



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAM

FOR THE

PROPOSED CAMDEN POWER STATION EFFLUENT MANAGEMENT SYSTEM UPGRADE, MPUMALANGA PROVINCE

APRIL 2013

VOLUME I: MAIN REPORT

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LIST OF ABBREVIATIONS

| | |
|--------|--|
| CE | Consulting Engineers |
| C | Contractor |
| CELO | Contractor Environmental Liaison Officer |
| CM | Contract Manager (Eskom) |
| NEMA | National Environmental Management Act (Dedicated Person) |
| ECO | Environmental Control Officer |
| ELO | Environmental Liaison Officer |
| EMP | Environmental Management Programme |
| DEA | Department of Environmental Affairs |
| RoD | Record of Decision |
| SABS | South African Bureau of Standards |
| SAHRA | South African Heritage Resource Agency |
| SAMOAC | South African Manual for Outdoor Advertising Control |
| SS | Site Supervisor |

Key Definitions

Auditing: A systematic process of objectively obtaining and evaluating evidence regarding the effectiveness and performance of the Environmental Management Plan.

Corrective Measures: A response required to eliminate the occurrence of a non-compliance with the requirements of the EMP.

Basic Assessment (BA): A systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Basic Assessment Report: A report describing the process of examining the environment effects of a development proposal, the expected impacts and the proposed mitigating measures.

Environmental Method Statement: A statements that indicates how compliance with environmental specifications will be achieved, providing a framework for the setting of objectives and targets.

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.

Mitigation Measures: These are the management measures that are used to mitigate negative impacts or enhance positive impacts associated with a proposed project.

Non-conformance: Non-compliance is issued when a transgression of the underlying management measures outlined in this document, relating to the construction, operation or decommissioning of the power lines occurs. A Non-conformance report must be completed setting out corrective actions, responsibilities and timeframes.

A. SECTION 1: GENERAL INFORMATION

1. Introduction

Baagi Environmental Consultancy CC, was appointed by Camden Power Station (Eskom SOC Holdings Limited) to undertake the Basic Assessment Process for the proposed upgrade of the Camden Power Station effluent management system . As per the EIA Regulations of 2010, this Draft Environmental Management Plan is required to accompany the Basic Assessment Report for the above-mentioned project.

The EMP, therefore, has to be understood and implemented within the context of the Final Basic Assessment Report (FBAR) for this project. It is thereby recommended that, all key players involved in the implementation of this plan have access to and review the FBAR for this project.

2. Background

It is widely accepted that any development can pose various risks to the environment as well as the inhabitants in the surrounding areas. These possible risks should be taken into account during both the construction and operational phase of the development. The purpose of this document is to provide management responses that will ensure impacts resulting from the development are minimised. This EMP is, therefore, a stand-alone document, which must be used onsite during each phase of the development (construction and operation).

This document is flexible, and will allow the contractor and Eskom to conform to the management commitments provided in this document. The management commitments will ensure that the anticipated risks on the environment will be minimised. The responsibility to undertake the requirements set out in the EMP rests with Eskom, the main contractors and subcontractors. Any party responsible for transgression of the underlying management measures outlined in this document will be held liable for non-compliances and will be dealt with accordingly.

The process that was followed in compiling the EMP is in compliance with Regulation 34 in terms of chapter 5 of the National Environmental Management Act (Act 107 of 1998), of the Environmental Impact Assessment Regulation, 2010 promulgated on the 18 June 2010. The purpose of this EMP is to formulate mitigation measures that are legally binding to all contractors during the construction phase as well as measures that should be implemented during the operational phase.

3. The Project Process and Phases

The detailed and overall process that is undertaken for the planning, construction and operation of the proposed project is as follows:

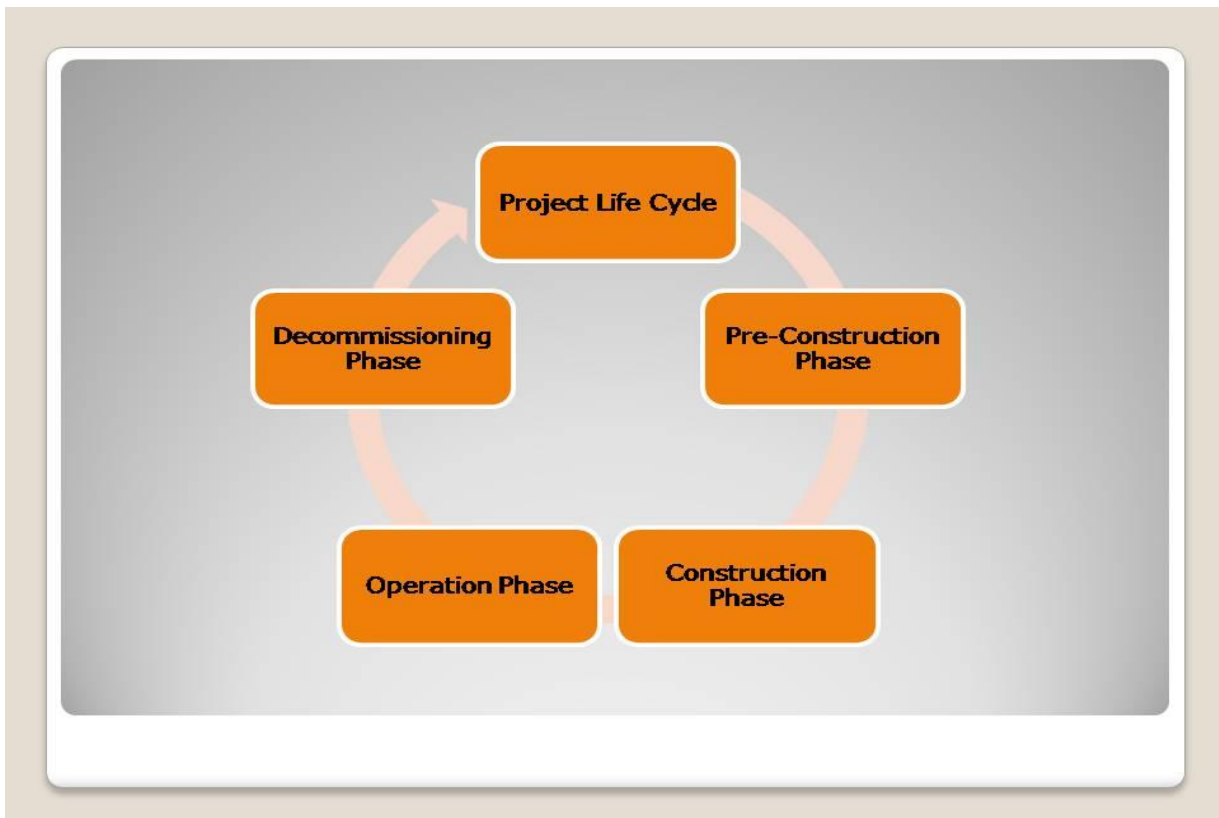
Construction Phase

The final outcome of this EMP, after the acceptance of the FBAR (and draft EMP) and the issuing of an RoD, is a site-specific construction Environmental Management Plan (CEMPR), therefore, details of the planning stage is not necessary. The bulk of the impacts during this phase will have immediate effect (e.g. noise, dust and water pollution). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated accordingly in conjunction with a commitment to sound environmental management from the Eskom Team.

Operational Phase

By taking pro-active measures during the construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

Project Life Cycle



4. Objectives of the EMP

The objective of this EMP is to ensure that:

- Environmental management conditions and requirements are implemented from the start of the project,
- The contractor is able to and shall include any costs of compliance with this EMP into the tender price;
- Precautions against environmental damage and claims arising from such damage are taken timeously;
- The completion date of the contract is not delayed due to environmental problems with any landowner, communities or regulatory authorities arising during the course of the project execution;
- The asset created conforms to environmental standard required by ISO 14001 and Transmission Policy;
- Environmental conditions stipulated in the Environmental Authorisation (EA), which is still to be issued, are implemented;
- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international from the start of the project;
- Verify environmental performance through information on impacts as they occur;
- Resolve problems and claims arising from damaged immediately to ensure a smooth flow of operations;
- Implementation of this EMP for the benefit of all involved; and
- Preservation of the natural environment by limiting destructive activities on site.

5. Legal Framework

Depending on the type of development that is being proposed, certain legislation applies, either as a framework to guide the development process or as permit or approval requirements. This EMP has been undertaken in accordance with provisions of the Constitution and principles of Integrated Environmental Management.

All legislation applicable to the development must be strictly enforced both during the construction and operational phases. The contractor must be acquainted with the relevant environmental legislation, including provincial and local government regulations, which are in place to ensure the protection of the environment. The environmental legislation applicable to the project includes, but is not limited to, the following:

- The Constitution of the Republic of South Africa, 1996;
- National Environmental management Act, 1998 (Act No. 107 of 1998) (NEMA);
- National Environmental Management: Air Quality Management Act (Act No. 39 of 2004);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Environmental Management: Biodiversity Act (Act 10 of 2004);
- Fencing Act(No. 31 of 1963 (as amended by act 108 of 1991));
- Occupational Health and Safety Amendment Act (Act No. 181 of 1998);
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- National Heritage Resource Act, 1999 (Act No. 25 Of 1999);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- National Environmental Management: Waste Act (Act No. 59 of 2008).

The Constitution of the Republic of South Africa

The Constitution of South Africa states that everyone has the right to an environment that is not harmful to his or her health or well-being and to have the environment protected for the benefit of present and future generations.

