Eskom Holdings Limited
Distribution Division

THE PROPOSED WESTGATE TARLTON KROMDRAAI 132 kV POWERLINE, KROMDRAAI SUBSTATION AND ASSOCIATED INFRASTRUCTURE

Draft Environmental Management Plan

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Environmental Management Plan for the Proposed Westgate Tarlton Kromdraai 132 kV Powerline, Kromdraai Substation and Associated Infrastructure

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GLOSSARY OF TERMS AND ABBREVIATIONS

EMP:
Environmental Management Plan. A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. This EMP focuses primarily on the construction phase and maintenance phase of the proposed project.

ENVIRONMENT:
In terms of the National Environmental Management Act (NEMA) (No 107 of 1998), "environment" means the surroundings within which humans exist and that are made up of:

(i) the land, water and atmosphere of the earth;
(ii) micro-organisms, plant and animal life;
(iii) any part or combination of (i) of (ii) and the interrelationships among and between them; and
(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

ESKOM'S PROJECT CO-ORDINATOR:
The person appointed by Eskom from time to time to act in the capacity and notified, by name and in writing by Eskom to the Contractor, to act as required in the contract.

CLERK OF WORKS:
The person appointed by Eskom from time to time to act in the capacity of site manager, and whose authority shall be notified in writing to the Contractor by Eskom's Project Co-ordinator, and is responsible for managing the construction process on site.

ENVIRONMENTAL CONTROL OFFICER:
An individual nominated through the Project Co-ordinator to act on behalf of the Project Co-ordinator in matters concerning the implementation and day to day monitoring of the EMP.

CONTRACTOR:
A person or company appointed by Eskom to carry out stipulated activities.

CONTRACTORS CAMP
A temporary camp, located within the BPC grant housing the contractors.

DEVELOPMENT SITE
The construction site areas for the distribution powerline, substation and associated infrastructure.

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1 INTRODUCTION

Eskom Holdings Limited Distribution Division (Eskom) is responsible for the distribution of electricity from substations at municipal level. In recognition of this mandate, Eskom is significantly expanding its Distribution Network countrywide to meet current and future electricity demands. Eskom has identified that the Tarlton area, situated in the western component of Gauteng, requires additional electricity capacity in order to meet both current and future needs within this area. The existing 11 kilovolt (kV) lines in this area are currently experiencing high loads as a result of the rapid growth rate of development in the area and the associated increase in the demand for electricity. To meet this demand Eskom proposes to strengthen the network by constructing a 132 kV distribution power line between the Westgate and Tarlton Substations and from the Tarlton Substation to a proposed new Kromdraai Substation, which will also be constructed should authorisation be granted.

The activities relevant to this project therefore entail the following:

- The construction of a 132 kV powerline from the existing Westgate substation in Randfontein to the existing Tarlton substation in Mogale City;
- The construction of a 132kV powerline from the existing Tarlton substation to the new proposed Kromdraai Substation;
- The construction of a new substation in Kromdraai on Portion 35 of the Farm Sterkfontein 173 IQ;
- The construction of associated infrastructure including access roads;
- Temporary facilities required during construction include the following (to be rehabilitated after completion of construction):
  - a construction camp;
  - temporary ablution and cooking facilities; and
  - waste disposal sites.

Activities relevant to this project as identified in Government Notice R. 386 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) are as follows:

1(1)m - " The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including –

- *canals;*
- *channels;*
- *bridges;*
- *dams; and*
- *weirs.*

4 - "The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland."

15 - ""The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long."

The main listed activity for this project is identified as activity number 1 in Government Notice R. 387 of NEMA as follows:

1 (l). "The construction of facilities or infrastructure, including associated structures or infrastructure, for "the transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more".

The Environmental Impact Assessment (including specialist investigations) has been conducted and a number of possible impacts of the project on the biophysical and socio-economic environment have been identified. Recommendations for the prevention and mitigation of these impacts during the construction and operational phases are captured in this Environmental Management Plan (EMP). This EMP serves to provide the actions for the management of identified environmental impacts emanating from the above-mentioned proposed activities.

The EMP is included as **Appendix K** in the Environmental Impact Report and it should be included in the Tender and Contract documentation for Contractors working on the project.

1.1 Applicable Documentation

The following environmental documentation is applicable for the project, and should be read in conjunction with this Environmental Management Plan (EMP):

- Environmental Impact Assessment Report for the proposed Westgate Tarlton Kromdraai 132 kV Distribution Powerline, Kromdraai Substation and Associated Infrastructure;
- Environmental Authorisation issued by the Department of Environmental Affairs and Tourism (DEAT) (once issued). Cognisance of the Environmental Authorisation must be taken once it has been issued. Where necessary, this EMP must be amended to comply with this Environmental Authorisation;
- Permits or licences that may need to be acquired at the time of construction such as a Water Use License in terms of the National Water Act,1998 (Act No. 36 of 1998);
- All acts, ordinances and by laws relevant to the proposed project; and
- Eskom Distribution Guidelines for the construction and operation of proposed infrastructure.

1.2 Structure of the Environmental Management Plan

The EMP provides mitigation and management measures for the following phases of the project:

- **Construction Phase**
  This section of the EMP provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications shall form part of the contract documentation and, therefore, the Contractor will be required to comply with the specifications to the satisfaction of the Project Co-ordinator and Environmental Control Officer, in terms of the construction contract.

- **Operation and Maintenance Phase**
  This section of the EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and responsibilities as required from Eskom within the operation and maintenance phase are specified.

It should be noted that this EMP is a dynamic document which should be updated as and when required on a continuous basis. This may be of particular importance once the final route alignment within the preferred corridor and the exact positioning of the poles has been selected, as at this stage it may be possible to add more 'site specific' management measures. Any amendments made must be submitted to both the Environmental Control Officer and Project Co-ordinator for approval prior to implementation.

1.3 Objectives of the EMP

The EMP has the following objectives:

- To outline functions and responsibilities of responsible persons;
- To state standards and guidelines which are required to be achieved in terms of environmental legislation;
- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts; and
- To prevent long-term or permanent environmental degradation.

2 FUNCTIONS AND RESPONSIBILITIES

The organisational structure identifies and defines the authority structure, and the communication structure of the various parties involved in the implementation of this EMP. All instructions and official communications regarding environmental matters and the EMP shall follow the organisational structure shown in **Figure 1**.

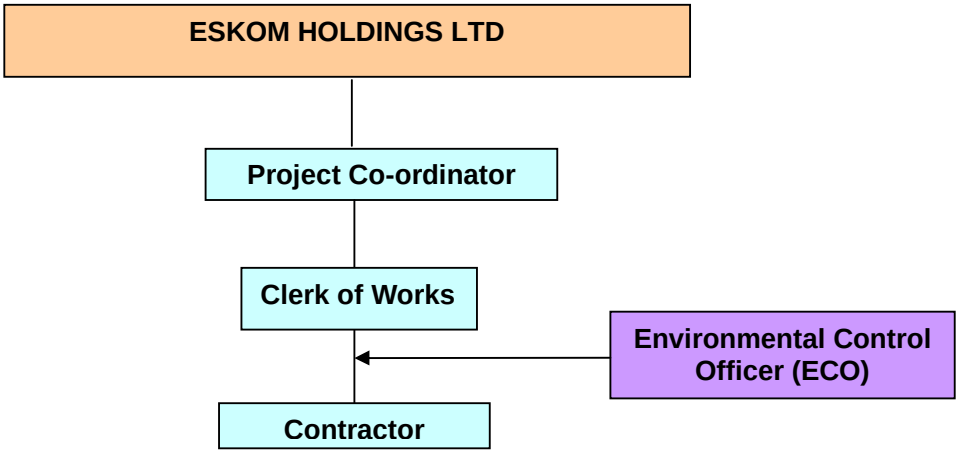


Figure 1: Organisational structure for construction of the proposed 132kv Powerline and Substation

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Co-ordinator, Clerk of Works and Environmental Control Officer (ECO) for this project are as detailed below.

The Project Co-ordinator will:

- ensure that Eskom and the Contractor are aware of all specifications, legal constraints and Eskom standards and procedures pertaining to the project specifically with regard to the environment;
- ensure that all stipulations within the EMP are communicated and adhered to by Eskom and its contractor(s);
- monitor the implementation of the EMP throughout the project by means of site inspections and meetings. This should be documented as part of the site meeting minutes; and
- be fully conversant with the Environmental Impact Report for the project, the conditions of the Environmental Authorisation (once issued), and all environmental legislation.

The Clerk of Works (Eskom's Representative) will:

- be fully conversant with the Environmental Impact Report;
- be fully conversant with the conditions of the Environmental Authorisation;
- be fully conversant with the Environmental Management Plan;
- be fully conversant with all environmental legislation and Eskom environmental policies and procedures, and ensure compliance with these;
- have overall responsibility for the implementation of the EMP;
- conduct audits to ensure compliance to the EMP;
- liase with the Project Co-ordinator or his delegate, the ECO and relevant discipline Engineers, on matters concerning the environment;
- prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site; and
- confine activities to the demarcated construction site.

The Environmental Control Officer (ECO) will:

- be fully conversant with the Environmental Impact Report;
- be fully conversant with the conditions of the Environmental Authorisation.;
- be fully conversant with the Environmental Management Plan;
- be fully conversant with all environmental legislation and Eskom environmental policies and procedures, and ensure compliance with them;
- undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP;
- take appropriate action if the specifications are not followed;
- monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- review and approve construction methods, with input from the Clerk of Works, where necessary;
- ensure that activities on site comply with all relevant environmental legislation;
- order the removal of person(s) and/or equipment in contravention of the specifications of the EMP;
- compile progress reports on a regular basis, with input from the Clerk of Works, for submission to the Project Co-ordinator, including a final post-construction audit; and
- liase with the Clerk of Works regarding the monitoring of the site, and to report any non-compliance or remedial measures that need to be applied.

The Contractor shall:

- ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- ensure that all Employees and co-contractors employed comply with the requirements and provisions of the EMP;
- prepare method statements;
- monitor environmental performance and conformance with the specifications contained in this document during daily site inspections;
- discuss implementation of and compliance with this document with staff at routine site meetings;
- report progress towards implementation of and non-conformances with this document at site meetings with ECO;
- notify ECO of the anticipated programme of works and fully disclose all details of activities involved;
- ensure that suitable records are kept and that the appropriate documentation is available to the ECO;
- Notify the ECO of all incidents, accidents and transgressions on site with respect to environmental management as well as requirements of the EMP and corrective actions/remedial action taken;
- report and record all accidents and incidents resulting in injury or death;
- inform the ECO of problems arising when implementing the EMP and ways of improving the EMP; and
- Inform the ECO of any complaints received.

3 ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS

3.1 Environmental Guidelines and Standards

All applicable environmental standards contained within the environmental legislation shall be adhered to. At the time of compiling this draft EMP, the following environmental guidelines and standards are applicable.

