Title	:	Basic Assessment Report Vosloorus Node Project One Social Housing Development
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ABBREVIATIONS

DWS.....Department of Water and Sanitation
EA ..... Environmental Authorisation
EAP ..... Environmental Assessment Practitioner
ECA ..... Environmental Conservation Act, 1989 (Act No. 73 of 1989)
ECO..... Environmental Control Officer
EIA ..... Environmental Impact Assessment
EMM.....Ekurhuleni Metropolitan Municipality
EMPr.....Environmental Management Programme
EO..... Environmental Officer
ESO ..... Environmental Site Officer
GDARD.....Gauteng Department of Agriculture and Conservation
I&AP .....Interested and Affected Parties
NEMA..... ... National Environmental Management Act, 1998 (Act No. 107 of 1998)
NWA .....National Water Act, 1998 (Act No. 36 of 1998)
OHS Act .....Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
OHS ..... Occupational Health and Safety
SHEQ ..... Safety, Health, Environment & Quality
IEM.....Integrated Environmental Management

DEFINITIONS

Aspect - Element of an organisation's activities, products or services that can interact with the environment.

Auditing - A systematic, documented, periodic and objective evaluation of how well the Environmental Management Programme (EMPr) 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, while keeping track of their compliance with the Environmental Authorization.

Contamination - Polluting or making something impure. The presence of a minor and unwanted constituent, contaminant or impurity in a material or natural environment.

Corrective (or remedial) action - Response required in addressing an environmental problem that is in conflict with the requirements of the EMPr. 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.

Environment - The surroundings within which humans exist and that are made up of land, water and atmosphere of the earth, micro-organisms, plant and animal life: or any part or combination of the two and the interrelationships among them, the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

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 Management System (EMS) - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

Environmental policy – A statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

Habitat - A habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

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, space, magnitude and intensity.

Indigenous species - Flora and Fauna species 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, etc.

Mitigation - Measures designed to avoid, educe or remedy adverse impacts. Actions that limit, stop or reverse the magnitude and/or rate of long-term effect on the environment.

Natural environment - Encompasses all living and non-living things occurring naturally on Earth or some region thereof. It is an environment that encompasses the interaction of all living species. Climate, weather, and natural resources that affect human survival and economic activity.

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

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

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

Recycling - A process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material. Collecting, cleaning and re-using materials.

Rehabilitation*', as defined by the United States National Research* **Council (1974)**, implies that the disturbed land will be returned to state and productivity level in accordance with an approved land use plan, ensuring that the system a stable ecological state; that it does not contribute to further environmental deterioration and is consistent with the surrounding aesthetic values (Wali, 1992).

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

Stormwater management – Strategies implemented to control the surface flow of stormwater 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 rehabilitation phases of a project.

Waste Management – Classifying, recycling, treatment and disposal of waste generated during construction and operational activities. Generation, prevention, characterization, monitoring, treatment, handling, reuse and residual disposition of solid wastes.

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

GA Environment (Pty) Ltd are independent environmental managers and impact assessors, that have been appointed by Ekurhuleni Metropolitan Municipality (EMM) to compile and submit an Environmental Management Programme (EMPr) in order to comply with the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] for the proposed development of Vosloorus Node Project One Social Housing Development.

Ekurhuleni Human Settlements proposes to develop high density housing on the remainder of Erf 18383, Erf 18382 and Erf 6519 of Vosloorus Ext 9 as part of the Vosloorus nodal development. The project entails development of high density residential units for rental and RDP housing to address the local economic development needs and housing backlog in the area.

Project 1 deliverable entails the planning, design and delivery of 4 to 10 storey walk-ups units at a density of between 80 and 100 units/hectare. This will complement the redevelopment of the existing Nguni and Sotho hostels and will further be supported by the development of the planned Vosloorus Station and transit oriented development around the station, inclusive of additional commercial and residential uses.However in terms of Appendix 7 of Government Gazette No 38282, an Environmental audit is required which must provide for recommendations regarding the need to ammend the EMPr, and where applicable the closure plan.

It is the requirement of the Environmental Compliance Audit process that risks to the environment are identified and these possible risks should be taken into account during the planning and construction phase of the development. These risks are presented in this Environmental Management Programme (EMPr). The implementation of this EMPr, through the appointed contractor, remains the responsibility of the applicant, the Ekurhuleni Metropolitan Municipality.

This EMPR document has thus been 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, 1998 (Act No. 107 of 1998), as amended [NEMA, 2013]. NEMA promotes the use integrated environmental management for activities that may have a significant effect on the environment. IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all the stages of the development process. NEMA advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an EMPr.

The NEMA EIA Regulations, December 2014 regulate the procedures and criteria for the submission and consideration of the EMPr including its content.

1.2 SITE LOCATION

The proposed site is located on Erf 18383, Erf 6519 and Erf 18382 of Vosloorus Ext 9.The proposed site which is presently vacant is located to the west of the N3 freeway just south of Barry Marais Road. The overall proposed site is owned by 3 different land owners, namely Ekurhuleni Metropolitan municipality, Department of education and a Private Hospital group.

The general natural drainage of the site is directed into the Rietspruit river system found on the east of the site and the Natalspruit River system found west of the site. There are no wet services currently installed on the site thus all surface water flows with the natural slopes either joining stormwater systems installed on the immediate vicinity or into the respective river systems. The site coordinates are 26 º 20' 36, 95" **S**; 28 º13' 14, 74" **E**.

