

GROUP CAPITAL



**ENVIRONMENTAL MANAGEMENT
PROGRAMME FOR THE CONSTRUCTION
WORKS AT HELIOS SUBSTATION TO
ACCOMMODATE THE INTEGRATION OF THE
LOERIESFONTEIN ORANGE IPP**

NOVEMBER 2016

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CONTENTS

1. SCOPE

2. INTRODUCTION

3. DESCRIPTION OF PROJECT

- 3 1 SUBTATION
- 3 2 PROJECT EXECUTION AREA
- 3 3 SITE ESTABLISHMENT
- 3 4 WORKSHOP AND EQUIPMENT STORAGE AREAS
- 3 5 STORAGE AREAS OF HAZARDOUS SUBSTANCES

4. PHYSICAL ISSUES AND THEIR CONTROL

- 4 1 SUBSTATION TERRAIN AREA
- 4 2 NATURAL DRAINAGES
- 4 3 ACCESS ROADS TO THE SITE
- 4 4 CONSTRUCTION RUBBLE DISPOSAL
- 4 5 VEGETATION CLEARING
- 4 6 FENCING REQUIREMENTS
- 4 7 FIRE PREVENTION
- 4 8 NOISE POLLUTION
- 4 9 CLAIMS FOR DAMAGES
- 4 10 REHABILITATION
- 4 11 MATERIAL STORAGE AREAS
- 4 12 BATCHING PLANTS
- 4 13 OLD EQUIPMENT
- 4 14 TRANSPORT OF EQUIPMENT

5. SOCIAL ISSUES AND THEIR CONTROL

- 5 1 SANITATION
- 5 2 PREVENTION OF DISEASE
- 5 3 INTERACTION WITH AFFECTED PARTIES
- 5 4 LITTERING CONTROL
- 5 5 DUST POLLUTION
- 5 6 AESTHETICS

REVISION DATE: 10 MAY 2012

GROUP CAPITAL LAND DEVELOPMENT HAND OVER CHECKLIST

PROJECT NAME HELIOS SUBSTATION LOERIESFONTEIN ORANGE 75MW PV
CONNECTION

DATE OF HANDOVER 17/11/2016

Items	YES/ NO/None	Comments
1) Environmental Approvals		
1 1 Environmental Authorization (EA) and conditions from EIA	None	
1 2 EMPr Approval	None	
1 3 Delineation of Roles and Responsibilities Report	Yes	Included in EMPr
1 4 Notice of commencement of Construction	None	
1 5 LD Permits Spreadsheet (status)	None	
2) Landowner Schedule and special conditions	None	Eskom Transmission
3) Co – ordinate list	None	Existing substation
4) Statutory applications / Approvals		
➤ National Roads	None	
➤ Provincial Roads	None	
➤ Telkom	None	
➤ Transnet Freight Rail	None	
➤ Transnet Pipelines	None	
➤ Department of Mining (Mineral rights approvals)	None	
➤ Department of Water & Environment (Water & Wetlands crossing approvals)	None	
➤ SAAF/DCA	None	
➤ Other	N/A	
5) Locality Sketch/Site Plan	None	
6) Signed Profiles by the project team	None	
7) Pre-construction Rights Audit report	None	
8) Identified project risks	None	
9) Handover Presentation	None	
10) Minutes of Handover session (to be provided after H/O meeting)	None	

Land Development Handover Checklist

REVISION DATE: 10 MAY 2012

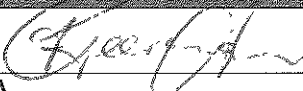
CONSTRUCTION LETTER: PM to inform LD in writing prior to commencement of construction

APPOINTMENT OF ECO: PM TO APPOINT

DATE OF HANDOVER:

LAND & RIGHTS PROJECT TEAM SIGNATORIES

PREPARED BY:

Name	Signature
Snr Environmental Cons: J Geeringh	
Negotiator:	N/A
Investigation & audit manager:	N/A

SUPPORTED BY

Name	Signature
Chief Land Surveyor:	N/A


HANDED OVER BY:

Name	Signature
Programme Manager: J Geeringh	

AUTHORIZED:

Name	Signature & Date
Land Development Manager: Amos Mboweni	 07/11/2016

SUBMITTED TO:

Name	Signature & Date
PDD Project Manager	 01/11/2016
Name (PDP PM):	
Name (PDP SHEQ)	

INTERNAL EMPr: HELIOS SUBSTATION LOERIESFONTEIN ORANGE PV CONNECTION

6. BIOLOGICAL ISSUES AND THEIR CONTROL

- 6 1 FAUNA
- 6 2 FLORA
- 6 3 HERBICIDE USE

7. CULTURAL ISSUES AND THEIR CONTROL

- 7 1 HERITAGE SITES
- 7 2 MONUMENTS / GRAVES
- 7 3 FARMHOUSES / BUILDINGS
- 7 4 INFRASTRUCTURE

8. REQUIREMENTS DURING CONSTRUCTION PERIOD

9. SITE SPECIFIC PROBLEM AREAS

- 9 1 ESTIMATED QUANTITIES FOR SPECIAL WORKS ON SITE

10. METHOD STATEMENTS FOR SPECIAL WORKS

11. SITE DOCUMENTATION / MONITORING / REPORTING

REFERENCES

PRO-FORMA

1. SCOPE

The scope of this Environmental Management Plan (EMPr) is to give environmental management guidelines, to the Contractor doing the construction work, in fulfilment of Eskom environmental requirements. This document is part of the contract and supplementary to Eskom's technical specifications. **The recommendations and constraints, as set out in this EMPr are enforceable under the general conditions of contract.**