The Act implies that measures must be implemented to:

1. Prevent pollution and ecological degradation;
2. Promote conservation, and
3. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The National Environmental Management Act

There are various elements within the National Environmental Management Act that are relevant to the construction and operational phases of the project. The 'polluter pays' concept is enforced to ensure that any party or parties, which undertakes any activity that may cause, causes or caused any pollution, must prevent, mitigate or remedy the effects.

Section 2 of Chapter 1 of the National Environmental Management provides details of the environmental management principles that should be adhere to during both the construction and operational phase of the development. The consideration of various factors must be brought into focus:

- Avoidance/minimisation of the loss of biodiversity,

- Avoidance/minimisation of the disturbance of ecosystems,
- Avoidance/minimisation of pollution,
- Avoidance/minimisation of cultural and heritage sites,
- Avoidance/minimisation/recycling of waste,
- Responsible and equitable use of renewable and non-renewable resources, and
- Avoidance/minimisation/mitigation of adverse impacts.

The National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act (AQA) is the main legislative piece that controls air pollution within South Africa. The main objective of the AQA is to restore, protect and enhance the quality of air in South Africa, through sustainable development. The AQA aims to achieve these objectives through the establishment of norms and standards, and provide a regulatory framework for air quality management planning and reporting.

The National Water Act

The National Water Act (NWA) is the main legislative piece that controls both private and public water use within South Africa. According to section 19(1) of the National Water Act ‘an owner of land, a person in control of land or a person who occupies or uses land on which any activity or process is or was performed or undertaken or any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.’

In accordance with Section 21 of the National Water Act the following are considered as water uses and therefore need to be licensed:

- a) Taking water from a water resource.
- b) Storing water.
- c) Impending or diverting the flow of water in a watercourse.
- d) Engaging in a stream flow reduction activity.
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- g) “Disposing of waste in a manner which may detrimentally impact on a water resource.
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- i) Altering the beds, banks, course or characteristics of a watercourse.

- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- k) Using water for recreational purposes.

National Environmental Management: Biodiversity Act

The Biodiversity Act provides for the management and conservation of South Africa's biodiversity within the framework of NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was established. The Biodiversity Act further requires landowners to manage and conserve South Africa's biodiversity for current and future generations. The National Spatial Biodiversity Assessment classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

Fencing Act

The Act regulates matters with regard to boundary fences of farms and makes provisions for the erection, alteration, maintenance, damage and repair of. It also spells rights of owners or lease holders where the land is subject to certain servitudes and outlines procedures for settling of disputes due to wilful actions including leaving gates opened and unauthorised entry to private land.

Occupational Health and Safety Amendment Act

The Act makes provision for the health and safety of persons at work and persons that are not employees against any hazards that may arise out of or in connection with the work related activities. The act has provisions regarding the maintenance and operation of plant and machinery, working conditions to the use of protective clothing and equipment. The Act therefore informs the EMP on measures and procedures to be incorporated regarding the safety and health of the persons on site.

Hazardous Substances Act

The main objectives of the Hazardous Substances Act is to provide measures, norms and standards for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure. The Hazardous Substances Act also aims to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.

The National Heritage Resources Act

The Act aims to promote an integrated system for the identification, assessment, and management of the heritage resources of South Africa. Section 35(4) of this above-mentioned Act states that no person may, without a permit issued by the responsible heritage resources authority; destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite.

This Act is concerned with the protection of the archaeological or paleontological sites or meteorites. Furthermore, Section 36(3) of the National Heritage Resources Act states that no person may, without a permit issued by the relevant heritage resources authority handle any human remains. Human remains can only be handled by a registered undertaker or an institution given the authority to do so under the Human Tissues Act (Act 65 of 1983 as amended).

Conservation of Agricultural Resources Act

The Act provides for control over the utilisation of the natural agricultural resources in the Republic of South Africa in order to promote the conservation of soil, the water resources, vegetation and the combating of weeds and invader plants.

The National Environmental Management: Waste Act

The National Environmental Management: Waste Act is the main legislative piece that aims to consolidate waste management within South Africa. Part 2 of the Waste Act details the general duty in respect to the management of waste by the holder of the waste. In accordance to Section 16(1) of the Waste act, 'a holder of waste must, within the holder's power, take all reasonable measures to:

- a) avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;
- b) reduce, re-use, recycle and recover waste;
- c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
- e) prevent any employee or any person under his or her supervision from contravening this Act; and
- f) prevent the waste from being used for an unauthorised purpose.'

6. Environmental Monitoring and Auditing

To measure and ensure compliance to this EMP it is imperative that a monitoring and auditing programme be established, in which monthly reports are submitted to Eskom and DEA to indicate the level of compliance. In addition, potential risks to the project will have to be identified. Where

the ECO identifies a transgression or blatant disregard to the EMP it should be reported to Eskom immediately and rectification steps undertaken.