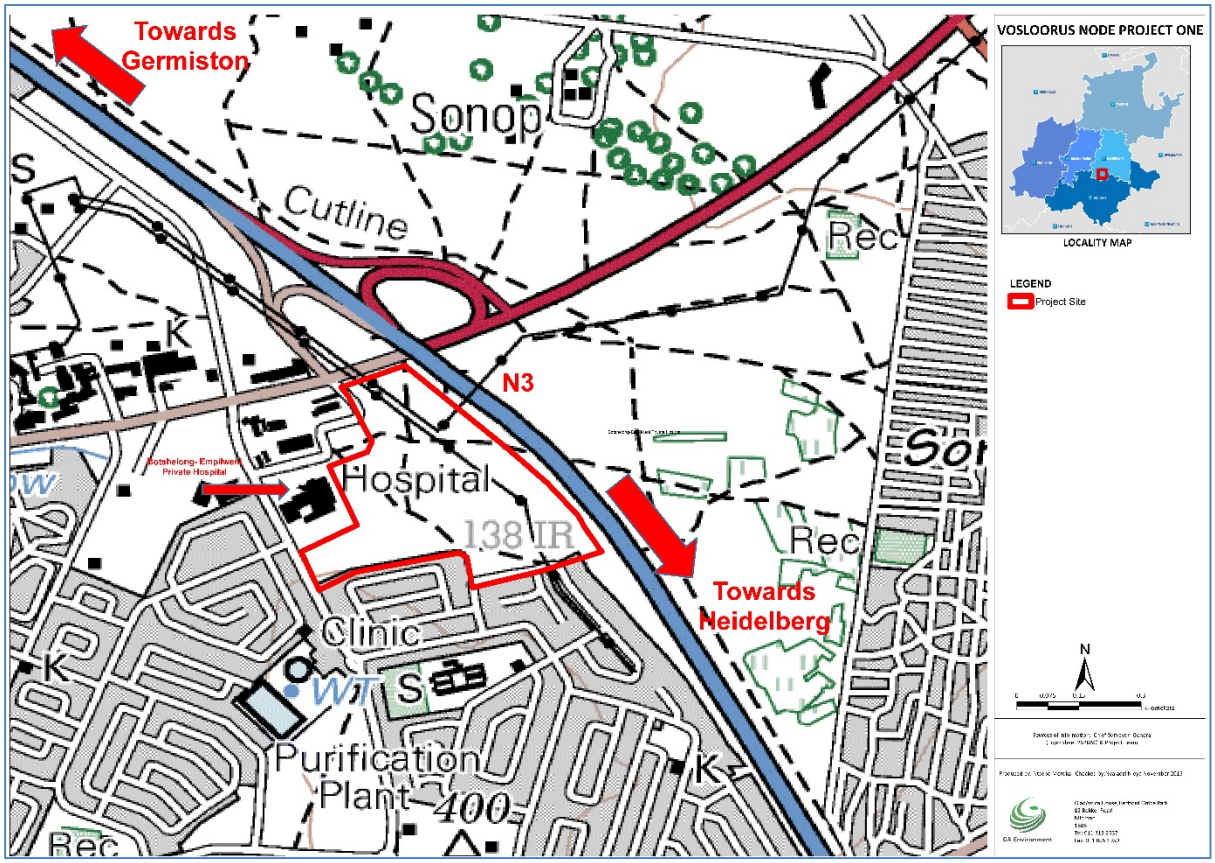

Figure 1: Locality Map of Vosloorus

1.3 DETAILS OF ENVIRONMENTAL IMPACT PRACTITIONER

The compilation of this EMPr document has also been based on the findings of the on site assessment undertaken by GA Environment. All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

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1.4 SCOPE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr serves to provide corrective measures needed during the development of Vosloorus Node project one for the activities that are anticipated to occur during construction and operation of the site. The general management of impacts from these activities is covered in this draft EMPr. This EMPr will also cover the pre planning phase, construction phase and the operational phase.

1.5 NATIONAL AND PROVINCIAL ACTS AND GUIDELINES

It is understood that any development during its construction and operational 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 and operation phase may require further licensing or environmental approval, e.g. bulk fuel storage, waste disposal, etc. The Contractor must consult the ER, SHEQ Officer and ECO on a regular basis in this regard. The common list of legislative references contained herein is by no means exhaustive, but is applicable to the general principals of this document.

- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
- Environment Conservation Act, 1989 (Act No. 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- National Environmental Management: Protected Areas Act, 2004 (Act No.31 of 2004)
- Fencing Act, 1963 (Act No. 31 of 1963)
- Forest Act, 1984 (Act No. 122 of 1984)
- National Act on Forests Act, 1998 (Act No. 84 of 1998)
- National Building Regulations and Standards Act, 1977 (Act No. 103 of 1977) (SABS 0400)
- National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- National Road Traffic Act, 1996 (Act No. 93 of 1996)
- National Veld and Forest Fires Act, (Act No. 101 of 1998)

- National Water Act, 1998 (Act No. 36 of 1998)
- Water Services Act, 1997 (Act No. 108 of 1997)
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
- Road Transportation Act, 1977 (Act No. 74 of 1977)

This EMPr has been compiled as per the requirements of NEMA EIA Regulations 2014 and in terms of Section 24N of the National Environmental Management Act (Act No. 107 of 1998).

1.5.1 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, 1998.
- The study area must be clearly defined and surveyed according to the project authorisation. All workforce members and other construction personnel are not to go beyond the defined footprint. Landowners are not comfortable when strangers come onto their properties.
- The Contractors must adhere to agreed and approved access points.
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damages are to be repaired immediately.
- Relevant landowners, 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 EMPr.
- Proper planning of the construction process must be undertaken to allow for disruptions due to rain and 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 should take place.
- Proper documentation and record keeping of all complaints and actions taken must be kept at the site office.
- Regular site inspections and good control over the construction process throughout the construction period should be undertaken.
- A positive attitude towards Environmental Management by all site personnel must be motivated through regular and effective awareness and training sessions.
- An ESO, on behalf of the Contractor, should be appointed to implement this EMPr. The EO and not the Contractor or his / her ESO is to deal with any landowner related matters.
- Environmental Audits should be carried out during and upon completion of rehabilitation on a biweekly basis.
- Social issues in terms of safety for human life, on employees should be encouraged. All construction areas and activities should be cordoned off and no casual access be gained, where deep trenches or open electrical infrastructure are to be exposed.

