, unless it is cleared with the owner. In such an event all requirements contained herein for the contractor's camps will apply.<br>vi. The contractor must provide labourers plastic bags to clean up the contractor's camp and construction site on a daily basis. These areas must then be inspected by the contractor or his/her ESO to ensure compliance with this requirement.<br>vii. The contractor is responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and, the topsoil restored in areas where landscaping is to take place. | • Minimise water pollution<br>• Minimise dust fallout<br>• Minimise unwarranted environmental damage outside the footprint<br>• Maintain a clean and healthy working environment<br>• Minimise impact to surrounding environment | • No signs of water or soil pollution<br>• No complaints from surrounding landowners or I&AP's<br>• No visible signs of litter<br>• Method statements | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E2 Fires**<br>i. The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised<br>ii. Absolutely no burning of waste is permitted.<br>iii. Fires will only be allowed in facilities especially constructed for this purpose within fenced Contractor's camps. Wood, charcoal or anthracite are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose.<br>iv. Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air.<br>v. No wood is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation. | • Minimise risk of veldt fires<br>• Minimise destruction of natural fauna and flora<br>• Maintain safety on site | • No veldt fires started by the contractor' s workforce<br>• No claims from landowners for damages due to veldt fires<br>• Method statement | Monitor daily | |
| **E3 Erosion and sedimentation**<br>i. The disturbance of steep slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface runoff. All slopes that are disturbed during construction must immediately be stabilised to prevent erosion. Where re-vegetation of slopes is undertaken, this must be done in accordance with the landscape architect (or appointed landscaper).<br>ii. To reduce the loss of material by erosion, the contractor must ensure that disturbance on site is kept to a minimum. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed.<br>iii. All disturbed areas will require rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed.<br>iv. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas. | • Minimise erosion damage<br>• Minimise impeding the natural flow of water<br>• Minimise scarring of the soil surface and land features<br>• Minimise disturbance and loss of topsoil<br>• Re-growth of disturbed areas. | • No erosion scars<br>• No loss of topsoil<br>• No interference with the natural flow of water<br>• No visible erosion scars once construction is completed<br>• The footprint has not exceeded the agreed boundaries<br>• All damaged areas successfully rehabilitated | As and when required | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E4 Fauna**<br>i. All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962<br>ii. All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake; a specialist must be called in to safely relocate the animal if the EO or ECO is not able to.<br>iii. Environmental induction training and awareness must include aspects dealing in safety with wild animals into on site. Focus on animals such as snakes and other reptiles that often generate fear by telling workers how to move safely away and to whom to report the sighting. Workers should also be informed where snakes most often hide so that they can be vigilant when lifting stones etc. | • Minimise disturbance to animals<br>• Minimise interruption of breeding patterns of birds<br>• Minimise destruction of habitat | • No complaints from Nature Conservation<br>• No litigation concerning applicable animal protection acts<br>• No measurable or visible signs of habitat destruction | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E5 Flora**<br>i. Trees and natural vegetation or any other natural features inside and outside the work area, which will not be cleared for construction purposes, must be clearly demarcated and not be defaced, removed, painted for benchmarks or otherwise damaged, even for survey purposes. The latter can only be done if stipulated in the EA and must be overseen by the EO and ECO. Any feature defaced by the contractor must be reinstated to the satisfaction of the ECO and penalties/fines may be imposed by the ER.<br>ii. Any corridors to surrounding natural areas must be maintained and protected; these must be demarcated as no-go areas.<br>iii. Locally indigenous plants must be used in the landscaping of the site. Plants that are proclaimed as problem plants or noxious weeds must be excluded from the landscaping plan and these must be removed immediately, should they occur on site. These plants, as well as any other problem plants within a specific region as stipulated by a qualified and experienced botanist, must be included in an alien management programme for the site. Eradication must occur every 6 months.<br>iv. The contractor must rehabilitate the construction camp and any other disturbed areas once construction activities have terminated. Compacted areas will be ripped and mulched in order to ensure recovery of the natural vegetation cover. A method statement must be provided and maintained by the contractor.<br>v. Once construction is complete, rehabilitation of un-built areas must be undertaken in order to restore the aesthetic & ecological value of the area. It is recommended the ECO be consulted with regard to the most appropriate rehabilitation vegetation and structures. Active re-vegetation must take place with locally indigenous vegetation under the supervision of the ECO.