3.1.1 Air Quality Guidelines

In terms of air quality, the Contractor will be required to describe how effective dust control measures will be achieved during the construction phase. This will only be required for activities which are to produce a significant amount of dust or other air-pollutants (e.g. excavation activities, use of heavy vehicles during construction, etc.).

3.1.2 Control of Alien Vegetation

In terms of Government Notice R1048, the following regulations are applicable with regards to the control of invasive alien vegetation and declared weeds:

- It is illegal to have declared weed species or invasive alien vegetation on one's property;
- The landowner must immediately take steps to eradicate them by using the methods prescribed in the regulations, namely;
  - uprooting and burning, or
  - the application of a suitable chemical weed-killer (herbicide), or
  - any other method of permanent eradication.
- One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or allow their seeds to be spread or blown onto other properties; and
- If the landowner does not comply with requirements above, a person may be found guilty of a criminal offence.

3.2 Environmental Permitting Requirements

Environmental permits which will be required to be obtained for construction are discussed briefly below. These will be required to be obtained before construction commences.

3.2.1 Stream Crossings and Abstraction of Water

Permission is required from the Department of Agriculture for the removal of river bank vegetation and disturbance of the river bank itself for all river crossings under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). All disturbances will have to be appropriately rehabilitated. The positions of pylons have not been determined as yet, and therefore the permit may or may not be required, depending on whether any of the pylons are located adjacent any rivers/streams. It is recommended that the banks of the watercourse be avoided wherever possible, to minimise environmental damage and to avoid the requirement of a permit.

It should be noted that pollution of river water (silt-laden run-off, oil from machines etc.) is a contravention of the National Water Act, 1998(Act No. 36 of 1998) and is not permitted.

If water is to be abstracted from a public stream during construction (for construction activities), a permit is required from the Department of Water Affairs and Forestry (DWAF). If water is to be abstracted from water of which the rights of use belong to private landowners, it will be necessary to establish whether their water use rights are still valid in terms of the provisions of the National Water Act, 1998, negotiate with the relevant landowners and then to obtain a permit from DWAF in terms of Section 21, 40 and 41 of the National Water Ac, 1998. It is recommended that use of water be restricted to potable water supplied to the site.

3.2.2 Heritage Sites

In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), a permit is required to be obtained for the disturbance, removal or destruction of any national and provincial heritage sites, archaeological and palaeontological sites, burial grounds and graves and public monuments and memorials. The demolition or dismantling of all man-made structures and buildings older than 60 years is subject to the approval of the relevant provincial heritage council under the National Heritage Council Act, 1999 (Act No. 11 of 1999).

3.2.3 Protected Plants

In terms of the National Forests Act, 1998 (Act No. 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Acts (Act No. 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants will require a permit.

Protected indigenous plants in general are controlled under the relevant Provincial Ordinances or Acts dealing with nature conservation, i.e. Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983). Included within the provincial Ordinance is the legislation regarding the plant species on the Red Data list.

For further detail about the management of protected plants on site refer to section 4.2.3.

3.2.4 Waste Disposal

All waste (general and hazardous) generated during the construction of the power line and associated infrastructure may only be disposed of at appropriately licensed sites (in terms of Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989). Cognisance must also be taken of the relevant provincial legislation in this regard. It should be noted that all controlling authority regulations pertaining to litter in terms of the Environment Conservation Act (sections 19, 19A and 24A) have been delegated to the provinces. For further detail regarding the management of waste on site refer to section 4.10.

3.2.5 Public Health

Soak-aways french drains and other similar types of sewage effluent and human waste disposal facilities must be approved by the nearest local authority in terms of their by-laws and relevant provincial standard by-laws. These facilities do not fall under provisions of the National Water Act, 1999 (Act No. 25 of 1999).

4 CONSTRUCTION PHASE

4.1 Site Establishment and Management

4.1.1 Construction Site Layout Plan

Once the alignment of the power line and the positioning of the poles have been finalised, the Contractor shall develop a construction layout plan, indicating the intended use of the site, including:

- The extent of the servitude area;
- Site access during both construction and operation (including all entry and exit points);
- Two metre interval contour lines;
- The locations of the power line poles;
- The route and the extent of access necessary to reach each pole location;
- All material and equipment storage areas (including storage areas for hazardous substances such as fuel, cement and herbicides);
- Construction offices and other structures (if required);
- Security requirements (including temporary and permanent fencing and lighting) and accommodation for security staff;
- Areas where vegetation is required to be cleared;
- Areas where material is to be stockpiled (including construction materials and topsoil);
- Solid waste collection facilities;
- Temporary construction phase stormwater control measures;
- Areas which require slope stabilisation during construction; and
- Provision of potable water and temporary ablution facilities for construction personnel.

The construction area should be clearly demarcated on the site plan, and all other areas must be considered no-go areas for the construction personnel.

Only designated areas may be used for the storage of construction material, topsoil, machinery, equipment and site offices.

The construction layout plan shall be made available to the Clerk of Works (Eskom's representative) for written approval. Throughout the period of construction, the Contractor shall restrict all activities to within the approved areas on the construction layout plan. Construction activities should be limited to the servitude areas, particularly in areas where sensitive vegetation is indicated.

4.1.2 Final Alignment of the Power Line and Positioning of Poles

Eskom is required to negotiate with each individual property owner regarding compensation and mitigation. The planned positions of poles must consider those areas with least possible impact on land-uses, as well as the minimising of potential economic losses. In order to achieve this a walkdown of the final alignment is recommended. The walkdown should be undertaken by the heritage, biodiversity, avifauna and visual specialists and the findings included in an updated EMP.

Construction must be avoided during the planting, harvesting, crop spraying and animal breeding seasons within the chosen corridor.

Potential impacts during the operational (maintenance) as well as decommissioning phases should be considered to determine the final alignment in order to minimise impacts on the vegetation and prevent the requirement for expensive mitigation measures during the later phases of the project life cycle.

Construction in streambanks should be completely avoided. Riparian areas should be spanned and pole structures should not be placed within close proximity to rivers and/or streams. Placement of footprints should be outside the 1:100 year floodlines. Crossing of riparian systems is only permitted at existing/ approved crossing points, taking due care to prevent additional/ new impacts. Access roads should not disturb the natural drainage patterns.

Consideration must also be given to potential geo-technical constraints in the study area. The following recommendations have been proposed by the geo-technical specialist:

- Abandoned shallow stopes up to 2 m wide may create sudden and differential settlements of this order at ground level and relocation of the pylon positions to solid ground would be the preferred option. The most suitable area would be to the west of the shallow stoping;
- Existing pylons located on areas of shallow stoping should not be burdened with any additional new power lines;
- Plans for all corridors in close proximity to existing slimes dams should be discussed with the mining company concerned since sufficient space for maintenance, expansion and re-processing will be required; and
- It is essential that a dolomite stability investigation be completed for the final chosen route, so that appropriate foundation and water precautionary measures can be recommended.

The contractor must comply with Eskom Safety Standards by constructing the power lines at the correct height (ground to lowest point of power line) (refer to section 4.1.3 below).

Furthermore the visual specialist indicated that each study area has a natural screening capacity, either through topographical variation or vegetative screening, or a combination of both. Thus, the study area provides the opportunity to locate certain sections of the power line through the exotic woodlands which will in effect completely or partially conceal the power line from outside vantage points.

4.1.3 Servitude Requirements and Clearances

Generally, 132 kV power lines require a servitude width of between 30 m and 52m. The majority of the proposed Westgate, Tarlton, and Kromdraai 132 kV power line will require a servitude width of 52 m (20 m either side of the centre line of the power line). A 52 m wide servitude is required for two lines. The servitude between the Westgate Substation and the Tarlton Substation must cater for the future construction of an additional power line.

A 24m separation distance will be required between the centre-line of the proposed power line and the centre-line of the proposed future power line, rendering the total width of the servitude between the Westgate Substation and the Tarlton Substation at 64m. The servitude between the Tarlton Substation and the Kromdraai Substation will have a maximum width of 40m.

Any extra space required outside the servitude shall be negotiated with the relevant landowners and approved by Eskom. All areas marked as no-go areas, identified by means of the EIA process, located inside the servitude shall be treated with the utmost care and responsibility.

High voltage power lines require a large clearance area for safety precautions. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances. **Table 1** summarises some of the key clearances relevant to the proposed 132 kV power line.

Table 1: Clearance specifications (Eskom, 2007a)

Clearances	Minimum Clearance Distance (m)
Ground clearance	6.7
Building structures not part of power line	3.8
Above roads in townships, proclaimed roads	7.5
Telkom telephone lines	2.0
Spoornet tracks	10.9

On receipt of an Environmental Authorisation by the environmental authorities and after negotiations for a final alignment with landowners, the centre line of the power line and co-ordinates of each bend point must be determined. Optimal pole sizes and positions must be identified and verified with a ground survey (in terms of the Environmental Management Plan (EMP) requirements).

Any tree or shrub in other areas which will interfere with the operation and/or reliability of the power line must be trimmed or completely cleared. The clearing of vegetation must take place, with the aid of a surveyor, along approved profiles and in accordance with this EMP and Eskom's minimum standards for vegetation clearing for the construction of new power lines.

4.1.4 Site Camp(s) and Construction Staff

The Contractor shall be responsible for negotiating the site camps(s) and conditions under which the site may be established with the relevant landowner(s) (if required). Prior to the establishment of the site camp(s), the Contractor shall produce a plan showing the positions of all buildings, vehicle wash areas, fuel and cement storage areas and other infrastructure for approval of the Clerk of Works.

The Contractor will be required to provide a motivational memorandum should more than one site camp be considered necessary for this project.

A signboard should be placed in the area of construction informing the public of the construction activities taking place, and preventing *ad hoc* access of the public on to the construction site with the associated risk to personal safety.

Construction staff must be adequately educated by the ECO as to the provisions included in the EMP and general environmentally friendly practice.

The conduct of on-site workers must be specified to the Contractor by Eskom. Specifications are to include sanitation, water and waste (litter), as well as informal trading and interfering in local community/cultural affairs. The following activities will be disallowed at site camp(s), and by the construction staff in general:

- The irresponsible use of welding equipment, oxy-acetylene torches and other naked flames which could result in veld fires or constitute a hazard;
- Indiscriminate disposal of rubbish or rubble;
- Littering of the site;
- Spillage of potential pollutants, such as petroleum products;
- Collection of firewood;
- Lighting of fires for cooking, heating or other purposes, and failure to exterminate any fires;

- Interference with any wildlife, fauna or flora;
- Poaching of any description;
- Use of any facility other than the chemical toilets provided;
- Burning of wastes and cleared vegetation under any circumstances;
- The use of rivers, streams, dams or any watercourses/surface water for washing purposes;
- Entering areas outside of the demarcated construction area; and
- The presence of construction staff at the construction site outside of the designated construction times (06h00-18h00), i.e. no construction staff are allowed to overnight on site, outside of the demarcated construction camp.