1.6 TASKS AND RESPONSIBILITIES

In order to ensure the sound development and effective implementation of the EMPr, it is necessary to identify and define the responsibilities and authority of the various persons and organisations that will be involved in the project. The following key roles will need to be provided for during the implementation of the EMPr:

- Authorities;
- Developer/ Proponent;
- Consulting Engineers (CE);
- Engineers Representative (ER);
- Environmental Officers (EO);
- Environmental Control Officer (ECO);
- Project Manager (PM);
- Contractors (C);
- Environmental Assessment Practitioner (EAP);

These roles and line of communication has been incorporated below:

1.6.1 Role players and Responsibility matrix

In order for the EMPr to be successfully implemented, all the role players involved in the project need to co-operate. An example of declaration of understanding between various parties working on site regarding the requirements of the EMPr must be produced (Refer to **Appendix 1**). For this, role players must clearly understand their roles and responsibilities, they must be professional and they must form respectful and transparent relationships, and maintain open lines of communication.

[Pre–EA] Potential role players or project teams will include the Authorities, Other Authority (OA), Developer / Proponent – (Developer), Consulting Engineers (CE), Engineers Representative (ER), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors, Environmental Assessment Practitioner (EAP). Furthermore the surrounding landowners, I&APs and the relevant environmental and project specialists are also important role players.

[Post-EA] These role players or the project team will consist of the Authorities, Other Authority, Developer / Proponent, Consulting Engineers (CE), Engineers Representative (ER), Environmental Officers (EO), Environmental Control Officer (ECO), Project Manager (PM), Contractors, Environmental Assessment Practitioner (EAP). Furthermore landowners, I&APs and the relevant environmental and project specialists are also important role players.

The functions and responsibilities of these role players are outlined in **Table 1.**

Table 1: Functions and Responsibilities of the Project Team

KEY	FUNCTION	RESPONSIBILITY
D	Ekurhuleni Metropolitan Municipality	Proponent is ultimately accountable for ensuring compliance with the EMPr and conditions set out 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 EMPr for the project. The developer is further responsible for providing and giving the mandate to enable the ECO to perform their 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). The RE will also be required to be familiar with the EMPr specifications.
PM	Project Manager	The Project manager has overall 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 EMPr in accordance with an agreed warning procedure.
ER	Engineers Representative	The consulting engineer's representative onsite. They have the power / mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the SHEQ Officer or ECO. The ER oversees site works, liaison with Contractor and ECO.
ECO	Environmental Control Officer	An independent appointment by the Developer to objectively monitor the implementation of relevant environmental legislations, conditions of the WL's, and this EMPr for the project. The ECO must be onsite prior to any site establishment and must endeavour to form an integral part of the project team. The ECO should be proactive and have access to specialist expertise as and when required, these include botanist's ecologists etc. The ECO must conduct audits on compliance to relevant environmental legislation, conditions of WL, and the EMPr 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. The ECO must liaise the relevant authorities and the project team. The ECO must communicate and inform the developer and CE of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMPr documentation is carried out. The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.

		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. The ECO must convey the contents of this EMPr 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. •The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to Example in **Appendix 3**) is to be kept on a continual basis.
C	Contractor	The principle Contractor is responsible for implementation and compliance with the requirements of the EMPr 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 EMPr. The contractor is required, where specified, to provide Method Statements setting out how the management actions contained in this EMPr will be implemented.
ESO	Environmental Site Officer	The ESO is employed by the Developer as his / her environmental representative to monitor, review and verify compliance with the EMPr by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor's management team. The ESO must be onsite 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 Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of this EMPr 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 / ies	Other authorities are those that may be involved in the approval process of this EMPr. Their involvement may include reviewing EMPr's to ensure the accuracy of the information relevant to their specific mandate. Other authorities may be involved in the development, review or implementation of this EMPr.
EAP	Environmental Assessment Practitioner	The definition of an EAP 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". GA Environment is the EAP for the Developer.

EO	Environmental Officer	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. The EO and not the Contractor or his / her ESO is to deal with any landowner related matters.

1.6.2 Awareness Training

The ECO is responsible for ensuring everyone onsite is given an environmental awareness induction session (including social risks for learners at the schools) which not only clearly defines what the environment is and gives specifics detailing the local environment, but also outlines the requirements of the EMPr as a management tool for the protection of the environment. Refresher courses must be conducted as and when required. The EO or ECO 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, etc. Awareness posters and a hand outs must be provided to create awareness throughout the site.

1.6.3 Contractor Environmental Method Statements

Method Statements are written submissions to the Engineer by the Contractor, in collaboration with his / her ECO, 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 EMPr. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement. An example of a template that can be used to record all applicable Method Statements by the Contractor is attached as **Appendix 2**.

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 any 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 EMPr.

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;
- Stormwater Management;
- Crew camps and construction lay-down areas;
- Workshop and maintenance areas;
- Cement and concrete batching;

- Dust control;
- Emergency spills procedures;
- Diesel tanks and refuelling procedures;
- Sourcing, excavating, transporting and dumping of fill, spoil material and waste;
- Erosion control;
- Safety onsite (SHEQ requirements)
- Topsoil management;
- Rehabilitation Work for wetland; vegetation clearing; storage of hazardous chemicals; and
- Fire.

1.7 SITE DOCUMENTATION

The following is list of documentation should be held onsite and made available to the ECO and / or Approving Authority on request.

- Site daily diary / instruction book / incident reports;
- Records of all remediation / rehabilitation activities;
- Copies of EO reports (management and monitoring);
- This EMPr;
- All applicable EAs and WML's;
- A Complaints register;
- Method statements signed by the contractor;
- The project Closure Plan; and
- The project Operational Plan.

Any other documents that are approved by the EMPr and the EA must also be included in the list above.