The final site-specific construction EMP (CEMP) is a living document and therefore must be updated from time to time. The ECO, in consultation with the proponent (Eskom) can make recommendations to the proponent for certain CEMP amendments. The proponent should then officially apply to DEA for the approval of the proposed amendments to the CEMP. The amended CEMP becomes valid once the authority (DEA) approves it in writing.

B. SECTION 2: SITE SPECIFIC ENVIRONMENTAL MANAGEMENT PROGRAM

1. Background

Environmental aspects that are generic and specific for the construction and operation stages for the project are identified and mitigation procedures are described.

During the construction phase, some habitat destruction and alteration inevitably takes place. Habitat destruction and alteration will result from the construction of the Surge Tower and its associated infrastructure, such as the substation building and the pipe work, as well as the pumping upgrade required for the reclamation dam.

Where it is anticipated that ecological qualities of the landscape are going to be particularly altered by the infrastructure related to the project, whether it to be the position or the result of construction requirements, it is necessary to identify those locations and to describe what mitigations are required. In this way the specific ecological mitigation relates to an identified condition that will result in short term or long term ecological impacts. If this is not addressed in time and in a particular manner, persistent and irreversible long-term ecological impacts will result.

2. Project Scope

The project has two main components namely the construction of the Camden Surge Tower, which falls under the ambient of NEMWA, and the Reclamation dam pumping capacity upgrade, which falls under the ambient of NEMA:

Camden Surge Tower

The Ash Water Return Reservoir, as the high level dam on site, receives water from De Jagers Pan (Ash Water dam) and supplies water, by means of gravity feed lines to the sluice water pumping system used to supply water at the correct flow and pressures for ashing and dusting activities from Unit 1 and Unit 8 (boiler units). The problem with the AWR system is that it has zero redundancy and the current condition of the AWRR is that it is partially blocked with various matter including, a black sludge and ash. Due to the fact that zero redundancy exists in the ash water return supply system to the station sluice pumping system and due to the continuous high demand of electricity supply to the national grid, no opportunity exists in conducting any kind of preventative maintenance or cleaning of the AWRR as the reservoir supply of water for ashing and dusting is required 24 hours a day. Therefore, it is necessary to construct additional infrastructure, in creating additional capacity to the station from a high level dam (reservoir), allowing systems to be interchanged in the event of emergencies in water supply from either source or in the event of preventative maintenance to be done on either system.

It is therefore purposed that a Surge Tower be constructed to complement the existing system with an additional reservoir that will provide a 2m additional static head with a capacity of 3050m³. The associated Surge Tower infrastructure will a small substation (10m x 10m) to

automate the flow between the two reservoirs and the pumping station at De Jagers Pan and pipes (<1000m) from the new tank which will tie into the existing pipe network for the AWRR

Camden Reclamation Dam Pumping Capacity Upgrade

The pumping capacity of the Reclamation Dam needs to be increased so that the dam can be emptied within 48hrs in case of emergency (e.g. rain storms). This part of the project will entail either installing additional pumps to the existing pumps or completely replacing the pumps with new ones. The discharge pipeline will either be the existing one or an additional one that may be installed depending on the flow calculations. (Please note that the discharge points will remain the same).

3. Environmental Matrix

| Function | Name / Cell No | Responsibility |
|--|----------------|---|
| Project Manager (PM) Eskom | | Overall management of project and EMP implementation |
| Site Supervisor/ Contract Manager (CM) Eskom | | Oversees site works, liaison with Contractor, PM and ECO |
| Environmental Control Officer (ECO) Eskom | | Implementation of EMP and liaison between Eskom, Contractor and Landowners |
| Contractor (C) | | Implementation and compliance with recommendations and conditions of the EMP, Appoints dedicated person (CELO) to work with ECO |
| Contractor Environmental Liaison Officer (CELO) | | Implementation of EMP, landowner interaction, environmental control of site actions, re-mediation and rehabilitation work. |
| Group Capital Environmental Advisor (Eskom) | | Environmental advice and auditing |

4. Responsibility of the Role Players

Eskom Holdings SOC Limited

The Eskom Team is responsible for ensuring that the development is implemented according to the requirements of the EMP. Although the Eskom Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The Eskom Team is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, CELO and contractor) to efficiently perform their tasks in terms of the EMP. The Eskom Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

The Eskom Team must ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP. The Eskom Team must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

Contractor

The contractor, as the Eskom's agent on site, is bound to the EMP conditions through its contract with the Eskom Holdings SOC Limited, and is responsible for ensuring that it adheres to all the conditions of the EMP. The contractor must be thoroughly familiarised with the EMP requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure they have provided sufficient budget for complying with all EMP conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMP.

Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the Eskom Holdings SOC Limited as an independent monitor of the implementation of the EMP and monitor project compliance. The ECO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management;
- Undertaking routine monitoring and identifying a competent person/institution to be responsible for specialist monitoring, if necessary; and
- The ECO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

The ECO will also be responsible for conducting the environmental induction-training course in order to provide the site employees with an understanding of Eskom's policies regarding safety,

health and environmental issues. This will include the overall objective of the EMP and of their roles and responsibilities. The typical environmental induction-training course should include:

- A site induction;
- Emergency incident and response training;
- Familiarisation with site environmental controls;
- Specific environmental training for relevant employees; and
- Convey areas of environmental sensitivity to the attention of employees and also procedure with regard to these areas.

Liaison with Authorities

The ECO will be responsible for liaising with the National Department of Environment (DEA). The ECO must submit monthly environmental reports and quarterly audit reports to the authorities. These environmental and audit reports must contain information on the contractor and Eskom's levels of compliance with the EMP.

The audit report must also include a description of the general state of the site, with specific reference to non-compliance. The ECO is to recommend corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1**) should be kept on a continual basis.

Liaison with Contractors

The Eskom EO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors with the necessary corrective action to be taken.

Contractor Environmental Liaison Officer (CELO)

The contractor must appoint an Environmental Liaison Officer (CELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the CELO for the contractors' attention and subsequently, CELO liaise with the main contractor for his or her attention. The CELO shall be permanently on site during the construction phase to ensure daily environmental compliance with the EMP and should ideally be a senior and respected member of the construction crew.

5. Method Statement

A contractor shall submit a written method statement (refer to **Appendix 2 for example of a method statement**) to the ECO for review and recommendations, covering these activities, which are identified (in this document and/or by the ECO), as being potential harmful to the environment. Method statements indicate how compliance with the Environmental Specification will be achieved. The approval of the method statements will be undertaken by the ECO.

The Method Statement shall state clearly:

- Timing of activities;
- Materials to be used;

- Equipment and staffing requirements;
- Proposed construction procedure designed to implement the relevant environmental specifications;
- The system to be implemented to ensure compliance with the above; and
- Other information deemed necessary by the ECO.

The method statement shall be submitted at least 14 working days prior to projected commencement of work on an activity, to allow the ECO time to review and provide recommendations on the method statement. The Contractor shall not commence work on that activity until such time as the method statement has been approved in writing by ECO, which shall be done within seven working days of receipt.

Due to changing circumstances, it may be necessary to modify method statements. In such cases, the proposed modifications must be indicated and agreed upon in writing between Eskom, the ECO and the Contractor.

The ECO and SS must retain records of any amendments and ensure that the most current version of any method statement is being used.

The following are typical Method Statement's which will be called for by the ECO:

- Location, layout and preparation of the construction camp(s) and materials storage areas;
- Location, layout and preparation of cement/concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas;
- Contaminated water management Program, including the containment of runoff and polluted water;
- Emergency construction Method Statements (including details of methods for fuel spills and clean up operations);
- Rehabilitation of disturbed areas and re-vegetation after construction is complete;
- Solid waste management and removal of waste from site; and
- Crossing of erosion trenches and drainage lines