<br>vi. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984). | • Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority<br>• Prevent litigation concerning removal of vegetation<br>• Encourage natural habitat fauna<br>• Minimise scarring of the soil surface and land features<br>• Minimise disturbance and loss of topsoil<br>• Minimise risk of veldt fires<br>• Minimise risk of fauna and flora destruction | • No litigation due to removal of vegetation without necessary permission<br>• No exotic plants used for landscaping<br>• No visible erosion scars once construction is completed<br>• The footprint has not exceeded the agreed boundaries<br>• All damaged areas successfully rehabilitated<br>• No veldt fires started by contractors work force<br>• No claims from landowners for damages due to veldt fires<br>• Method statement | As and when required | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E6 Heritage**<br>i. In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local Council should they come across any findings of heritage resources within 24 hours.<br>ii. Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours.<br>iii. Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist.<br>iv. Under no circumstances must archaeological artefacts be removed, destroyed or interfered.<br>v. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency on the appropriate provincial heritage resource agency. | • Limit the destruction of the country's heritage resources<br>• The preservation and appropriate management of new archaeological finds should these be discovered during construction. | • No destruction of or damage to known archaeological sites | Monitor Daily | |
| **E7 No-go / sensitive areas**<br>i. All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. There must be no vehicular access to the drainage lines/ river outside the development area.<br>ii. The construction footprint must be kept to a minimum must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities thus reducing the infringement of the development on surrounding habitats.<br>iii. No-go areas must be demarcated with fencing/warning tape and signs before any construction activities commence. These areas and the type of fencing/demarcation must be approved by the relevant specialist involved in the EIA process. The EO and ECO must be on site in order to make sure the correct areas are fully demarcated. | • Minimise the potential for the spread of the of the construction footprint<br>• Reduce loss of fauna and flora habitat<br>• Minimise the potential for loss of protected and or endangered fauna and flora species | • No sign of movement through "no go" areas.<br>• Containment of footprint | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E8 Access route/haul roads**<br>i. No unauthorised access is permitted. Any authorised clearing for access roads must be done under the supervision of the ECO.<br>ii. Any damage or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated.<br>iii. Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage.<br>iv. Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require application for a water use licence.<br>v. Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel must be informed and ensure that this is enforced. | • Minimise loss of topsoil and enhancement of erosion<br>• Minimise fauna and flora displacement by destruction of natural habitats | • No erosion on access roads after completion of construction<br>• No loss of topsoil due to runoff water on access roads | As required, monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E9 Crime, safety and security**<br>i. No site staff, other than security personnel and skeleton staff will be housed on site unless otherwise stipulated in the Environmental authorisation. Security personnel and skeleton staff must be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that open fires are not necessary.<br>ii. A boundary fence must be erected; this will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times.<br>iii. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations.<br>iv. The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.<br>v. The contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.<br>vi. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps. | • Reduce the risk of potential incidences<br>• Minimise the potential impact on the environment | • No incidences reported | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **E10 Visual impact**<br>i. Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas.<br>ii. Landscaping must enhance the aesthetic appeal of the development.<br>iii. Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill.<br>iv. The ECO will comment on the visual impact as part of the ECO's monitoring requirements. | • Minimise visual impact | • No complaints from I & AP's | Monitor daily | |
| **E11 Geotechnical**<br>i. Founding conditions for individual structures must be confirmed by a qualified Geotechnical Engineer / Structural Engineer / Geologist.<br>ii. All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SABS 1200DA.<br>iii. Mechanical methods of rock breaking will have noise and dust impacts that must be managed. Method Statements for chemical breaking must be provided by the ER. | • Minimise potential structural faults<br>• Minimise trench collapse | • No visible signs of backfill deterioration or trench collapse | As and when required | |