1.7.1 Pro forma documentation

a) Prior to the commencement of construction activities

The following attached pro forma documentation should be filled out and is binding to the EMPr 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; and
- Access negotiations and physical access plan based on the Master Plan of the study area, if available.

b) During construction activities

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

- Method Statements;

- ECO / Engineer approval for method statements;
- Environmental incidents; and
- Records of all remediation / rehabilitation activities.

2. CONSTRUCTION PHASE EMPR – IMPLEMENTATION

The point of departure for this EMPr 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 this EMPr is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of construction and its associated impacts are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document i.e. a living 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. The EMPr should be used for all phases of the project.

The tables outlined in this report 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.

2.1 Preconstruction phase

The 'pre-construction' section of this EMPr, 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 onset 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. 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.

2.2 Construction phase (construction and rehabilitation phase)

The "construction" section refers to all construction and its operation-related activities that will occur within the approved area 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 EMPr contains specific mitigation requirements and requested contractor method statements stipulated where required.

2.3 Structure and Contents of Tables

The table consists of seven parts which are included as key requirements of EMPr as defined in the NEMA EIA Regulations 2014. These sections are described below as follows:

- Phase of development – This section will identify either pre-construction (planning) or actual construction activities.
- Impact / issue - This section 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.
- 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 - Provides time guidelines for the 'Responsible party' by which he / she is to action or manage the required mitigation.
- Responsible Party – Provides the details of the responsible team member which should account on the activities highlighted in column 1 to 4.

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

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE PARTY
A1 Project contract and programme i. The EMPR shall be required as part of the NEMA process 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. ii. A copy of this EMPr shall be available onsite. The Contractor must ensure that all the personnel onsite, sub-contractors and their team, suppliers, are familiar with and understand the specifications contained in this EMPr.	• Contingencies for minimising negative impacts anticipated to occur during the closure • Ensure environmental awareness and formalise environmental responsibilities and implementation	• Contract records • Signed declaration pro forms by contractor • Mitigation measures to be complied with	Once-off	• ECO • Contractor
A2 Appointments and duties of project team i. Before construction activities commence, role players must have a clear indication of to their role in the implementation of this EMPr ii. 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 EMPr. iii. Transparency of the process and ensuring that the relevant stakeholders are in agreement.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase • Engaging with the relevant stakeholders on issues pertinent to finalization of expropriation process	• Contract records • Signed declaration pro forms • Appointment of role-players • Accepted finalized agreements between stakeholders. Property owners fairly compensated.	Once-off	• ECO • Contractor
A3 Method statements i. As required in 1.1.3, 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.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Approved method statements and relevant pro forma documents • Regular Review of the Method statements in line with current activity • Training records	As and when required and need be.	• ECO • Contractor

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

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE PARTY
ii. Where applicable, the contractor shall provide job-specific training on an ad-hoc basis when workers are engaged in activities which require method statements.				
A4 Site demarcation and development i. The surveys for the overall project area and construction footprint as approved in the EA must be completed and clearly demarcated and fenced (where practical) before the contractors set up their crew camps or begin construction. ii. "No-go" areas (identified grave sites) identified during the EIA process must be clearly demarcated (e.g. warning tape) prior to the commencement of construction activities. iii. The site activities and sequencing of the construction activities should be regulated by relevant legislature, regulations, and standards	• Contingencies for minimising negative impacts anticipated to occur during the construction phase • Adherence to the EMPr and legislative requirements	• Demarcated area's • Filled in section of this document • EMPr adhered to	As and when required	• ECO • Contractor
A5 Emergencies, non-compliance and communication 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 the natural water resources from spills; contamination of soils from spills; soil erosion, Safety (Casual Access) and Storm water Management. ii. The contractor understands that failure to adhere to the requirements of the EMPr 'Tolerances', over and above the costs incurred for any	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Method statements	As and when required	• ECO • Contractor

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

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE PARTY
remediation required as result of the specific non-compliance, shall be followed.				
A6 Permits and Permissions i. The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, updating the Department of Water and Sanitation (DWS) Water Use licence and other monitoring programs. ii. The Contractor shall maintain a database of all pertinent permits and permissions required for the contract as a whole and for critical activities for the duration of the contract.	• Adherence to the EMPr and legislative requirements	• Compliance with legislation and EMPr requirements	Prior to Construction	• Developer • Contractor
A7 Existing Services and Infrastructure i. The Contractor shall ensure that existing services (e.g. Fencing, roads, pipelines, power lines and telephone services) are not damaged or disrupted unless required by the contract and with the permission of the RE. ii. The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted. iii. Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities. iv. A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	• Avoiding impact on surrounding services such as Eskom infrastructure and other underground infrastructure on site • All services identidied particularly Eskom must be notified prior to construction	• Infrastructural impacts • Services impacts	Daily	• Developer • ECO • ESO • Contractor
A8 Environmental Awareness Training The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; i. What is meant by "Environment"	• Raise awareness of importance of Environmental protection	• Environmental Management • Reduce and manage potential Environmental impacts	Daily	• Developer • ECO • ESO

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

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE PARTY
ii. Why the environment needs to be protected and conserved iii. How construction activities can impact on the environment iv. What can be done to mitigate against such impacts v. Awareness of emergency and spills response provisions vi. Social responsibility during construction of the sub-transmission lines e.g. being considerate to local residents vii. It is the Contractor's responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. viii. Training should be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary. ix. The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.				• Contractor