The EMPr has a long-term objective to ensure that:

- 1) Environmental Management considerations are implemented from the design phase of the project,
- 2) The Contractor is able to and shall include any costs of compliance with this EMPr into the tender price,
- 3) Precautions against environmental damage and claims arising from such damage are taken timeously,
- 4) The completion date of the contract is not delayed due to environmental non-conformances and problems with the Grid staff, Communities or Regulatory Authorities arising during the course of the project execution, and
- 5) The asset created conforms to environmental standards as required by the Eskom Environmental Policy

Eskom requires a commitment from the Eskom Project Manager and the Contractor on the following issues:

1. To adhere to the Eskom Environmental Policy at all times.
2. Ensure environmental requirements stipulated in the EMPr are implemented
3. Resolve problems and claims arising from construction damage immediately to ensure a smooth flow of operations.
4. To preserve the environment by limiting destructive actions on site.

The Project Manager and Contractor must take into consideration that this EMPr will be implemented and amended as required for the duration of the contract. The management of the environment changes over time and therefore this document shall be updated where necessary to ensure environmental management is implemented during all phases of the project. All environmental management requirements for the operational phase arising from the implementation of the project must be identified and the Grid must be informed of such requirements.

Responsibility Matrix.

Function	Name + Tel	Responsibility
Eskom Project Manager (PM)		Overall management of project and EMPr implementation
Eskom Contract Manager (CM)		Contract management.
Eskom Site Supervisor (SS)		Site supervision
Appointed Environmental Control Officer (ECO)		Implementation of EMPr and liaison between Eskom, Contractor and the Grid (Can be the site supervisor due to scale of the project)
Contractor (C)		Implementation and compliance with recommendations and conditions of the EMPr,
Eskom GC Land Development Environmental Advisor	John Geeringh 083 632 7663	Environmental advice

2. INTRODUCTION

Construction works for upgrading or expansion of an existing facility is regulated by legislation under section 28 of the National Environment Management Act (NEMA), 107 of 1998, as amended which requires environmental duty of care. It is thus imperative that precautions are taken to ensure that environmental damage is minimised during construction. This will take a concerted effort from Eskom and the Contractor and detailed planning is of the utmost importance. All works to be performed under this EMPr is located within the Transmission property boundaries at Helios substation.

The Environmental Control Officer (ECO) shall convey the contents of this EMPr to the Contractor site staff and discuss the contents in detail with the Eskom Project Manager and Contractor at a pre-construction meeting. This formal induction training shall be done with all main and sub-contractors. Record of the training date, people whom attended and discussion points shall be kept by the ECO.

Good relations with the Grid staff must be established and sustained. This will help in the solving of problems and the prevention thereof. Lines of communication should always be open to ensure proper and timeous reaction to complaints. The contact numbers of the ECO and / or Eskom Site Supervisor shall be made available to the Grid staff. The reputation of both the Contractor and Eskom is at stake and should be the drive for everybody involved to perform in excellence.

During the construction period the ECO shall monitor the Works, to measure compliance with the requirements of the EMPr. The Grid Environmental Advisor shall inspect the Works upon completion of the contract. If satisfied the Works shall be taken over by the Grid.

3. DESCRIPTION OF THE PROJECT

3.1 SUBSTATION

The substation where the work will be performed is Helios substation. Distribution requested Grid Planning to provide them with a budget quotation for the integration of an Independent Power Producer (IPP) generation plant, Loeriesfontein Orange facility, located near Helios Main Transmission Substation (MTS). The developer has requested a single 132kV in-feed point at Helios MTS. The IPP was a preferred bidder in round 4 of the DoE programme to install renewable generation plant and to feed into the national grid.

High level Scope at Helios Substation:

- Equip 1 x 132kV feeder bay
- Commissioning of new infrastructure

The new feeder bay will be equipped on the terrace extension.

3.2 PROJECT EXECUTION AREA

Construction activities are limited to the area as demarcated by Eskom and shown on the site plans within the Eskom owned property at Helios MTS. Any area outside Eskom owned property, required to facilitate access, construction camps or material storage areas, shall be negotiated with the affected Landowner and written agreements shall be obtained. If required environmental authorisation shall be obtained for any listed activity in terms of the Regulations, 2014, which may be triggered by activities outside the demarcated area.

Should water be required from sources other than Eskom supply, a written agreement shall be reached between the Contractor and the water owner in the presence of Eskom / ECO. **Should the Contractor be required to use water from a source administered by the Department of Water and Sanitation (DWS), the required Water Use License (WUL) shall be**

obtained from DWS. Strict control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used

For the planned Works, the Works area shall be demarcated clearly to prevent unauthorised people from wandering onto site and getting injured. All activities shall be limited to the demarcated area and the Contractor workforce shall refrain from venturing outside this area.