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| **E12 Hydrology**<br>i. The ER and or the ECO must assess whether regular water sampling of surface and or ground water resources within the immediate and surrounding environment are necessary. Should this be the case, baseline data from sampling must be obtained relevant to the activity and sensitivity of the area. Regular sampling must then be carried out to determine deviations from the baseline data.<br>ii. Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the Resident engineer as well as the ECO. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell e.g. retention ponds<br>iii. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas.<br>iv. The contractor must ensure that excessive quantities of sand, silt and silt-laden water do not enter the storm water system. Design of the storm water drainage system must ensure that the local and surrounding natural systems are not negatively impacted. Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken. These measures must be reviewed and audited by the ECO.<br>v. No wastewater may run freely into any of the surrounding streets, naturally vegetated areas or the Kuils River. Runoff containing high sediment loads must not be released into natural or municipal drainage systems or nearby watercourses. If this becomes a problem it is | • Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments<br>• Minimise impeding the natural flow of water<br>• Minimise the impact on natural water flow dynamics<br>• Minimise scarring of the soil surface and land features<br>• Minimise damage to river and stream embankments<br>• Minimise erosion of embankments and subsequent siltation of rivers and streams<br>• Minimise damage to riverine habitats | • No visible signs of pollution<br>• No signs of siltation of water courses<br>• No visible erosion scaring once construction is completed<br>• Minimum loss of topsoil<br>• No access roads through river and stream banks<br>• No visible erosion scars on embankments once construction is completed<br>• No erosion or siltation downstream<br>• No deviation from baseline data during regular sampling | As and when required, monitor daily | |