The Contractor shall:

- Ensure that the entire camp site(s) is fenced and that gates are locked after hours and over weekends;
- Ensure that firebreaks are made and maintained along the inside perimeter of the fence (where appropriate);
- Ensure that appropriate sanitation and cooking facilities are provided and maintained at all work sites; and
- Ensure that no open fires are permitted at the camp site(s).

The establishment of fencing and firebreaks must be negotiated with the relevant landowner(s). Furthermore it was the recommendation of the visual specialist to locate construction camps and stock yards in the least visible areas. This ensures use of the natural screening capacity of the site by placing these facilities in the lower lying areas of the site or adjacent to a dense vegetation patch with sufficient height to conceal these project components.

The contractor must be obliged to ensure that workers are educated about HIV/AIDS and that condoms are readily distributed. The local health services are to participate in order to ensure the implementation of education/condom distribution programmes.

4.1.5 Materials Handling, Use and Storage and Transport

Procedures for materials handling must be discussed with and approved by the ELO prior to commencement of this activity.

(a) Hazardous materials

The Contractor shall comply with all relevant national, regional and local legislation with regard to the transport, use and disposal of hazardous materials. If necessary, the Contractor shall obtain the advice of the manufacturer with regard to the safe handling of hazardous materials. Any claims against the Contractor shall be for his account.

The Contractor shall ensure that there is an emergency procedure to deal with accidents and incidents (eg spills) arising from hazardous substances. The Contractor shall immediately report major incidents (spills in excess of 10 litres) to the ECO.

The Contractor shall maintain a register of any spills or incidents involving hazardous materials, as well as measures taken.

The Contractor shall be responsible for training of all personnel on site who will be handling hazardous material about its proper use, handling and disposal.

(b) Use of cement/concrete

The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. Therefore the Contractor shall ensure that:

- Concrete shall not be mixed directly on the ground;
- All wastewater resulting from batching of concrete shall be disposed of via the wastewater management system;
- Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented;
- Mortar boards, mixing trays and impermeable sumps shall be used at all mixing and supply points. Contaminated water shall be disposed at a waste disposal site approved by the ECO;
- Unused cement bags are to be stored, in weatherproof containers, so as not to be effected by wind, rain or runoff events;
- Used bags shall be disposed of on a regular basis via the solid waste management system, and shall not be used for any other purpose;
- Concrete transportation shall not result in spillage; and
- All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete pour section and disposed off. Washing the remains into the ground is not acceptable. All excess aggregate shall also be removed.

(c) Transport of materials outside the site

The Contractor shall comply with all the applicable local, regional and national by-laws with regard to road safety and the transport of materials, especially hazardous and/or toxic materials. Any claims against the Contractor shall be for his account.

4.1.6 Installation and Management of Servitude Gates

In terms of Eskom's servitude agreement, Eskom (and/or its appointed Contractor) has the right to enter and be present on a property at any time (in an appropriately marked vehicle), whether it be to perform work on the property itself or to gain access to adjacent properties. In order to assist with access, Eskom may erect gates as necessary, in consultation with the property owner.

The Contractor shall:

- Provide and install a servitude gate, at Eskom's discretion and in consultation with the landowner, at points where the 132 kV power line crosses a fence in which there is no suitable gate within the extent of the servitude;
- Ensure that all construction vehicles pass through the gates when crossing fence lines;
- Ensure that no fences are dropped (even on a temporary basis) for the purpose of driving over them; and
- Ensure that all gates within the extent of the servitude used are kept closed and locked when not in immediate use.

No construction work shall be allowed to commence on any section of the line unless all gates in that section have been installed to Eskom's complete satisfaction.

4.2 Site Clearance and Management

4.2.1 Site Clearance

Prior to the start of construction, a survey of the final pole positions along the servitude is to be conducted by an appropriately qualified biodiversity specialist familiar with the surrounding area. A protocol is to be developed, where necessary, for the removal and relocation of any affected threatened and protected plants located during this survey (refer to section 4.2.3).

Vegetation should not be cleared to a height less than 100mm, ensuring that the groundcover still remains. No further vegetation may be removed. No bulldozers may be used. Instead, vegetation must be removed by hand. All cleared areas shall be stabilised as soon as possible. The Contractor shall keep the soil in any unstabilised areas wet in order to control wind-blown dust. The area of exposed ground (i.e. naked soil) must be minimised at any point in time to reduce the risk of erosion and dust pollution.

In terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), the disposal of vegetation by burying or burning is prohibited. Therefore, cleared vegetation shall be removed from the site by the Contractor and disposed of at an appropriate licensed waste disposal site. No vegetative matter shall be burnt or removed for firewood under any circumstances by any Eskom employee or contractor.

Topsoil is to be stripped from areas in which construction is to take place. The topsoil must be separated from the subsoil during excavation activities, and stockpiled in a designated stockpile area. The subsoil must be disposed of from site at an approved disposal site, due to its unsuitability for plant growth. The topsoil stockpile will then be used during the rehabilitation phase to provide a suitable medium for the germination of seeds and establishment of stored plants.

4.2.2 Protection of Vegetation and Crops

The Contractor shall ensure that all works are undertaken in a manner which minimises the impact on vegetation and crops outside of the site area as designated in the construction site layout. However, it may be necessary in certain instances to remove or prune vegetation outside of the servitude in order to prevent possible damage to the power line. This must be undertaken in consultation with the Clerk of Works and the landowner.

Close co-ordination with affected landowners will provide information on timed farming-related activities and associated timeframes (planting, harvesting, crop-spraying and breeding seasons). Where possible, construction activities should be responsive to the needs and requirements of the landowners. Landowners/residents are to be notified in advance regarding the construction programme, the type of activities to be undertaken, and any equipment that will traverse the property. Procedures must be implemented in the case of compensation for maintenance, stock and crop losses.

The following provisions shall apply with regards to vegetation on adjacent land:

- Any vegetation (i.e. trees) with a vertical height greater than the horizontal distance from its base to the centreline of the servitude must be removed or sufficiently pruned. This is to ensure that the power line will not be damaged in the event of the vegetation uprooting or falling over;
- No vegetative material adjacent to the site shall be removed or pruned without prior written approval from the relevant landowner and the ECO;
- No vegetative material adjacent to the site shall be burned for any reason; and

- No damage shall be caused to any crops unless the extent of the intended damage is agreed upon by both the landowner and the Clerk of Works (Eskom representative) prior to work commencing.

4.2.3 Threatened and/or Protected Plant Species

A protocol describing the actions to be followed if a threatened species is found should be in place. Prior to vegetation clearance, any threatened and/or protected plant species which have been identified by the vegetation specialist and/or ECO must be removed and transplanted, wherever possible. These plant species should be planted in similar soil conditions and to the same depth as they were before removal. Care should be taken during the removal of plants to ensure that they are not damaged. The plants should be watered directly after transplanting to settle the soil. The Contractor must be assisted by an experienced individual or organisation.

The proposed study area falls within two main vegetation types, namely Carletonville Dolomite Grassland and Soweto Highveld Grassland. There are other vegetation types in the surrounding areas, however these are not affected by the proposed development.

The Carltonville Dolomite Grassland is a species-rich mosaic of plant community types occurring on undulating plains dissected by rocky chert ridges. It is a vegetation type that is characterized by the presence of the species, *Aristida congesta*, *Brachiaria serrata*, *Cynodon dactylon*, *Digitaria tricholaenoides*, *Diheteropogon amplectens*, *Eragrostis chloromelas*, *Eragrostis racemosa*, *Heteropogon contortus*, *Loudetia simplex*, *Schizachyrium sanguineum*, *Setaria sphacelata*, *Themeda triandra*, and a wide variety of herbaceous forbs and other grasses. This vegetation type is considered to be Vulnerable (Driver *et al*., 2005 and Mucina *et al*., 2006), and whilst the conservation target is 24%, only a small extent is currently protected and 23% is considered to be transformed, mostly by cultivation (17%), urbanization (4%), forestry (1%) and mining (1%) (Mucina *et al*. 2006).

The Soweto Highveld Grassland is a short to medium-high, dense, tufted grassland dominated almost entirely by Themeda triandra occurring on moderately undulating landscapes of the Highveld plateau. According to Mucina et al. (2006), this is grassland that is characterized by the dominance of the species, *Themeda triandra*, accompanied by a variety of other grasses, such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. This vegetation type is considered to be Endangered (Driver *et al*., 2005 and Mucina *et al*., 2006). The conservation target is 24%, only a small extent is currently protected. A total 47% is considered to be transformed, mainly by cultivation, urban sprawl, mining and building of road infrastructure (Mucina *et al*. 2006).

The larger area of grassland in the northern half of the study area between Tarlton and Kromdraai, including the area within the Krugersdorp Nature Reserve falls within Carletonville Dolomite Grassland and is classified as Vulnerable and occurring primarily on Chuniespoort dolomite geology. This area has been cultivated to a large degree, however many of the shallower soils were not ploughed thus these, along with some areas of sandier soils constitute the remaining expanse of grassland. There are portions of these grasslands that are in relatively good condition. In the broad study area this is medium height grassland dominated by the grasses and forbs *Schizachyrium sanguineum*, *Themeda triandra*, *Brachiaria serrata*, *Digitaria erianthe*, *Eragrostis racemosa*, *Panicum natalense*, *Sporobolus fimbriatus*, *Eragrostis gummiflua*, *Heteropogon contortus*, *Diheteropogon amplectens*, *Eragrostis curvula*, *Eragrostis chloromelas* and *Cynodon dactylon*.

The remaining patches of grassland are considered to have elevated conservation importance due to poor rates of conservation nationally. Untransformed natural grassland is considered to have a high sensitivity and conservation importance within the study area along the proposed corridor alignments.

Two threatened orchid species (*Habenaria barbertoniae* and *Habenaria mossii*) have a high probability of occurring within the study area, and the threatened species *Melolobium subspicatum* has a medium probability of occurring in the study area.

Two species (*Hypoxis hemerocallidea* and *Eucomis autumnalis* subsp. *clavata*) classified as declining have a medium and high probability of occurring in the study area. These species are not of concern as they are both very widespread and disturbance to a small part of the total population will not in any way impact on the chance of survival of these species in the future.

Two species that are listed as data deficient (DD) (*Cheilanthes deltoidea* subsp *nov.* and *Lotononis adpressa* subsp. *leptantha*) have a medium probability of occurring in the study area. These species are unlikely to be affected by the proposed infrastructure.

In areas where the alignment crosses over areas characterised by sensitive vegetation, the final placement of the pole structures should be surveyed and verified by a vegetation specialist in order to:

- determine the actual occurrence of threatened and or protected plant species; and
- ensure that appropriate mitigation measures are taken, i.e. shifting of proposed pole positions to avoid sensitive vegetation, removal for plants for genetic propagation, relocation of plants (the relocation of sensitive species is not considered a favourable option due to the unknown secondary impacts of the relocated plants on the receiving environment and the low probability of long-term survival of the relocated specimens due to high habitat specificity).