No work shall commence until the Project Manager ensured that all pre-construction requirements in the EMPr are fulfilled before the Contractor occupies the site. The Grid shall be kept informed of all developments on construction at all times. All the requirements from the Grid must be considered during the construction phase to ensure smooth transition and handover at project completion.

3.3 SITE ESTABLISHMENT

Site establishment shall take place in an orderly manner and all amenities shall be installed at Camp sites before the main workforce move onto site. The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction. The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom.

Where Eskom facilities are available the Contractor shall make use of such facilities where it is viable and negotiated with the Grid. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. One toilet shall be installed for every 20 members of the workforce, with a minimum of 2 required notwithstanding the number of workers on site.

The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered waste dump. A certificate of disposal shall be obtained by the Contractor and kept on file.

Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burned on site unless a suitable, permitted incinerator is available.

3.4 WORKSHOP AND EQUIPMENT STORAGE AREAS

Where possible and practical all maintenance of vehicles and equipment shall take place in a demarcated workshop area. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil, especially where emergency repairs are done outside the workshop area. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. A **certificate of disposal** shall be obtained by the Contractor and kept on file.

Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and re-mediated to the satisfaction of the ECO. The Contractor shall be in possession of an emergency oil spill kit that must be complete and available at all times on site.

3.4.1 The following shall apply to hazardous substance spills:

- All contaminated soil / yard stone shall be removed and be placed in containers and not be stored longer than 90 days
- Smaller spills can be treated on site with appropriate spill treatment substances and apparatus
- A Contractor shall be used for the removal and disposal of contaminated soil to a registered waste site
- All spills of hazardous substances must be reported to the ECO

3.5 STORAGE AREAS OF HAZARDOUS SUBSTANCES

All hazardous substances shall be stored in suitable containers and storage areas shall be bunded at 110% of capacity. This includes all carbon

substances like fuel and oil as well as herbicides and battery acid. A register shall be kept on all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Any leaking containers shall be repaired or removed from site (See 3.4.1 for actions after spills).

4. PHYSICAL ISSUES AND THEIR CONTROL

4.1 SUBSTATION TERRAIN AREA

Where terracing is required, topsoil shall be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone. Topsoil shall be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil. Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards.

If any blasting activities are required during terrace establishment, the relevant legislation and Eskom procedures shall be fully complied with. The neighbouring landowners shall also be informed and the area shall be cleared of all stock animals.

Where required, all sloped areas shall be stabilised to ensure proper rehabilitation is effected and erosion is controlled. These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications shall be adhered to and implemented strictly.

The retained topsoil shall be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion. Where required, re-vegetation can also be enhanced using a vegetation seed mixture as described in section 4.10 of this EMP.

4.2 NATURAL DRAINAGE'S

Under no circumstances shall the contractor interfere with any watercourses in the vicinity of the site. Should deviation of such watercourses be required as

part of the contract design specification, the specifications shall be adhered to strictly and a WUL or GA shall be obtained prior to commencement of any works. The ECO shall ensure that all watercourses are adequately protected to prevent downstream siltation due to erosion on site. Rubble from the construction process shall be removed from site and may under no circumstances be dumped into any natural drainage channels. The normal flow of runoff water must not be impeded, as this will enhance erosion.

4.3 ACCESS ROADS TO THE SITE

Planning of access routes to the site for construction purposes shall be done in conjunction between the Contractor, Eskom and the Grid staff. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall properly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY" sign. Existing access roads should be used where possible to limit the requirement for new access roads which may require environmental authorisation.

Where new access roads are constructed, this must be done according to relevant design specifications and environmental authorisation if required. Drainage channels shall be suitably designed to ensure erosion does not occur, especially at the outflows. The new access road shall be designed to allow for the natural flow of water where required. All areas susceptible to erosion shall be protected with suitable erosion control measures from the onset of the project. Prevention is the total aim as restoration is normally very difficult and costly.

All required measures shall be taken to rehabilitate damaged areas in accordance with design specifications.

4.4 CONSTRUCTION RUBBLE DISPOSAL

The Contractor shall dispose of all excess material from site in an appropriate manner and at an appropriate landfill site. All packaging material shall be removed from site and disposed of and not burned on site.

No material shall be left on site that may cause injury or risk thereof. Broken, damaged and unused spares such as porcelain, glass, nuts, bolts and washers shall be picked up and removed from site. Surplus concrete may not be dumped indiscriminately on site, but shall be properly disposed of. *Concrete trucks shall not be washed on site after depositing concrete into foundations.* Any spilled concrete shall be cleaned up immediately.

4.5 SITE CLEARING

Vegetation clearing to allow for site establishment as well as construction purposes may be required. All alien vegetation shall be eradicated from site during the project. Indigenous vegetation that does not pose any risks to the operation of the substation upon completion of the contract should be retained for esthetical purposes. **Such vegetation shall be identified by the ECO and Project Manager and clearly indicated on the site plans.**

The use of herbicides shall only be allowed after a proper investigation into the type to be used, the long-term effects and the effectiveness of the agent. A suitably qualified contractor with a PCO license shall be used for herbicide application and application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the Supplier's specifications.