6. *Generic Mitigation Measures*

The following tables form the core of this EMP for the construction and operational phases of the development. These tables should be used as checklists on site, especially during the construction phase. Compliance with this EMP must be audited weekly or monthly depending on duration during the construction phase and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|-------------------------------|---|---|-----------------------------|
| Appointment and Duties of ECO | The Eskom must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMP. | Proponent should appoint ECO for entire project | Eskom Holdings Limited |
| | The Eskom must provide the contractor and sub-contractors with a copy of the EMP. | EMP document should always be available on site and made available to all parties | Eskom Holdings Limited |
| | The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMP. | Ensure compliance of EMP | ECO, CM |
| | The ECO must form part of the project management team and where possible attend all relevant project meetings. | Ensure continuous communication on matters involving the project | ECO |
| | The contractor must ensure that the contractors and sub-contractors attend an environmental briefing and training session presented by the ECO prior to commencing activities on site. | Ensure understanding of the EMP conditions | Contractor, ECO |
| Appointment and Duties of ELO | The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel. | To ensure continuous compliance with the EMP document | Contractor |
| EMP | This EMP must be made binding to the main contractor as well as individual sub-contractors and should be included in tender documentation for the construction contract. | EMP should always be adhered to | Eskom Holdings Limited, ECO |
| Environmental | The contractor must take corrective action to mitigate an incident | Corrective measures should be | ELO, ECO, |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|-------------------------------|---|---|-------------------|
| incidents | appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves. | implemented | Contractor |
| Emergency Preparedness | If chemicals have the potential to be released on the construction sites, emergency contingency plans should be prepared as safety measures. These safety measures should be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites. | Ensure proper measures are taken in dealing with the hazardous material. | CM, ECO, CELO, C |
| Planning and Site Preparation | All work must be undertaken in an environmentally sensitive manner. | Minimise degradation to surrounding environment | C, ECO, CELO |
| | The Contractor must provide Eskom with the intended actions and programme for site establishment including the site layout, demarcation for hazardous materials storage, soil stockpiles, storm water management infrastructure, access points for deliveries and services, and the position of site offices and ablutions. | Minimise degradation to surrounding environment and the avoidance of health and safety risks based on improper planning | C, CELO |
| | All site establishment components must be positioned to: <ul style="list-style-type: none"> • Limit visual intrusion on neighbours; and • Minimise the area disturbed. | To ensure continuous compliance with the EMP document and to prevent unnecessary impacts | C,ECO,CELO |
| Waste | All waste must be handled as per Municipality Waste Management Policy. Waste should be determined as per National Environmental Management Waste Act 2008(Act 59 of 2008). | Ensure correct separation of waste per their categories. | ECO, Contractor |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------|--|--|-------------------|
| General | On completion of work, the Contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, waste and temporary infrastructure. | To ensure proper rehabilitation and reducing of residual impacts | Contractor, ECO |
| | All persons employed by the Contractor and its subcontractors shall abide by the requirements of these General Environmental Protection Specifications. Any employees of the Contractor and its subcontractors found to be in breach of any of the General Environmental Protection Specifications may be ordered by the ECO to leave the site forthwith. The order may be given orally or in writing. Confirmation of an oral order will be given as soon as practicable. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site. | Ensure the compliance of safety guidelines to avoid unnecessary accident | Contractor, ECO |
| | No uncontrolled discharges from the site/working area. All discharge points will require approval. Discharges include concrete mixing, vehicle washing etc. | Avoidance of unnecessary spillages | Contractor, ECO |
| General | The Contractor shall not use the land forming the site of, or connected with, the site for any purpose whatsoever other than for the proper carrying out of the work under the contract and shall place any camps that may be required for employees on sites approved by the ECO and consulting engineer. | Compliance with set rules within the area | Contractor, ECO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------------|--|---|---|
| | No vegetation shall be damaged or cut down by the Contractor or by any of his employees whether for use on the project or otherwise without the written consent of the Engineer or the Environmental Control Officer and then only where and in the manner as they may direct. | Avoid damage or loss to protected species | Contractor, ECO, Eskom Holdings Limited |
| | Construction equipment may not move outside the area defined as the site. | Construction material to be confined to a designated areas | Contractor, ECO |
| | The site is to be responsibly managed to reduce risks to groundwater. | Avoid groundwater contamination | Contractor, ELO |
| Vegetation clearing | <p>The following should be undertaken during vegetation clearing:</p> <ul style="list-style-type: none"> • Minimise damage to vegetation, • Minimise possibility of erosion due to removal of vegetation, • Minimise removal of plant material on river and stream embankments, • Eradication of alien invader species | Vegetation removal to be done correctly to ensure minimal disturbance and potential erosion | Contractor, ELO |
| Herbicide use | Control over the use of herbicides | No signs of vegetation dying due to leaching of herbicides one year after completion of the bush clearing | Contractor, ECO |
| Erosion, sedimentation | Storm water on site must be managed within the local authorities accepted regulations. | Avoid soil erosion | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|-----------------------------------|---|--|--------------------------------------|
| and flooding | Construction equipment and machinery must be kept in a demarcated area. The spillage of oils and fuel must be limited and contained. Where oils have leaked onto the soil, the soil must be removed and disposed of at an approved dumping site at the end of the construction phase or as required by the ECO. | Ensure control of hazardous materials | Contractor, ECO |
| Access Road | Planning of access routes must be done in conjunction between the Contractor, Eskom, and the ECO. | No unnecessary disturbances as a result of new or temporary road construction. | Contractor, Engineer, ECO, Landowner |
| Sanitation | Ensure that proper sanitation is achieved | No impacts with regards to sewage disposal | Contractor |
| Destruction of heritage resources | Construction personnel must be alert and must inform the local Council should they come across any findings. | Ensure protection of heritage resources | Contractor |
| | Should any additional archaeological artefacts be exposed during excavation, work on the area where the artefacts were found must cease immediately and the ECO must be notified as soon as possible. | Ensure protection of heritage resources | Contractor, ELO |
| | Upon receipt of such notification, the ECO must arrange for the excavation to be examined by a specialist as soon as possible. | Ensure protection of heritage resources | Contractor, ECO |
| | Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with. | No destruction of, or damage to, known archaeological sites | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|-----------------------|--|--|---------------------|
| | Any archaeological sites exposed during construction or operational phases may not be disturbed prior to authorisation by the South African Heritage Resources Agency. The removal, exhuming, destruction, altering or any other disturbances of heritage sites must be authorised by SAHRA in terms of the National Heritage Resources Act (Act No. 26 of 1999) | No destruction of, or damage to, known archaeological sites | Contractor, ECO |
| Littering Control | Neat workplace and site | No unnecessary impacts from construction phase | Contractor |
| Traffic impact | Vehicular movement beyond the property boundaries should be limited during peak hour. Access to the site must follow current and established routes. | To avoid traffic congestion within the area due to the construction | CM, ECO, Contractor |
| | It must be ensured that a backlog of traffic does not develop at the access points during peak hours, through the implementation of an efficient and effective access control system. | To avoid traffic congestion within the area due to the construction and avoidance of disturbance to traffic flow | CM, ECO, Contractor |