Where indicated, highly sensitive vegetation, habitat or species populations should be adequately protected from damage or loss (e.g. fenced) during construction. Access to these areas should be strictly prohibited. Penalties for removal and/or destruction of threatened species for any reason (firewood, medicinal use, collectors value, etc) should be agreed upon beforehand.

Where it is absolutely essential to cut protected indigenous trees, Provincial Ordinances shall be adhered to. The necessary permits, as well as the landowner's written consent shall be obtained prior to commencement of any work.

In addition to the possible encountering of any protected species, mature indigenous trees should be avoided by the alignment of the 132 kV power line as far as possible. It must be taken into consideration that some of the trees located in the study area may be alien species (refer to 4.2.4). Other indigenous species constituting juvenile trees and bushes and herbaceous species, particularly bulbs, can be rescued in the site clearance, and used in the rehabilitation of the line as described in section 4.13.

4.2.4 Alien Vegetation

Monitoring the potential spread of declared weeds and invasive alien vegetation to neighbouring land and protecting the agricultural resources and soil conservation works are regulated by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and should be addressed on a continual basis.

In view of the fact that the presence of declared weeds is illegal, it is recommended that the landowner/manager comply with the following legally prescribed requirements (refer to Sections 1, 2, 5 and 6 of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), as well as government notice GN R1048):

a) The landowner/manager must take steps to eradicate the declared weeds by using the methods prescribed in the regulations, namely
   - uprooting and burning, or
   - the application of a suitable chemical weed-killer (herbicide), or
   - any other method which will ensure their permanent eradication.

b) One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or to allow their seeds to be spread or blown onto other properties; and
c) If the landowner/manager does not comply with the requirements under a) and b) above, he/she is guilty of a criminal offence.

The Contractor shall remove all alien vegetation within the power line servitude as listed in the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), or as directed by the ECO during the construction period.

The method used for clearing of alien trees should include a full long-term alien eradication programme. The mature trees should be cut down to knee height and herbicide should be applied to all exposed surfaces (a dye should be mixed with the herbicide to assist with identifying trees where it has been applied). All alien plant material should then be removed from site to reduce seeds from spreading. All seedlings and young plants should be removed by hand, ensuring that roots are removed with the plant. Follow-up clearing should be implemented following the initial alien removal (after approximately two months), to eradicate all the seedlings that will germinate following the removal of the mature specimens. Follow-up clearing will be required on an annual basis to prevent the aliens from re-establishing (Bromilow, 2001).

Other alien species present in the area may not be listed as declared weeds according to the legislation; however it is recommended that these species be removed where possible, particularly during the maintenance of the servitude.

4.2.5 Herbicide Use

The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides.

Therefore, the Contractor shall:

- Ensure that a registered pest control operator applies or supervises the application of all herbicides;
- Ensure that all Eskom policies on the use and application of herbicides shall be adhered to;
- Ensure that all herbicides are stored in a well-ventilated demarcated storage area;
- Ensure that a register of all contents of the storage area is kept and updated on a regular basis; and
- Ensure that a daily register of all relevant details of herbicide usage is kept, and that such a register is maintained by the relevant Eskom custodian.

4.2.6 Specific Mitigation Measures Recommended by the Biodiversity Specialist

In addition to the above general mitigation measures relating to floral biodiversity and site clearance, cognisance must also be taken of the following mitigation measures as stipulated by the Biodiversity Specialist (the complete biodiversity specialist study has been included in the Environmental Impact Assessment Report).

Table 2: Mitigation Measures recommended by the Biodiversity Specialist *(in the event that these recommendations are found to conflict with the general mitigation measures discussed in the sections above, the recommendations stipulated in this table must take precedence).*	
General Mitigation Measures (measures that are required/ recommended for the entire line and during the maintenance/ construction process):	
1	During design stage, ensure powerline is routed outside of sensitive habitats or areas where populations of threatened species occur. Assess the footprint of the infrastructure where it occurs in untransformed natural habitat in order to determine whether any populations of sedentary threatened organisms will be affected by the infrastructure. Thereafter, plan to place powerline route and individual pylons and other infrastructure away from these sites. It will be necessary for specialists in different groups of organisms to undertake detailed filed assessments of the untransformed natural habitats where there is a high possibility of Red List organisms occurring. Such assessments include a Red List plant survey.
2	Make use of existing access roads, ensuring proper upgrade/ construction/ maintenance in order to limit erosion, proliferation of weeds, etc.
3	If sensitive habitats cannot be avoided, then during construction, ensure construction impacts are contained as much as possible to as small an area as possible.
4	A stormwater management plan is required to manage potential runoff problems during construction and operation.
5	Following construction, rehabilitation of disturbed areas is required.
6	Avoid of areas with sensitive soils, steep slopes, etc
7	Avoid translocating stockpiles of topsoil from one place to another in order to avoid translocating soil seed banks of alien species.
8	During operation, the clearing of alien plants within the powerline and infrastructure servitude is required to control alien invasions. This is mandatory, according to current legislation.
9	During construction, control potential dust problems at construction sites by regular spraying of water onto the ground.
10	During construction, management of fires emanating from construction camps is required and education of labourers concerning management of fires.
11	During operation, a burning programme should be compiled to reduce fuel loads under powerlines without implementing a fire frequency that is too high for the affected vegetation.

4.3 Faunal Interactions

No red data mammals have been confirmed for the proposed study area. However, Geoffroy's horseshoe bat (*Rhinolophus clivosus*), Peak-saddle Horseshoe bat (*Rhinolophus blasii*), Temminck's hairy bat (*Myotis tricolor*), White-tailed rat (*Mystromys albicaudatus*) and the South African Hedgehog (*Atelerix frontalis*) occurred here historically (museum records). Other vertebrate species with a distribution and habitat preference that co-incides with the proposed study area are the Striped Harlequin Snake and Giant Bullfrog.

On the basis of habitat preference and geographical distribution, the White-tailed rat and South African Hedgehog have a medium chance of occurring at sites along the proposed

corridor alignments, however no signs of any of them were found. The Southern African Hedgehog occurs in a wide variety of terrestrial habitats where there is ample ground cover. It could therefore occur in any untransformed terrestrial habitats in the study area. The White-tailed Rat occurs in Highveld and montane grassland, where it requires sandy soils with good cover. It has been previously recorded in this grid and could therefore occur in grasslands within the study area.

There is one Red List reptile species that could occur in the study area, the Striped Harlequin Snake. This species has a medium chance of occurring in the study area. On the basis of habitat requirements it could occur in old termitaria or under rocks in grassland. It could therefore occur in the grasslands in the study area.

There is one Red List amphibian that could occur in the study area, the Giant bullfrog. This species occurs in seasonal, shallow grassy pans in flat open areas, but also utilizes non-permanent vleis and shallow water on the margins of waterholes and dams. It has not previously been recorded in the proposed study area and, on the basis of habitat requirements, has only a medium chance of occurring in the study area as a whole.

Data reveals that the report rates for most Red Data species are relatively low in the study area. Exceptions to this include the Cape Vulture, Greater Flamingo and White Stork. These are critical species and can be considered “flag ship” species for the impacts of electrocution and collision respectively. It must be noted that many “non Red Data” bird species also occur in the study area and will also be impacted on by the power line.

4.3.1 Bird Anti-Collision Devices

It is recommended that anti-collision devices are provided by Eskom on the power line at identified bird-sensitive areas.

The most sensitive areas from a bird collision perspective is where the 132 kV power line will cross drainage lines and/or skirt dams/wetland areas. Prior to the commencement of construction, the route must be surveyed by an appropriately qualified ornithologist in order to finalise sections of the route requiring the application of bird flappers. Bird perches must also be incorporated into the final design of tower structures and may be necessary along the entire power line route, though are of particular importance adjacent to waterbodies. Landowners should also be contacted in this regard for any further information regarding existing problems between birds and power line infrastructure in the area.

Bird Flappers

Figure 2 illustrates the marking method of bird flappers on overhead earthwires (viewed from above). No flappers should be fitted on the conductors. Flappers should be alternated black and white, as illustrated.

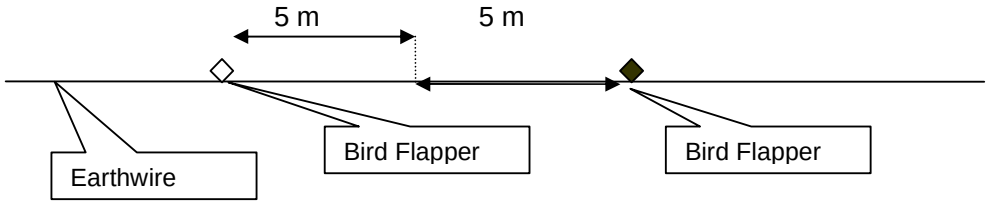


Figure 2 : Fitting method for Bird Flappers, as viewed from above.

4.3.2 Construction Phase Impacts

The contractor shall ensure that the following guidelines are enforced during the construction phase when managing the personnel:

- No killing of any fauna (including snakes) for any purposes
- Should a problem arise when encountering a snake or any other problem animal, a professional should be called in to remove the problem animal.
- No feeding of wildlife.

Construction and maintenance workers should be educated as to the identification of vulnerable species and conservation laws, and killing of any animal, including snakes, should be strictly forbidden.

4.3.3 Specific Mitigation Measures Recommended by the Avifaunal and Biodiversity Specialists

In addition to the above general mitigation measures relating to faunal interactions, cognisance must also be taken of the following mitigation measures as stipulated by the Avifaunal Specialist (the full studies of these specialists have been included in the Environmental Impact Assessment Report).

Table 3: Mitigation Measures recommended by the Avifaunal and Biodiversity Specialists *(in the event that these recommendations are found to conflict with the general mitigation measures discussed in the sections above, the recommendations stipulated in this table must take precedence).*

Avifauna	
General Mitigation Measures (measures that are required/ recommended for the entire line and during the maintenance/ construction process):	
1	The high risk sections of line should be marked with a suitable anti collision marking device on the earth wire as per the Eskom guidelines.
2	Vegetation clearing should be kept to an absolute minimum. The proposed powerline should be aligned alongside existing infrastructure to prevent negative impacts on new areas of habitat.
3	Care should always be taken to prevent disturbance by construction workers.
4	Monitoring of the proposed infrastructure on birds must be ongoing to allow for site specific recommendations.

4.3.4 Management of Complaints

The Contractor shall, as soon as reasonably possible, put within 24 hours of becoming aware of a complaint relating to wildlife interaction, respond to the complaint and register the complaint in the Environmental Register.

4.4 Access and Traffic Management

Prior to the commencement of construction, Eskom shall:

- Negotiate the use of access roads required to gain access to the servitude with the relevant landowners.