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| recommended that an attenuation pond be constructed to allow solids to settle prior to runoff leaving the site.<br>vi. Approval must be obtained from DWAF for any activities that require authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998), which includes extraction of water from a watercourse.<br>vii. The ECO must be consulted prior to the demarcation of drainage lines and wetlands.<br>viii. No vehicular access is allowed in permanently wet areas.<br>ix. In areas where construction or construction activities are not necessary/required “NO ENTRY” signs must be strategically placed along rivers, streams and other natural or man-made drainage lines, which are in close proximity to access routes.<br>x. No roads are to be cut through river and stream banks as this may lead to erosion causing siltation of streams and downstream dams. Existing drifts and bridges must be used if the landowner gives his consent. Such structures must then be thoroughly examined for strength and durability before they are used. | | | | |

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| **E13 Soil**<br>i. The contractors must provide and maintain a method statement for "management of topsoil".<br>ii. Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include the permanent works, pipeline trenches, stockpiles, access roads, construction camps and lay down areas. Topsoil must be stripped after the clearing of woody vegetation and before excavation or construction commences.<br>iii. Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant seeds. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas.<br>iv. Ripping must be done to a depth of 250 mm in two directions at right angles. Topsoil must be placed in the same soil zone from which it has been stripped.<br>v. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas.<br>vi. All topsoil must be removed and stockpiled on the site.<br>vii. However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation (e.g. blackjacks, etc.) must not be permitted unless a programme to eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO.<br>viii. Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction.<br>ix. Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent.<br>x. Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment.<br>xi. Remediated slopes must be graded to preferably 1:2<br>xii. Slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas.<br>**xiii.** Disturbed surfaces to be rehabilitated must be ripped and the area must be backfilled with excavated material from the site. | • Minimise scaring of the soil surface and land features<br>• Minimise disturbance and loss of soil<br>• Minimise construction footprint<br>• Minimise sedimentation of nearby drainage lines<br>• Maintain the integrity of topsoil's for future landscaping and rehabilitation<br>• Containment of invasive plant growth | • No visible erosion scars once construction is completed<br>• The footprint has not exceeded the agreed site in terms of EA etc.<br>• Minimal invasive weed growth<br>• No signs of sedimentation and erosion<br>• Method statement | Daily | |