The Contractor for vegetation clearing shall comply with the following parameters:

- The contractor must have the necessary knowledge to be able to identify different species.
- The contractor must be able to identify declared weeds and alien species that can be totally eradicated.
- The contractor must be in possession of a valid PCO licence.

Management objectives are to

- Minimise unnecessary damage to vegetation
- Minimise possibility of erosion due to removal of vegetation

- Minimise removal of plant material on river and stream embankments
- Minimise damage to natural features
- Minimise damage to vegetation due to herbicide leaching and spills
- Ensure no litigation due to unauthorised removal of vegetation

4.6 FENCING REQUIREMENTS

PERMANENT FENCING TO BE INSTALLED MUST CONFORM TO ESKOM DESIGN STANDARDS

The site shall be fenced to prevent any loss or injury to persons or livestock during the construction phase if required. Temporary fencing is to take the form of a diamond mesh or bonnox fence with a minimum height of 1,8m. Metal or wooden standards at 20 m centres, with three metal or wooden droppers between the standards are to be used. A minimum of 3 plain wire strands shall be tensioned horizontally, the lowest strand being at a height of 100 mm above average ground level.

All Eskom gates shall be fitted with locks and be kept locked at all times during the construction phase, especially when works are stopped during weekends and holidays. All claims arising from gates left open shall be investigated and if at fault, settled in full by the Contractor. If any existing fencing interferes with the construction process, such fencing shall be deviated until construction is completed. The deviation of fences shall be negotiated and agreed with the Landowner in writing.

Management objectives are to

- Prevent any loss or injury to persons or livestock during the construction phase
- Properly installed gates to allow access to the site
- Minimise damage to private fences
- Limit access to Eskom and Contractor personnel
- Prevent transgressions of the fencing act and therefore litigation

- Prevent damage to fences and subsequent complaints from Landowners

4.7 FIRE PREVENTION

No open fires shall be allowed on site under any circumstance. All FOOD PREPARATION shall be done in demarcated areas that are safe and cannot cause runaway fires. The Contractor shall have operational fire-fighting equipment available on site, especially during the winter months. The contact number of the local fire fighting department must be displayed on site.

4.8 NOISE POLLUTION

The Contractor shall ensure that noise levels remain within acceptable limits as prescribed in terms of the Health Act and OHS Act. This applies especially after working hours and during the night.

4.9. CLAIMS FOR DAMAGES

The ECO / Eskom Site Supervisor shall keep a photographic record of any damage to areas outside the demarcated site area. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage should be directed to the ECO for appraisal and be reported to Eskom Legal Department. The Contractor shall be held liable for all unnecessary damage to the environment. **A register shall be kept of all complaints from surrounding Landowners, Grid staff or Community members. All complaints / claims shall be handled immediately to ensure timeous rectification / payment for damages by the responsible party.**

4.10. REHABILITATION

All damaged areas shall be rehabilitated upon completion of the contract in accordance with design specifications. In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, slopes in excess of 2% must be

contoured and slopes in excess of 12% must be terraced. Extra seed shall be sown on disturbed areas as directed by the ECO (see below for specifications). Other methods of rehabilitating disturbed sites may also be used at the discretion of the Project Manager to comply with the requirements of the EMP, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slopes. The type of soil shall also be taken into consideration.

A mixture of vegetation seed can be used provided the mixture is carefully selected to ensure the following:

- a) Annual and perennial species are chosen.**
- b) Pioneer species are included.**
- c) Species chosen will grow in the area under natural conditions.**
- d) Root systems must have a binding effect on the soil.**
- f) The final product should not cause any ecological imbalance in the area.**

4.11 MATERIAL STORAGE AREAS

Specifications require the protection of Eskom supplied material on site, especially conductor drums. This normally requires that a firebreak be created around a material storage area. Once construction has been completed on site and all excess material has been removed, the material storage area shall be rehabilitated. If the area was badly damaged, re-seeding shall be done and fencing in of the area shall be considered if livestock will subsequently have access to such an area. For seeding the same provisions as in 4.10 shall apply.

4.12. BATCHING PLANTS

Should a batching plant have to be established, the sites shall be negotiated with the Landowner / Grid staff depending on the location. The site must be designed to contain water runoff and cement residues and for proper storage of cement. The site design must not trigger the requirement for an environmental authorisation. The site shall be cleared of all foreign material upon completion of the contract. The area shall be rehabilitated to its natural

state Any spilled concrete shall be removed and soil compacted during construction shall be ripped, levelled and re-vegetated.

4.13 OLD EQUIPMENT

All old equipment removed during the project shall be stored in such a way as to prevent pollution of the environment Oil containing equipment shall be stored to prevent leaking or be stored on drip trays should such equipment already be leaking. All scrap steel shall be stacked neatly and any disused and broken insulators shall be stored in containers.