4.4.1 Traffic Control Measures

Strict controls should be imposed on construction traffic to ensure minimal disturbance to neighbours and fellow road-users. Access routes should be defined prior to construction, and must be strictly adhered to. The Contractor shall ensure the implementation of the following traffic control measures and shall conform to Eskom's driving standards at all times:

- All drivers shall be in possession of an appropriate valid driver's license;
- All construction vehicles travelling on public roads shall adhere to the specified speed limits;
- Only designated roads and entrances approved by Eskom and agreed to in writing by the landowner shall be used;
- The movement of all vehicles and equipment shall be controlled such that they remain on designated routes;
- No deviation from approved access roads shall be allowed. Any deviation from the approved access roads shall be closed and rehabilitated immediately at the Contractor's cost; and
- No member of the construction workforce shall be permitted to drive a construction vehicle under the influence of alcohol or narcotic substances.

4.4.2 Use of Roads

The Contractor shall:

- Ensure maximum use of both the existing power line servitude and roads to gain access to the site during the construction phase, thereby minimising the need for the construction of new roads;
- Record the condition of all private roads to be used to gain access to the site (e.g. to be photographed), and agree to their condition with Eskom and the landowner prior to use by the Contractor;
- Ensure that all private roads which are used to gain access to the site are maintained at all times;
- Ensure that all temporary access roads no longer required are decommissioned and the area rehabilitated;
- Ensure that, upon completion of construction, all private roads are left in at least the original condition. Any damage that may have occurred during the construction phase must be repaired;
- Rehabilitation and re-vegetation (if necessary), of all access roads created during the construction process that will not be used for future maintenance of the servitude; and
- Ensure ripping of areas on construction sites that were visibly compacted by construction activities in order to allow for the re-establishment of natural vegetation.

Only upon Eskom's written approval shall new access roads be constructed. The Contractor shall:

- Provide justification for the need for the new access road;
- Obtain approval for the alignment/route from Eskom and the affected landowner(s);
- Avoid excessive disturbance to the area, and not traverse sensitive habitats; and
- Adhere to a maintenance plan for the access road, should it be required by Eskom as a service road, during the maintenance phase.

Eskom is required to negotiate with individual landowners regarding maintenance of access roads, as well as with regards to compensation in the event of damage to existing infrastructure (e.g. fences) or stock losses. Access gates are to be kept closed in order to prevent any stock losses or unintended movement of cattle. Specifics regarding access control are to be individually agreed with the affected landowner.

Fences and gates being installed must be of high quality to ensure durability. Eskom must ensure that:

- Access roads for maintenance purposes are kept in good travelling conditions and cleared of any obstructions;
- Fences are regularly inspected for any damages. Should any damages occur, repairs are to be undertaken immediately; and
- Gates to access roads must be closed after entering and exiting properties and locked. When access is not required, gates must be permanently closed and locked.

4.4.3 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to traffic and access management, respond to the complaint and register the complaint in the Environmental Register.

4.5 Construction within the Servitude and Substation Area

The Contractor shall:

- Ensure that all foundation excavations are kept covered or barricaded in a manner acceptable to the Clerk of Works (Eskom's representative) to prevent injury to people, livestock and wildlife;
- Ensure that material removed from the excavation, which is not suitable or not required for backfill is spread evenly over or adjacent to the pole position or within the substation area. Any material not considered by the Clerk of Works to be suitable for backfilling shall be disposed of at an appropriate DWAF licensed waste disposal site. The ECO shall obtain a list of nearby landfill sites and will determine the most appropriate site for disposal;
- Ensure that all excavated soil suitable for backfill is returned to the excavation by backfilling, with the subsoil first and the topsoil last;
- Ensure that the transformer oil catch pit and the transformer oil holding dam at the substation site are appropriately maintained in order to ensure no leakage of oil occurs which could result in soil and/or groundwater pollution; and
- Fence off the substation site at the commencement of the construction phase and ensure that the fence is maintained throughout the construction period until such time as the site is handed over to Eskom, in order to prevent the endangering of the safety of people and animals in the area.

4.5.1 Management of Construction Materials

The Contractor shall:

- Ensure that imported and construction materials are stockpiled only in designated areas, as per the approved construction layout plan;
- Ensure that imported and construction materials are appropriately managed in order to reduce dust generation;
- Ensure that imported materials are free of alien vegetation, weeds, litter and other contaminants; and
- Ensure measures are implemented to prevent spillage of concrete or other substances that could permanently destroy vegetation or the surrounding habitat.

4.5.2 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to construction activities, respond to the complaint and register the complaint in the Environmental Register (refer to Section 4.16).

4.6 Air Quality Management

4.6.1 Fugitive Dust

Fugitive dust can be defined as natural and/or human-associated dust which becomes airborne due to the forces of wind or human activity. The control of fugitive dust is one of the most sensitive issues at construction sites. Potential sources of fugitive dust emissions during the construction phase include:

- Vehicle entrained dust from access roads and the construction site; and
- Wind erosion from open areas and stockpiled imported and construction materials.

It should be taken into consideration that watering of construction roads may result in erosion. Selection of an appropriate dust suppression programme must, therefore, be made taking into consideration the nature of the study area and vehicle movements. It may be appropriate not to implement dust suppression mitigation on construction roads. It should also be noted that any dust disturbance will be limited to daylight hours.

The Contractor shall:

- Ensure the implementation of effective and regular control techniques for fugitive dust sources within the Contractors area of responsibility. As appropriate, mitigation measures will include:
    - water spray of construction roads and work areas where appropriate, and where the risk of erosion is not significant (water for dust suppression shall only be taken from an approved source to be agreed to by the Clerk of Works or the ECO and the landowner);
    - adherence to speed limits for all vehicles;
    - stabilisation of disturbed areas as soon as possible after disturbance, through the introduction of vegetation or the use of stone-covering; and
    - limiting the extent of the area of exposed ground susceptible to dust emissions at any single point in time.

4.6.2 Gases and Smoke

Small quantities of noxious and/or offensive gaseous air pollutants and smoke could be generated during construction. Potential sources include:

- Combustion products from vehicle engines or veld fires; and
- Odours from solid waste and temporary ablution facilities.

Such gaseous air pollutants and smoke can be a nuisance to the construction workforce and to the public.

The Contractor shall, therefore ensure that:

- all vehicles and equipment are kept in a serviceable condition to avoid excessive exhaust fumes;
- there are no open fires under any circumstances; and

- disturbances due to unpleasant odours are prevented through the implementation of Environmental Specifications for Waste Management (refer to Section 4.10).

4.6.3 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to air pollution, respond to the complaint and register the complaint in the Environmental Register.

4.7 Noise Management

The Contractor shall:

- Take all necessary steps to minimise noise generation within the Contractors area of responsibility;
- Limit "noisy activities" (e.g. drilling) to daylight hours;
- Compile a list of all activities, vehicles and equipment likely to generate excessive noise during the construction phase;
- Provide all equipment with standard silencers and maintain silencer units on vehicles and equipment in good working order; and
- If blasting is required, times should be negotiated with nearby landowners such that they can take appropriate steps to safeguard domestic animals and livestock. All surrounding structures should be checked for stability prior to blasting.

Any drilling and other construction activities should be limited to daylight hours. No construction activities are to be undertaken during weekends, especially when in close proximity to communities. All machinery must be maintained in good working order, in compliance with generally accepted noise levels. Any high impact activity would require prior warning to adjacent landowners.

4.7.1 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to noise management, respond to the complaint and register the complaint in the Environmental Register.

4.8 Water Management

4.8.1 Water for Domestic Use

The Contractor shall implement measures to ensure that the construction workforce present on the site has access to sufficient potable water. Measures must include, *inter alia*:

- The provision of potable water at various points on the site; and
- Provision of facilities for hand washing at all ablution facilities and near all toilets.

4.8.2 Water Consumption

The Contractor shall implement the following measures to minimise water consumption:

- Create awareness and encourage the construction workforce to use water sparingly such that there is no wastage of water;
- Ensure that no natural water sources (i.e. streams, rivers, boreholes) are used for construction activities or for domestic purposes by the construction workforce;
- Negotiate the use of water for any purpose with the landowner and the appropriate authorities; and
- Obtain written approval from Eskom for the use of such water.

4.8.3 Water Pollution Management

The Contractor shall implement the following water pollution prevention measures:

- Ensure that working areas where hazardous substances (such as cement and vehicle fuels) are handled or stored are designed to collect and contain these hazardous substances;
- Ensure that no pollution enters surface water or has the potential to pollute groundwater by ensuring that there is containment of spillages (e.g. diesel, oils, etc) and that there is an emergency plan in place to deal with accidental spillage;
- Ensure that washing of containers, equipment, vehicles and other surfaces only occurs at designated washing areas;
- Ensure that sufficient ablution facilities are provided (at least one toilet for every 25 members of the construction workforce). Adequate numbers and placement of portable chemical toilet facilities at construction sites is crucial to prevent unnecessary pollution of the surrounding environment;
- Place temporary ablutions at strategic points on the site to ensure that they are accessible to all members of the construction workforce. These locations are to be approved by the Clerk of Works prior to establishment; and
- Ensure that no spillage occurs when the temporary ablution facilities are cleaned or emptied, and that the wastewater is removed from the site.

4.8.4 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to water management, respond to the complaint and register the complaint in the Environmental Register.

4.9 Mitigation and Management of Heritage Sites and Objects

4.9.1 General Mitigation and Management Measures for Heritage Features

Although a large number of heritage resources are known to exist in the region, based on current knowledge, few would be impacted on by the proposed development. The only area of concern is in the northern section, in the vicinity of the new Kromdraai Substation and the corridor leading from that station. In this region, a number of early hominid and palaeontological sites are located. However, these sites are well documented and it would be easy to avoid them. See Figure 3 below.