| Phase of development | CONSTRUCTION | EAP | Strategic Environmental Focus |
|---|---|---|---|
| Impact / issue | Specialist requirements (F) | Proponents signature | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| **F1 Botanical Impact Assessment**<br>i. Any planting conducted during rehabilitation and landscaping should comprise indigenous species only. | • Prevention of invasive plant growth | • Method statement (rehabilitation) | As and when required | |
| **F2 Heritage Assessment**<br>i. Areas where mature trees exist that are not demarcated for construction and can be avoided by construction activates should be marked off as no-go areas in order to retain as many mature trees as possible. | • Minimise the loss of mature trees as land mark features in the area | • No sign of movement through “no go” areas | As and when required | |
| **F3 Traffic Impact Assessment**<br>i. Prior to construction, the developer must show how he/she intends to ensure that the recommendations of the Traffic Impact Assessment will be met by either:<br>a) the signalisation of the La Belle / Cilmor Road intersection (should it be known at the time of construction that the Bottelary Road / R300 intersection will be implemented in the future); OR<br>b) the upgrading of the Bottelary / La Belle intersection (as per recommendations set out in the TIA) AND the signalisation of the La Belle / Cilmor Road intersection (should it be known at the time of construction that the Bottelary Road / R300 intersection will not be implemented in the future).<br>ii. Construction of the internal road infrastructure must be done in accordance with the recommendations of the Traffic Impact Assessment in terms of road reserve widths, black top widths, sidewalks, embayments and signalisation (refer to the Traffic Impact Assessment). | • Minimise the impact of the development on the existing traffic situation and infrastructure | • Refer to the Traffic Impact Assessment | As and when required | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
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| **F4a Freshwater Ecosystem Assessment and Freshwater Verification Assessment**<br>i. Rubble, soils and other materials resulting from the demolition of existing instream structures (broken bridges, gabions and berms) and from the construction of new structures within the floodplains of the river must be contained and removed from the river course and the floodplain immediately.<br>ii. An existing sewer line runs along western bank of the Kuils River. The sewer will remain where it is, however; where construction is in close proximity to the existing sewer line and is unavoidable, the excavations must be done by hand while at all times ensuring that the soil beneath the sewer line is not destabilized.<br>iii. On completion of the construction phase, the sewer line should be covered and vegetated to ensure that the pipeline will not become exposed in the future due to erosion.<br>iv. Measures to prevent erosion must be taken for any activities taking place within the river course or on the floodplains of the Kuils River.<br>v. Access to the river by machinery for maintenance and rehabilitation must be done in consultation with the City of Cape Town.<br>vi. Stormwater during the construction and operational phase is not allowed to discharge directly into the river, but rather into the stormwater system.<br>**F4b Freshwater Assessment (February 2016)**<br>i. Construction activities should preferably take place during the drier months (lower rainfall months). The construction works in the river should begin at the downstream point of the works in the river and proceed upstream. The works in the river should be completed within the dry season and revegetation should be undertaken as soon as possible after construction | • Minimise blockage of river channel<br>• Minimise flood risk | • No sign of blockage of water flow in the river channel | Daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| works have been completed. If possible rehabilitation should be undertaken of portions of the river reach progressively and in conjunction with the construction works.<br>ii. The disturbed bed and bank areas should be rehabilitated immediately after construction and shaping of river banks are complete, with suitable indigenous plants as suggested in the plant list in Appendix 2. Existing indigenous vegetation within the river channel could potentially be retained and set aside during the construction for use in the revegetation of the channel post construction.<br>i. In designing the new river channel, different landscaping elements such as boulders could be used within the stream channel to create more diverse aquatic habitat. Shaping the beds and banks in such a way that the river meanders within the 50m wide corridor of the mainstream would also be favoured rather than just a straight channel. This would create a scenario more true to what the river would have originally looked like and would once again also create more diverse habitat.<br>v. All rubble and waste debris that has resulted from the clearing and demolition of the existing structures in the river channel should be removed out of the river channel, its banks and the riparian buffer zone.<br>v. Care should be taken that any soil used for the reshaping of the channel that is brought onto the site does not contain the seeds of alien invasive plants.<br>i. During this early establishment phase of the river upgrade, ongoing monitoring and control of the growth of invasive alien plants will be necessary as it will be easier to remove the young invasive alien plants.<br>vii. Should the construction works adjacent to the river take place during the rainfall period, any contaminated runoff from the construction site or activities should be prevented from entering the stream.<br>viii. Ablution facilities should be supplied to the construction workers that should be located should be outside the riparian zone and should be regularly serviced. | | | | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| ix. Proper on-site management for the storage and use of materials and waste to prevent any potential pollution of the river should be addressed in the Environmental Management Plan for the project.<br>x. Monitoring and clearing of blockages within the stream channel will need to be undertaken on an ongoing basis. Clearing of debris in the channel should be undertaken according to the recommended method provided above. Clearing of nuisance growth of plants within the channel if necessary should also be undertaken be hand during the low/no flow period.<br>xi. Frequent monitoring of the river channel and banks will need to be undertaken after construction, following high flows events to ensure that any eroded areas are repaired as soon as possible to prevent progressive damage.<br>xii. Monitoring and clearing of alien invasive plants along the banks and within the stream will need to be undertaken on an ongoing basis according to the applicable recognised methods for clearing of alien invasive plant growth. | | | | |
| **F5 HIA and SWMP**<br>i. Prior to construction, the depth of the proposed flood storage area just north of the Bottelary Bridge needs to be finalised such that all flood storage lost due to the development within the flood plains of the Kuils River is accounted for in this storage area.<br>ii. Removal of existing structures in the river channel and the replacement of these structures with anti-erosion structures, as per the HIA and SMP report.<br>iii. Scour protection mechanisms (reno-mattress and gabion structures) around the abutments of the proposed Cilmor Street Bridge, as outlined in the HIA and SWMP report, must be implemented.<br>iv. The stormwater system, including the erosion protection measures, as indicated in the HIA and SWMP report must be implemented. | • Minimise the reduction of flood storage capacity<br>• Minimise the potential for erosion within the river channel<br>• Prevention of local scour around the Cilmor Street Bridge<br>• Effective stormwater management within the development | • Refer to the HIA and SWMP report (Appendix 1) | As an when required | |
| **F6 Rehabilitation measures** | • Minimise impact on freshwater ecosystem | • River banks slopes no steeper than 1:7 | Rehabilitation should begin as soon as | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | NOTES |
|---|---|---|---|---|
| i. **All** areas that are compacted, cleared or disturbed must be rehabilitated as soon as construction activities have ceased in that particular area. Rehabilitated areas must be cordoned off as "no-go" areas to ensure re-growth of vegetation.<br>ii. River bank slopes should be graded to no steeper than 1:7 (vertical: horizontal).<br>iii. Plants used for rehabilitation of the riparian zone (within 40 m of either side of the river channel) should be indigenous riparian/freshwater plants.<br>iv. Plants used for rehabilitation of areas outside of the riparian zone should be indigenous plants and grasses.<br>v. The proposed flood storage area just north of the Bottelary Bridge must be vegetated with indigenous reeds. | functioning<br>• Minimise ecosystem impacts<br>• Minimise erosion and sedimentation of the river channel and river banks<br>• Increase attenuation of flood waters | • Establishment of vegetation planted | construction activities in any particular area of the development have ceased. Rehabilitation should be monitored as and when required. | |

