



## **ESKOM TRANSMISSION**

---

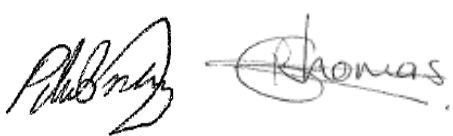
# **Eskom Thyspunt Nuclear Integration Project**

## **Environmental Management Plan: Power lines**

**Issue Date:** 28 January 2013

**Revision No.:** 3

**Project No.:** 9520

<b>Date:</b>	18 September 2012
<b>Document Title:</b>	Environmental Management Plan for the Eskom Thyspunt Nuclear Integration Project – Power lines
<b>Author:</b>	Shaun Taylor and Faith Kalibbala
<b>Revision Number:</b>	2
<b>Checked by:</b>	Paul da Cruz, Rebecca Thomas
<b>Approved:</b>	Paul da Cruz, Rebecca Thomas
<b>Signature:</b>	
<b>For:</b>	ESKOM TRANSMISSION
COPYRIGHT IS VESTED IN SiVEST IN TERMS OF THE COPYRIGHT ACT (ACT 98 OF 1978) AND NO USE OR REPRODUCTION OR DUPLICATION THEREOF MAY OCCUR WITHOUT THE WRITTEN CONSENT OF THE AUTHOR	

The Independent Environmental Assessment Practitioner:

We, SiVEST Environmental, declare that we –

- act as the Independent Environmental Assessment Practitioners in this application for the proposed Eskom Thyspunt Nuclear Integration Project in the Eastern Cape;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2006;
- do not have and will not have any vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity; and
- will provide the competent authority with access to all information at our disposal regarding the application, whether such information is favourable to the applicant or not.

**ESKOM TRANSMISSION**

TTLIP - Environmental Management Plan: Power lines

Revision No. 3

28 January 2013

**prepared by: SiVEST Environmental**

Page 1

# ESKOM TRANSMISSION

## THYSPUNT NUCLEAR INTEGRATION PROJECT

### DRAFT EMP – POWER LINES

Contents	Page
<b>1 CHAPTER 1: GENERAL INTRODUCTION AND BACKGROUND.....</b>	<b>7</b>
<b>1.1 Introduction .....</b>	<b>7</b>
1.1.1 Overview of the proposed project .....	7
<b>2 TECHNICAL COMPONENTS .....</b>	<b>3</b>
<b>2.1 Power Line Servitudes and Tower Types .....</b>	<b>3</b>
<b>2.2 Substation Upgrading Components and Details.....</b>	<b>5</b>
2.2.1 Dedisa Substation .....	5
2.2.2 Grassridge Substation .....	5
<b>2.3 Project Responsibilities .....</b>	<b>5</b>
2.3.1 Project manager .....	6
2.3.2 Environmental Control Officer .....	6
2.3.3 Contractor .....	7
2.3.4 Eskom Transmission .....	7
2.3.5 The Environmental Liaison Officer (ELO) .....	7
2.3.6 Environmental Audits.....	13
<b>2.4 Layout of Environmental Management Plan .....</b>	<b>14</b>
2.4.1 Introduction .....	14
2.4.2 Pre-construction (Site establishment).....	15
2.4.3 Construction .....	15
2.4.4 Operation .....	16
2.4.5 Decommissioning Phase .....	16
<b>2.5 Objectives of an EMP .....</b>	<b>16</b>
2.5.1 Environmental monitoring .....	17
<b>2.6 Compliance with the EMP .....</b>	<b>18</b>
2.6.1 Method Statements .....	18
2.6.2 Penalties for non-compliance.....	18
2.6.3 Training and awareness .....	20
<b>2.7 Applicable Legislation, Development Strategies and Guidelines .....</b>	<b>20</b>
<b>3 CHAPTER 3: MITIGATION GUIDELINES .....</b>	<b>21</b>
<b>3.1 Introduction .....</b>	<b>21</b>
<b>3.2 Pre-construction Phase.....</b>	<b>21</b>
3.2.1 Site preparation .....	21
3.2.2 Consultation .....	22
3.2.3 Site Clearing.....	23
<b>3.3 Construction Phase.....</b>	<b>24</b>
3.3.1 Construction Camp.....	24
3.3.2 Construction traffic and access .....	27

ESKOM TRANSMISSION

TTLIP - Environmental Management Plan: Power lines

Revision No. 3

28 January 2013

prepared by: SiVEST Environmental

Page 2

H:\Thyspunt Printing\4. EMP\Thyspunt EMP - Power lines Rev 3 - 28Jan2013 RT.docx

3.3.3	Environmental Education and Training.....	29
3.3.4	Soils and Geology .....	31
3.3.5	Erosion Control.....	34
3.3.6	Water Use and Quality.....	37
3.3.7	Surface and Groundwater.....	38
3.3.8	Waste Management .....	41
3.3.9	Biodiversity.....	44
3.3.10	Avifauna.....	49
3.3.11	Air Quality .....	49
3.3.12	Noise and Vibrations .....	50
3.3.13	Energy use.....	52
3.3.14	Agricultural Potential .....	52
3.3.15	Employment .....	53
3.3.16	Occupational Health and Safety .....	54
3.3.17	Security.....	59
3.3.18	Socio-economic Environment .....	61
3.3.19	Community Engagement .....	68
3.3.20	Visual Impact .....	68
3.3.21	Heritage, Palaeontology and Khoisan Heritage .....	70
<b>3.4</b>	<b>Operation Phase .....</b>	<b>74</b>
3.4.1	Construction Site Decommissioning.....	74
3.4.2	Rehabilitation and Maintenance.....	76
3.4.3	Operation and Maintenance.....	77
3.4.4	Air Quality .....	78
3.4.5	Biodiversity.....	79
3.4.6	Waste Management .....	81
3.4.7	Khoisan Heritage.....	81
3.4.8	Visual Impact.....	81
<b>3.5</b>	<b>Decommissioning phase.....</b>	<b>82</b>
<b>4</b>	<b>CHAPTER 4: CONCLUSION.....</b>	<b>83</b>
<b>4.1</b>	<b>Pre-Construction Phase .....</b>	<b>83</b>
<b>4.2</b>	<b>Construction Phase.....</b>	<b>83</b>
<b>4.3</b>	<b>Operational Phase .....</b>	<b>84</b>
<b>4.4</b>	<b>Decommissioning Phase.....</b>	<b>84</b>

#### List of Tables:

Table 1: Responsibilities.....	8
Table 2: Environmental Management Responsibilities .....	9
Table 2: Example of Procedure for Conducting Audits .....	13
Table 3: Site preparation .....	21
Table 4: Consultation .....	22
Table 5: Site Clearing.....	23
Table 6: Construction Camp .....	24
Table 7: Construction Traffic and Access.....	27
Table 8: Environmental Education and Training .....	30

Table 9: Soils and Geology.....	31
Table 10: Erosion Control.....	34
Table 11: Water Use and Quality.....	37
Table 12: Surface and Groundwater .....	38
Table 13: Waste Management.....	41
Table 14: Biodiversity .....	44
Table 16: Noise and Vibrations.....	50
Table 17: Energy use .....	52
Table 18: Agricultural Potential .....	52
Table 19: Employment.....	53
Table 20: Occupational Health and Safety .....	55
Table 21: Security .....	59
Table 22: Socio-economic Environment.....	61
Table 23: Community Engagement.....	68
Table 24: Visual Impact.....	68
Table 25: Construction Site Decommissioning .....	74
Table 26: Rehabilitation and Maintenance .....	76
Table 27: Operation and Maintenance .....	77
Table 29: Air Quality.....	78
Table 30: Biodiversity .....	79
Table 31: Waste Management.....	81
Table 31: Khoisan Heritage .....	81
Table 33: Visual Impact.....	81

## List of Figures

Figure 1: Locality Map- Northern and Southern Corridors and PE Substation at the start of the EIR phase .....	1
Figure 2: The latest Corridors and EIA Team-preferred alignments (Detailed map is provided in Appendix 14).....	2
Figure 3: The Self-Supporting (Strain) Tower type .....	3
Figure 4: The Cross Rope Suspension Tower Type .....	4
Figure 5: the Guyed Suspension Tower .....	4
Figure 6: Difference between cross rope suspension towers (left photo) and self support towers (left in right photo) and a guyed suspension tower (right in right photo) .....	4

## Glossary of terms:

---

### ESKOM TRANSMISSION

TTLIP - Environmental Management Plan: Power lines

Revision No. 3

28 January 2013

prepared by: SiVEST Environmental

Page 4

**Construction Phase:** The activities pertaining to the preparation for and the physical construction of the proposed development.

**Contractor:** Persons/organisations contracted by Eskom Transmission to carry out parts of the work for the proposed development.

**Dam:** A dam is defined in the National Water Act as any existing or proposed structure which is capable of containing, storing or impounding water (including temporary impoundment or storage).

**Decommissioning:** Means to take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.

**Engineer (E) / Project Manager (PM):** Person/organisation appointed by the Contractor to oversee the work of all consultants, sub-developers, contractors, residents and visitors.

**Environment:** NEMA defines "environment" as "the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any interrelationships among and between them and the physical, chemical aesthetic and cultural properties and conditions that influence human health and well-being".

**Environmental Control Officer (ECO):** Person/organisation appointed by the Contractor who will provide direction to the Project Manager concerning the activities within the Construction Zone, and who will be responsible for conducting the environmental audit of the project during the construction phase of the project according to the provisions of the Environmental Management Plan.

**Environmental Management Plan (EMP):** The EMP is a detailed plan for the implementation of the mitigation measures to minimise negative environmental impacts during the life-cycle of a project. The EMP contributes to the preparation of the contract documentation by developing clauses to which the contractor must adhere for the protection of the environment. The EMP specifies how the construction of the project is to be carried out and includes the actions required for the Post-Construction Phase to ensure that all the environmental impacts are managed for the duration of the project's life-cycle.

**Operational Phase (Post Construction):** The period following the Construction Phase, during which the proposed development will be operational.

**Pre-Construction Phase:** The period prior to commencement of the Construction Phase, during which various activities associated with the preparation for the Construction Phase will be undertaken.

**Rehabilitation:** Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was in before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

**Site Manager:** The person, representing the Contractor, responsible for all the Contractor's activities on the site including supervision of the construction staff and activities associated with the Construction Phase. The Site Manager will liaise with the Project Manager in order to ensure that the project is conducted in accordance with the Environmental Management Plan.

**Abbreviations:**

C	Contractor
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EA	Environmental Authorisation
ESS	Environmental Scoping Study
I & APs	Interested and Affected Parties
MC	Main Contractor
SM	Site Manager
SO	Safety Officer
PM	Project Manager
MSDS	Material Safety Data Sheets
VIP	Ventilated Improved Pit latrine

# **ESKOM TRANSMISSION**

## **THYSPUNT NUCLEAR INTEGRATION PROJECT**

### **DRAFT EMP – POWER LINES**

## **1 CHAPTER 1: GENERAL INTRODUCTION AND BACKGROUND**

### **1.1 Introduction**

To integrate the electricity that will be generated by the proposed Thyspunt Nuclear Power Station into the national grid, Eskom Transmission has appointed SiVEST to undertake an EIA for the proposed Thyspunt Transmission Lines Integration Project (TTLIP) which entails the installation of Transmission power lines the upgrading of existing substations and the proposed Port Elizabeth Substation.

Associated with the EIA SiVEST has compiled an EMP for the TTLIP. This EMP will cover the installation of the Transmission infrastructure aspects of the project. A separate EMP for the proposed Substation construction and upgrades has been compiled.

This EMP has been compiled in line with the recommendations in the above-mentioned EIA, as well as from issues identified by SiVEST Environmental Division. More detail will be provided by the contractors and engineers once the detailed design has been completed. It should be noted that this is *not* a detailed Construction EMP as may be required by the Department of Environmental Affairs should environmental authorisation be granted for the proposed project. The detailed CEMP would need to be compiled based on this generic draft EMP and based on the input of a number of environmental specialists who have recommended that a 'walk down' of the draft final tower positions be undertaken.

#### *1.1.1 Overview of the proposed project*

The overall project includes two corridors that have been proposed for the TTLIP (Figure 1). Each corridor is unique, the details of which is described below:



- **Proposed Northern Corridor:** 3 x 400kV Transmission power lines
  - 3x 400kV Transmission power line from Thyspunt past Uitenhage to Eskom's existing Grassridge Transmission Substation
  - 2x 400kV Transmission power lines from the Grassridge Substation to the Dedisa Transmission Substation
  
- **Proposed Southern Corridor:** 2 x 400kV Transmission power lines
  - 2x 400kV Transmission power lines from Thyspunt to the newly proposed Port Elizabeth Transmission Substation
  - 2x 400kV Transmission power lines from the newly proposed Port Elizabeth Transmission Substation to Eskom's existing Grassridge Transmission Substation
  
- **Proposed new Port Elizabeth Transmission Substation location**
  - Two proposed (study) sites for the new PE Substation are proposed; in the Fitches Corner Area and in the area between Despatch and KwaNobuhle.
  - The minimum size (footprint) of the proposed Port Elizabeth Transmission Substation site is 320m x 230m, which needs to accommodate:
    - i. Four (4) 400kV Transmission power lines exiting the proposed substation
    - ii. Three (3) 400/132kV transformer bays; and
    - iii. Eight (8) 132kV feeder bays.
  
- **Proposed upgrade of Eskom's existing Grassridge and Dedisa Transmission Substations**
  - These upgrades include the associated infrastructure required to integrate the proposed new substation into Eskom's Electricity Transmission grid (including the construction of service/access roads, the construction of a extra lighting towers at the substation sites, etc).
  - Additional feeder bays to accommodate additional lines.

The map below shows the location of the corridors ***at the start of the EIA phase*** (refer to section 6.4 of the EIR for route changes).