Phase of development	CONSTRUCTION
Impact / issue	Materials (B)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE
Handling				
B1 Stockpiles i. All stockpiled material must be easily accessible without any environmental damage. ii. The stockpiles may only be placed within demarcated areas which must be approved by the ECO. iii. Storm water runoff from any stockpile sites and other related areas must be directed into the storm water system with the necessary pollution prevention measures such as silt traps. iv. Stockpiles are to be stabilised if signs of erosion are visible. v. Soils from different horizons must be stockpiled so that topsoil stockpiles do not get contaminated by sub-soil material. vi. Topsoil stockpiles must be monitored for invasive vegetation growth. Contractors must remediate as and when required in consultation with the ECO. vii. No plant, workforce or any construction related activities may be allowed onto topsoil stockpiles. viii. Topsoil stockpiles must be clearly demarcated as no-go areas. ix. Stockpiles should not be higher than 2.5 meters to avoid compaction, while the slopes of the stockpiles should not be steeper than 1 vertical to 1.5 meters horizontally.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Containment of invasive plant growth should be encouraged • Minimise contamination of stormwater run-off will be encouraged	• No visible erosion scars once construction is completed	Daily	• ECO • ESO • Contractor
B2 Oil and chemicals i. The contractor must provide method statements for the “handling & storage of oils and chemicals” and “emergency spills procedures”. ii. These substances must be confined to specific and secured areas within the contractor’s construction site, 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.	• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts	Daily	• ECO • ESO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	Materials (B)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE
iii. Drip trays (minimum of 10 cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised to prevent environmental harm. iv. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. v. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. vi. Spill kits must be available onsite 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). 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).		• Method statements as set out by the contractor adhered to.		
B3 Cement and Concrete 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. 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, rocky outcrops, streams, wetlands and natural vegetation. iii. Cleaning of cement mixing and handling equipment must be done using proper cleaning trays. iv. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility. v. Any spillage that may occur must be investigated and immediate remedial action must be taken.	• Minimise the possibility of cement residue entering into the surrounding environment • Minimise pollution of soil, surface and groundwater resources	• No evidence of contaminated soil on the construction site • Method statement	Monitored daily	• ECO • ESO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	Materials (B)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE
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. vii. Cement batching areas must be located in consultation with the ER, ESO or ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas.				
B4 DANGEROUS AND TOXIC MATERIALS **(Provision of storage facilities)** 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. 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. iii. In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) for must be informed immediately. iv. Storage areas must display the required safety signs depicting "no smoking", no naked flames" and "danger" containers must be clearly marked to indicate contents as well as safety requirements. v. The contractor must supply a method statement for the storage of hazardous materials at tender stage. vi. Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDSs must be updated as required. vii. Casual access to the storage facilities should not be encouraged. All dangerous materials and equipment should be safely locked away as to prevent contract workers and employees from using and entering these areas freely.	• Prevention of pollution of soil, surface and groundwater resources	• No visible signs of pollution • No litigation due to transgression of pollution control acts	**Monitor daily**	• ECO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	Materials (B)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION / MONITORING	RESPONSIBLE
B5 USE OF DANGEROUS AND TOXIC MATERIALS i. The contractor must keep the necessary materials and equipment onsite to deal with spills / fire of the materials present should they occur. 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. iii. A record must be kept of all spills and the corrective action taken.	• Prevention of pollution of soil, surface and groundwater resources • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts	**As and when required**	• ECO • ER

Phase of development	CONSTRUCTION
Impact / issue	FACILITY (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
C1 EATING AREAS FOR CONSTRUCTION WORKERS i. The contractors must provide and maintain a method statement for "construction site and construction lay down areas". ii. The Contractor must, in conjunction with the ECO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis. iii. No fires shall 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 ECO.	• Control potential influx of vermin and flies and rats • Neat work place and hygienic environment • Minimise negative social impacts to the employees.	• No visual sign of vermin, flies and rats • No complaints from I&APs and the landowner / client	Once off, monitor daily	• ECO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	FACILITY (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. v. Informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractor's discretion, facilities can be made available within the designated eating area. vi. Litter (even if originating outside the camp) and concrete bags, etc. must be picked up daily and put into suitably closed bins to prevent pollution.				
C2 TOILETS AND ABLUTION FACILITIES 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 12 workers of the appointed contactor. ii. Sanitary arrangements must be to the satisfaction of the ECO and the OHS official 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. iii. Toilets provided by the contractor must be easily accessible to ensure they are utilised. All toilets will be located within the construction site. Should toilets be needed elsewhere, their location must first be approved by the ECO. 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. v. Toilets out onsite 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 or the bush • Minimise potential of diseases onsite and influence the health of the employees • Minimise potential to pollute soils, water resources and natural habitats	• Workforce use toilets provided and not the bush • No complaints received from I&APs as well as members of the workforce • No visible or measurable signs pollution of the environment (soils, ground and surface water)	As and when required	• Contractor
C3 WASTE MANAGEMENT i. The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on	• Sustainable management of waste by recycling	• Disposal of rubble and refuse in an appropriate manner	Continuous throughout the construction phase of the project	• ECO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	FACILITY (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. ii. 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. iii. Bins must be clearly marked for ease of management. iv. All refuse bins must have a lid secured so that animals cannot gain access. 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. 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 EMPr. Proof of this undertaking must be issued to the ECO. 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 ECO. viii. A waste disposal management plan should be encouraged. ix. Chemical containers and packaging brought onto the site must be removed for disposal at a suitable and licenced site. x. A skip, with a cover, must be used to contain refuse from construction i.e. bins, rubble and other construction material.	• Minimise litigation and complaints by I&APs • Control potential influx of vermin and flies thereby minimising the potential of diseases and pests onsite and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats • Adherence to the waste disposal management plan	with no rubble and refuse lying onsite • Ensuring the site is neat and tidy • No complaints are received from surrounding residents, businesses and road users • Sufficient containers available onsite for disposal of domestic and construction related impacts • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Method statement adhered to and waste disposed of in accordance with the waste disposal management plan		
C4 DUST 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. ii. The construction site must be watered during dry and windy conditions to control dust fallout.	• Reduce dust fall out at construction site • Minimise loss of valuable soil material	• No visible signs of dust around the contractor's camp • No complaints from I&APs • No incidences reported to ECO	Monitor daily	• ECO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	FACILITY (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
iii. 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. iv. In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and construction site must be surfaced with a temporary surface such as gravel to assist with dust suppression. v. All vehicles transporting material that can be blown off (e.g. soil, rubble, etc.) must be covered with a tarpaulin, and speed limits of 40 km/h must be adhered to. vi. Excessive dust conditions must be reported to the ECO. vii. All forms of dust pollution must be managed in terms of the NEM: AQA and its amendments.		• No visible evidence of dust contamination on the surrounding environment • Method statement adhered to		
C5 WORKSHOP EQUIPMENT, MAINTENANCE AND STORAGE i. The contractors must provide and maintain a method statement for "workshop maintenance and cleaning of plant". 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. iii. Workshop areas must be monitored for oil and fuel spills and such spills must be cleaned and remediated to the satisfaction of the EO or ER. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. SUNSORB	• Prevent pollution of the environment • Minimise chance of transgression of the acts controlling pollution • Disposal of hazardous substances in an appropriate manner	• No pollution of the environment • No litigation due to transgression of pollution control acts • Method statement adhered to	Monitor daily	• ECO • ER • EO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	FACILITY (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
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. v. The Contractor must be in possession of an emergency spill kit that is complete and available at all times onsite. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. vi. The following must be applied • All contaminated soil 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. • All spills of hazardous substances must be reported to the ECO. • The contractor must comply with the regulations of the OHS				
C6 NOISE i. All construction vehicles must be in a good working order to reduce possible noise pollution. ii. Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only. Work hours during the construction phase must be strictly enforced unless permission is given iii. No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance. iv. 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. v. Noisy activities must take place only during working hours. The ECO must inform all I&APs 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 surrounding environment, road users and neighbouring land owners. These activities could include, but are not limited to, piling, use of pneumatic jack-hammers and compressors, bulk demolitions, etc.	• Maintain noise levels below "disturbing" as defined in the National Noise Regulations • Minimise the nuisance factor of the development	• No complaints from surrounding landowners or I&AP's	As and when required	• ECO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
D1 CONSTRUCTION SITE i. The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas". ii. Dedicated wash areas must be provided and maintained in good working order. iii. The construction site 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 from the Department of Water and Sanitation (DWS). iv. The construction site, offices and storage facilities must be located within the site boundaries and not within the 1:100 flood line or within 32 m from the edge of the watercourse or the riparian habitat, whichever is the greatest. 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. v. The contractor must provide labourers plastic bags to clean up the 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. vi. The contractor is responsible for cleaning the construction site of all structures, equipment, residual litter and building materials at the end of the construction period. vii. Erection of the construction site should be encouraged in already disturbed areas onsite.	• Minimise water pollution • Minimise dust fallout in the immediate surroundings • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Crew camp activities should be in line with the OHS regulations	• No signs of water or soil pollution (surface- and groundwater resources) • No complaints received from the surrounding landowners / I&AP's • No visible signs of litter at the crew camps • Method statements adhered to	Monitor daily	• ECO • Contractor
D2 FIRES 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.	• Minimise risk of veld fires and loss of natural habitat • Maintain safety on site and the community in general	• No veld fires started by the contractor' s workforce • No claims from landowners for damages due to veld fires	Monitor daily	• ECO • EO • Contractor