| Servicing of Vehicles | Prevention of contamination emanating from servicing area impacting on surrounding environment | Minimise impacts on the surrounding environment | CM, ECO, Contractor |
| Health and Safety | The site and employees 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. | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------|---|--|----------------------|
| | Ensure the contacts details of the police or security company and ambulance services are available on the site. | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO, ECO |
| | Ensure that the handling of equipment and materials is supervised and adequately instructed. | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO |
| | Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence. | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO |
| | Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO |
| | A concrete platform with a bund wall must be allocated to accommodate fuel, oil paint, bitumen, herbicide and insecticides to guard against infiltration of hazardous substances into the soil. Fuel tanks must be bunded to hold 110% of the contents of the tank. The tanks shall be housed in a roofed area so that no water will collect within the bund wall | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO |
| | A complete emergency spill kit shall be available on site at all times. The Contractor must also ensure that relevant staff members are trained to use the emergency spill kit and on the manner in which to deal with spills of hazardous substances (oils, diesel or petrol). | Ensure compliance to legislation and regulations to reduce health and safety incidents | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|-----------------------|---|--|----------------------|
| Noise pollution | The development must comply with the local by-laws regarding health and noise. | Minimise noise impacts that may be generated from construction activities | Contractor, ELO |
| | A written warning of two (2) days indicating the approximate time of blasting (if any) and/or drilling must be given to affected residents. | Minimise noise impacts that may be generated from construction activities | Contractor, ELO |
| | Institute noise control measures during construction for all applicable activities and maintain machinery in good working order. | Minimise noise impacts that may be generated from construction activities | Contractor |
| Atmospheric pollution | Dust generation must be controlled by regular watering of roads and construction area, should the need arise. | Minimise dust and vehicle emissions that may be generated from construction activities | Contractor |
| | No refuse waste should be burnt on the premises or on surrounding premises. | Minimise dust and vehicle emissions that may be generated from construction activities | Contractor |
| | All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 30 km/h must be adhered to. | Minimise dust and vehicle emissions that may be generated from construction activities | Contractor |
| | Vehicles to be used during the construction phase are to be kept in good working condition so as not to be the source of excessive fumes and nuisance. | Minimise dust and vehicle emissions that may be generated from construction activities | Contractor, ELO |
| Visual impact | Construction waste must be removed on a weekly basis and be disposed of at a suitably registered landfill. | Minimise visual impact that may be generated from construction activities | Contractor crew, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------|--|--|------------------------|
| | Advertising on site must be in accordance with South African Manual for Outdoor Advertising Control (SAMOAC). | Minimise visual impact that may be generated from construction activities | CM |
| | The construction camp must be placed to prevent any visual intrusion and be kept in a clean and orderly state at all times. | Minimise visual impact that may be generated from construction activities | Eskom Holdings Limited |
| Waste Management | Construction waste must be removed from the construction site frequently and disposed of at a registered landfill site. | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO, ECO |
| | Sufficient containers, that are correctly demarcated and covered, must be on the construction site to handle the general and hazardous waste generated on site | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO, ECO |
| | Containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard. | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO, ECO |
| | All liquid effluent must be disposed of in a manner approved by the Local Authority | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO |
| | All stakeholders will adhere to Eskom's waste management policy | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------------|---|---|-------------------|
| | A complete emergency spill kit shall be available on site at all times. The Contractor must also ensure that relevant staff members are trained to use the emergency spill kit and on the manner in which to deal with spills of hazardous substances (oils, diesel or petrol). | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO |
| | Hazardous waste must be disposed of at either a licensed H:h or H:H waste disposal site depending on the class of hazardous waste being disposed . | Minimise negative impact that may be generated from incorrect storage and disposal of construction waste | Contractor, ELO |
| Storm Water Management | Litter blocking storm water system must be removed. | Minimise negative impact that may be generated from incorrect storm water management and contaminated water containment | Contractor, ELO |
| | Storm water must be effectively captured and led well away from structures. | Minimise negative impact that may be generated from incorrect storm water management and contaminated water containment | Contractor, ELO |
| | No ponding of surface water shall occur adjacent to foundations both during and after construction. | Minimise negative impact that may be generated from incorrect storm water management and contaminated water containment | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|------------------|---|---|-------------------|
| | Pollutants such as cement, concrete, lime, chemicals and fuels shall not be discharged into any water source or wetland. | Minimise negative impact that may be generated from incorrect storm water management and contaminated water containment | Contractor, ELO |
| Fire Prevention | The Contractor must document a fire reduction management plan. The plan will identify sources of fire hazards, and appropriate management measures to reduce the identified risk. The relevant authority will be notified of such potential fire hazards. | Prevention of damage and health risks associated with veld fires. | Contractor, ELO |
| | No fires shall be allowed on site under any circumstance | Prevention of damage and health risks associated with veld fires. | Contractor, ELO |
| | Accidental fires in natural grassland should be prevented through proper sensitization of the contractors and their workers towards the associated risks, dangers and damage of property. | Prevention of damage and health risks associated with veld fires. | Contractor, ELO |
| | The Contractor shall have fire-fighting equipment, for each construction team readily available on site, especially during the winter months. The fire fighting equipment shall be regularly checked and shall be approved by the ECO / Safety and Health Officer on site | Prevention of damage and health risks associated with veld fires. | Contractor, ELO |
| | An emergency preparedness Program should be in place in order to fight accidental veld fires, should they occur. The adjacent land owners/users/managers should also be informed and/or involved. | Prevention of damage and health risks associated with veld fires. | Contractor, ELO |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|---------------------|---|---|----------------------|
| Groundwater quality | A complete emergency spill kit shall be available on site at all times. The Contractor must also ensure that relevant staff members are trained to use the emergency spill kit and on the manner in which to deal with spills of hazardous substances (oils, diesel or petrol). | Minimise negative impact on groundwater resources through spillages | ECO, Contractor, ELO |
| | Storm water must be effectively contain any contaminated run-off emanating from the site | Minimise negative impact on groundwater resources through spillages | ECO, Contractor, ELO |
| Terrain | Minimise scarring of the soil surface and land features, minimise disturbance and loss of top soil, Rehabilitate all disturbed areas along the servitude. | No visible erosion scars once construction is completed, minimised loss of top soil at any site, no barren areas visible three months after construction is completed and all damaged areas successfully rehabilitated. | ECO, Contractor, ELO |
| Wet areas | Avoid wet areas to prevent damage. | No damage to wet areas | ECO, Contractor |
| Erosion control | Storm water must be effectively captured and led well away from structures and not to be disposed of in surrounding water resources | Minimise local sedimentation and erosion | ECO, Contractor |
| Fauna | It is illegal to interfere with any wildlife or other fauna. All fauna occurring on-site shall be protected. Hunting and snaring must not be permitted. | Minimise loss of biodiversity | ECO, Contractor |