## ANNEXURE 1

## DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

## ANNEXURE 2

## DECLARATION OF UNDERSTANDING BY THE ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

## ANNEXURE 3

## DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

**ANNEXURE 4 A**

# METHOD STATEMENT: Solid Waste Management

**CONTRACT**:…… **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** [give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

*Insert additional pages as required

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

| *Insert additional pages as required |
|---|

# METHOD STATEMENT: Solid Waste Management (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW IS WASTE TO BE MANAGED ON SITE?** (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

***DECLARATIONS for Method Statement*** **Solid Waste Management (contd.)**

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

**ANNEXURE 4 B**

# METHOD STATEMENT:

## Crew Camps and Construction Lay Down Areas

**CONTRACT**:…….. **DATE**:……..

**WHAT CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS ARE REQUIRED ON SITE DURING CONSTRUCTION?** (give a brief description of these): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

**WHERE ARE THE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE LOCATED?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

# METHOD STATEMENT:

## Crew Camps and Construction Lay Down Areas (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE MANAGED?**
(provide as much detail as possible, including annotated sketches and plans where possible): *
Note: please attach extra pages if more space is required

***Insert additional pages as required**

***DECLARATIONS for Method Statement***

# Crew Camps and Construction Lay Down Areas (contd.)

**1) ENGINEER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

**2) ECO**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**

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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

**ANNEXURE 4 C**

# METHOD STATEMENT:

## Workshop and Maintenance/Cleaning of Plant

**CONTRACT**:…… **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the works): * Note: please attach extra pages if more space is required

| |
|---|
| |
| ***Insert additional pages as required** |

**WHERE ARE THE WORKSHOPS AND CLEANING BAYS TO BE LOCATED?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

| |
|---|
| |

*Insert additional pages as required

# METHOD STATEMENT:

## Workshop and Maintenance/Cleaning of Plant (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE WORKSHOPS AND PLANT MAINTENANCE/CLEANING TO BE MANAGED DURING CONSTRUCTION?** (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

***DECLARATIONS for Method Statement***

# Workshop and Maintenance/Cleaning of Plant (contd.)

**1) ENGINEER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

**2) ECO**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**

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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

**ANNEXURE 4 D**

# METHOD STATEMENT: Cement and Concrete Batching

**CONTRACT**:…… **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

# METHOD STATEMENT:

## Cement and Concrete Batching (contd.)

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

**Start Date:**…….. **End Date:**……

**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

*Insert additional pages as required

***DECLARATIONS for Method Statement***

# Cement and Concrete Batching (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT: Dust Control

**CONTRACT**:…….. **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN ON SITE THAT COULD GENERATE DUST?** (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

**WHERE ARE THE WORKS TO BE UNDERTAKEN** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

# METHOD STATEMENT: Duct Control (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE THE WORKS TO BE UNDERTAKEN SO AS TO MINIMISE AND CONTROL DUST GENERATION ON SITE?** (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

***DECLARATIONS for Method Statement***

# Dust Control (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT:

## Hydrocarbon and Emergency Spill Procedure

**CONTRACT**:…….. **DATE**:……..

**WHAT HAZARDOUS SUBSTANCES (INCL. FUELS) ARE TO BE STORED ON SITE?** (give a brief description of the works): * Note: please attach extra pages if more space is required

| |
|---|
| |
| ***Insert additional pages as required** |

**WHERE ARE THE THESE SUBSTANCES TO BE STORED ON SITE?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

| |
|---|
| |

*Insert additional pages as required

# METHOD STATEMENT:

## Hydrocarbon and Emergency Spill Procedures (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE HAZARDOUS SUBSTANCES TO BE MANAGED TO AVOID SPILLAGES AND WHAT EMERGENCY PROCEDURES ARE TO BE IMPLEMENTED IN CASE OF A SPILLAGE?**
(provide as much detail as possible, including annotated sketches and plans where possible): *
Note: please attach extra pages if more space is required

*Insert additional pages as required

***DECLARATIONS for Method Statement***

# Hydrocarbon and Emergency Spill Procedures (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT:

## Diesel Tanks and Re-fuelling Procedures

**CONTRACT**:…….. **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the number and capacity of diesel tanks to be kept on site): * Note: please attach extra pages if more space is required

| |
|---|
| *Insert additional pages as required |

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

| |
|---|
| *Insert additional pages as required |

# METHOD STATEMENT:

# Diesel Tanks and Re-fuelling Procedures (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE DIESEL TANKS TO BE MANAGED AND RE-FUELLING 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