Once material has been scrapped and the contract has been placed for removal, the Contractor shall ensure that any equipment containing pollution causing substances is removed in such a way as to prevent spillage and pollution of the environment The Contractor shall also be equipped to contain and clean up any pollution causing spills Disposal of unusable material shall be at a registered waste disposal site and a certificate of disposal shall be obtained and copied to Eskom

4.14 TRANSPORT OF EQUIPMENT

All equipment moved onto site or off site during a project is subject to the legal requirements as well as Eskom specifications for the transport of such equipment Trucks leaking carbon substances will not be allowed on site Drip trays must be available and be used to ensure no leaking of carbon substances during operations on site Oil filled equipment have specific safety requirements regarding their handling, transport and storage The Contractor shall meet these safety requirements under all circumstances All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.

The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident.

5. SOCIAL ISSUES AND THEIR CONTROL

5.1 SANITATION

The Contractor shall install mobile chemical toilets on site. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate excretion or urinating on site shall be allowed. Ablution facilities shall be within 100m from workplaces but not closer than 100m from any natural water bodies. There should be enough toilets available to accommodate the workforce (minimum requirement 1: 20 workers or 2 toilets on site where the workforce is more than 20). Toilets shall be serviced regularly and the ECO shall inspect toilets to ensure compliance to health standards.

5.2 PREVENTION OF DISEASE

The Contractor workforce shall be sensitised regarding sexually transmitted diseases, especially HIV and Aids, in accordance with Eskom policies and the HIV awareness campaign.

5.3 INTERACTION WITH AFFECTED PARTIES

The success of any project depends mainly on the good relations with the affected Landowner, Communities and Grid staff. It is therefore required that the ECO and the Contractor establish good relations with all the affected parties at the substation site.

All negotiations for any reason shall be between the ECO, the affected parties and the Contractor. **NO** verbal agreements shall be made. All agreements shall be recorded in writing and all parties shall co-sign the documentation.

The affected parties shall always be kept informed about any changes to the construction programme should they be involved. If the ECO is not on site the Contractor should keep the affected parties informed. The contact numbers of the Contractor and the ECO shall be made available to the affected parties.

This will ensure open channels of communication and prompt response to queries and claims.

All contact with the affected parties shall be courteous at all times. The rights of any affected parties shall be respected at all times.

5.4. LITTERING CONTROL

Littering by the workforce of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite (See also 3.3). Adequate waste collection bins shall be placed on site and regularly maintained to prevent overflow and spilling. All waste shall be collected and properly disposed of as per the waste management plan and NEMWA requirements. Waste shall be separated on site for recycling purposes.

5.5. DUST POLLUTION

The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the Landowner, neighbouring Communities or Grid staff at the substation. Watering of cleared areas and temporary access roads is recommended, as this is normally the greatest cause of dust pollution. Speed limits must be implemented, especially on private dirt roads leading to the site. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.

5.6. AESTHETICS

The site shall be kept visually and aesthetically pleasing, especially in and around the Contractor camp. The ECO shall regularly inspect the site to ensure that it is neat and clean. Where required, the campsite shall be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. Screening can be done by use of shade cloth or corrugated fencing.

6. BIOLOGICAL ISSUES AND THEIR CONTROL

6.1 FAUNA

The Contractor shall under no circumstances interfere with domesticated or wild animals at or near the site or campsite without the Landowner or Community members being present. This includes the moving of livestock where they interfere with construction activities. No poaching shall be tolerated under any circumstances. Animal dens close to the site and works areas must be marked as no-go areas.

6.2 FLORA

Protected or endangered species may occur on or near the construction site. Special care should be taken not to damage or remove any such species unless absolutely necessary. Permits for removal must be obtained from DAFF should such species be affected. All plants not interfering with the operation of the substation shall be left undisturbed, clearly marked and indicated on the site plan. **Collection of firewood is strictly prohibited** (refer also 4.5) ;

6.3 HERBICIDE USE

Herbicide use shall only be allowed with the approval of Eskom and according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used (See also 4.5)

7. CULTURAL ISSUES AND THEIR CONTROL

7.1 HERITAGE SITES

There is no known heritage material on the proposed construction site. Should any heritage artefacts be uncovered during construction, their existence shall be reported to the ECO immediately. Such areas shall be marked as no go areas. Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage Resources Association (SAHRA) or the relevant Provincial Heritage Agency if any heritage material is to be destroyed or altered.

7.2 GRAVES

There are no known graves on the proposed construction site. Should any graves be found during construction such sites shall be clearly marked and treated as a no-go area. No destruction of any site shall be allowed. Should it be necessary to remove any graves, the necessary procedures shall be followed and permits obtained.

7.3 FARMHOUSES / BUILDINGS

If construction activities are close to any inhabited area, the necessary precautions shall be taken by the Contractor to safeguard the lives and property of the inhabitants. The Contractor shall under no circumstances interfere with the property of Landowners, Grid staff or nearby Communities.

7.4. INFRASTRUCTURE

No interruptions other than those negotiated shall be allowed to any essential services. Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. A record of any damage and remedial actions shall be kept on site.

All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties. Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect.

Any possible disruptions to essential services must be kept to a minimum and should be well advertised and communicated to the affected parties. The position of all pipelines and irrigation lines in the vicinity of the site must be identified and clearly marked and protected. Where required such lines shall be deviated.