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
ii. Fires will only be allowed in facilities especially constructed for this purpose within the fenced Contractor's construction site should there be one. Wood, charcoal or anthracite are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose. iii. Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air. iv. 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. v. No fires are allowed near or adjacent to the edge (riparian habitat) of identified wetland. .		• Method statement adhered to		
D3 EROSION AND SEDIMENTATION i. To reduce the loss of material by erosion, the contractor must ensure that disturbance onsite 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.	• Minimise erosion damage • Minimise impeding the natural flow of water • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas.	• No erosion scars • No loss of topsoil • No interference with the natural flow of water • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated by the landscaper	As and when required	ECO
D4 FAUNA i. All activities onsite must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962) [APA]. ii. The extent of the construction site must be demarcated and no vegetation is to be removed outside of this zone.	• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat and impacts on the riparian habitat	• No complaints from any I&AP • No litigation concerning applicable animal protection acts	Monitor daily	• Contractor • ECO • Faunal Specialist

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
iii. 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. iv. Development should be located in areas of lowest and clustered closest to existing developments especially taking into account the current development layout v. Sensitive areas should be fenced off (whilst maintaining natural movement of fauna) prior to construction as "No Go" zones and all construction related impacts / activities should be prohibited within these zones. vi. Boards containing information pertaining to Orange / Red / Listed floral species (i.e. identification, conservation status and importance, biology, habitat requirements and management requirements) within the area should be erected within the construction and development zone and should be clearly visible to any construction personnel / visitors / residents.	• No casual access of workers and the general community			
D5 FLORA i. An alien eradication and management program that needs to be monitored fortnightly in the rain season and monthly in the dry seasons ii. Retain as much of the existing vegetation as possible to act as a visual screen. This can be phased out and replaced by new trees as the construction progresses but it's important to retain it for as long as possible. i. Locally indigenous plants must be used in the landscaping of the site. Should this not be viable exotic plants may be utilized, however these plants may not exhibit the ability to be classified as problem plants spreading uncontrollably. Plants that are proclaimed as problem plants or noxious weeds must be excluded from the landscaping plan and these must be removed immediately.	• Minimal disturbance to vegetation where such vegetation does not interfere with construction • Prevent litigation concerning removal of vegetation • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Minimise risk of veld fires	• No litigation due to removal of vegetation without necessary permission • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries	As and when required	• Contractor • ECO • Ecological Specialist (where applicable)