***Insert additional pages as required**

***DECLARATIONS for Method Statement***

# Diesel Tanks and Re-fuelling Procedure (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT:

**Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material**

**CONTRACT**:……. **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

# METHOD STATEMENT:

**Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material (Contd.)**

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

**Start Date:**…….. **End Date:**…….

**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

***Insert additional pages as required**

***DECLARATIONS for Method Statement***

## Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material (Contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

**ANNEXURE 4 I**

# METHOD STATEMENT:

## Topsoil Management

**CONTRACT**:…….  **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the works to be undertaken that require topsoil to be stripped): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

# METHOD STATEMENT:

## Topsoil Management (contd.)

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

**Start Date:**…….. **End Date:**……

**HOW ARE TOPSOIL STOCKPILES TO BE MANAGED?** (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

***DECLARATIONS for Method Statement***

# Topsoil Management (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT:

## Fire Management

**CONTRACT**:…….. **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

# METHOD STATEMENT:

## Fire Management (contd.)

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

**Start Date:**…….. **End Date:**……

**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

*Insert additional pages as required

***DECLARATIONS for Method Statement***

# Fire Management (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
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_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# METHOD STATEMENT:

## Rehabilitation of Crew Camps and Other Disturbed Areas

**CONTRACT**:…….  **DATE**:……..

**WHAT WORK IS TO BE UNDERTAKEN?** (give a brief description of works to be undertaken that may result in the need for rehabilitation of the affected areas): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

**WHERE ARE THE WORKS TO BE UNDERTAKEN?** (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

# METHOD STATEMENT:

## Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

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

**Start Date:**…….. **End Date:**…….

**HOW ARE THE REHABILITATION 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

*Insert additional pages as required

***DECLARATIONS for Method Statement***

## Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

**1) ENGINEER**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) ECO**
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated:._____

**2) CONTRACTOR**
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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____
(Signed) (Print name)

Dated: _____

# INCIDENT AND ENVIRONMENTAL LOG

| ENVIRONMENTAL INCIDENT LOG | | | | |
|---|---|---|---|---|
| **Date** | **Env. Condition** | **Comments**<br>*(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)* | **Corrective Action Taken**<br>(*Give details and attach documentation as far as possible)* | **Signature** |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## ANNEXURE 6

# SUBDIVISION PLAN


| PHASE 1 | | | | | |
|---|---|---|---|---|---|
| ZONING | LAND USE | PTN.NR'S | N | AREA (ha) | % |
| General Industry zone G1 | Primary uses as per GI 1 zoning | 1 - 10 | 10 | 4,74 | 76,21 |
| Utility zone | Sub-station | 11 - 13 | 3 | 0,04 | 0,64 |
| Transport zone 2 | Public road | 14 | 1 | 1,44 | 23,15 |
| TOTAL | | | 14 | 6,22 | 100 |

| PHASE 2 | | | | | |
|---|---|---|---|---|---|
| ZONING | LAND USE | PTN.NR'S | N | AREA (ha) | % |
| General Industry zone G1 | Primary uses as per GI 1 zoning | 15 - 60 | 46 | 7,68 | 50,16 |
| Open space zone 2 | Public Open Space | 61 | 1 | 3,69 | 24,10 |
| Utility zone | Sub-station | 62 - 66 | 5 | 0,04 | 0,26 |
| Transport zone 2 | Public road | 67 - 68 | 2 | 3,90 | 25,47 |
| TOTAL | | | 54 | 15,31 | 100 |

| PHASE 3 | | | | | |
|---|---|---|---|---|---|
| ZONING | LAND USE | PTN.NR'S | N | AREA (ha) | % |
| General Industry zone G1 | Primary uses as per GI 1 zoning | 69 | 1 | 4,17 | 54,58 |
| Open space zone 2 | Public Open Space | 70 | 1 | 3,47 | 45,40 |
| Utility zone | Sub-station | 71 | 1 | 0,003 | 0,02 |
| TOTAL | | | 3 | 7,64 | 100 |