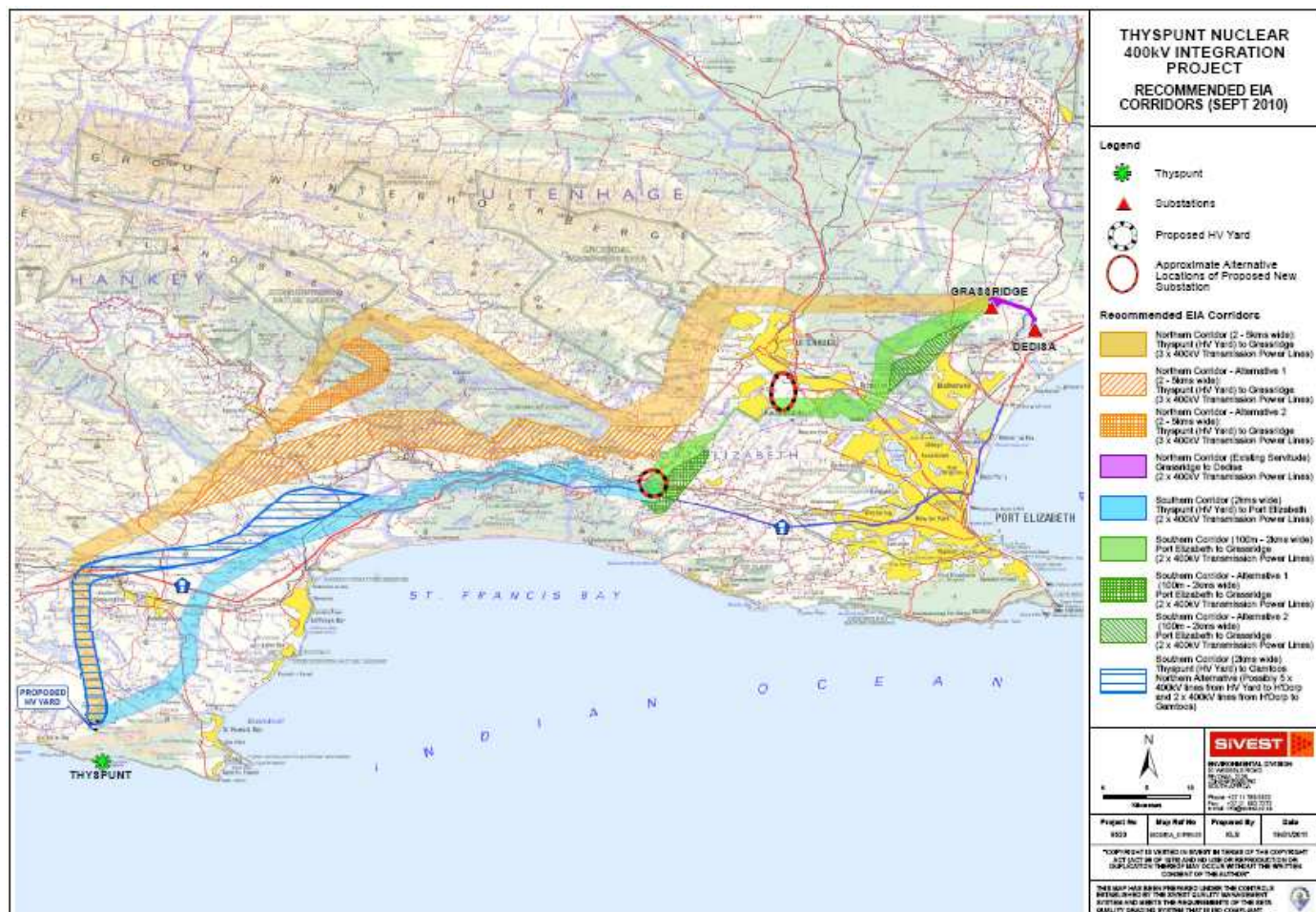


Figure 1: Locality Map- Northern and Southern Corridors and PE Substation at the start of the EIR phase

### **Important information pertinent to the corridors:**

It is important to note that these corridors (Northern and Southern) are not alternatives to each other, as both are anticipated to be utilised by Eskom to carry a total of 5 X 400kV lines from the proposed nuclear power station. Eskom has identified the need to keep the proposed lines in two separate alignments as a risk aversion factor; Two separate and independently operated transmission line corridors are proposed in order to guarantee the electricity supply from the proposed Thyspunt Nuclear Power Station should the transmission lines in one of the corridors become non-operational, the electricity supply from the proposed power station would be guaranteed.

In terms of location alternatives assessment, the corridors provide adequate space for a number of potential alternative alignments to be located within them. In a section of the Northern Corridor three distinct alternatives were presented for assessment in the EIA phase. Similarly in three sections along the Southern Corridor alternatives were presented for assessment.

The EIA corridors were narrowed from the scoping phase corridors (which were typically ~5km in width) to an approximate 2km width. There are certain points along the corridors where the corridors have been narrowed to avoid sensitive areas.

The study area (as indicated in Figure 1 above) indicates the boundary for the identification of stakeholders and for specialists to undertake their environmental studies for this proposed TTLIP.

### **Changing of Corridors through the EIR phase**

As described in more detail in section 6.4 of the EIR, the corridors have undergone significant changes through the full EIA process, and within the EIR phase in response to various environmental issues that have been identified / raised by stakeholders and I&APs. The corridors at the time of writing are presented in the map below. Most of the specialist studies for the EIR-phase have been undertaken based on the corridors presented for assessment at the start of the EIR-phase, but this EIR has taken cognisance of the latest alignments and corridors in terms of each environmental parameter assessed.

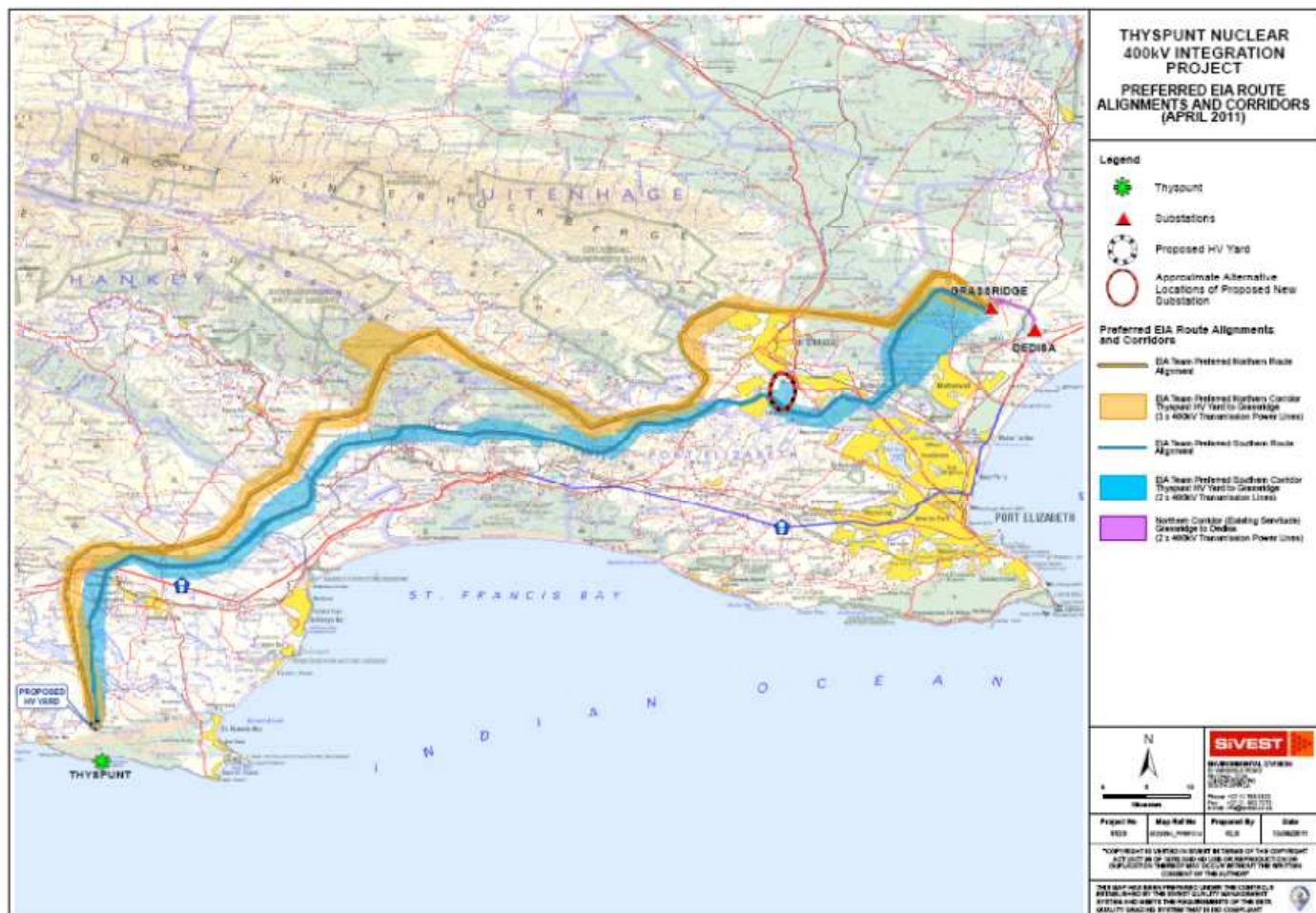


Figure 2: The latest Corridors and EIA Team-preferred alignments (Detailed map is provided in Appendix 14)

## 2 TECHNICAL COMPONENTS

### 2.1 Power Line Servitudes and Tower Types

- In terms of Eskom standards, a single 400kV line will require a servitude of 55m in width.
- Assuming the Northern Corridor has 3 Transmission lines in it – the servitude will be a total of 165m wide.
- Assuming the Southern Corridor has 2 Transmission lines in it – the servitude will be a total of 110m wide.
- In most cases the land beneath the overhead lines can be used, as normal, by the landowners. Eskom, however, require that no dwellings or vegetation/crops higher than 4m be established within the servitude.
- Currently it is proposed (but not finalised) that the Cross Rope Suspension-type tower will be used (Figure 4). This tower is approximately 40m in height. The total footprint area required for each tower is 70m x 30m (including the tower supports). A diagram of the proposed tower and other potential tower types is indicated below.
- Self Support tower types will be used as strain towers (a strain tower is a larger tower utilised in bends and where reinforcement is required with regards to tower stability).

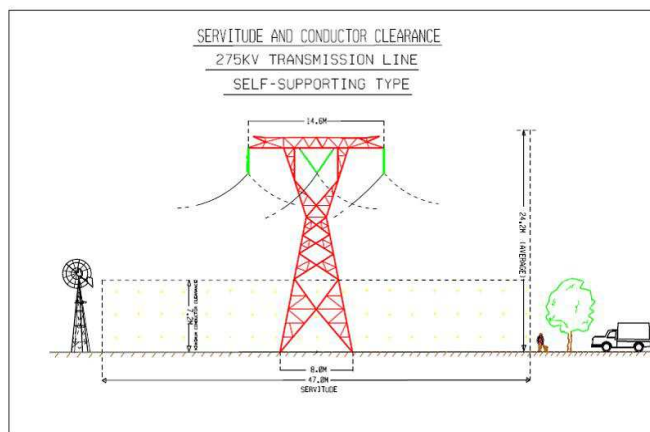


Figure 3: The Self-Supporting (Strain) Tower type



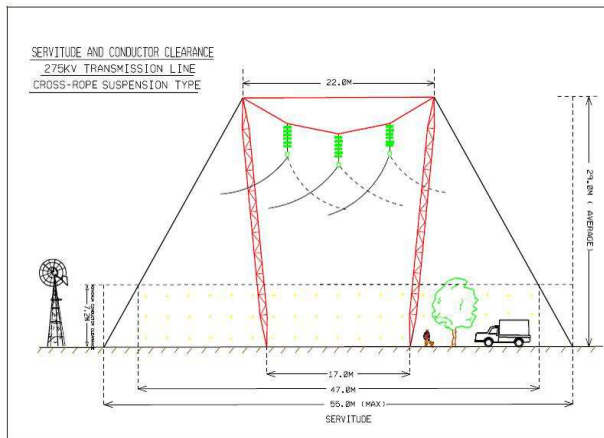


Figure 4: The Cross Rope Suspension Tower Type

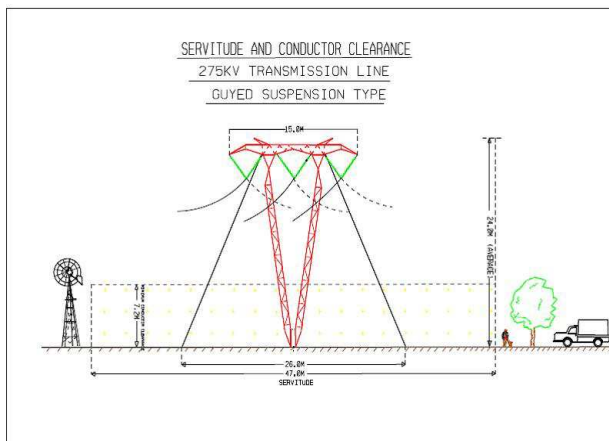


Figure 5: the Guyed Suspension Tower



Figure 6: Difference between cross rope suspension towers (left photo) and self support towers (left in right photo) and a guyed suspension tower (right in right photo)

## 2.2 Substation Upgrading Components and Details

As part of this project, both the Dedisa and Grassridge Substations are proposed to be upgraded. The details of the proposed upgrading are provided below.

### 2.2.1 Dedisa Substation

At the Dedisa Substation the 400kV busbar system at needs to be extended and the feeder 3 needs to be fully equipped to deal with the new lines. Thus a fully equipped 400 kV feeder bay with double busbar selection and bypass capability needs to be constructed. Essentially this upgrading will entail the construction of new metal structures within the substation. The fence surrounding the substation will need to be extended and new operational lighting will need to be erected; lighting masts 24m high will need to be erected. No new roads will be required to be built as part of the upgrading.

### 2.2.2 Grassridge Substation

At Grassridge, similar new provisions for the lines need to be made. The set up is slightly different to Dedisa, and at Grassridge bringing in the fourth feeder will require that the busbar be sectionalised further to create a fourth zone. The busbar system will further have to be extended by two bays. No new fencing, extra roads or additional lighting will be required to be installed at the substation.

## 2.3 Project Responsibilities

Several professionals will form part of the construction team. The most important from an environmental perspective are the Project Manager, the Environmental Control Officer (ECO) and the contractor.

The Project Manager is responsible for the implementation of the EMP on the site during the pre-construction and construction phases of the project.

The ECO is responsible for monitoring the implementation of the EMP during the design, **pre-construction** and **construction** phases of the project.

The contractor is responsible for abiding by the mitigation measures of the EMP which are implemented by the Project Manager during the **construction** phase.

Eskom (the project proponent) is responsible for the implementation of the EMP during the operational and decommissioning phases of the project.

#### *2.3.1 Project manager*

The Project Manager is responsible for the overall management of the project and the EMP implementation. The following tasks will fall within his / her responsibilities:

- Be aware of the findings and conclusions of the Environmental Impact Assessment and the conditions stated within the environmental authorisation.
- Be familiar with the recommendations and mitigation measures of this EMP, and implement these measures.
- Monitor site activities on a daily basis for compliance.
- Conduct internal audits of the construction site against the EMP.
- Confine the construction site to the demarcated area.
- Rectify transgressions through the implementation of corrective action.