8. REQUIREMENTS DURING CONSTRUCTION PERIOD

- 1 Proper and continuous liaison between Eskom, the Contractor and affected parties to ensure everyone is informed at all times
- 2 The affected parties and Grid staff shall be informed of the starting date of construction as well as the phases in which the construction shall take place
- 3 The Contractor must adhere to all conditions of contract including the requirements of the EMP_r and Grid special conditions.
- 4 Proper planning of the construction process to allow for disruptions due to rain and very wet conditions
- 5 Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary repairs should be done to prevent damage to equipment and plant.
6. All manmade structures shall be protected against damage at all times and any damage shall be rectified immediately
- 7 The Contractor shall ensure that all damaged areas are rehabilitated to the satisfaction of Eskom and that any outstanding claims are settled.
- 8 Proper documentation and record keeping of all complaints and actions taken,
9. Regular site inspections and good control over the construction process throughout the construction period
10. Appointment of an Environmental Control Officer on behalf of the Project Manager to implement the requirements of this EMP_r

9. SITE SPECIFIC PROBLEM AREAS

There are no known site specific problems at the proposed construction site as it falls inside Eskom owned property. A minor extension of the terrace is required.

9.1 ESTIMATED QUANTITIES FOR SPECIAL WORKS ON THE SITE

There are no special works required for this project. Normal material requirement quantities are included in the contract and are not included here.

10. METHOD STATEMENTS FOR THE CONTRACT

The Contractor shall supply the following method statements to the Project Manager before works on that aspect start:

- 10.1 Method statement for camp site establishment
- 10.2 Method statement for vegetation clearing if required
- 10.3 Method statement for waste management (all types of waste)
- 10.4 Method statement for rehabilitation of disturbed areas
- 10.5 Method statement for water management
- 10.6 Method statement for environmental incident management (fire, spills, etc)

All agreements regarding **extra works for environmental compliance** shall be in writing and well documented. Work shall only commence upon approval by the Eskom Project Manager. The ECO shall ensure that all works are in accordance with method statements and contract specifications.

11. SITE DOCUMENTATION / MONITORING / REPORTING

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legal. Regular

monitoring of site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the Contract Manager / Site Supervisor shall keep abreast of all works to ensure no problems arise.

Regular monthly environmental compliance reports shall be forwarded to the Project Manager with all information relating to environmental matters. The following matters must be reported on a monthly basis by the ECO:

- 1 Complaints received from affected parties and actions taken
- 2 Environmental incidents, such as oil spills, etc. and actions taken
- 3 Incidents possibly leading to litigation and any legal contraventions
- 4 Environmental damage that needs specialised rehabilitation measures to be taken

The following documentation shall be kept on site by the ECO:

- 1 Site diary.
- 2 Complaints register.
- 3 Records of all remediation / rehabilitation activities
- 4 *Copies of monthly reports to the **Project Manager** for auditing purposes.*
5. Copy of the Environmental Management Programme
- 6 Minutes of site meetings including discussions on environmental issues.
- 7 Major incident register
- 8 Minor event register.
9. Register of audits.

12. APPENDICES

- 1 SITE DRAWINGS (To be supplied by the Project Manager)
2. ESKOM SPECIFICATIONS (To be supplied by the Project Manager)

REFERENCES

Conservation of Agricultural Resources Act, Act 43 of 1983
Fencing Act, Act 31 of 1963
Hazardous Substances Act, 15 of 1973.
Health Act, Act 63 of 1977
National Environmental Management Act, Act 107 of 1998
NEM Waste Act, Act 59 of 2008
National Heritage Resources Act, Act 25 of 1999
National Water Act, Act 36 of 1998
Occupational Health and Safety Act, Act 85 of 1993



Eskom								
Site	Helios Substation	Scope of Work		1 x 132kV feeder bay to accommodate Loeriesfontein Orange PV				
Project code		Project Manager		JJ Joubert	Compiled by	John Geeringh		
					Date	01 November 2016		
Activity	Environmental Aspect	Impact (Y/N)	Significance (H/M/L/VL/N)	Regulatory requirements	Actions to be taken	Responsible Team/Person	Due Date	Date Compl
Site Establishment, De-establishment and House keeping								
Civil contractor, erection contractor, commissioning team, Eskom construction teams, all other teams)								
Establish contractors yard/store	Heavy vehicle dust	Yes	Medium	National Water Act	Contractor to provide Method Statement of site layout & management actions	Appointed contractor	TBA	TBA
	Site cleaning			Health Act	Licensed drivers & operators to obey all road & local bylaws	ECO		
	Water management			OHS Act				
	Concrete spills			NEMA				
				Transmission EMPr				
				National Roads Act				
Establishment of construction camp & ablution facilities	Heavy vehicle dust	Yes	Medium	National Water Act	Site to be kept tidy & hygienic with special reference to sanitation & water	Appointed contractor	TBA	TBA
	Site cleaning			Health Act	water management	ECO		
	Ablution facilities			OHS Act				
	Water management			NEMA Acts	Contractor to provide Method Statement of site layout & ablution & waste water management			
	Concrete spills			Transmission EMPr				
				National Roads Act				
De-establish contractors yard, store, camp & ablution facilities	Heavy vehicle dust	Yes	Medium	OHS Act	All waste, garbage, surplus materials & oil spills to be cleared & site rehabilitated	Appointed contractor	TBA	TBA
	Refuse, waste, scrap, oil spills & concrete spills			NEMA Acts		ECO		
				National water Act				
				Transmission EMPr				
				National Roads Act				
Clear site	Refuse, waste, scrap & oil spills	Yes	Medium	OHS Act	All waste, refuse, surplus materials and packaging material to be removed from site	Appointed contractor	TBA	TBA
				NEMA Acts		ECO		
				Transmission EMPr				
Delivery of materials & goods								
(Equipment, control panels, steel, cable, accessories, all civil material, construction tools & machinery, storage containers, miscellaneous goods)								
Delivery of materials	Heavy vehicle dust	Yes	Low	National Roads Act	Licensed drivers & operators to obey all road & local bylaws	Appointed contractor	TBA	TBA
Offloading of materials	Material storage			OHS Act	Correct loading & securing of equipment			
	Off loading materials			NEMA Acts	Separated materials			
	Crane vehicle				Prevention of oil leaks			
Delivery of Control panels	Heavy vehicle dust	Yes	Low	OHS Act	Licensed drivers & operators to obey all road & local bylaws	Appointed contractor	TBA	TBA
Off-loading of Control panels	Material storage			National Road Act	Correct loading & securing of equipment			
	Off loading materials			NEMA Acts	Crane operator to be accredited			
	Crane vehicle							