| PHASE 1 - 3 | | | | |
|---|---|---|---|---|
| ZONING | LAND USE | N | AREA (ha) | % |
| General Industry zone G1 | Primary uses as per GI 1 zoning | 57 | 16,59 | 56,87 |
| Open space zone 2 | Public Open Space | 2 | 7,16 | 24,55 |
| Utility zone | Sub-station | 9 | 0,08 | 0,27 |
| Transport zone 2 | Public road | 3 | 5,34 | 18,31 |
| TOTAL | | 71 | 29,17 | 100 |

| PTN NR | AREA (m²) | PTN NR | AREA (m²) |
|---|---|---|---|
| 1 | 6334 | 51 | 1881 |
| 2 | 3594 | 52 | 1296 |
| 3 | 3631 | 53 | 1296 |
| 4 | 3924 | 54 | 1508 |
| 5 | 4229 | 55 | 1392 |
| 6 | 4654 | 56 | 1297 |
| 7 | 5122 | 57 | 1513 |
| 8 | 5717 | 58 | 1983 |
| 9 | 5426 | 59 | 1296 |
| 10 | 4780 | 60 | 7554 |
| 11 | - | 61 | - |
| 12 | - | 62 | - |
| 13 | - | 63 | - |
| 14 | - | 64 | - |
| 15 | 4562 | 65 | - |
| 16 | 3395 | 66 | - |
| 17 | 3302 | 67 | - |
| 18 | 1242 | 68 | - |
| 19 | 1127 | 69 | 41700 |
| 20 | 1122 | | |
| 21 | 1116 | | |
| 22 | 1111 | | |
| 23 | 1105 | | |
| 24 | 1100 | | |
| 25 | 1195 | | |
| 26 | 1154 | | |
| 27 | 1111 | | |
| 28 | 1084 | | |
| 29 | 1084 | | |
| 30 | 1082 | | |
| 31 | 1081 | | |
| 32 | 1082 | | |
| 33 | 1093 | | |
| 34 | 1109 | | |
| 35 | 1205 | | |
| 36 | 3298 | | |
| 37 | 1374 | | |
| 38 | 1391 | | |
| 39 | 1387 | | |
| 40 | 1382 | | |
| 41 | 3053 | | |
| 42 | 1358 | | |
| 43 | 1517 | | |
| 44 | 1499 | | |
| 45 | 1304 | | |
| 46 | 1395 | | |
| 47 | 1442 | | |
| 48 | 1296 | | |
| 49 | 1296 | | |
| 50 | 1331 | | |

NOTA: ALLE AFSTANDE BY BENADERING EN ONDERHEWIG AAN OPMETING
NOTE: ALL MEASUREMENTS APPROXIMATE AND SUBJECT TO SURVEYING

| HERSIENINGS • REVISIONS | | |
|---|---|---|
| NO | DATUM/DATE | BESKRYWING/DESCRIPTION |
| 01 | 28 March 2014 | Revise layout, Move connection roads (north & south) to 90m from centre point of Climor Road. |
| 01 | 28 March 2014 | Widen road at Climor Intersection. |
| 02 | 9 June 2014 | Revise layout - JWard latest survey<br>Revise layout according to Collin's new 50m river corridor |
| 02 | 18 June 2014 | Change phase 3 to 1 large erf. |
| 02 | 14 July 2014 | Finalise land use table |
| 02 | 28 July 2014 | Add sub-stations and finalise land use table |
| 03 | 4 Aug 2014 | Revise cadastral lines according to J Botha comments. |
| 04 | 27 Aug 2014 | Revise cadastral according to new corridor alignment |
| 04 | 28 Aug 2014 | Move substations (11, 65, 66) |
| 04 | 16 Sep 2014 | Finalise land use & erf size table |