#### *2.3.2 Environmental Control Officer*

The Environmental Control Officer is responsible for the implementation of the EMP during the construction phase and liaison between the Contractor and the Landowners. The ECO will liaise and report to the Contractor, landowners and authorities. It is important to note that the ECO is usually a party independent of the proponent or the contractor, as specified by the EA. The following tasks will fall within his / her responsibilities:

- Be aware of the findings and conclusions of the Environmental Impact Assessment and the conditions stated within the environmental authorisation.
- Be familiar with the recommendations and mitigation measures of this EMP.
- Conduct monthly audits of the construction site according to the EMP and EA.
- Educate the construction team about the management measures of the EMP and EA.
- Regular liaison with the construction team and the project leader.
- Recommend corrective action for any environmental non-compliance incidents on the construction site.



- Compile a regular report highlighting any non-compliance issues as well as good compliance with the EMP.
- 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 must 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.

### 2.3.3 Contractor

The contractor is responsible for the implementation and compliance with recommendations and conditions of the EMP.

- Ensure compliance with the EMP at all times during construction
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
  - Public involvement / complaints
  - Health and safety incidents
  - Hazardous materials stored on site
  - Non compliance incidents

The Contractor shall under no circumstances interfere with the property of landowners or nearby communities.

### 2.3.4 Eskom Transmission

Eskom will assume ultimate responsibility for the project and all activities related to the construction process i.e. non compliance, penalties etc.

### 2.3.5 The Environmental Liaison Officer (ELO)

The ELO will be appointed by the Contractor to implement the EMP and monitor activities on site on a daily basis. The ELO will be the ECO's representative on the site and will report back on all audit trips. The ELO must report any major incidents immediately to the ECO

Table 1: Responsibilities

Function	Responsibility
Project Manager (PM) Eskom	<ul style="list-style-type: none"> <li>Overall management of project and EMP implementation</li> </ul>
Senior Site Supervisor/ Contract Manager (CM) Eskom	<ul style="list-style-type: none"> <li>Oversee site works, liaison with Contractor (ELO), PM and ECO</li> </ul>
Environmental Control Officer (ECO) – Appointed by Eskom	<ul style="list-style-type: none"> <li>Implementation of EMP, and monitoring of compliance with the requirements of the CEMP.</li> <li>Liaison between Eskom, Contractor and Landowners, including negotiation of access plan.</li> <li>Maintains close communication with the ELO, and oversees the ELO's environmental control, remediation and rehabilitation actions (including checking that the complaints register and register of environmental incidents are being maintained by the ELO).</li> <li>Environmental awareness training of the contractor and select main construction staff</li> <li>Settlement of damage claims and completion of Damage Release Forms</li> <li>Negotiating and acquiring release forms from affected land owners at the end of the construction period.</li> </ul>
Contractor (MC)	<ul style="list-style-type: none"> <li>Ensures the implementation and compliance with recommendations and conditions of the EMP as well as the EA; Appoints dedicated person (ELO) to work with ECO</li> </ul>
Contractor-appointed Environmental Liaison Officer (ELO)	<ul style="list-style-type: none"> <li>Monitoring of compliance with EMP, environmental control of site actions, adjusting of environmental quality of works performed by construction staff, remediation and rehabilitation work.</li> <li>Reports back to the ECO through compilation of regular site inspection reports.</li> <li>Ensures compliance of construction activities with</li> </ul>

Function	Responsibility
	<p>relevant environmental legislation.</p> <ul style="list-style-type: none"> <li>▪ Maintains the complaints register that is kept on-site.</li> <li>▪ Keeps record of all environmental incidents and ensures that corrective action is taken.</li> <li>▪ Compiles method statements from the project-specific EMP</li> <li>▪ Environmental awareness training of all staff.</li> <li>▪ Day-to-day management of landowner requirements and landowner liaison; ensures all landowner special conditions are met.</li> </ul>
Environmental Advisor (Eskom)	<ul style="list-style-type: none"> <li>▪ Environmental advice and auditing</li> </ul>

The following are the environmental management responsibilities of the various parties during construction and operational phases. Unless otherwise stated the EMP will be adhered to as follows:

- The ELO will be the responsible party for all compliance of this EMP during the construction phase.
- The monitoring party will be the ECO.
- Method of record keeping will be monthly audits.
- Audit Technique will be the review of records that will be kept on site by the ELO and/ or site inspections.
- Eskom will bear ultimate responsibility.

Table 2: Environmental Management Responsibilities

ITEM	PROJECT COMPONENT AND ACTIVITY	RESPONSIBLE PARTY	MONITORING PARTY	AUDIT TECHNIQUE
<b>1.1</b>	<b>PRE-CONSTRUCTION (SITE ESTABLISHMENT)</b>			
1.1.1	Site preparation	MC, ELO	ECO	SITE VISIT
1.1.2	Consultation	MC, ELO	ELO,ECO	SITE VISIT
<b>1.2</b>	<b>CONSTRUCTION ACTIVITIES</b>			
1.2.1	Site Clearing	MC	ELO,ECO	SITE VISIT

ITEM	PROJECT COMPONENT AND ACTIVITY	RESPONSIBLE PARTY	MONITORING PARTY	AUDIT TECHNIQUE
1.2.2	Construction traffic and access	MC, ELO	ECO	SITE VISIT
1.2.3	Construction Camp	MC, ELO	ECO	SITE VISIT
1.2.4	Environmental Education and Training	MC, ELO, ECO	ECO	SITE VISIT
1.2.5	Soils and Geology	MC, ELO	ECO	SITE VISIT
1.2.6	Erosion Control	ELO	ECO	SITE VISIT
1.2.7	Water Use and Quality	ELO	ECO	SITE VISIT
1.2.8	Surface Water and Groundwater	ELO	ECO	RECORDS REVIEW
1.2.9	Waste Management	ELO	ECO	SITE VISIT
1.2.10	Flora	ELO	ECO, Ecologist (When necessary)	SITE VISIT
1.2.11	Fauna	ELO	ECO, Ecologist (When necessary)	RECORDS REVIEW, SITE VISIT
3.1.12	Air Pollution	ELO	ECO	RECORDS REVIEW, SITE VISIT
3.1.13	Noise and Vibrations	ELO	ECO	RECORDS REVIEW, SITE VISIT
3.1.14	Energy use	ELO	ECO	RECORDS REVIEW, SITE VISIT
3.1.16	Agricultural Potential	ELO	ECO	RECORDS REVIEW, SITE VISIT

ITEM	PROJECT COMPONENT AND ACTIVITY	RESPONSIBLE PARTY	MONITORING PARTY	AUDIT TECHNIQUE
3.1.17	Employment	ESKOM, MC	ECO	RECORDS REVIEW, SITE VISIT
3.1.18	Occupational Health and Safety	MC, ELO	ECO, Safety Officer	SITE VISIT
3.1.20	Security	MC, ELO	ECO	SITE VISIT
3.1.21	Socio-economic Environment	MC, ELO	ECO	RECORDS REVIEW, SITE VISIT
3.1.22	Community Engagement	ELO	ECO	SITE VISIT
3.1.23	Visual Impact	ELO	ECO	SITE VISIT
<b>4.1</b>	<b>OPERATION ACTIVITIES</b>			
4.1.1	Construction Site Decommissioning	ESKOM		RECORDS REVIEW
4.1.2	Operation and Maintenance			RECORDS REVIEW
4.1.3	Surface and Groundwater	ESKOM		RECORDS REVIEW
4.1.4	Air Quality	ESKOM		RECORDS REVIEW
4.1.5	Noise	ESKOM		
4.1.6	Pollution Control	ESKOM		
4.1.7	Biodiversity	ESKOM, ELO		
4.1.8	Waste Management	ELO		
4.1.9	Health and Safety	ELO, SO		
4.1.10	Visual Impact	ELO		
<b>5.1</b>	<b>DECOMMISSIONING ACTIVITIES</b>			

ITEM	PROJECT COMPONENT AND ACTIVITY	RESPONSIBLE PARTY	MONITORING PARTY	AUDIT TECHNIQUE
5.1.1	Ongoing Stakeholder involvement	ELO		SITE VISIT
5.1.2	Community health and safety	ELO		
5.1.3	Waste management	ELO		
5.1.4	Surface and groundwater	ELO		
5.1.5	Biodiversity	ELO		

### 2.3.6 Environmental Audits

Table 3: Example of Procedure for Conducting Audits

Objective	To ensure that formal audits of the EMP are scheduled and performed so as to verify compliance with the requirements of the EMP.
Scope	This procedure describes the sequence of events required to perform a compliance audit and the verification of implemented corrective action
Responsibilities	<p>The ECO or a person authorised and appointed by him / her, is responsible for the maintenance of the Environmental Audit System</p> <p>The ECO is responsible for the scheduling and execution of the audit, as well as the verification of the implementation of corrective action. At his/her discretion, this authority may be delegated to responsible company personnel or to an independent Environmental Auditing Authority to perform the audit on his/her behalf.</p> <p>Auditors shall have no direct responsibility in the area/system being audited. They will be trained in techniques for auditing environmental systems.</p> <p>The head of department (HOD)/supervisor for an area/system to be audited (or a responsible person nominated by him/her) will assist the audit team in the execution of the audit. The HOD will also be responsible for timely corrective actions based on the findings of the audit.</p>
Procedure	
Planning the audit	<p>The ECO or his / her authorised delegate, shall plan the audit of a particular environmental area or system as follows:</p> <ul style="list-style-type: none"> <li>▪ He / she shall inform, in writing, the division to be audited of the intention to conduct an audit at least two weeks prior to the audit. This notification must include the audit objective, scope and duration and any assistance required from the division.</li> <li>▪ It is recommend that the audit be undertaken with the ELO present so as to facilitate the communication between the ECO and the contractor's representatives.</li> <li>▪ On completion of the audit, an audit findings sheet shall be prepared and submitted to company senior management as well as to the Department/section, which was audited.</li> <li>▪ Corrective actions shall be implemented, as soon as possible after the audit.</li> </ul>

Audit External Schedule	The external environmental audits will be scheduled annually.
Audit Check List	Auditing will be performed by collecting evidence for verification through interviews, relevant documentation and observation of activities and conditions. Instances of non-conformity to EMP criteria must be recorded. An environmental audit checklist can be used as a guide to address all relevant issues.
Audit Compliance	See below.
Audit Findings and Reporting of non-compliances	<p>The audit team shall review all evidence of their audit findings to decide on non-compliance. Audit findings of non-compliance must be documented and supported by evidence in the Audit Findings Report.</p> <p>The non-compliance findings will be communicated to the Project Manager and his representatives during an audit feedback meeting.</p> <p>The person responsible for corrective action will sign the audit findings report sheet to indicate acceptance and commitment to the required corrective action</p>

The Independent auditor will:

- Conduct audits
- Submit audit reports to ECO and relevant authority
- Engage specialist sub consultants when required.

## 2.4 Layout of Environmental Management Plan

### 2.4.1 Introduction

This Draft EMP addresses both generic issues as well as specific issues. The generic and specific issues in the EMPs are each separated into different phases. Each phase has specific issues unique to that period of the development and operation of the power lines, substations and associated infrastructure. The impact is identified and given a brief description. The phases of the development are then identified as below:

- Pre-construction (Site Establishment)
- Construction (including associated rehabilitation of affected environment)



- Operation Phase
- Decommissioning of substations

This EMP seeks to manage and keep to a minimum the negative impacts of a development and at the same time, enhance the positive and beneficial impacts.

The EMP specifies mitigation measures for the following environmental aspects:

#### 2.4.2 *Pre-construction (Site establishment)*

- Site preparation
- Consultation
- Site clearing

#### 2.4.3 *Construction*

##### [Toc260312388](#)

- Construction Camp
- Construction Traffic and Access
- Environmental Education and Training
- Soils and Geology
- Erosion Control
- Water Use and Quality
- Surface and Groundwater
- Waste Management
- Biodiversity
- Avifauna
- Air Pollution
- Noise and Vibrations
- Energy use
- Agricultural Potential
- Employment
- Occupational Health and Safety
- Security
- Socio-economic Environment
- Community Engagement
- Visual Impact
- Heritage, palaeontology and Khoisan Heritage

#### 2.4.4 Operation

- Construction Site Decommissioning
- Operation and Maintenance
- Surface and Groundwater
- Air Quality
- Noise
- Biodiversity
- Waste Management
- Visual Impact

#### 2.4.5 Decommissioning Phase

- Ongoing Stakeholder involvement
- Community health and safety
- Waste Management
- Surface and Groundwater
- Biodiversity

### 2.5 Objectives of an EMP

The objectives of this EMP are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels
- To identify measures that could optimise beneficial impacts
- To create management structures that address the concerns and complaints of I&APs with regards to the development
- To establish a method of monitoring and auditing environmental management practices during all phases of development
- Ensure that the construction and operational phases of the project continues within the principles of Integrated Environmental Management and Environmental Management System (EMS) ISO 14001 Principles
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- Ensure that the safety recommendations are complied with.
- Propose mechanisms for monitoring compliance with the EMP and reporting thereon.

- Specify time periods within which the measures contemplated in the environmental management plan must be implemented, where appropriate.

The EMP Seeks to highlight the following:

- Avoiding impacts by not performing certain actions
- Minimising impacts by limiting aspects of an action
- Rectifying impacts through rehabilitation, restoration, etc of the affected environment
- Compensating for impacts by providing substitute resources or environments
- Minimising impacts by optimising processes, structural elements and other design features
- Provide ongoing monitoring and management of environmental impacts of a development and documenting of any transgressions /good performances
- The EMP is a legally binding document that all parties involved in the project must be made aware of.

#### 2.5.1 *Environmental monitoring*

A monitoring programme will be implemented for the duration of the construction phase of the project. This programme will include:

- Monthly audits which will be conducted by the Environmental Control Officer in accordance with the EMP and conditions of the Environmental Authorisation. These audits can be conducted randomly and do not require prior arrangement with the project manager.
- Compilation of an audit report with a rating of the compliance towards the EMP. This report will be submitted to the relevant authorities.

The ECO 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 must be directed to the ECO for appraisal. A register shall be kept of all complaints from the landowner or community (Annexure A). All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

A copy of the EMP must be kept on site during the construction phase. The EMP will be made binding on all contractors operating on the site and must be included within the Contractual Clauses. Those responsible for environmental damage must pay the repair costs both to the

environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (the polluter pays principle).

## **2.6 Compliance with the EMP**

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

- Within the boundaries of the site, site extensions and access roads there is evidence of contravention of clauses;
- If environmental damage ensues due to negligence;
- The contractor fails to comply with corrective or other instructions issued by the ECO or Authorities within a specified time,
- The Contractor fails to respond adequately to complaints from the public.

Eskom is deemed not to have complied with the EMP if:

- Within the boundaries of the site there is evidence of contravention of clauses;
- If environmental damage ensues due to negligence;
- They fail to respond adequately to complaints from the public.