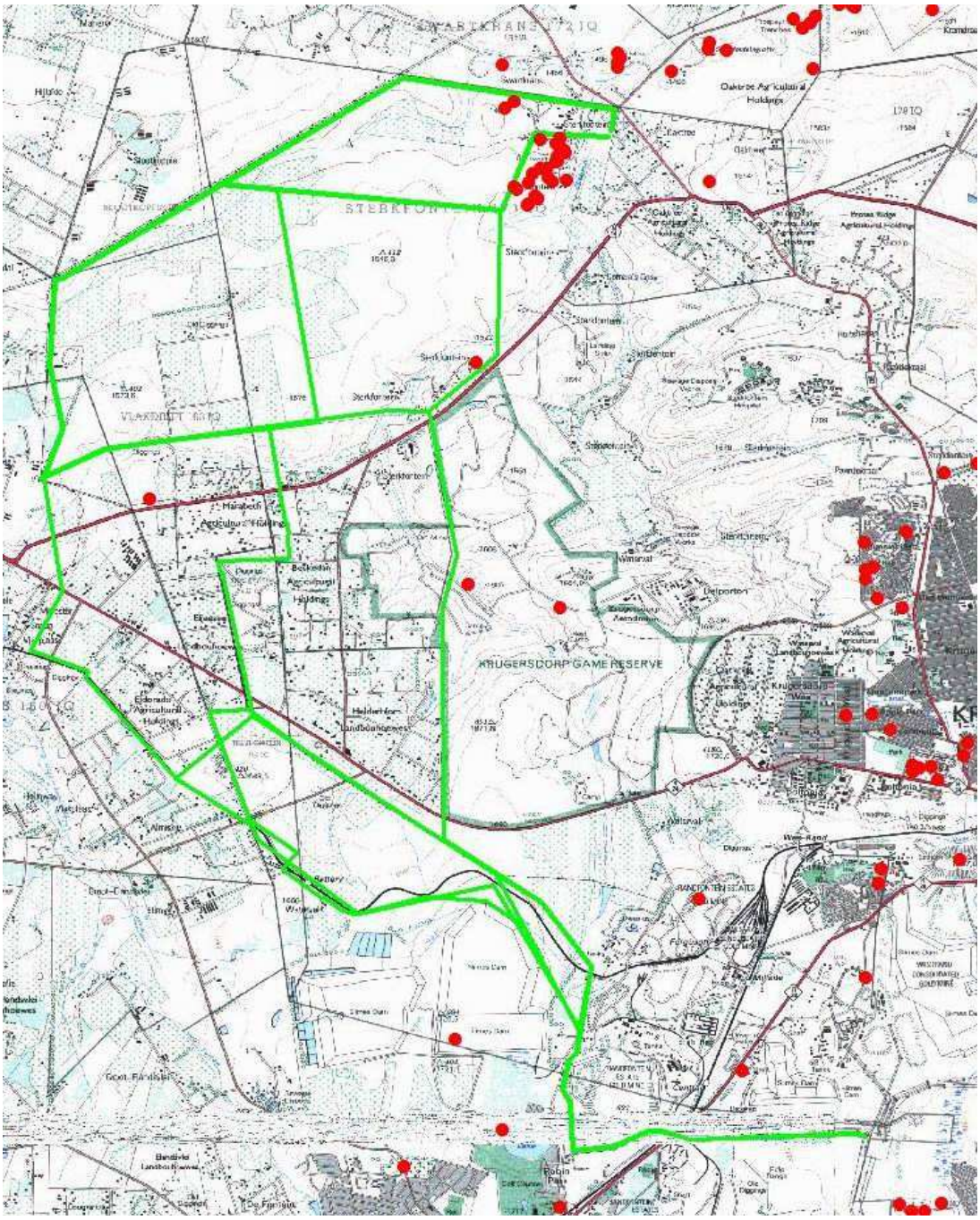


Figure 3: Map showing the location of known sites of cultural significance (red dots) in relation to the various alternative corridors

Should any heritage sites or artefact be uncovered during the construction process, the following applies:

- All archaeological sites older than 100 years are protected by the National Heritage Resources Act,1999 (Act No. 25 of 1999) and no site may be removed, disturbed or demolished without a permit issued by the South African Heritage Resources Agency (SAHRA). In certain cases, permission from the local communities, i.e. sensitive remains (for example human remains) must be negotiated.

Subsequent to examining the heritage components of the Environmental Impact Assessment Report, the ECO should inform construction managers prior to construction what heritage sites and cultural material may be encountered in the area and the procedures to follow should sites be uncovered. Managers must inform the workers not to disturb (dig) sites, make any collections of material, i.e., medallions, cartridges or other artefacts, and not to disturb (dig, camp or make fires) stone wall structures or any other structure associated with a heritage site. If heritage sites and/or cultural material are found, work should be stopped and SAHRA should be informed immediately such that an archaeologist can investigate the site and determine its significance. Enough time should be allowed to excavate, remove or collect material if it should be necessary.

The Contractor shall:

- Familiarise himself/herself with those structures that are classified as heritage sites within his area of responsibility;
- Prevent any heritage site from being unnecessarily damaged;
- Advise the construction workforce of the penalties associated with the unlawful removal of heritage objects, as set out in the relevant legislation;
- Be responsible for payment of penalties (as per the relevant legislation) resulting from deliberate or negligent damage to a heritage object;
- Immediately stop work in the vicinity of any potential heritage objects or sites being unearthed during construction;
- Notify the ECO of the unearthed objects; and
- Obtain the necessary permits for the disturbance, removal or destruction of any heritage objects or sites. The ECO shall notify the South African Heritage Resources Agency (SAHRA) to arrange for the object to be evaluated by a qualified specialist. Depending on the authenticity and significance of the object, the specialist shall prescribe measures necessary to document the find and remove the object from the site (with the necessary permit from SAHRA) prior to construction activities being able to continue.

Should any archaeological sites of significance be located within the defined corridor alignment during construction activities, all possibilities need to be investigated to avoid the site. The contractor must also ensure that employees are aware of the various locations of archaeological sites in or close to the construction sites, and to mark these areas and to ensure that the construction workers do not traverse or disturb the site/area.

4.9.2 Specific Mitigation Measures Recommended by the Heritage Specialist

In addition to the general mitigation measures relating to heritage features (discussed in section 4.9.1 above), cognisance must also be taken of the following mitigation measures as stipulated by Heritage Specialist (the complete heritage impact study has been included in the Environmental Impact Assessment Report).

Table 4: Mitigation Measures recommended by the Heritage Specialist *(in the event that these recommendations are found to conflict with the general mitigation measures discussed in the sections above, the recommendations stipulated in this table must take precedence).*	
1	An archaeologist must inspect each site selected for the erection of a pole structure, construction roads and construction campsites. If a particular pole structure impacts on a heritage site but cannot be shifted, the controlled excavation of the site prior to development, can be implemented. This can only be done by a qualified archaeologist after obtaining a valid permit from SAHRA.
2	Riverbanks, rims of pans and smaller watercourses should be avoided as far as possible.
3	Saddle or neck between mountains, hills and/or outcrops) should also be avoided.

4	Avoid all patches of bare of vegetation unless previously inspected by an archaeologist.
5	Rock outcrops might contain rock shelters, engravings or stone walled settlements, and should therefore be avoided unless previously inspected by an archaeologist.
6	Communities living close to the proposed corridors should be consulted as to the existence of sites of cultural significance.
7	All graves or cemeteries should be avoided, unless when totally impossible.
8	Archaeological material, by its very nature, occurs below ground. It should therefore be kept in mind that archaeological sites might be exposed during construction.

4.10 General and Hazardous Waste Management

Waste generated by the Contractor shall be the responsibility of the Contractor, and shall be disposed of by the Contractor off-site at an appropriate licensed waste disposal facility.

4.10.1 Waste Management Procedures

The Contractor shall ensure the implementation of the following waste management procedures:

- Maintain good housekeeping practices to ensure that there is proper collection and no accumulation of waste within the site area;
- Ensure that staff are educated as to the different types of waste generated during construction, and that the waste is correctly disposed of.
- Provide appropriate containers (with lids/nets where waste could become airborne) within designated areas for construction rubble, general waste and hazardous waste on site;
- Ensure that the containers designated for the disposal of waste are appropriately and clearly marked according to the intended waste stream. Use should be made of appropriate pictures and colours to ensure that the containers are easily identifiable by all members of the construction workforce;
- Arrange for the removal of full waste containers as soon as possible by an appropriate waste contractor to be disposed of at an appropriately licensed disposal site. The Contractor shall supply the ECO with a certificate of disposal;
- Ensure that all waste is removed off site to an approved waste disposal site;
- Ensure no waste is burned, buried or used for rehabilitation purposes;
- Prevent temporary dumping of waste anywhere on site;
- Hazardous waste shall not be stored or stockpiled in any area other than that designated on the construction site layout. The location of this area shall be agreed with the Clerk of Works;
- Ensure that Hazardous Waste Disposal Manifests are obtained from the administrators of hazardous waste disposal sites. Hazardous waste should be disposed of at the nearest appropriate licensed Hazardous Waste Disposal Site;
- Ensure that no hazardous waste is disposed of in containers intended for general waste;
- Documentation regarding waste collection and disposal/recycling shall be collated and made available to the Project Co-ordinator, his delegate, or the ECO, on request; and
- Littering, specifically of the natural areas, should be prevented. Adequate containers for litter removal should be supplied on site. These containers should be emptied on a

regular basis and the contents removed to an appropriate and licensed waste disposal site. Illegal dumping shall not be tolerated.

4.10.2 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to waste management, respond to the complaint and register the complaint in the Environmental Register.

4.11 Management of Hazardous Substances

The Contractor shall ensure the implementation of the following procedures for the management of hazardous substances:

- Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils, lubricants and grease;
- Ensure that all hazardous substances are handled in accordance with the manufacturer's specifications, legal requirements and Eskom's procedures;
- Store all hazardous substances (including oils, fuels, chemicals, etc.) in a manner prescribed in the relevant Acts and Regulations, namely the Environment Conservation Act, 1989 (Act No. 73 of 1989), the Hazardous Substances Act, 1973 (Act 15 of 1973) and the National Water Act, 1956 (Act No. 54 of 1956);
- Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances (e.g. fuel or lubricating oil);
- Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances.
- Arrange and supervise the implementation of clean-up operations and appropriate disposal of contaminated materials at a licensed hazardous waste disposal site;
- Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean up of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences; and
- Report the nature and extent of the spill to the Environmental Control Officer, the Risk Manager and the Technical Service Officer at the nearest Eskom Depot as soon as reasonably possible, but within 24 hours.

The Environmental Control Officer shall prescribe measures to be implemented in order to prevent spills of potentially hazardous substances.

4.11.1 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to the management of hazardous substances, respond to the complaint and register the complaint in the Environmental Register.

4.12 Safety and Security

4.12.1 General Procedures

The Contractor shall ensure the implementation of the following safety and security measures:

- Clearly mark dangerous areas and restrict access to these areas;
- Ensure compliance with the Occupational Health and Safety Act,1993 (Act No. 85 of 1993);
- Ensure that no person under the influence of alcohol or narcotic substances is allowed to work on the site;
- Ensure adequate signage is provided along affected main roads, at the two ends where construction is occurring at the present time, and at the entrance to the construction of the substation;
- Ensure that employees are aware of the telephone numbers of emergency services, where these are readily available, and the procedure to be followed in the event of an emergency. The ECO should source these contact details prior to construction;
- In terms of construction worker safety, safety management plans must be implemented;
- In terms of community safety, community safety concerns are to be addressed by the Contractor (as this was raised as an issue in the public participation process). Workers employed and vehicles used should be readily identifiable as Eskom construction staff. Workers may be obligated to wear identity cards or corporate clothing to assist the community in identifying them as construction workers; and
- All construction areas to be fenced off before any construction activities take place, access control to construction sites to be in place, and signage to be displayed indicating dangerous areas, etc. All construction materials and equipment to be safely stored. Construction materials to be guarded during operation. Road network to and from construction sites to be clearly marked. Construction company to have security on site at all times.