					Prevention of oil leaks	Appointed contractor	TBA	TBA
Building & civils works								
Remove existing yard stone & stockpile	Heavy vehicle dust	Yes	Low	OHS Act	Prevention of oil leaks	Appointed contractor	TBA	TBA
	Yard stone storage			HV Regs	Separated materials	ECO		
	Oil spills				Dust management			
Excavate foundations	Heavy vehicle dust	Yes	Low	OHS Act	Prevention of oil leaks	Appointed contractor	TBA	TBA
	Workers with hand tools			HV Regs	PPE to be used			
	Oil spills				Spread spoil evenly			
					Dust management			
Excavate earthmat & cable trenches	Heavy vehicle dust	Yes	Low	OHS Act	Prevention of oil leaks	Appointed contractor	TBA	TBA
	Workers with hand tools			HV Regs	PPE to be used			
	Oil spills				Spread spoil evenly			
					Dust management			
Mixing concrete	Concrete dust	Yes	Low	OHS Act	PPE to be used	Appointed contractor	TBA	TBA
	Cement bags			National Water Act	Litter management	ECO		
				NEMA Acts	Water management			
Cast blinding layer	Concrete spills	Yes	Low	OHS Act	Spills to be prevented and cleared	Appointed contractor	TBA	TBA
				NEMA				
Construct Cable trenches	Concrete spills	Yes	Low	OHS Act	Spills to be prevented and cleared	Appointed contractor	TBA	TBA
				NEMA				
Place copper earthing	Copper offcuts	Yes	Low	OHS Act	Collect off cuts for recycling	Appointed contractor	TBA	TBA
				HV Regs				
Backfill foundation & trenches	Compacting machinery	Yes	Low	OHS Act	Prevention of oil leaks	Appointed contractor	TBA	TBA
	Workers with hand tools			HV Regs	Use of PPE			
					Dust management			
					Water management			
Instate yard stone	Heavy machinery dust	Yes	Low	OHS Act	Prevention of oil leaks	Appointed contractor	TBA	TBA
	Oil leaks			HV Regs	Use of PPE			
	Workers with rakes				Dust management			
Final inspection	Site inspection	No	None	OHS Act	Site to be cleared of litter and rubble	Project Manager	TBA	TBA
				HV Regs		Grid Representative		
				NEMA Acts		Site supervisor		
				Transmission EMPr		Appointed contractor		
						ECO		
Take over works	Take Over/ Hand Over	No	None	Transmission EMPr	Site accepted from	Project Manager	TBA	TBA