### *2.6.1 Method Statements*

It is Eskom standard practice that method statements for various construction-related activities be produced by the Contractor's Environmental Liaison Officer (ELO). These method statements will outline in detail how various activities must be undertaken so as not to cause any environmental damage / impacts. It is very important that these method statements be signed off by the ECO. Any changes to the method statements that are made during the construction period must be approved by the ECO. Method statements must be kept on site as part of the official environmental documentation.

### *2.6.2 Penalties for non-compliance*

Application of a penalty clause to the contractor will apply for incidents of non-compliance. The penalty imposed will be per incident and will be deducted from the contractor's monthly payment certificate. Unless stated otherwise in the project specification, the penalties imposed per incident

or violation will be pre-determined and agreed upon between the Contractor and the ECO. These will vary in amount based upon the severity and/or regularity of the incidence occurring.

The ECO in consultation and with the approval of the Senior Site Supervisor shall issue spot fines if the Contractor infringes specifications of the EMP and EA. The Contractor shall be advised in writing of the nature of the infringement and the amount of the spot fine. The Contractor shall be liable for the fine and it is his responsibility to recover the fine from the relevant employee. The Contractor (through the Environmental Officer) shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement. The Contractor is also advised that the imposition of spot fines does not replace any legal proceedings from the authorities, landowners and/or members of the public that may institute against the Contractor. Spot fines for minor offences shall be between R500.00 and R5 000.00, depending upon the severity of the infringement. The decision on how much to impose will be made by the ECO and will be final. In addition to the spot fine, the Contractor shall be required to make good any damage caused as a result of the infringement at his own expense. A preliminary list of infringements for which spot fines will be imposed is as follows:

- Using areas outside the working areas without permission/accessing “no-go areas”;
- Clearing and/or levelling area outside of the working areas;
- Littering of the site and surrounds;
- Burying waste on site and surrounds;
- The undertaking of informal ablutions
- Making fires on site;
- Spillage onto the ground or water bodies of oil, diesel, or any other potential pollutants;
- Picking/damaging plant material, especially that from the residual areas of natural bush on the site;
- Damaging/killing wild or domestic animals/birds;
- Discharging effluent and/or stormwater onto the ground or into surface water;
- Repeated contravention of the specification or failure to comply with instruction

In this context the ECO shall retain records of all fines issued. Monies for the spot fines will be deducted from the Contractors monthly certificate.

The Senior Site Supervisor, on recommendation from the ECO, may also order the Contractor to suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the EMP (i.e. more than 3 cases of infringements). The suspension will be enforced until such time as the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

### 2.6.3 Training and awareness

- Training of construction workers

The Construction Workers must receive basic training in environmental awareness, including the storage and handling of hazardous substances, minimisation of disturbance to sensitive areas, management of waste, and prevention of water pollution. They must be informed of how to recognise historical / archaeological artefacts that may be uncovered. They must also be appraised of the EMP's requirements.

- Contractor performance

The Contractor must ensure that the conditions of the Environmental Management Plan are adhered to. Should the Contractor require clarity on any aspect of the EMP the Contractor must contact the Environmental Control Officer for advice.

## 2.7 Applicable Legislation, Development Strategies and Guidelines

The following legislation applies:

- Constitution of South Africa (Act No. 108 of 1996)
- National Environmental Management Act (Act No 107 of 1998) – NEMA
- Environment Conservation Act (Act No 73 of 1989)
- National Heritage Resources Act (Act No 25 of 1999)
- National Water Act (Act No 36 of 1998)
- Hazardous Substances Act (Act No. 15 of 1973)
- Protected species – provincial ordinances
- National Forests Act (Act No 84 of 1998)
- Conservation of Agricultural Resources Act (Act No 43 of 1983)
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
- National Veld and Forest Fire Act (Act No 101 of 1998)
- Occupational Health and Safety Act (Act No 85 of 1993)
- National Environmental Management: Air Quality Act (Act No. 39 of 2004)
- Atmospheric Pollution Prevention Act (Act No. 45 of 1965)

### 3 CHAPTER 3: MITIGATION GUIDELINES

#### 3.1 Introduction

Mitigation guidelines are addressed through four phases namely Pre-construction (Site Establishment) Phase; Construction Phase (and associated rehabilitation of affected environment); Operational Phase (Post-Construction) as well as Decommissioning Phase. Each phase has specific issues unique to that period of the development and operation of the proposed infrastructure. The impact is identified and given a brief description. The four phases of the development are then identified and addressed below:

#### 3.2 Pre-construction Phase

##### 3.2.1 Site preparation

Table 4: Site preparation

IMPACT	SITE PREPARATION This section deals with the preparation of the site and actions that need to be implemented before construction commences	RESPONSIBILITY
PHASE	PRE-CONSTRUCTION	MC, ELO, ECO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>Appoint construction team and suitable manager</b></p> <ol style="list-style-type: none"><li>1. Appoint an Environmental Control Officer and Environmental Liaison Officer. The ELO is appointed on the contractor's behalf while the ECO is appointed on the proponent's behalf.</li><li>2. The Contractor must draw up method statements for relevant construction activities. The ECO must approve all of the method statements before they become operational.</li></ol> <p><b>Site demarcation and compliance</b></p> <ol style="list-style-type: none"><li>3. Before construction begins, all areas to be developed must be</li></ol>	

	<p>clearly demarcated with fencing or orange construction barrier where applicable.</p> <ol style="list-style-type: none"> <li>4. Walk-downs for avifaunal, heritage, floral, faunal and surface water issues must be undertaken prior to construction.</li> <li>5. All tower positions must be pegged by a qualified surveyor prior to the onset of construction.</li> <li>6. All existing boreholes within the power line corridor have to be identified and surveyed.</li> <li>7. The contractor and ECO must ensure compliance with conditions described in the EA.</li> <li>8. All no-go areas on the servitude must be properly fenced off / demarcated and signage placed prior to the onset of construction.</li> <li>9. Records of compliance / non-compliance with the conditions of the authorisation must be kept and be available on request.</li> <li>10. Records of all environmental incidents must be maintained and a copy of these records be made available to provincial department on request throughout the project execution.</li> </ol> <p><b>Labour</b></p> <ol style="list-style-type: none"> <li>11. All unskilled labourers must be drawn from the local market and where possible use should be made of local semiskilled and skilled personnel.</li> </ol> <p><b>Design of towers in the region of the Coega Fault</b></p> <ol style="list-style-type: none"> <li>12. The Coega Fault that runs to the north-west of the Motherwell township must be taken into account in the design and placement of the towers in this area</li> <li>13. A suitably qualified geotechnical specialist must approve the tower foundation designs in this area prior to their construction and must make recommendations to ensure the stability of these towers in the event of seismological activity</li> </ol>	
--	--	--

### 3.2.2 Consultation

Table 5: Consultation



<b>IMPACT</b>	<b>CONSULTATION</b> This section deals with the public consultation of the site and actions that need to be implemented before construction commences	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>PRE-CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<b>Consultation</b> <ol style="list-style-type: none"> <li>1. Landowners shall be informed of the starting date of construction as well as the phases in which the construction shall take place.</li> <li>2. Provide a mechanism through which information could be exchanged between the project proponent and stakeholders.</li> <li>3. Surrounding communities must be kept informed, through the identified and agreed consultation channels, of the commencement of construction.</li> <li>4. Solicit views and concerns from the public and allow them to suggest mitigations and enhancement measures.</li> </ol>	

### 3.2.3 Site Clearing

Table 6: Site Clearing

<b>IMPACT</b>	<b>SITE CLEARING</b> This section deals with site clearing and actions that need to be implemented before construction commences	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>PRE-CONSTRUCTION</b>	<b>MC</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION/ METHOD STATEMENT</b>	<b>Site clearing</b> <ol style="list-style-type: none"> <li>1. Site clearing must take place in a phased manner, as and when required.</li> <li>2. Areas which are not to be constructed on within two months must not be cleared in order to reduce erosion risks.</li> <li>3. The area to be cleared must be clearly demarcated and this footprint strictly maintained.</li> <li>4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site.</li> <li>5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.</li> </ol>	

### 3.3 Construction Phase

#### 3.3.1 Construction Camp

Table 7: Construction Camp

IMPACT	<b>CONSTRUCTION CAMP</b> This section deals with construction camp and actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	MC / ELO / ECO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>Site of construction camp</b></p> <ol style="list-style-type: none"> <li>Choice of site for the Contractor's camp requires the Project Manager and ECO's permission and must take into account location of local residents and / or ecologically sensitive areas, including flood zones. A site plan must be submitted to the Project Manager for approval.</li> <li>The size of the construction camp must be minimized (especially where natural vegetation or grassland has had to be cleared for its construction).</li> <li>Adequate parking must be provided for site staff and visitors. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.</li> <li>Suitable control measures over the Contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.</li> </ol> <p><b>Construction Camp</b></p> <ol style="list-style-type: none"> <li>All Construction Camps are to be fenced off in such a manner that unlawful entry is prevented and access is controlled. Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the Construction Camp must be controlled by a guard or otherwise monitored, to prevent unlawful access.</li> <li>The Construction camp must be set up in accordance with Eskom standards for setting of construction of camps. The ECO and Contractor must inspect this site to confirm and note any</li> </ol>	

	<p>environmental sensitivity.</p> <p>16. The construction camp layout plan must be provided to the ECO for approval prior to the construction of the camp.</p> <p>17. The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom if this does not already exist on the site.</p> <p>18. Site establishment shall take place in an orderly manner and all required amenities shall be installed at camp sites before the main workforce move onto site.</p> <p>19. All construction equipment must be stored within this construction camp.</p> <p>20. All associated oil changes etc (no servicing) must take place within this camp on a sealed surface such as a concrete slab.</p> <p>21. An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment</p> <p>22. All Construction Camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.</p> <p>23. The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the Construction Camps, and shall conform to all relevant health and safety standards and codes. No pit latrines, French drain systems or soak away systems shall be allowed and toilets may not be situated within 50 meters of any surface water body or a 1:100 year flood line. A sufficient number of toilets shall be provided to accommodate the number of personnel working in the area.</p> <p>24. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed.</p> <p>25. No fires will be allowed and the Contractor must make alternative arrangements for heating. LP Gas may be used, provided that all required safety measures are in place. The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter.</p> <p><b>Storage of materials (including hazardous materials)</b></p>	
--	---	--

	<p>26. Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary.</p> <p>27. Storage areas must be designated, demarcated and fenced if necessary.</p> <p>28. Storage areas must be secure so as to minimize the risk of crime. They must also be safe from access by unauthorised persons i.e. children / animals etc.</p> <p>29. Fire prevention facilities must be present at all storage facilities.</p> <p>30. Proper storage facilities for the storage of oils, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume, and this must be sited away from drainage lines in a site with the approval of the Project Manager. The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events.</p> <p>31. All fuel storage areas must be roofed to avoid creation of dirty stormwater</p> <p>32. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.</p> <p>33. The stormwater drainage network system must be kept separate from the sewage effluent and wastewater system.</p> <p>34. These networks must be designed and constructed in such a manner that stormwater will drain into a watercourse or into the municipal storm water system, if available in the area.</p> <p>35. Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.</p> <p>36. Storage areas containing hazardous substances / materials must be clearly signposted.</p> <p>37. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.</p>	
--	---	--

	<p>38. An approved waste disposal contractor must be employed to remove and recycle waste oil, if practical. The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</p> <p>39. All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.</p> <p>40. All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the EPCM and ECO for information. Emergency response procedures to be followed and implemented.</p> <p><b>Drainage of construction camp</b></p> <p>41. Surface drainage measures must be established in the Construction Camps so as to prevent</p> <ul style="list-style-type: none"> <li>▪ Ponding of water;</li> <li>▪ Erosion as a result of accelerated runoff; and,</li> <li>▪ Uncontrolled discharge of polluted runoff</li> </ul>	
--	---	--

### 3.3.2 Construction traffic and access

Table 8: Construction Traffic and Access

IMPACT	CONSTRUCTION TRAFFIC AND ACCESS This section deals with construction traffic and access as well as actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	MC / ELO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>Construction traffic</b></p> <p>1. 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.</p> <p>2. The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled in terms of its potential hazards according to specifications. All the</p>	

	<p>required safety labelling on the containers and trucks used shall be in place.</p> <ol style="list-style-type: none"> <li>3. 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.</li> <li>4. Construction routes and required access roads must be clearly defined</li> <li>5. No new access roads to be created through wetlands and drainage lines. Existing tracks, preferable outside of wetlands and drainage lines must be used.</li> <li>6. Access planning to all power line routes through the Longmore area must take into account the sensitivity of the area in terms the presence of endangered species in the rivers and streams in the area. Only existing forestry road access through the Longmore Plantation are to be utilised.</li> <li>7. Access planning to all power line routes through the Longmore Forest Area must take the presence of forestry operations into account. Regular liaison between the Contractor, ECO and Mountain to Oceans (MTO – the forestry operators in the area) must take place.</li> <li>8. Delivery of equipment must be undertaken with the minimum amount of trips to reduce the carbon footprint of these activities</li> <li>9. Access of all construction and material delivery vehicles must be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.</li> <li>10. Damping down of the un-surfaced access roads must be implemented to reduce dust and nuisance.</li> <li>11. Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.</li> <li>12. Servicing must be done in dedicated service areas on site or else off site if no such area exists.</li> <li>13. Oil changes must take place on a concrete platform and over a drip tray to avoid pollution.</li> <li>14. Soils compacted by construction shall be deep ripped to loosen compacted layers and re-graded to even running levels.</li> <li>15. Any temporary access roads to be rehabilitated prior to contractors leaving the site.</li> </ol> <p><b>Access</b></p> <ol style="list-style-type: none"> <li>16. The main routes on the site must be clearly signposted and printed</li> </ol>	
--	---	--

	<p>delivery maps must be issued to all suppliers and Sub-Contractors.</p> <p>17. Planning of access routes to the site for construction purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached must be documented and no verbal agreements must be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY for construction vehicles" sign.</p> <p><b>Road maintenance</b></p> <p>18. The ECO must establish and agree maintenance responsibilities with the landowner.</p> <p>19. 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</p> <p>20. Where necessary suitable measures shall be taken to rehabilitate damaged areas.</p> <p>21. Contractors must ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damages as soon as these develop.</p> <p>22. If necessary, staff must be employed to clean surfaced roads adjacent to construction sites where materials have spilt.</p> <p><b>General</b></p> <p>23. The contractor shall meet 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.</p> <p>24. The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken.</p> <p>25. Care for the safety and security of community members crossing access roads must receive priority at all times.</p>	
--	--	--

### 3.3.3 Environmental Education and Training

Table 9: Environmental Education and Training

IMPACT	ENVIRONMENTAL EDUCATION AND TRAINING This section deals with the environmental training of construction employees.	RESPONSIBILITY
PHASE	CONSTRUCTION	MC, ELO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>Environmental training</b></p> <ol style="list-style-type: none"> <li>1. Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics covered must include: <ul style="list-style-type: none"> <li>▪ What is meant by "Environment"</li> <li>▪ Why the environment needs to be protected and conserved</li> <li>▪ How construction activities can impact on the environment</li> <li>▪ What can be done to mitigate against such impacts</li> <li>▪ Awareness of emergency and spills response provisions</li> <li>▪ Social responsibility during construction e.g. being considerate to local residents</li> </ul> </li> <li>2. Environmental awareness training for all construction staff must be undertaken by the ELO prior to construction starting.</li> <li>3. The ECO must undertake training of the contractor and other main contractors (training of other staff is the responsibility of the ELO).</li> <li>4. Project manager shall ensure that the training and capabilities of the Contractor's site staff are adequate to carry out the designated tasks.</li> <li>5. It is the Contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</li> <li>6. Training must be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary.</li> <li>7. Use must be made of environmental awareness posters on site.</li> <li>8. The need for a "clean site" policy also needs to be explained to the workers.</li> <li>9. Staff operating equipment (such as excavators, cranes, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. No operator shall be permitted to operate critical items of mechanical equipment without having been</li> </ol>	



	<p>trained by the Contractor and certified competent by the Project Manager.</p> <p>10. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Manager.</p> <p>11. Environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts must be undertaken by the ELO.</p> <p>12. Staff must be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.</p> <p><b>Monitoring of environmental training</b></p> <p>13. The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator must be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended.</p>	
--	--	--

### 3.3.4 Soils and Geology

General guidelines for management of soils are provided in annexure B.