4.12.2 Fire Management

The Contractor shall:

- Take reasonable and active steps to avoid increasing the risk of fire through activities on site. Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property;
- Ensure that no fires are lit on site under any circumstances. The use of open fires for cooking of food, etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided;
- Report any fires which occur to the ECO as soon as possible.
- Ensure that there is basic fire-fighting equipment available on site at all times;
- Educate specific members of the construction force regarding the location and use of fire-fighting equipment;
- Restrict smoking activities to demarcated smoking areas;
- Ensure that an emergency preparedness plan is 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; and
- The use of branches of trees and shrubs for fire-making purposes must be strictly prohibited.

4.12.3 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to safety and security, respond to the complaint and register the complaint in the Environmental Register.

4.13 Community Considerations

The contractor/s appointed for the construction phase should use local facilities for services and Eskom should ensure that this is taken on board during the tendering stage.

Where possible contractors should attempt to hire from local communities (Randfontein and Mogale City). However, due to the low skills levels in the area, it is recognised that the majority of skilled posts are likely to be taken by people from outside the area. An employment office should be set up prior to the commencement of the construction phase in order to identify locals who can be employed on the project.

The contractor should ensure that all staff are informed of the consequences of stock theft and trespassing on adjacent farms at the outset of the construction phase.

The local authorities, community organizations and leaders should be informed of the project and the potential job opportunities for locals. The employment selection process should seek to promote gender equality.

The contractor should make themselves aware of the availability of local firms that qualify as potential service providers (construction companies, catering companies, waste collection companies etc). These companies should be notified of tenders and invited to bid for project related work.

The compromise of the 'sense-of-place' / ambience of an area is a concern. I-Scape undertook the visual study. The study aimed to assess the value of the visual resource based on its ecological, cultural and historic importance, scenic quality and sense of place. The most significant impact identified is the change in the existing qualities of the visual resource due to the construction and operation of the proposed 132kV Powerline and substation at Kromdraai. The following mitigative measures were identified by the visual specialist.

Table 5: Mitigation Measures recommended by the Visual Specialist *(in the event that these recommendations are found to conflict with the general mitigation measures discussed in the sections above, the recommendations stipulated in this table must take precedence).*	
1	Usually the eye will move up in valleys and down ridges of a mountainous scene. These are the obvious locations where power lines and substations should be restricted in order to maintain visual coherence of the horizon line.
2	Each study area has a natural screening capacity, either through topographical variation or vegetative screening, or a combination of both. The study area provides the opportunity to locate certain sections of the power line through the exotic woodlands which will in effect completely or partially conceal the power line from outside vantage points.
3	Relocation of the substation to a less exposed site is preferred otherwise the screening capacity of the site can be enhanced through additional screen planting.

4	It is highly recommended that the existing power line network be upgraded. Where an existing power line can be dismantled and substituted by a single larger capacity power line, the option must be considered as this will have the least visual change.
5	Locate construction camps and stock yards in the least visible areas. Make use of the natural screening capacity of the site by placing these facilities in the lower lying areas of the site or adjacent to a dense vegetation patch with sufficient height to conceal these project components.
6	Keep the construction camp neat and tidy at all times.
7	Establish limits of disturbances during construction through demarcating construction areas to the minimum area required for construction.
8	Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line corridor.
9	Retain as much of the existing vegetation as possible, specifically existing mature trees that contributes to the natural screening capacity of the site.
10	Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces.
11	Minimise unsightly cut- and fill areas by stepping in the substation building platform and thereby lowering the structure by as much as possible.
12	Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits.
13	Establish tree lanes in strategic places namely on the property boundary of all the substations, adjacent properties or in passing road reserves.
14	Avoid construction during weekends and holidays near residential areas and tourist attractions such as guest houses, nature or conservation areas.
15	Signage should be simple and unobtrusive and not be placed against the skyline.
16	A definite effort should be made to reduce the height and scale of the structures, if at all possible.
17	Maintenance of the servitude in terms of clearing up littering and dumped refuse is highly recommended.
18	All lighting, especially perimeter security lighting at the Kromdraai Substation must be shielded to minimise light spillage and pollution.
19	Previously rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may become an unsightly feature.
20	Screen planting that was specifically established to minimise the intrusiveness of the power line or substation must be maintained and dead or sick plants replaced for a determinate period after construction.

4.13.1 Management of Complaints

The Contractor shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to the community, respond to the complaint and register the complaint in the Environmental Register.

4.14 Site Rehabilitation

The Contractor shall:

- Ensure that all disturbed areas are stabilised as soon as possible after disturbance. Particular attention must be paid to slopes greater than 20° (1:5) and other areas prone to erosion which should be appropriately vegetated. Rehabilitated areas that are susceptible to erosion due to their position in the landscape should be adequately protected by soil conservation measures;
- Ensure that rehabilitation is undertaken as soon as possible after completion of construction activities in any one area of the site;
- Ensure that all construction access roads are closed and the area rehabilitated upon completion of the construction works, unless otherwise specified by the Clerk of Works and agreed with the landowner;
- Remove from the site all construction equipment, surplus material, waste and temporary structures and works of every kind before the final hand-over. After completion of construction, the site should be properly cleaned of any construction waste, litter etc. and adequately rehabilitated/re-vegetated;
- Rehabilitate any environmental damage caused by construction activities before the final hand-over;
- Removal of all excavated material (rocks, excess soil, etc.) and construction rubble after construction is completed;
- Re-vegetated areas should be monitored by the Environmental Control Officer every 3 months for the first 12 months and once a year thereafter until the vegetation is stabilised;
- Rehabilitated areas showing inadequate surface coverage (less than 30% within 9 months after rehabilitation) should be prepared and re-vegetated from scratch with a suitable grass mix that is compatible with the surrounding vegetation;
- Exotic weeds and invaders that are likely to establish on the rehabilitated areas are to be controlled to allow grasses to properly establish;
- Damage to rehabilitated areas should be repaired promptly; and
- The erosion risk will be reduced significantly during the dry season (i.e. winter). Therefore, depending on the construction schedule, excavation activities should aim to be focussed during winter.

The rehabilitation schedule and procedure to be adhered to is as follows:

Table 6: The standard methodology to be employed in the rehabilitation of construction areas

Step	4.14.1 Method	4.14.2 Equipment
1	Remove all construction material from the area where construction has been completed	To be undertaken by hand
2	The ground should be sloped so as to attain a natural slope and to attain a natural water flow, if it has been altered during construction (the natural slope should be altered as little as possible during construction).	To be undertaken by hand
3	Topsoil that has been stockpiled during construction must be applied to the area to undergo rehabilitation. The depth of the topsoil layer to be applied depends on the natural depth of topsoil in the area, and the amount of topsoil that may have been lost during construction.	Topsoil must be applied from the topsoil stockpiled during construction
4	The area should be mulched to improve water retention, and brushwood applied to act as a soil stabiliser. Mulch and brushwood must be applied more heavily in areas which are presently well-wooded.	The mulch used should be woodchip, obtained commercially or from trees removed during site clearance. The brushwood is obtained from the bushes and trees removed during site clearance.
5	The naked ground will be seeded with a stabilising grass mix, suited to the conditions. The quantity of seed used will depend on the slope, with a steeper slope requiring a heavier application of seed. For slopes: • >15º: 25-50 kg/ha • <15º: 15-25 kg/ha The natural seedbank in the topsoil will supplement the seed mix applied.	The seed mix should consist of the following species (in decreasing order of proportion constituting the seed mix): • *Eragrostis curvula* • *Digitaria eriantha* • *Cynodon dactylon* (forms a mat/ lawn to rapidly cover the area between the other tuft-forming grasses) • *Chloris gayana* • *Eragrostis tef* (annual, therefore will die after a year and therefore can't constitute the majority of the seed mix)
6	The areas which have been seeded must be regularly watered directly after seeding until the grass cover becomes established. Watering should ensure that no erosion of the topsoil and seed mix takes place.	A hosepipe must be available on site.
7	If the grasses have not established after a period of two months after seeding, the areas should be reseeded. If necessary, another dressing of topsoil should be applied prior to seeding.	As above

8	Slope stabilisation measures may be necessary in places where grass has not been able to establish and there is an erosion risk. The measures implemented depend on the situation, and can be varied as necessary.	Various slope stabilisation measures are available and vary in effectiveness according to the situation including • Onion bags • Logs/bark held in place with pegs Rows of *Cynodon dactylon*/ *Hyparrhenia hirta* held in place with pegs.

4.15 Monitoring

A monitoring programme shall be in place not only to ensure conformance with the EMP through the contract/work instruction specifications, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are, or could result in significant environmental impacts for which corrective action is required. As part of the contract or work instruction, Eskom shall stipulate the period and frequency of monitoring required. The Project Co-ordinator shall ensure that the monitoring is carried out.

An environmental control officer (ECO) must be appointed to ensure compliance with the EMP, and to carry out monitoring activities. The ECO will report to the Clerk of Works should any non-compliance be evident or corrective action necessary. Only in severe cases of non-compliance, or repeated offences, will the ECO be required to report to the Project Co-ordinator.

4.16 Compliance with Environmental Management Plan Specifications

- The EMP shall be available on-site at all times;
- All persons employed by the Contractor or his sub-contractors shall abide by the requirements of the EMP;
- Any members of the construction workforce found to be in breach of any of the specifications contained within the EMP may be ordered by the Project Co-ordinator or Clerk of Works to leave the site. The order may be given orally or in writing. Confirmation of an oral order will be provided as soon as practically possible, but the absence of a written order shall not be cause for an offender to remain on site. No extension of time will be granted for any delay or disadvantage to the Contractor brought about by an offender ordered to leave the site;
- The Contractor shall not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP;
- Should the Contractor be in breach of any of the specifications contained in the EMP, the Project Co-ordinator shall, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work shall be suspended should non-compliance continue;
- Should non-compliance continue, further written notification shall be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work shall be suspended as specified previously; and
- The Contractor shall be responsible and shall bear the cost of any delays, corrective or remedial actions required as a result of non-compliance with the specifications and clauses of the EMP.

4.17 Environmental Register

The Contractor shall:

- Report incidents involving Contractor employees and/or the public that could potentially cause negative sentiment and perception towards the project and/or Eskom;
- Report environmental complaints and correspondence received from the public to the Project Co-ordinator or the ECO;
- Record and report incidents that cause harm or may cause harm to the environment to the ECO;
- Record all hazardous materials used on site; and
- Maintain a record of all Hazardous Waste Disposal Manifests detailing the nature of the hazardous waste disposed of, the hazardous waste classification and the location of the site to which such waste was sent.