| Activity / issue | Action required/ Management Objectives | Measurable targets | Responsible Party |
|---------------------|---|--|------------------------------------|
| Flow of information | All communication with the public is to be handled by Eskom's community relations department | To avoid confusion and misinterpretation of information. | ECO, CM, C, ELO |
| | Site inspections are to be conducted by the Eskom Team and contractor on an ad hoc basis during the course of the project or as agreed by the parties involved. Operation inspections should occur annually. A two-week notice is to be issued prior to these inspections. A 48-hour notice period is required for any unplanned inspections. | To ensure conformance and compliance with the EMP | Eskom Holdings Limited, Contractor |
| | The inspections should refer to the implementation of the above-mentioned actions as well as any other matters of concern. Monthly audits, during the construction phase, should be undertaken to ensure that the EMP is implemented and sound environmental management occurs in the operational phase. This should be done by the ECO. | To avoid confusion and misinterpretation of information. To define the responsibility among the responsibility structure of the project team | ELO, ECO, CM, Contractor |
| | Adjacent landowners should be informed one month in advance of construction activities commencing in vicinity of their properties | To avoid complications with land owners | CM |
| Construction Policy | All stakeholders will abide by Eskom Construction Policy | To ensure compliance on all parties involved. | ECO, ELO, CM, Contractors |

C. SECTION 3: CONCLUSIONS

This Environmental Management Plan should be used as an on-site reference document during all phases of this development, and auditing should take place in order to determine compliance with this EMP. Parties responsible for transgression of this EMP should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour / negligence should receive penalties.

The EIA process facilitated the identification of relevant and practical mitigation measures, which may be used by the construction team and Eskom to draw up and respond to Tender documentation. It is thus key to this process that this document be included during tendering to allow all potential bidders for this work to seriously consider and cost for such mitigation. This will ensure that the document receives the necessary buy in that it requires from the outset of the project

In order to have records of environmental incidences and the handling thereof, it is suggested that incidence logs (refer to **Appendix 1**) be filled in by the Environmental Control Officer or Environmental Liaison Officer. The contract manager needs to be informed of such incidences and further actions need to be taken, should the need arise.

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APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

| ENVIRONMENTAL INCIDENT LOG | | | | |
|----------------------------|-----------------------|---|---|-------------------------|
| Date | <i>Env. Condition</i> | Comments (Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available) | Corrective Action Taken (Give details and attach documentation as far as possible) | <u>Signature</u> |
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APPENDIX 2: METHOD STATEMENTS

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 Program 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.)**
(SAMPLE)

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: _____