Table 10: Soils and Geology

IMPACT	SOILS AND GEOLOGY	RESPONSIBILITY
	This section deals with soils and geology and actions that need to be implemented during construction	
PHASE	CONSTRUCTION	MC/ ELO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>General</b></p> <ol style="list-style-type: none"> <li>1. Minimise disturbance of natural vegetation on the sites.</li> <li>2. Access routes must ideally be planned on areas less susceptible to erosion/ destabilization/ compaction or appropriate action must be taken to minimise impact, e.g. planning of new access routes along</li> </ol>	

	<p>contour lines and minimizing of cutting and filling operations.</p> <ol style="list-style-type: none"> <li>3. Rehabilitate soil and vegetation</li> <li>4. Implement effective erosion control measures</li> <li>5. Install silt fences</li> <li>6. Access routes must follow contour lines, avoid unconsolidated sands or sands with a low clay percentage, and steer clear of densely vegetated areas</li> <li>7. Avoid higher yielding aquifers and shallow soils, underlain by rock types with favorable aquifer attributes</li> </ol> <p><b>Topsoil</b></p> <ol style="list-style-type: none"> <li>8. The contractor must, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. Due to the length of the line, this will have to be undertaken in a number of locations due to the likely variability of soils along the route.</li> <li>9. The full depth of topsoil must be stripped from areas affected by construction (tower positions) and related activities prior to the commencement of major earthworks. This must include the building footprints, working areas and storage areas.</li> <li>10. At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites. During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that.</li> </ol> <p><b>Soil Stripping</b></p> <ol style="list-style-type: none"> <li>11. No soil stripping must take place on areas within the site that the contractor does not require for construction works or areas of retained vegetation.</li> <li>12. Subsoil and overburden in all construction and lay down areas must be stockpiled separately to be returned for backfilling in the correct soil horizon order.</li> <li>13. Construction vehicles must only be allowed to utilize existing tracks or pre-planned access routes.</li> </ol> <p><b>Soil Stockpiles</b></p>	
--	---	--

	<p>14. Stockpiles must not be situated such that they obstruct natural water pathways.</p> <p>15. Stockpiles must not exceed 2m in height unless otherwise permitted by the Engineer.</p> <p>16. If stockpiles are likely to be exposed to windy conditions or heavy rain, they must be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases.</p> <p>17. Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.</p> <p>18. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage / leakage occur must be attained and given to the project manager.</p> <p><b>Fuel storage</b></p> <p>19. Topsoil and subsoil to be protected from contamination. This must be monitored on a monthly basis by a visual inspection of diesel/oil spillage and pollution prevention facilities.</p> <p>20. Fuel and material storage must be away from stockpiles.</p> <p>21. Any storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</p> <p><b>Concrete mixing</b></p> <p>22. The concrete batching plant must be contained within a bunded area.</p> <p>23. Concrete mixing must only take place within designated areas.</p> <p>24. Ready mixed concrete must be utilised where possible.</p> <p>25. No vehicles transporting concrete to the site may be washed on site.</p> <p>26. If a batching plant is necessary, run-off must be managed effectively to avoid contamination of other areas of the site. Run-off from the batch plant must not be allowed to enter the storm water system.</p>	
--	---	--

	<p>27. The ECO shall ensure that all agreements reached with the Landowner are fulfilled, and that such areas be rehabilitated once construction is completed. Should any claim be instituted against Eskom, due to the actions of the Contractor at a batching plant site, Eskom shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.</p> <p><b>Earthworks</b></p> <p>28. Soils compacted during construction must be deeply ripped to loosen compacted layers and re-graded to even running levels. Topsoil must be re-spread over landscaped areas.</p> <p>29. It is very important that the foundation excavations for the proposed structures be inspected by an engineering geologist or geotechnical engineer prior to the placing of steel reinforcement or concrete in order to determine that the structure is being founded upon the correct material, and also to detect whether any active layers have been exposed by the foundation excavation.</p> <p><b>Coega Fault</b></p> <p>30. The Coega Fault that runs to the north-west of the Motherwell township must be taken into account in the design and placement of the towers in this area.</p> <p>31. Avoid areas in 300m buffer surrounding the Coega fault</p> <p>32. A suitably qualified geotechnical specialist must approve the tower foundation designs in this area prior to their construction and must make recommendations to ensure the stability of these towers in the event of seismological activity</p> <p>▪</p>	
--	---	--

### 3.3.5 Erosion Control

Table 11: Erosion Control

IMPACT	EROSION CONTROL	RESPONSIBILITY
	This section deals with erosion and actions that need to be implemented during construction	

PHASE	CONSTRUCTION	ECO
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<ol style="list-style-type: none"> <li>1. Wind screening and stormwater control must be undertaken to prevent soil loss from the site.</li> <li>2. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</li> <li>3. Other erosion control measures that can be implemented are as follows: <ul style="list-style-type: none"> <li>▪ Brush packing with cleared vegetation</li> <li>▪ Mulch or chip packing</li> <li>▪ Planting of vegetation</li> <li>▪ Hydroseeding / hand sowing</li> </ul> </li> <li>4. Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.</li> <li>5. The entire Longmore Forest Area needs to be designated as sensitive due to the presence of the endangered Hewitt's Ghost Frog in the streams in the area. A strong emphasis needs to be placed on the prevention of erosion anywhere in this area, as eroded material could be transported into the rivers as silt, thus degraded the aquatic environment. Any erosion that emerges must be immediately remediated. Both erosion and destabilization can, to a degree, be addressed by minimizing disturbance of natural vegetation on the sites.</li> <li>6. Access routes must be planned on areas less susceptible to erosion/destabilization/compaction or appropriate action must be taken to minimize impact, e.g. planning of new access routes along contour lines and minimizing of cutting and filling operations.</li> <li>7. Zones directly adjacent to Coega fault must be avoided.</li> <li>8. All erosion control mechanisms need to be regularly maintained.</li> <li>9. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.</li> <li>10. Retention of vegetation where possible to avoid soil erosion</li> <li>11. Vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</li> <li>12. Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with indigenous grasses.</li> <li>13. No impediment to the natural water flow other than approved erosion control works is permitted.</li> </ol>	

	<p>14. To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</p> <p>15. Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.</p> <p>16. No new access roads to be construction through drainage lines and wetlands. Only existing roads must be used.</p> <p><b>Run-off</b></p> <p>17. Culverts must be constructed under roadways that cross the natural flow of water in order to prevent damming.</p> <p>18. Oil traps must be installed to remove the bulk of the oil from the stormwater, which water can then be used on haul roads for dust suppression or as wash down water in the wash bays.</p>	
--	---	--

### 3.3.6 Water Use and Quality

Table 12: Water Use and Quality

IMPACT	WATER USE AND QUALITY This section deals with water use and quality as well as actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	ECO
MITIGATION / METHOD STATEMENT	<p><b>Water Use</b></p> <ol style="list-style-type: none"> <li>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users</li> <li>2. No water must be abstracted from a natural water body unless authorised under a General Authorisation under the National Water Act, or unless authorised by the Department of Water Affairs through a water use licence if such a licence is required.</li> <li>3. No water must be abstracted from any stream or river in the Longmore Area due to the sensitivity of the rivers and streams in this area.</li> <li>4. Water must be reused, recycled or treated where possible.</li> <li>5. Consultation with key stakeholders to understand any conflicting water use demands and the communities' dependency on water resources and conservation requirements within the area.</li> <li>6. The construction team must take into account the presence of springs on rural properties, especially in cases where those springs are used to supply water to the farm. All landowner requirements in this account must be taken into account. All springs / wells must be clearly demarcated as no go areas and only used subject to the agreement of the owner of the property.</li> </ol> <p><b>Water Quality</b></p> <ol style="list-style-type: none"> <li>7. Discharge to surface water must not result in contaminant concentrations in excess of DWA standards.</li> <li>8. Efficient oil and grease traps or sumps must be installed and maintained at re-fuelling facilities, workshops, fuel storage depots, and containment areas and spill kits must be available with emergency response plans.</li> </ol>	Engineer

	<p><b>Stormwater</b></p> <p>9. The construction site / areas must be managed in order to prevent pollution of downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.</p> <p>10. Silt fences must be used to prevent any soil entering nearby watercourses and becoming silt that would pollute these.</p> <p>11. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.</p> <p>12. Promote a water saving mind set with construction workers in order to ensure less water wastage.</p> <p>13. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency.</p> <p>14. Earth, stone and rubble is to be properly disposed of, or utilised on site so as not to obstruct natural water path ways over the site (i.e. these materials must not be placed in stormwater channels, drainage lines or rivers).</p> <p>15. If a batching plant is necessary, run-off must be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas.</p> <p><b>Groundwater resource protection</b></p> <p>16. The Coega fault poses a sizeable limitation to development from an aquifer pollution point of view, therefore areas in 300m buffer surrounding the Coega fault must be avoided.</p>	
--	--	--

### 3.3.7 Surface and Groundwater

Table 13: Surface and Groundwater

IMPACT	SURFACE WATER AND GROUNDWATER This section deals with surface and groundwater and actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	ECO / Main Contractor



ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	Surface Water Features	
	<ol style="list-style-type: none"> <li>1. All surface water features i.e. rivers and wetlands must be spanned by the power lines and that towers are located out of their buffer zones as assigned by the wetland assessment. This is particularly important for drainage areas within the Longmore area due to the presence of the Hewitt's Ghost Frog.</li> <li>2. Alignment must avoid all wetlands too wide to be spanned</li> <li>3. No new roads must be constructed across any surface water features. Existing road accesses across surface water features must be used, and if necessary the road crossing must be upgraded / improved to allow construction traffic to pass over it without impacting the surface water resource</li> <li>4. Particular care must be taken to prevent erosion and siltation into watercourses.</li> <li>5. Site staff shall not be permitted to use any open water body or natural water resource adjacent to or within the construction areas for the purposes of bathing, washing of clothing or for any construction or related activities (unless the appropriate permit has been obtained from the Department of Water Affairs - DWA).</li> <li>6. Municipal water (or another source approved by the ECO) must instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.</li> <li>7. Relevant departments and other emergency services must be contacted in order to deal with spillages and contamination of aquatic environments.</li> <li>8. Disturbed surfaces must be kept to a minimum. All surfaces must be rehabilitated with indigenous vegetation, especially grass species, as soon as construction activities are complete.</li> <li>9. Storm water management must be enforced by monitoring runoff levels. At the start of erosion, accelerated run-off must be diverted away from bare soil.</li> <li>10. After construction, the site should be graded to ensure free flow of runoff and to prevent ponding of water.</li> <li>11. Drainage must be controlled to ensure that runoff from the site will not culminate in offsite pollution or cause water damage to properties further down from the site.</li> <li>12. Storm water management Plan should ensure that the ultimate flow from the development does not result in any negative</li> </ol>	

	<p>impacts on downstream properties or watercourse and must therefore ensure that stormwater is managed within the overall site as effective as possible.</p> <p>13. This storm water management plan must be submitted to the Department of Water Affairs prior to construction.</p> <p><b>Hazardous materials</b></p> <p>14. Use and or storage of materials, fuel and chemicals which could potentially leak into the ground must be controlled.</p> <p>15. All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</p> <p>16. Any hazardous substances must be stored at least 50m from any of the water bodies on site, and 150m away from any water bodies .</p> <p>17. The Contractor (monitored by the ECO and ELO) must be responsible for ensuring that potentially harmful materials are properly stored in a dry, secure, ventilated environment, with concrete or sealed flooring and a means of preventing unauthorised entry.</p> <p>18. Contaminated wastewater must be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the construction camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.</p> <p>19. Any chemical, solid waste and contaminated water which may be generated from the proposed activity must not pose any adverse impact on identified dams.</p> <p>20.</p> <p><b>Concrete mixing</b></p> <p>21. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth</p> <p>22.</p> <p><b>Public areas</b></p>	
--	--	--

	<p>23. Food preparation areas must be provided with adequate washing facilities and food refuse must be stored in sealed refuse bins and removed from site on a regular basis.</p> <p>24. The contractor must take steps to ensure that littering by construction workers does not occur and persons must be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>25. No washing or servicing of vehicles on site.</p>	
--	---	--

### 3.3.8 Waste Management

Table 14: Waste Management

<b>IMPACT</b>	<b>WASTE MANAGEMENT</b> This section deals with waste management and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<p><b>General Waste management</b></p> <ol style="list-style-type: none"> <li>1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</li> <li>2. Where considerable quantities of waste are generated, this must be placed in 200 litre bins or skip containers and removed once full. Additionally, the generated waste will need to be transported to a registered landfill site. These must be kept covered and arrangements made for them to be collected regularly.</li> <li>3. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill.</li> <li>4. A housekeeping team must be appointed to regularly maintain the litter and rubble situation on the construction site and in the construction camp.</li> <li>5. In general, any litter must be cleared immediately.</li> <li>6. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal, wood and then be</li> </ol>	