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
ii. No open fires shall be allowed onsite under any circumstances, fires will only be permitted in adequate facility within the construction site, Forest Act, 1984 (Act No. 122 of 1984) [AFA]. iii. Alien vegetation should be removed from the study area and an alien control plan should be encouraged. iv. A plant rescue and vegetation rehabilitation plan should be implemented. v. Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from local authority. vi. All construction vehicles and equipment as well as construction material should be free of plant material. vii. Landscape development should incorporate indigenous vegetation.	• Removal of alien plant species to encourage indigenous plant growth • Remove only vegetation where essential for construction and do not allow any disturbance to adjoining natural cover. •	• All damaged areas and banks successfully rehabilitated • No veld fires started by contractors work force • No claims from landowners for damages due to veldt fires • Plants that are found during clearing should be planted into landscaped gardens.		
D6 HERITAGE RESOURCES i. Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA ii. Should any historically significant finds (e.g. artefacts, human remains or sites of cultural or archaeological importance) be located, work must cease and the Provincial Heritage Resources Authority Gauteng (PHRAG) must be contacted immediately. Work in the area can only be resumed once the site has been completely investigated and PHRAG have given permission to the developer to resume any activities. iii. Under no circumstances may any worker destroy or interfere with the informal cemetery or any other issue of heritage significance. iv. If at any stage the site is disturbed a qualified archaeologist must be contracted to evaluate the damage and make recommendations on the appropriate mitigation measures.	• Avoid damage to heritage resources. • Report all finds of human artefacts to police • Include section on possible heritage finds in induction prior to construction activities take place • Implement chance find procedures in case where possible heritage finds area made	• Limited or no damage to heritage resources	Monthly	• Contractor • ECO • Heritage Specialist
D7 NO-GO / SENSITIVE AREAS i. All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction.	• Reduce loss of fauna and flora habitat	• Containment of footprint	Monitor daily	• Contractor • ECO

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
ii. The construction footprint must be kept to a minimum, must be clearly demarcated (e.g. warning tape) prior to the commencement of construction activities thus reducing the infringement of the development on surrounding habitats. This should especially be encouraged as to prevent local communities from gaining casual access to the construction site and minimising the risks associated with loss of lives or the risks involved with sustaining possible injuries. This is applicable for the wetland onsite. iii. Demarcate all sensitive sites including those to be used for open spaces i.e. soil compaction, etc. iv. Toolbox talks can be used to indicate where the sensitive sites are.				
D8 ACCESS ROUTES / POINTS i. Any authorised clearing for access roads must be done under the supervision of the ECO. ii. Any damaged or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated. 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. iv. Access Control is needed for areas to be proclaimed as the conservancy. Sensitive areas should be fenced off. Protection of construction staff. v. Access Control is needed for prevention of unauthorised access for non-construction staff.	• Minimise loss of topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats	• No erosion on access roads after completion of construction • No loss of topsoil due to runoff water on access roads	As required, monitor daily	• Contractor • ECO
D9 CRIME, SAFETY AND SECURITY i. The site and crew are to be managed in strict accordance with the OHS Act and the National Building Regulations.	• Reduce the risk of potential incidences • Minimise the potential for impacts associated with loss of human lives and risk of injuries	• No incidences reported by any I&AP	Monitor daily	• Applicant • ECO

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
ii. 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 and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc. iii. 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. iv. 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. v. A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction.				
D10 VISUAL IMPACT i. Shade cloth must be utilised to conceal and minimise the visual impact of construction site, lay down and storage areas. ii. Only general waste must be removed every week or more often as the need arises and be disposed of at a registered landfill (if there is no space available). iii. Keep dust levels down by regularly wetting dirt roads and exposed soil areas inside the construction site. iv. Clearly demarcate the construction site to limit the area of disturbance. v. Remove rubble and other rubbish off site as soon as possible. vi. Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed soil surfaces.	• Minimise visual impact. • To achieve the goal of reducing the visual intrusion of the proposed development and to assist in blending the proposed development into the surrounding character, the enviro-architectural design guidelines will inform the key aspects of architectural form, materials and finishes for the proposed development. It should be noted that no precise formula or model exists to ensure innovative design and	• No complaints from I&AP's and local residents. • Evidence of windblown litter	Monitor daily	• Applicant • ECO

Phase of development	CONSTRUCTION
Impact / issue	Construction Phase (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE
vii. Minimise large and potentially unsightly cut-and-fill embankments by stepping the building platform and thereby lowering the structure by as much as possible. viii. Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits. Alternatively, embankments must be stabilised preferably through planting to cover up any exposed soil or hard retain wall structures and to restrict erosion. ix. Retain as much of the existing vegetation as possible to act as a visual screen. This can be phased out and replaced by new trees as the construction progresses but it's important to retain it for as long as possible. x. Locate the stockyards is not visible xi. Keep the construction site neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of the sight from sensitive viewpoints. xii. Enhance the screening capacity of the site by erecting a temporary fence with a 5m high shade cloth around the construction site.	blending with the visual character of the area. • Reduce and limit dust clouds. • Limit area of disturbance. • Limit the duration of exposed soil surfaces. • Locate construction site and stockpiles in the least visible area. • Provide additional screening to increase the visual absorption capacity of the site.			

Phase of development	CONSTRUCTION
Impact / issue	Construction (E)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE PARTY/PARTIES
E1 HYDROLOGY i. Increased run-off during construction must be managed using 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 ii. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of NWA is be responsible for all costs incurred by organisations called to assist in pollution control and / or to clean up polluted areas. iii. 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. iv. No wastewater may run freely into any of the surrounding streets or naturally vegetated areas. Runoff containing high sediment loads must not be released into natural or municipal drainage systems or nearby watercourses. v. Approval must be obtained from DWA for any activities that require authorisation in terms of Section 39 of NWA.	• Minimise pollution of soil, surface and groundwater resources in the immediate and surrounding environments • Minimise impeding the natural flow of water • Minimise the impact on natural water flow dynamics • Minimise scarring of the soil surface and land features • Minimise damage to river and stream embankments (where applicable) • Minimise erosion of embankments and subsequent siltation of rivers and streams • Minimise damage to riverine habitats and the wetland (where applicable)	• No visible signs of pollution • No signs of siltation of the stream south-east of the site. • No visible erosion scaring once construction is completed • Minimum loss of topsoil • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed • No erosion or siltation downstream and wetland • No deviation from baseline data during regular sampling	As and when required, monitor daily	• Applicant • ECO
E2 SOIL i. The contractors must provide and maintain a method statement for "management of topsoil" (if remaining). ii. 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. iii. 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.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines	• No visible erosion scars once construction is completed • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement adhered to.	Daily	Contractor

Phase of development	CONSTRUCTION
Impact / issue	Construction (E)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	RESPONSIBLE PARTY/PARTIES
iv. 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. v. All topsoil must be removed and stockpiled on the site. vi. Single handling is recommended. Stockpiles must not be higher than 2m to avoid compaction. vii. Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent. viii. Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment. ix. Slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas.	• Containment of invasive plant growth			

3. MONITORING PHASE EMPR

3.1 PREAMBLE

The following tables form the core mitigation measures appropriate to the operational phase of the EMPr. 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.