Structural steel works								
Place steelwork on foundations	Steel offcuts	Yes	Low	OHS Act	All off cuts collected for recycling	Appointed contractor	TBA	TBA
	Steel cutting & grinding			HV Regs	Management of used cutting disks			
	Crane vehicle			Transmission EMPr	Prevention of oil leaks			
Connect earthing to steelwork	Welding, brazing	Yes	Low	OHS Act	Management of used brazing rods	Appointed contractor	TBA	TBA
				HV Regs				
				Transmission EMPr				
Final inspection	Site inspection	No	None	OHS Act	Site to be cleared of litter and rubble	Project Manager	TBA	TBA
				HV Regs		Grd Representative		
				Transmission EMPr		Site supervisor		
						Appointed contractor		
						ECO		
Take over works	Take Over/ Hand Over	No	None	Transmission EMPr	Site accepted from	Project Manager	TBA	TBA
					Contractor & Handed over to	Grd Representative		
					Grd Representative	Site supervisor		
						Appointed contractor		
						ECO		
Equipment Installation								
(Circuit Breakers, Current Transformers, Isolators, Insulators, Surge Arresters, Voltage Transformers, Earth Switches)								
Install Circuit Breaker	Heavy vehicle dust	Yes	Low	OHS Act	Crane operators to be licenced in	Appointed contractor	TBA	TBA
	Circuit Breakers			HV Regs	accordance with OHS Act			
	Oil leaks			NEIMA Acts	No damage to surrounding infrastructure			
	Crane vehicle			National Water Act	All personnel to be suitably accredited			
					Prevention of oil leaks			
Install CT's, VT's & CVT's	Heavy vehicle dust	Yes	Low	OHS Act	Crane operators to be licenced in	Appointed contractor	TBA	TBA
	Crane vehicle			HV Regs	accordance with OHS Act			
					No damage to surrounding infrastructure			
					All personnel to be suitably accredited to			
					Prevention of oil leaks			
Install Isolators, Insulators & SA's	Heavy vehicles	Yes	Low	OHS Act	Crane operators to be licenced in	Appointed contractor	TBA	TBA
	Isolators			HV Regs	accordance with OHS Act			
	Crane vehicle				Prevention of oil leaks			
Install Earth Switch	Heavy vehicles	Yes	Low	OHS Act	Crane operators to be licenced in	Appointed contractor	TBA	TBA
	Earth Switches			HV Regs	All personnel to be suitably accredited to	Appointed contractor	TBA	TBA
	Crane vehicle				perform the duties			
					Prevention of oil leaks			
Install control & protection panels	Protection panels	Yes	Very low	OHS Act	All personnel to be suitably accredited to	Appointed contractor	TBA	TBA
				HV Regs	perform the duties			
					Redundant cable collected for recycling			

Final inspection	Site inspection	No	None	OHS Act HV Regs Transmission EMPPr	Site to be cleared of litter and rubble	Project Manager Grid Environ Advisor Site supervisor Appointed contractor ECO	TBA	TBA
Take over works	Take Over/ Hand Over	No	None	Transmission EMPPr	Site accepted from Contractor & Handed over to Grid Representative	Project Manager Grid Environ Advisor Site supervisor Appointed contractor ECO	TBA	TBA
Stringing & Cabling								
(Cables, clamps, string sets, conductor, tubes, light fittings, labels, other accessories)								
Install cables, clamps, conductor, tubes, labels, light fittings, accessories	Cables, clamps, conductor, tubes, labels accessories	Yes	Very low	OHS Act HV Regs	Crane operators to be licenced in accordance with OHS Act No damage to surrounding infrastructure All personnel to be suitably accredited to perform the duties All cable off cuts collected for recycling	Appointed contractor	TBA	TBA
Measure, cut conductors/cables to size & fit clamps	Hand tools Conductor/Cable off cuts	Yes	Low	OHS Act HV Regs	Cable off cuts collected for re-cycling Safe use of hand tools	Appointed contractor	TBA	TBA
Terminate new conductors & clamps onto equipment	Crane trucks Engine & hydraulic oil	Yes	Low	National Water Act OHS Act HV Regs	Adequate oil drip trays & clean-up kits to be available on site All crane operators to be accredited Prevention of oil leaks	Appointed contractor	TBA	TBA
Scrapping & recycling of cabling	Scrap cabling	Yes	Medium	OHS Act NEMA Acts	Safe scrapping and recycling of scrap material & cables	Appointed contractor	TBA	TBA
Final inspection	Site inspection	No	None	OHS Act HV Regs Transmission EMPPr	Site to be cleared of litter and rubble	Project Manager Grid Environ Advisor Site supervisor Appointed contractor ECO	TBA	TBA
Take over works	Take Over/ Hand Over	No	None	Transmission EMPPr	Site accepted from Contractor & Handed over to Grid Representative	Project Manager Grid Environ Advisor Site supervisor Appointed contractor ECO	TBA	TBA

Testing & Commissioning									
(All equipment testing, earthing system, system integration)									
Commissioning of CB	Circuit Breakers	Yes	Very low	OHS Act HV Regs	Safe working procedures	Appointed contractor	TBA	TBA	
Commissioning of CT's VT's & CVT's	CT's, VT's	Yes	Very low	OHS Act HV Regs	Safe working procedures	Appointed contractor	TBA	TBA	
Commissioning of Isolators	Isolators	Yes	Very low	OHS Act HV Regs	Safe working procedures	Appointed contractor	TBA	TBA	
Commissioning of Earth Switches	Earth Switches	Yes	Very low	OHS Act HV Regs	Safe working procedures	Appointed contractor	TBA	TBA	
Testing & commissioning control & protection panels	Testing	No	None	OHS Act Work procedures	Safe working practices	Appointed contractor	TBA	TBA	
Testing & commissioning overall system integration	Testing	No	None	OHS Act Work procedures	Safe working practices	Appointed contractor	TBA	TBA	
Final inspection	Site inspection	No	None	OHS Act HV Regs	Site to be cleared of litter and rubble	Project Manager	TBA	TBA	
				Transmission EMPr		Site supervisor			
						Appointed contractor			
						ECO			
Take over works	Take Over/ Hand Over	No	None	Transmission EMPr	Site accepted from Contractor & Handled over to Grid Representative	Project Manager	TBA	TBA	
						Grid Environ Advisor			
						Site supervisor			
						Appointed contractor			
						ECO			