	<p>recycled. An independent contractor can be appointed to conduct this recycling.</p> <p>7. Littering by the employees 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.</p> <p>8. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours.</p> <p>9. 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.</p> <p>10. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant.</p> <p>11. Under no circumstances may solid waste be burnt on site.</p> <p>12. It is important that the contractors (and sub-contractors by implication) and workers must be informed of the facilities and procedures available for the disposal of waste.</p> <p>13. Any chemical, solid waste and contaminated water which may be generated from the proposed activity must not pose any adverse impact on identified dams.</p> <p>14. Chemical or ablution toilet facilities to be used on-site during construction phase of the project to be used by construction workers must be located more than 100 meters away from the edge of identified dams.</p> <p><b>Hazardous waste</b></p> <p>15. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of off site at a licensed landfill site, where practical. Incineration may be used where relevant.</p> <p>16. Contaminants to be stored safely to avoid spillage.</p> <p>17. Machinery must be properly maintained to keep oil leaks in check</p> <p>18. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated</p> <p><b>Sanitation</b></p> <p>19. The Contractor shall install mobile chemical toilets on the site.</p>	
--	---	--

	<p>20. Staff shall be sensitised to the fact that they must use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</p> <p>21. Ablution facilities shall be within 50m from workplaces and not closer than 50m from any natural water bodies or boreholes. There must be enough toilets available to accommodate the workforce (minimum requirement 1: 15 workers). Male and females must be accommodated separately where possible.</p> <p>22. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</p> <p>23. Toilets must be no closer than 50m from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. In the Longmore area this distance must be increased to 150m.</p> <p>24. Under no circumstances may open areas or the surrounding bush be used as a toilet facility.</p> <p>25. The construction of "Long Drop" toilets are forbidden, but rather toilets connected to a sewage treatment plant or chemical toilets.</p> <p>26. Potable water must be provided for all construction staff.</p> <p><b>Remedial actions</b></p> <p>27. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>28. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</p> <p>29. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</p> <p>30. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>31. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>32. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>33. Contaminated remediation materials must be carefully removed</p>	
--	--	--

	from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.	
--	---	--

### 3.3.9 Biodiversity

Table 15: Biodiversity

<b>IMPACT</b>	<b>BIODIVERSITY</b> This section deals with Biodiversity and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<p><b>Existing vegetation</b></p> <ol style="list-style-type: none"> <li>1. Vegetation removal must be limited to tower positions where at all possible, and vegetation must not be cleared under the lines unless it is a technical requirement. This is particularly important in areas of thicket (valley bushveld) vegetation where the clearing of vegetation would create a visible 'scar' in the landscape that would be associated with a visual impact.</li> <li>2. Only vegetation within the footprint must be removed.</li> <li>3. Vegetation is to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step.</li> <li>4. Vegetation clearing on tower sites must be kept to a minimum. Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide.</li> <li>5. Smaller vegetation can be flattened with a machine, but the blade must be kept above ground level to prevent scalping. Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.</li> <li>6. Trees and vegetation not interfering with the statutory clearance to the conductors can be left under the line. Dense vegetation under the line which could cause a fire hazard, particularly in the middle third of the span in the vicinity of the lowest point of the conductors, will be considered as a separate case.</li> </ol>	

	<p>7. Upon completion of the stringing operations and before handover, the servitude must be inspected and all vegetation interfering with the safe operation of the line shall be removed / cut down.</p> <p>8. Existing access roads must be utilised as much as possible. If access is require across natural vegetation, this must be limited to a two land access track with no major clearing. It is critical that thicket clearing is kept to an absolute minimum due to the sensitivity of this vegetation to clearing. Spanning is possible across this vegetation particularly with power lines of this size.</p> <p>9. Wetlands must not be affected where at all practical.</p> <p>10. The construction of towers in areas of steep slopes (e.g. mountain sides, especially in the Longmore area) must ideally be accessed by helicopter unless there is an access road located in close proximity in order to reduce the need for vegetation disturbance.</p> <p>11. Also, areas of poorly protected vegetation must be preserved as much as possible in order to avoid further impacts on these already heavily impacted vegetation units. Examples of these include Albany Alluvial Vegetation (associated with the rivers in the study area), Eastern Coastal Shale Band Vegetation and Humansdorp Shale Renosterveld.</p> <p>12. Indigenous vegetation occurring within valleys and kloofs that are crossed by the power lines must be treated as highly sensitive, and not to be disturbed. These kloofs must be spanned, and towers must be placed on the edges of the kloofs on level ground where possible, as level ground is typically more transformed.</p> <p>13. Permits from DAFF for removal of any protected tree species must be in place.</p> <p>14. All riparian vegetation must be treated as being sensitive, and must be demarcated as being a no go area.</p> <p>15. Materials must not be delivered to the site prematurely which could result in additional areas being cleared or affected.</p> <p>16. No vegetation to be used for firewood.</p> <p><b>Fauna occurring in the study area</b></p> <p>17. Use of appropriate construction techniques is critical</p> <p>18. No trapping, snaring or killing of fauna on the construction site is allowed.</p>	
--	---	--

	<p>19. No faunal species must be harmed by maintenance staff during any routine maintenance at the development.</p> <p>20. Pits and excavations must be regularly checked for animals that may have fallen in.</p> <p>21. Animals occurring on site must be left alone. The ECO must be consulted and before removing any animals obstructing construction activities. The ECO will provide assistance in their removal.</p> <p>22. The entire Longmore Area must be treated as sensitive due to the presence of the Hewitt's Ghost Frog in the streams and rivers in the area. Streams and rivers in this area must be strictly maintained as no go areas and must not be affected in any way by construction activities. In this context strict attention must be paid to preventing erosion and resultant siltation into streams.</p> <p><b>Demarcation of construction and lay-down areas</b></p> <p>23. All plants not interfering with the construction shall be left undisturbed clearly marked and indicated on the site plan.</p> <p>24. The construction areas must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.</p> <p>25. Vegetation removal must be phased in order to reduce impact of construction.</p> <p>26. Construction site office and lay-down areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>27. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.</p> <p><b>Utilisation of resources</b></p> <p>28. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</p> <p><b>Exotic vegetation</b></p> <p>29. Alien vegetation on the site will need to be controlled.</p>	
--	--	--



	<p>30. The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.</p> <p>31. The spread of exotic species occurring throughout the site must be controlled.</p> <p>32. The removal of all existing alien invasive vegetation in the construction footprint is recommended. This vegetation must be carefully removed to avoid the creation of erosion or the spreading of seeds of these species.</p> <p><b>Herbicides</b></p> <p>33. Herbicide use shall only be allowed 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.</p> <p>34. The use of pesticides and herbicides on the site must be discouraged. This impacts on important pollinator species of indigenous vegetation.</p>	
<b>Site Specific Mitigation Measures</b>		
	<p>35. A walk down of the route by the biodiversity specialist must take place when tower locations and access requirements are finalised to ensure that any sensitive faunal or floral species are not affected by the location of the tower</p> <p>36. An on-site ecologist must be present when excavation takes place to ensure that any uncovered species are protected from destruction (It is important to remember that even though these species have not been encountered, they could be in a dormant stage and suddenly arise during construction due to more favourable conditions).</p> <p>37. Demarcation of sensitive areas prior to construction activities starting as per the sensitivity map.</p> <p>38. Prior to construction in areas of natural vegetation, the ELO and ECO must contact the Hopewell Conservancy (Brian Corrigan) to allow the Hopewell Conservancy to be able to salvage any indigenous plant species that are to be removed / destroyed through construction activities. The responsibility for this removal</p>	

	<p>of the plants would lie with the conservancy and not the contractor</p> <p>39. Intensive environmental audits (frequently in sensitive areas) by an independent party during this construction period.</p> <p>40. A copy of the Environmental Management Programme as well as the specialist studies must be present at the construction site for easy reference to specialist recommendations in sensitive areas.</p> <p>41. It is recommended that the construction crew be educated about the sensitivities involved in these areas as well as the potential species they could encounter. A poster of sensitive species (compiled by a qualified specialist) must be kept on the construction site for easy reference.</p> <p>42. Where possible, construction must take place during winter i.e. the dormant stage to minimise impacts on vegetation during the growing season.</p> <p>43. All natural areas impacted during construction must be rehabilitated with locally indigenous species.</p> <p>44. Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>45. Rehabilitation must take place as soon as construction is complete to avoid the edge effect, the infiltration of alien species and soil erosion around the study area.</p> <p>46. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</p> <p>47. The use of pesticides and herbicides in the study area must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p>48. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.</p> <p>49. If any Alluvial Albany Vegetation (AAV) and Humansdorp Shale Renosterveld red data or endemic species are encountered, they are either to be avoided or translocated into a protected site which supports AAV vegetation. The translocation process must be overseen by the ECO to ensure careful and successful re-planting.</p> <p>50. The appointed ECO must be suitably qualified to be able to identify red data species, must any occur along the finalised</p>	
--	--	--

	alignment. 51. No indigenous plant matter is to be collected without the appropriate permit.	
--	---	--

### 3.3.10 Avifauna

<b>IMPACT</b>	<b>AVIFAUNA</b> This section deals with avifauna issues as well as actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<ol style="list-style-type: none"> <li>1. A detailed walk down of the tower positions to be undertaken once these tower positions have been finalised</li> <li>2. Fitting anti-collision marking devices onto spans (these will be identified during the avifaunal specific walk down)</li> <li>3. Minimise the impact of habitat destruction during the construction phase. Exact measures will be highlighted in the site specific EMP and will include measures such as using all existing roads, not clearing vegetation under the power lines as and when possible, etc.</li> <li>4. During the avifaunal “walk through” prior to construction, any nesting sites of the mentioned species will be identified and case specific recommendations provided. The Environmental Control Officer must also identify any breeding birds along the servitude. These breeding sites can then be managed appropriately.</li> </ol>	

### 3.3.11 Air Quality

<b>IMPACT</b>	<b>AIR QUALITY</b> This table deals with mitigation measures to prevent air pollution	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		

<b>MITIGATION METHOD STATEMENT</b>	<b>Dust control</b> <ol style="list-style-type: none"> <li>1. Wheel washing and damping down of un-surfaced and un-vegetated areas must occur in areas close to potential receptors of dust pollution. The ECO and ELO must identify these areas prior to construction starting in that particular area or prior to construction traffic needing to move along unsurfaced roads in certain areas.</li> <li>2. Retention of vegetation where possible will reduce dust travel</li> <li>3. Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>4. The ELO must monitor weather forecasts relating to periods of expected high winds; dust control methods such as damping down must be undertaken regularly when high winds are forecast for the study area.</li> <li>5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to sensitive receptors such as the Landowner, neighbouring communities.</li> <li>6. Dust generation must be kept to a minimum and suppressed on access roads and construction areas during dry periods. This can be accomplished by the regular application of water or a biodegradable soil stabilisation agent.</li> <li>7. Speed limits on un-surfaced roads must not be exceeded.</li> <li>8. Speed limits for construction vehicles must be clearly signposted and must be monitored by the ELO and ECO</li> <li>9. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the ELO under the supervision of the ECO.</li> </ol>	
--	---	--

### 3.3.12 Noise and Vibrations

Table 16: Noise and Vibrations

IMPACT	NOISE This section deals with noise and actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	ELO
ENVIRONMENTAL MANAGEMENT PLAN		

<b>MITIGATION METHOD STATEMENT</b>	/ <ol style="list-style-type: none"> <li>1. The construction phase must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</li> <li>2. Truck traffic must be routed away from noise sensitive areas, where possible.</li> <li>3. Noise levels must be kept within acceptable limits.</li> <li>4. Noisy operations must be combined so that they occur where possible at the same time.</li> <li>5. Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive areas must not be allowed.</li> <li>6. Construction workers to wear necessary ear protection gear.</li> <li>7. Noisy activities to take place during allocated construction hours</li> <li>8. Noise from labourers must be controlled.</li> <li>9. Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the contractor may be instructed to remove the offending vehicle or machinery from site</li> <li>10. The contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the contractor or his Sub-Contractors by the contractors own transport.</li> <li>11. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.</li> <li>12. Should blasting be required, the contractor will need to obtain a blasting permit. Moreover, the contractor must make the public aware of when blasting is to take place as well as the specific times of blasting. Blasting activities must take place at reasonable times and during daily working hours.</li> </ol>	
--	--	--

### 3.3.13 Energy use

Table 17: Energy use

<b>IMPACT</b>	<b>ENERGY USE</b> This section deals with energy use and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<ol style="list-style-type: none"> <li>1. Energy saving lighting must be implemented across the board within the construction camp and where any temporary offices are located.</li> <li>2. Water saving measures must be implemented.</li> <li>3. Equipment not in use must be switched off and unplugged to save on unnecessary energy costs.</li> </ol>	

### 3.3.14 Agricultural Potential

Table 18: Agricultural Potential

<b>IMPACT</b>	<b>AGRICULTURAL POTENTIAL</b> This section deals with agricultural potential and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ECO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<ol style="list-style-type: none"> <li>1. All centre pivot irrigation and important agricultural infrastructure must be avoided by the proposed power lines. Careful tower placement and consultation with the affected land owner will reduce the predicted impacts. It is strongly recommended that the EIA Team-preferred alignments for both corridors be used as these avoid sensitive areas from an agricultural perspective as far as possible. Growing crops must be disturbed as little as possible.</li> <li>2. Interact with landowners to discuss where they would ideally like to see the power lines situated on their property to have the least impact on their farming practices, the negotiation phase forms part of the final survey/line route selection.</li> <li>3. Employ a low impact routing to avoid / skirt high value agricultural</li> </ol>	

	<p>land (centre pivot irrigation, chicken broiler farms, orchards) and important agricultural infrastructure. This is particularly important for the various agricultural hot spots identified in this study</p> <ol style="list-style-type: none"> <li>4. Land owners who undertake crop cultivation must be consulted as to when harvesting of crops is expected. Construction activities through these areas must not interfere with harvesting activities, and must ideally occur when fields are fallow.</li> <li>5. Construction activities must take into account the presence of livestock that is kept within camps. In such areas access control must be strictly maintained, with only the necessary personnel accessing these areas in order to minimise the risk of stock moving into other camps and to ensure that no stock theft occurs.</li> <li>6. All boreholes / wells must be recorded along the alignment prior to the construction of the lines. Any boreholes falling within the planned servitude must either be moved (i.e. another borehole drilled) or the alignment must be shifted, as boreholes located under power lines are unable to be serviced.</li> <li>7. Avoid forestry areas as far as possible or use existing fire breaks and run along roads / tracks between forestry blocks in commercial plantations as opportunities to traverse these areas to avoid the loss of existing trees.</li> <li>8. The utilisation of optimal tower designs (generally the guyed suspension tower is preferred) when crossing active crop land (e.g. maize) to further reduce the potential impacts.</li> <li>9. Attempt to place towers on the edge of existing agricultural areas and span active agricultural fields as far as possible.</li> <li>10. Ensure adequate compensation is paid to land owners where necessary.</li> <li>11. Keep vegetation and soil disturbance to a minimum.</li> <li>12. Avoid placing towers on steep slopes.</li> <li>13. Stabilise disturbed areas.</li> <li>14. Retain vegetation sods for remediation efforts.</li> </ol>	
--	--	--