The above records will form an integral part of the Contractors' Records. These records will be kept with the EMP, and will be made available for scrutiny if so requested by the Project Co-ordinator or his delegate and the ECO.

The ECO shall put in place an Environmental Register to document:

- All environmental complaints and correspondence received from the public, Eskom or the construction workforce;
- Incidents of non-compliance with the EMP; and
- Any other environmental incidents related to the construction phase of the project.

The ECO shall ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident;
- Causes of complaint/incident;
- Party/parties responsible for causing complaint/incident;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents.

5 OPERATION AND MAINTENANCE PHASE

5.1 Maintenance of the Servitude and Substation Areas

5.1.1 Bush Clearance Requirements

Eskom is required to conduct maintenance along the servitude in order to ensure the continued reliable operation of the power supply. An important component is bush clearing to ensure that vegetation does not interfere with the operation of the line. In terms of the bush clearing to be undertaken, Eskom shall:

- Ensure that all alien and invasive vegetation, as well as any trees which could grow and interfere with the power line along the centre line of the servitude are cleared on a regular basis;
- Ensure that all alien vegetation within the servitude and substation areas is cleared and treated with the appropriate herbicide (see 5.1.3 below);
- Ensure all unwanted vegetation (i.e. all alien and invasive vegetation, as well as other vegetation which could interfere with the operation of the substation) within the substation area is cleared on a regular basis; and
- Ensure that all vegetation that is removed is not left *in situ*, but is removed from site to an appropriate disposal site.

Landowners and the relevant authorities must be informed of maintenance activities in advance. Eskom's servitude must be properly maintained, although agricultural activities can still take place under the power line.

5.1.2 Protected Plant Species

Where it is absolutely essential to cut protected indigenous trees, Provincial Ordinances shall be adhered to. The necessary permits, as well as the landowner's written consent shall be obtained prior to commencement of any work.

5.1.3 Herbicide Use

The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act,1947 (Act No. 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides.

Therefore, Eskom shall:

- Ensure that a registered pest control operator applies or supervises the application of all herbicides;
- Ensure that all herbicides are stored in a well-ventilated demarcated storage area;
- Ensure that a register of all contents of the storage area is kept and updated on a regular basis; and
- Ensure that a daily register of all relevant details of herbicide usage is kept, and that such a register is maintained by the relevant Eskom custodian.

5.1.4 Conduct of Employees

The following restrictions or constraints shall be placed on the maintenance staff in general:

- No indiscriminate disposal of rubbish or rubble;
- No littering of the servitude and substation areas and the surrounding areas;

- No collection of firewood;
- No interference with any wildlife, fauna or flora;
- No poaching of any description; and
- No use of facilities other than the chemical toilets provided.

5.1.5 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to the maintenance of the power line servitude and/or substation areas, respond to the complaint and register the complaint in the Environmental Register.

5.2 Access and Traffic Management

5.2.1 Access Control

Eskom shall:

- Ensure that all maintenance staff are readily recognisable as Eskom employees, and that use is made of appropriately marked vehicles when on or moving between properties;
- Adhere to any specifications of landowners with regard to access or use of roads; and
- Ensure that appropriate signage is displayed indicating the danger of electricity and electrical infrastructure. Eskom are to educate communities (minors and adults) regarding this danger.

5.2.2 Management of Servitude Gates

Eskom shall:

- Ensure that all maintenance vehicles pass through gates when crossing fences;
- Ensure that no fences are dropped (even temporarily) for the purposes of driving over them; and
- Ensure that all gates within the extent of the servitude used for access to the site are kept closed and locked when not in immediate use by Eskom or its contractors.

5.2.3 Traffic Control Measures

Eskom shall ensure the implementation of the following traffic control measures:

- All drivers shall be in possession of an appropriate valid driver's license;
- All maintenance vehicles travelling on public roads shall adhere to the specified speed limits;
- Only designated roads and entrances agreed to in writing by the landowner shall be used;
- Moderate speeds (to be agreed to by Eskom) shall be employed and adhered to on all access/service roads;
- The movement of all vehicles shall be controlled such that they remain on designated routes;
- No member of the workforce shall be permitted to drive a vehicle under the influence of alcohol or narcotic substances;
- No deviation from approved access roads shall be allowed; and
- Travel in wet weather conditions shall be limited as far as possible in order to minimise the potential for erosion along access/service roads.

Should any damage occur to the road surface during maintenance activities as a result of non-compliance with the above traffic control measures, the nature and extent of damage should be recorded within Eskom's environmental register and then repaired to the written satisfaction of the landowner. It is Eskom's responsibility to prove that maintenance activities within the servitude have not resulted in any erosion or damage of the access roads.

5.2.4 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to access and traffic management, respond to the complaint and register the complaint in the Environmental Register.

5.3 Faunal Interactions

- The maintenance staff may not harm or kill any fauna during the activities of maintaining the servitude;
- Should there be an interaction with wildlife (e.g. avifauna), it must be reported to the ECO, and the Technical Service Officer at the nearest Eskom Depot as soon as reasonably possible, but within 24 hours;
- Wildlife interaction shall be investigated by the ECO;
- The ECO shall write a report regarding the incident, and make recommendations; and
- A follow up site inspection shall be conducted by the ECO in order to assess the effectiveness of the recommendations.

Additional Specific Mitigation Measure recommended by the Avifaunal Specialist:

- Monitoring of the proposed infrastructure on birds must be ongoing to allow for site specific recommendations.

5.3.1 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to wildlife interaction, respond to the complaint and register the complaint in the Environmental Register.

5.4 Air Quality Management

5.4.1 Fugitive Dust

The major potential source of fugitive dust emissions during the operation and maintenance phase include vehicle entrained dust from access/service roads.

Eskom shall ensure the implementation of effective and regular control techniques for fugitive dust sources. As with the construction phase, it should be taken into consideration that watering certain areas in order to suppress fugitive dust may result in erosion. It may be appropriate not implement dust suppression mitigation in such areas. Appropriate, mitigation measures will include:

- use of wet suppression (where appropriate) at maintenance work areas where surfaces are destabilised for maintenance purposes; and
- adherence to speed limits for all vehicles using the access/service roads.

5.4.2 Gases and Smoke

Small quantities of noxious and/or offensive gaseous air pollutants and smoke could be generated during operation as a result of combustion products from vehicle engines. In order to avoid the emission of gaseous air pollutants, Eskom shall ensure that all vehicles are kept in a serviceable condition to avoid excessive exhaust fumes.

5.4.3 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to air pollution, respond to the complaint and register the complaint in the Environmental Register.

5.5 Noise Management

In order to limit noise generation during maintenance activities, Eskom shall provide all equipment with standard silencers and maintain silencer units on vehicles and equipment in good working order.

In addition, all noise from activities at the substation during the operation and maintenance of the substation shall be within acceptable limits (according to the Environment Conservation Act and the National Environmental Management Act), taking into consideration that maintenance activities may be required at the substation site outside of working hours.

5.5.1 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to noise management, respond to the complaint and register the complaint in the Environmental Register.

5.6 Waste Management

Eskom shall ensure the following waste management practices are implemented during operation and maintenance:

- The transformer oil catch pit and the transformer oil holding dam at the substation site are emptied on a regular basis, and the oil appropriately disposed of at an appropriate DWAF licensed waste disposal site or sold to a recycling merchant for recycling; and
- All structures and/or components replaced during maintenance activities are appropriately disposed of at an appropriate DWAF licensed waste disposal site or sold to a recycling merchant for recycling.

5.6.1 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to waste management, respond to the complaint and register the complaint in the Environmental Register.

5.7 Management of Hazardous Substances

Eskom shall ensure the implementation of the following procedures for the management of hazardous substances:

- Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils, lubricants and grease;
- Ensure that all hazardous substances are handled in accordance with the manufacturer's specifications, legal requirements and Eskom's procedures;
- Store all hazardous substances in a manner prescribed in the relevant Acts and Regulations (e.g. in a well-ventilated area);
- Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances (e.g. fuel or lubricating oil);
- Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances;
- Arrange and supervise the implementation of clean up operations and proper disposal of contaminated materials at a licensed hazardous waste disposal site;
- Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction and the cleanup of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences; and
- Report the nature and extent of the spill to the ECO, the Risk Manager and the Technical Service Officer at the nearest Eskom Depot as soon as reasonably possible, but within 24 hours.

The ECO shall prescribe measures to be implemented in order to prevent spills of potentially hazardous substances.

5.7.1 Management of Complaints

Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to the management of hazardous substances, respond to the complaint and register the complaint in the Environmental Register.

5.8 Compliance with the Environmental Management Plan Specifications

- All persons employed by Eskom or its Contractors shall abide by the requirements of the EMP;
- Any members of the operation and maintenance workforce found to be in breach of any of the specifications contained within the EMP may be ordered by the Project Co-ordinator or ECO to leave the site. The order may be given orally, or in writing. Confirmation of an oral order will be provided as soon as practically possible, but the absence of a written order shall not be cause for an offender to remain on site; and
- Eskom shall not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP.

5.9 Environmental Register

The Clerk of Works shall:

- Report incidents involving employees and/or the public that could potentially cause negative sentiment and perception towards the project and/or Eskom;
- Report environmental complaints and correspondence received from the public to the Project Co-ordinator or the ECO; and
- Record and report incidents that cause harm or may cause harm to the environmental to the ECO.

The above records will form an integral part of the Contractors' EMP. This EMP will be made available for scrutiny if so requested by the Project Co-ordinator or his delegate and the ECO.

The ECO shall put in place an Environmental Register to document:

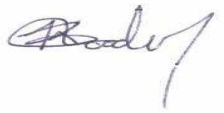
- All environmental complaints and correspondence received from the public, Eskom or the construction workforce;
- Incidents of non-compliance with the EMP (refer to Section 5.8); and
- Any other environmental incidents related to the construction phase of the project.

The ECO shall ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident;
- Causes of complaint/incident;
- Party/parties responsible for causing complaint/incident;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents.

DOCUMENT CONTROL SHEET
(FORM IP180/B)

CLIENT	:	Eskom Holdings Limited – Distribution (Central Region)		
PROJECT NAME	:	Westgate Tarlton Kromdraai 132kV Powerline and Substation EIA	**PROJECT No.** :	J26219
TITLE OF DOCUMENT	:	Draft Environmental Management Plan		
ELECTRONIC LOCATION	:	**P:\J26219 Eskom Tarlton Kromdraai Powerline EIA\3.1 EIA Phase\Draft EIA Report**		

	Approved By	Reviewed By	Prepared By
ORIGINAL	NAME **Reuben Heydenrych**	NAME **Reuben Heydenrych**	NAME **Kasantha Moodley**
DATE **9 July 2009**	SIGNATURE 	SIGNATURE 	SIGNATURE 

	Prepared by	Prepared By	Prepared By
ORIGINAL	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

	Approved By	Reviewed By	Prepared By
REVISION	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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