3.2 STRUCTURE AND CONTENTS OF TABLES

The table consists of four parts as follows:

Environmental Consideration / 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'.

Frequency of action - Provides time guidelines for the 'Responsible party' by which he / she is to action or manage the required mitigation

Responsible Party – Provides the details of the responsible team member which should account on the activities highlighted in column 1 to 4.

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Where applicable, the mitigation measures for the construction phase will be carried forward to the operations phase. In addition, the following specific measures will also apply:

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
1. Heritage			
2. Biodiversity	Area will be landscaped after construction.	Landscaping to be undertaken after the contractor has finished with construction.	Developer
3. Socioeconomic	Operation of the development will increase job creation and will boost the local economy through further local economic activity	1)Workers employed from local communities 2) Goods and services provided by local sources	
4. Water Resources	Discharging storm water from development may increase volume of water within watercourse	1) Ensure clean storm water is discharged into wetland	
	Discharging storm water from development may change the water chemistry and physical properties of the water in the watercourse i.e. temperature, turbidity etc.	1) Ensure clean storm water is discharged into wetland 2) Prior removal of silt and litter	
	Contamination emanating for the development can	1) Implement and maintain a clean and dirty water system on site	

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
	enter the watercourse through the storm water discharge pipeline	2) Ensure clean storm water is discharged into wetland 3) Prior removal of silt and litter	
	Burst / leaking sewer pipeline would result in contamination of surface and groundwater resources	1) Continuous monitoring along sewer pipeline 2) Immediate clean-up in the event of spillages	
5. Soil Resources	Burst / leaking sewer pipeline would result in contamination of soil resources	1) Continuous monitoring along sewer pipeline 2) Immediate clean-up in the event of spillages	Developer
	Mismanagement of the waste reduction and recycling depot could result in contamination of the surrounding soil resources	1) Employ competent and qualified staff to manage waste 2) Develop and implement a waste management plan	
6. Sustainable Utilisation of Resources	Operation of a waste reduction and sorting area will limit the volume of waste sent to landfills	1) Employ competent and qualified staff to manage waste 2) Develop and implement a waste management plan	Developer
	Operation of a waste reduction and sorting area will reduce the use of natural resources (particularly non-renewable ones) during production	1) Employ competent and qualified staff to manage waste 2) Develop and implement a waste management plan	

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
	Operation of a waste reduction and sorting area will reduce emissions and discharges from producing manufactured goods	1) Employ competent and qualified staff to manage waste 2) Develop and implement a waste management plan	
	Improper management of sorting area could result in the facility being a nuisance and pollution hazard	1) Employ competent and qualified staff to manage waste 2) Develop and implement a waste management plan	
7. <u>Flora</u>	Proliferation of exotic vegetation and weeds in disturbed areas. o The vegetation occurring within open space within or adjoining the development could degrade over time if suitable rehabilitation of the disturbed soils does not take place. Furthermore, the vegetation could deteriorate due to	• All exotic flora and weeds to be eradicated in environmentally friendly manner, on a continual basis. o Grasslands benefit from fire as well as grazing. The environmental management plan should incorporate a regular burning programme in order to keep the grassland functioning optimum. Also, small mammals (grazers) could be introduces into the grasslands of the development (e.g. Grey duikers). This EMPr must be explained and accepted by prospective owners of the residential stands as well as commercial ventures. This will ensure that the burning programme (e.g. once every 4 years) are not criticised by residents and pressure applied on the governing body to halt the burning programme. o A residency association must be created that includes an environmental management	Developer

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
	a lack of grazing or fire o Loss of open space Human activities in open spaces created within the proposed development could encourage the establishment and spread of alien invasive plant species.	portfolio. This person(s) will ultimately be responsible for implementing an environmental policy as well as the environmental management plan(s). o After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. o Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. o The survival rate of the relocated plant species must be monitored and any problems mitigated.	
8. Traffic	Increased vehicles as a result of new businesses in the area will affect existing traffic.	• A backlog of traffic should not develop at any access point to residential, business or industrial properties. • All traffic management must be undertaken in accordance with the National Road Traffic Act, 1996 (Act No. 93 of 1996).	Developer
9. General		• The relevant mitigation measures proposed for the construction phase should be carried forward to operations, where potential environmental impacts may still occur.	Developer

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
		• The contractor must perform appropriate maintenance functions, as required. Responsible parties must be competent in the necessary maintenance tasks. • Feedback must be provided to the ECO and project proponent on a frequent basis.	

4 DECLARATION OF UNDERSTANDING BY THE DEVELOPER/ENGINEER/CONTRACTOR (APPENDIX1)

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme (EMPr) 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: _____

Witness 2: _____

5 METHOD STATEMENT: SOLID WASTE MANAGEMENT (APPENDIX 2)

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**

6 INCIDENT AND ENVIRONMENTAL LOG (APPENDIX 3)

ENVIRONMENTAL INCIDENT LOG				
Date	**Environmental Condition**	**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)*	**Signature**

7 REFERENCES

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

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

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.

Republic of South Africa (1998) National Environmental Management Act (Act No. 107 of 1998) (NEMA).