### 3.3.15 Employment

Table 19: Employment

IMPACT	EMPLOYMENT	RESPONSIBILITY
--------	------------	----------------

ESKOM TRANSMISSION  
TTLIP - Environmental Management Plan  
Revision No. 2  
24 January 2013

prepared by: SiVEST Environmental

	<b>This section deals with employment and actions that need to be implemented during construction</b>	
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>MC</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION METHOD STATEMENT</b>	<p><b>Labour</b></p> <ol style="list-style-type: none"> <li>1. The use of labour intensive construction measures must be used where appropriate.</li> <li>2. Training of labour to benefit individuals beyond completion of the project.</li> </ol> <p><b>Recruitment Plan</b></p> <ol style="list-style-type: none"> <li>3. All unskilled labourers must be drawn from the local market i.e. and where possible use must be made of local semiskilled and skilled personnel.</li> <li>4. When unskilled labour is required, the contractor must use the local department of labour, local municipality structures and community leaders to assist in sourcing the labour.</li> <li>5. Local suppliers to be used where possible</li> <li>6. Ensure adequate advertising in the project community areas, local papers for skilled labour. Adverts will be placed in each area where the public meetings were conducted.</li> <li>7. The recruitment process must be equitable and transparent. A concerted effort will be made to guard against nepotism and/or any form of favouritism during the process</li> <li>8. The informal daily recruitment of workers at the construction camp must be avoided in order to prevent the congregation and loitering of job seekers at the construction camp.</li> <li>9. The recruitment of skilled labour will follow standard advertising process in national newspapers and interview based selection</li> <li>10. Record of official complaints by employees to authorities i.e. Labour and Social Security (Annexure A for complaints record sheet).</li> </ol>	

### 3.3.16 Occupational Health and Safety



Table 20: Occupational Health and Safety

IMPACT	HEALTH AND SAFETY This section deals with health and safety and actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	MC/ SAFETY OFFICER
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION METHOD STATEMENT	<p data-bbox="496 568 683 600"><b>Worker safety</b></p> <ol style="list-style-type: none"> <li>1. Safety measures for work procedures must be implemented.</li> <li>2. First aid kits must be available and accessible on site.</li> <li>3. A health and safety plan in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) must be drawn up by the Contractor and approved by the ECO to ensure worker safety.</li> <li>4. Workers must be thoroughly trained in using potentially dangerous equipment</li> <li>5. Contractors must ensure that all equipment is maintained in a safe operating condition.</li> <li>6. A safety officer must be appointed.</li> <li>7. A record of health and safety incidents must be kept on site.</li> <li>8. Any health and safety incidents must be reported to the Project Manager immediately.</li> <li>9. First aid facilities must be available on site at all times and a number of employees trained to carry out first aid procedures.</li> <li>10. Workers have the right to refuse work in unsafe conditions.</li> <li>11. The Contractor shall take all the necessary precautions against the spreading of disease such as measles, foot and mouth, etc. especially under livestock.</li> <li>12. A record shall be kept of drugs administered to construction staff or precautions taken and the time and dates when this was done. This can then be used as evidence in court should any claims be instituted against Eskom or the Contractor.</li> <li>13. The contractor must ensure that all construction workers are well educated about HIV/ AIDS and the risks surrounding this disease. The location of the local clinic where more information and counselling is offered must be indicated to workers.</li> <li>14. Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents.</li> </ol>	

	<p><b>Worker facilities</b></p> <p>15. Eating areas must be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.</p> <p>16. Fires are not to be allowed outside controlled areas.</p> <p>17. Ablution toilet facilities to be used by construction workers during the construction phase of the project must be regularly emptied and their content must be disposed of into a permitted Wastewater Treatment Works.</p> <p><b>Hazardous substances</b></p> <p>18. Working areas must be provided with adequate ventilation and dust/fume extraction systems to ensure that inhalation exposure levels for potentially corrosive, oxidizing, reactive or siliceous substances are maintained and managed at safe levels.</p> <p>19. Eye wash and emergency shower systems must be provided in areas where there exists the possibility of chemical containment of workers and the need for rapid treatment.</p> <p><b>Electrical Safety and isolation</b></p> <p>20. Use of electrical safety devices on all final distribution circuits and appropriate testing schedules applied to such safety systems.</p> <p>21. All sources of hazardous energy or hazardous substances must have written procedures for isolation, identifying how the system, plant or equipment can be made and kept safe.</p> <p><b>Physical Hazards</b></p> <p>22. Geotechnical safety - Planning, designing and operating all structures such that geotechnical risks are appropriately managed.</p> <p><b>Machine and Equipment</b></p> <p>23. Use of contrast colouring on equipment/machinery including the provision of reflective markings to enhance visibility</p>	
--	--	--

	<p>24. Use of moving equipment/machinery equipped with improved operator sight lines</p> <p>25. Issuing workers with high visibility clothing</p> <p>26. Use of reflective markings on structures, traffic junctions, and other areas with a potential for accidents</p> <p>27. Installing safety barriers in high risk locations</p> <p><b>Fitness for work</b></p> <p>28. Review shift management systems to minimize risk of fatigue. Establish alcohol and other drugs policy for the operation.</p> <p><b>Travel and remote site health</b></p> <p>29. Develop programs to prevent both chronic and acute illnesses through appropriate sanitation and vector control systems.</p> <p>30. Where food is prepared, food preparation storage and disposal must be reviewed regularly and monitored to minimise risk of illness.</p> <p><b>Protective gear</b></p> <p>31. Personal Protective Equipment (PPE) must be made available to all construction staff and must be compulsory. Hard hats and safety shoes must be worn at all times and other PPE worn where necessary i.e. dust masks, ear plugs etc.</p> <p>32. No person is to enter the site without the necessary PPE.</p> <p><b>Site safety</b></p> <p>33. The construction camp must remain fenced for the entire construction period.</p> <p>34. Potentially hazardous areas are to be demarcated and clearly marked</p> <p>35. Adequate warning signs of hazardous working areas.</p> <p>36. Emergency numbers for local police and fire department etc must be placed in a prominent area.</p> <p>37. Fire fighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire</p>	
--	---	--

	<p>extinguishers, a fire blanket as well as a water tank.</p> <p>38. Suitable conspicuous warning signs in English and all other applicable languages must be placed at all entrances to the site.</p> <p>39. All speed limits must be adhered to.</p> <p><b>Construction equipment safety</b></p> <p>40. All equipment used for construction must be in good working order with up to date maintenance records.</p> <p><b>Hazardous Material Storage</b></p> <p>41. Staff that will be handling hazardous materials must be trained to do so.</p> <p>42. Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor.</p> <p>43. All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material. These areas must be roofed to avoid contamination of stormwater.</p> <p>44. Material Safety Data Sheets (MSDS) which contain the necessary information pertaining to a specific hazardous substance must be present for all hazardous materials stored on the site.</p> <p><b>Procedure in the event of a petrochemical spill</b></p> <p>45. A spill kit needs to be kept on site to address any unforeseen spillages.</p> <p>46. The individual responsible for or who discovers the petrochemical spill must report the incident to the Project Manager, Contractor or ECO.</p> <p>47. The problem must be assessed and the necessary actions required will be undertaken.</p> <p>48. The immediate response must be to contain the spill.</p> <p>49. The source of the spill must be identified, controlled, treated or removed wherever possible.</p>	
--	---	--

	<p><b>Fire management</b></p> <p>50. Fire fighting equipment must be present on site at all times.</p> <p>51. All construction staff must be trained in fire hazard control and fire fighting techniques.</p> <p>52. All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.</p> <p>53. No open fires will be allowed on site.</p> <p>54. Smoking may only be conducted in demarcated areas.</p> <p><b>Safety of surrounding residents</b></p> <p>55. All I &amp; AP's must be notified in advance of any known potential risks associated with the construction site and the activities on it. Examples of these are:</p> <ul style="list-style-type: none"> <li>▪ Earthworks / earthmoving machinery on steep slopes above houses / infrastructure</li> <li>▪ Risk to residence along haulage roads / access routes</li> <li>▪</li> </ul> <p><b>Emergency evacuation plan</b></p> <p>56. Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency.</p> <p>57. All permanent staff must undergo safety training.</p> <ul style="list-style-type: none"> <li>▪</li> </ul> <p><b>Maintenance</b></p> <p>58. The corridor and surrounding areas are to be regularly maintained. A maintenance schedule must be drawn up and records of all maintenance kept.</p>	
--	---	--

### 3.3.17 Security

Table 21: Security

IMPACT	SECURITY	RESPONSIBILITY
--------	----------	----------------

ESKOM TRANSMISSION  
TTLIP - Environmental Management Plan  
Revision No. 2  
24 January 2013

prepared by: SiVEST Environmental

	<b>This section deals with security and actions that need to be implemented during construction</b>	
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>MC /SAFETY OFFICER</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION METHOD STATEMENT</b>	/ <ol style="list-style-type: none"> <li>1. A security company must be employed to guard the construction camp and monitor access.</li> <li>2. Labour must be transported to and from the site to discourage loitering in adjacent areas and possible increase in crime or disturbance.</li> <li>3. Unsocial activities such as consumption or illegal selling of alcohol, drug utilisation or selling and prostitution on the construction area or in and around the construction camp shall be prohibited. Any persons found to be engaged in such activities must receive disciplinary or criminal action taken against them.</li> <li>4. Only pre-approved staff must be permitted to stay within the staff accommodation which will be provided.</li> <li>5. The site shall be fenced, where necessary to prevent any loss or injury to persons during the construction phase.</li> <li>6. During periods of temporary site closure, the site must be secured to ensure no access to the site. This applies to the construction camp as well.</li> <li>7. No alcohol / drugs to be present on site.</li> <li>8. No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).</li> <li>9. No harvesting of firewood from the site or from the business property adjacent to it without prior consent from the ECO.</li> <li>10. Construction staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility are forbidden).</li> <li>11. Trespassing on private / commercial properties adjoining the construction areas is forbidden.</li> <li>12. All landowner requirements in terms of safety such as closing of gates, access to properties etc. must be fully adhered to.</li> <li>13. The ELO must timeously inform affected landowners where construction is to occur of the onset of the construction process.</li> <li>14. Driving under the influence of alcohol is prohibited.</li> <li>15. All employees must undergo the necessary safety training and wear the necessary protective clothing.</li> </ol>	

	16. The site must be secured in order to reduce the opportunity for criminal activity in the locality of the construction site.	
--	---	--

### 3.3.18 Socio-economic Environment

Table 22: Socio-economic Environment

<b>IMPACT</b>	<b>SOCIO-ECONOMIC ENVIRONMENT</b> This section deals with Socio-economic Environment and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>MC / ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION</b>	<ol style="list-style-type: none"> <li>1. All contact with the affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times.</li> <li>2. The successful completion of the project depends greatly on good relations with Landowners. The Contractor's Environmental Officer will thus be the liaison officer for the entire contract.</li> <li>3. The appointed ECO used during construction must have the necessary knowledge and skills to identify social problems and address these when necessary.</li> <li>4. The ELO shall be available to investigate all problems arising on the work sites concerning the Landowner</li> <li>5. All negotiations for any reason shall be conducted between the ECO, the Landowner and the Contractor (ELO) with the ECO present.</li> <li>6. No verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation.</li> <li>7. The Landowner shall always be kept informed by the ELO about any changes to the construction programme should they be affected.</li> <li>8. The contact numbers of the ELO and the Eskom ECO shall be made available to affected landowners. This will ensure open channels of communication and prompt response to queries and claims.</li> <li>9. A complaints register must be kept on site (A complaints record</li> </ol>	

	<p>sheet is provided in annexure A). Details of complaints must be incorporated into the audits as part of the monitoring process. This must be in carbon copy format, with numbered pages. Any missing pages must be accounted for by the Contractor.</p> <p>10. Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. A record of all damage and remedial actions shall be kept on site.</p> <p>11. 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.</p> <p>12. Care must be taken not to damage irrigation equipment, lines, channels and crops, as this could lead to major claims being instituted against Eskom and the Contractor.</p> <p>13. Neighbouring landowners must always be notified beforehand of any construction activity that is going to take place in close proximity to their property. They must be informed of the number of people that will be on site and on the activities they will engage in.</p> <p>14. It is recommended that an awareness drive be implemented to the relevant parties to focus on respect, adequate communication and the 'good neighbour principle'.</p>	
<b>SITE SPECIFIC MITIGATION</b>		
	<p>15. All existing boreholes within the power line corridor have to be identified and surveyed. If found to be directly below the power line, negotiations with the owner have to be conducted to agree on the way the owner could be compensated.</p> <p>16. The temporary loss of cultivated land should be included in the negotiation process with the landowner.</p> <p>17. The clearing of an area on a farmland for the construction process should take place after the harvesting season. Landowners should be compensated for the loss of cultivated land.</p> <p>18. Agricultural land disturbed by construction must rehabilitated upon completion of the construction activities to ensure that the land is returned in the same condition as prior to the construction activities.</p> <p>19. Mitigation measures should be implemented to avoid any negative impact on animals (e.g. fencing off the construction</p>	



	<p>area).</p> <p>20. Eskom or its appointed contractor(s) must assist with the temporary relocation of livestock, as well as relocating cattle back to their original grazing area upon completion of the construction phase. This must be done with the landowner or foreman present.</p> <p>21. Where the construction of power lines will result in temporary loss of agricultural land (for grazing) on farms, the construction period, all affected grazing areas must be rehabilitated to the original grazing condition to ensure that cattle can continue to graze in the area so as to minimise economic loss to the farmers.</p> <p>22. Where the area cannot be rehabilitated to its original condition within a short space of time, Eskom or its appointed contractor(s) must provide alternative food sources to the farmer for the period required for natural rehabilitation to occur within the grazing area.</p> <p>23. In terms of construction worker influx, awareness needs to be raised amongst construction workers about local traditions and practices.</p> <p>24. Local businesses must also be informed that construction workers will move into the area to enable local businesses to plan for the extra demand.</p> <p>25. Ensure that the local communities communicate their expectations of construction workers' behaviour with them.</p> <p>26. Ensure that employment procedures/policies are communicated to local stakeholders, especially community representative organisations and ward councilors.</p> <p>27. Have clear rules and regulations for access to the construction site to control loitering. Consult with the local SAPS to establish standard operating procedures for the control and/or removal of loiterers at the construction site.</p> <p>28. Construction workers must be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags.</p> <p>29. The contractor must monitor areas where people gather in the field on a regular basis as this is normally the first indication that (informal) settlement might take place in the area. These people must be removed in co-operation with the local SAPS to prevent</p>	
--	---	--

	<p>the formation and/or expansion of informal settlements in the area, especially if it encroaches upon the servitude.</p> <p>30. Unskilled job opportunities must be afforded to local residents. Local trade unions, community leaders or the department of labour could assist with the recruitment process to counteract the potential for social mobilisation.</p> <p>31. Equal opportunities for employment must be created to ensure that the local female population also has access to these opportunities. Females must be encouraged to apply for positions.</p> <p>32. An aggressive STI and HIV/AIDS awareness campaign must be launched, which is not only directed at construction workers but also at the community as a whole</p> <p>33. Access at the construction site must be controlled to prevent sex workers from either visiting and/or loitering at the construction village or the construction sites.</p> <p>34. Local women must be empowered. This could be achieved by employing them to work on the project, which in turn would decrease their (financial) vulnerability</p> <p>35. The relocation of households and/or population segments results in a negative social impact which is further intensified by the number of years and attachment a household and/or individuals have to a certain place. The resettlement and/or displacement of households and/or population segments should therefore be avoided as far as possible. Failing that, the following mitigation measures should be implemented:</p> <ul style="list-style-type: none"> <li>▪ Residents should be sufficiently compensated and assisted with the relocation process.</li> <li>▪ A form of compensation should also be granted to individuals who are residing in informal settlements encroaching upon the servitude.</li> <li>▪ A formal grievance procedure should be implemented and communicated to landowners to ensure a fair and transparent process</li> </ul> <p>36. Individuals with the potential to develop their skills must be afforded training opportunities. Eskom or its appointed contractors must be involved in this process.</p> <p>37. Mechanisms must be developed to provide alternative solutions for creating job security upon completion of the project. This could include formal and/or informal training on how to look for</p>	
--	--	--

	<p>alternative employment, information on career progression, etc. to ensure that people are equipped to seek other jobs with the skills that they have gained.</p> <p>38. Payment must comply with applicable Labour Law legislation in terms of minimum wages.</p> <p>39. Where local labourers are employed on a more permanent basis, cognisance must be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as You Earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of either continuous financial support when the worker's position on the construction team has become redundant or once the construction phase ends.</p> <p>40. The final routes of the transmission lines must be routed as far away from human infrastructure as possible. In this regard the lines must be routed as closely as possible to the EIA Team-preferred alignments for both corridors as these have been aligned to avoid areas of human habitation and infrastructure.</p> <p>41. Develop a procurement policy that is easy to understand and ensure that local subcontractors also comply with the procurement policy and any other applicable policies.</p> <p>42. Ensure that local subcontractors receive the necessary support in terms of resources.</p> <p>43. Agree on specific performance criteria prior to appointment.</p> <p>44. Identify the segment that might benefit from informal indirect opportunities, and assist them with skills development and subsidise initiatives that are sustainable.</p> <p>45. Encourage construction workers to use local services</p> <p>46. Route transmission power line as far away from homesteads, buildings and irrigation system as is possible.</p> <p>47. Power lines must be routed along agricultural property boundaries as far as possible to avoid the sterilisation of agricultural land.</p> <p>48. Minimise visual profile of the transmission power line by choosing routes where topography allows for visual reduction – the EIA Team-preferred alignments must be used as the basis for the final alignments as these have been aligned to avoid visually-sensitive areas.</p> <p>49. Make maximum use of undeveloped routings to place towers</p>	
--	--	--

	<p>and avoid intensively developed properties when possible.</p> <p>50. The power lines should be routed at least 200m away from residential areas within the urban zone whenever possible</p> <p>51. Compensate at market rates for property value loss as indicated by an independent valuations expert once exact route is known</p> <p>52. Determine exact stage of residential development on properties where such development is planned.</p> <p>53. Within each corridors avoid properties according to the following criteria:</p> <p>54. Highest - Properties for which rezoning and/or subdivision has been granted.</p> <p>55. High – Properties for which rezoning and/or subdivision has been agreed to by the municipality and applications have been submitted.</p> <p>56. Medium – Properties for which rezoning and/or subdivision are planned and preliminary work has been done by town planners.</p> <p>57. Low – Properties for which rezoning and/or subdivision are planned but no work has been started.</p> <p>58. Construction workers should be made aware of the limited capacity of the municipal services network.</p> <p>59. Negotiations with the affected local municipalities must be conducted and a “demand-side management” should be implemented.</p> <p>60. Sufficient portable chemical toilets should be provided on site and at the construction village (if applicable).</p> <p>61. If applicable, contractors should ensure adequate sanitation services (e.g. showers) at the construction village with effective drainage facilities to ensure that used water is carried away from the site.</p> <p>62. The land valuator should be experienced in valuating the land in question.</p> <p>63. The process should be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in “empty promises”).</p> <p>64. The negotiation should be done for the servitude as a whole and not as segmented parts of the servitude.</p> <p>65. Contracts should be reviewed by an independent body.</p> <p>66. Land owners should be made aware that a pre- and post evaluation of their land value is possible.</p> <p>67. Avoid structures and fixed capital features whenever possible.</p>	
--	---	--

	<p>68. If structures and features cannot be avoided, relocate structure where possible or compensate farmers for lost assets.</p> <p>69. Avoid all southern routes due to the intensity of infrastructure development.</p> <p>70. Avoid high productivity farmland where possible to avoid inhibiting future irrigation development</p>	
--	---	--

### 3.3.19 Community Engagement

Table 23: Community Engagement

<b>IMPACT</b>	<b>COMMUNITY ENGAGEMENT</b> This section deals with surrounding community and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION</b>	<ol style="list-style-type: none"> <li>1. A communication guideline must be drafted and agreed upon with authority representatives and affected communities.</li> <li>2. Open and transparent community engagement to be followed as culturally appropriate.</li> <li>3. Records (written) to be kept of all community engagements (e.g. complaints, resolutions, etc)</li> <li>4. A social investment action plan must be in place prior to construction and this plan needs to be incorporated into the EMP to allow for monitoring of its implementation.</li> </ol>	

### 3.3.20 Visual Impact

Table 24: Visual Impact

<b>IMPACT</b>	<b>VISUAL</b> This section deals with visual issues and actions that need to be implemented during construction	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>CONSTRUCTION</b>	<b>ELO / LA</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION METHOD STATEMENT</b>	<p><b>Power line routing and avoiding of sensitive areas</b></p> <ol style="list-style-type: none"> <li>1. It is essential that the final route alignment be based as far as possible on the EIA Team-preferred alignment as this alignment was routed to avoid visually-sensitive areas as far as possible.</li> <li>2. Unless technically required, vegetation must not be cleared under the lines, especially in areas of thicket vegetation, as this would result in a visual 'scar' within the landscape; vegetation must only be cleared in the tower footprints.</li> </ol>	

	<p>3. Within areas of natural (especially thicket) vegetation, the lines must be routed along existing breaks in the vegetation, such as fence lines or cut lines, as far as possible to avoid visual intrusion into the landscape.</p> <p>4. The power lines must not be routed through any areas of high visual sensitivity, especially nature reserves and tourism establishments.</p> <p>5. The routing of the power lines must avoid ridges; where the power lines have to cross ridges, they must be routed as far as possible within saddles or 'neks' so that they are less intrusive over this high ground.</p> <p>1. For instance, the ridge to the north-west of Humansdorp, the lines must be routed through a low point or saddle within the ridge to minimise the visual intrusion associated with the power lines and to prevent the power lines from breaking the horizon as far as possible.</p> <p>6.</p> <p><b>General</b></p> <p>7. Construction activities must not occur at night and lighting must only be erected where absolutely necessary</p> <p>8. Construction camps and equipment storage facilities are to be shielded with shade netting if the camp is located within the viewshed of any visually sensitive receptors.</p> <p>9. Construction traffic must not deviate from designated routes or access roads;</p> <p>10. Construction areas are to be kept clean and tidy</p> <p>11. Measures must be taken to suppress dust arising from construction activities</p> <p>12. Labour being transported to the site must take cognisance of litter and waste concerns</p> <p>13. Equipment being transported to the site must be covered with tarpaulins</p> <p>14. Topsoil stockpiles must be well managed and seeded when possible if not utilised within three months</p> <p>15. It is recommended that equipment be stored discreetly so as not to increase visual impacts</p> <p>16. Construction must be conducted in the shortest possible time in order to reduce visual impacts.</p>	
--	--	--

### 3.3.21 Heritage, Palaeontology and Khoisan Heritage

IMPACT	HERITAGE AND PALAEOLOGY This section deals with heritage and palaeontological issues as well as actions that need to be implemented during construction	RESPONSIBILITY
PHASE	CONSTRUCTION	ELO
ENVIRONMENTAL MANAGEMENT PROGRAMME		
MITIGATION / METHOD STATEMENT	<ol style="list-style-type: none"> <li>1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA.</li> <li>2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts are uncovered in the affected area.</li> <li>3. The contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.</li> <li>4. Any discovered 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) should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.</li> <li>5. Should any archaeological sites / graves be uncovered during construction, their existence shall be reported to MRP immediately.</li> </ol>	
SITE SPECIFIC MITIGATION		
	<ol style="list-style-type: none"> <li>6. A heritage specialist must undertake a "walkdown" of the pre-liminary profiled servitudes and its surroundings (i.e. at least a buffer width / distance of 50 m from the edge of the servitude) to assess the impact (particularly the direct impacts) of tower positions and access roads on archaeological, cultural and heritage sites prior to finalisation of the construction EMP.</li> <li>7. This exercise is important to ensure that should sites and/or artefacts be identified within the pre-liminary profiled servitudes, the necessary measures are considered and adhered to as per the "Recommended Management Measures" such as to document and fence off the sites, features and objects if needs be, create a comprehensive geo-rectified map book which will serve as a management tool during construction</li> </ol>	



	<p>and operation (i.e. maintenance of servitudes). By doing so, adjustments to the servitudes (i.e. tower positions and access roads, etc) will be proposed to avoid as many impacts as possible. If avoidance fails, permits will be applied for from SAHRA.</p> <p>8. All sensitive heritage sites must be avoided as far as possible. This is especially the case with type-sites such as identified in the Kabeljousrivier area by Binneman. Sites that cannot be avoided must be excavated in full by an archaeologist qualified in Stone Age archaeology.</p> <p>9. Isolating known heritage sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed, but only as last case scenario.</p> <p>10. Plan of action must be developed if unknown burial places are discovered. In exceptional cases, relocation of graves can be implemented after required procedures have been followed.</p> <p><b>Archaeology</b></p> <ul style="list-style-type: none"> <li>○ All stakeholders and key personnel should undergo an archaeological induction course during this phase</li> <li>○ It is important to recognize any significant material being unearthed, making and to make the correct judgment on which actions should be taken.</li> </ul> <p><b>Graves</b></p> <ul style="list-style-type: none"> <li>○ Mitigation of graves will require a fence around the cemetery with a buffer of at least 20 meters.</li> <li>○ If graves are accidentally discovered during construction, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. Where possible, the graves should be relocated</li> </ul> <p><b>Paleontology</b></p> <ul style="list-style-type: none"> <li>○ A qualified palaeontologist specialist will undertake a “walkdown” of the pre-liminary profiled servitudes and its surroundings (i.e. at least a buffer width / distance of 50 m from the edge of the servitude) to assess the impact (particularly the direct impacts) of tower positions and access roads on archaeological, cultural and heritage sites prior to finalisation of the construction EMP. This exercise is important to ensure that the area is surveyed by the</li> </ul>	
--	---	--

	<p>qualified palaeontologist specialist to ensure the identification of fossils, if any and be able to recommend appropriate management measures for construction and operation (i.e. tower positions and access roads, etc) will be proposed to avoid as many impacts as possible. If avoidance fails, permits will be applied for from SAHRA.</p> <ul style="list-style-type: none"> <li>○ A monitoring plan must be agreed upon by all the stakeholders for the different phases of the project focusing on the areas where earthmoving will occur.</li> <li>○ If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.</li> <li>○ Should substantial fossil remains (e.g. well-preserved fossil fish, reptiles or petrified wood) be exposed during construction, however, the ECO should carefully safeguard these, preferably in situ, and alert SAHRA as soon as possible so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional paleontologist.</li> <li>○ A management plan must be developed for managing the heritage resources in the surface area impacted by operations during construction and operation of the development. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations, and communication routes to follow in the case of a discovery.</li> </ul> <p><b>Khoisan Heritage (Short and Long term)</b></p> <ul style="list-style-type: none"> <li>○ Targeted Focus Group Meetings with all levels of KhoiSan interest groups, national, provincial and local (Short &amp; Long Term)</li> <li>○ Additional documentary and archival research regarding the sites in order to Integrated sites of significance and morphological zones in the landscape that are no-go or, red flagged areas (Short term)</li> <li>○ The detailed comprehensive geo-rectified map book” must be carried out concurrently with the walkdown of the approved corridors during the verification of the pre-liminary profiles for tower positions. The compiled map book and the construction EMP will then be placed for public review and the results of this consultation will drive the recommendations of the Final EMP. The Final EMP will then be submitted to DEA, SAHRA and other competent authorities for consideration and approval.</li> </ul> <p>○</p>	
--	--	--

--	--	--

### 3.4 Operation Phase

#### 3.4.1 Construction Site Decommissioning

Table 25: Construction Site Decommissioning

IMPACT	CONSTRUCTION SITE DECOMMISSIONING This section deals with the demolishing of the construction camp and the actions that need to be implemented	RESPONSIBILITY
PHASE	OPERATION	Main contractor / Developer / ECO / ELO
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION / METHOD STATEMENT	<p><b>Removal of equipment</b></p> <ol style="list-style-type: none"> <li>1. All structures comprising the construction camp are to be removed from site.</li> <li>2. The area that previously housed the construction camp is to be checked for spills of substances such as oil etc, and these shall be cleaned up.</li> <li>3. All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area shall be top soiled and regressed using the guidelines set out in the rehabilitation section that follows in this document.</li> </ol> <p><b>Temporary services</b></p> <ol style="list-style-type: none"> <li>4. The Contractor must arrange the cancellation of all temporary services.</li> <li>5. A copy of all weigh-bridge certificates from waste disposed are to be presented to the ECO.</li> <li>6. Temporary roads must be closed and access across these, blocked.</li> <li>7. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO.</li> </ol> <p><b>Associated infrastructure</b></p> <ol style="list-style-type: none"> <li>8. Surfaces are to be checked for waste products from activities</li> </ol>	

	<p>such as concreting or asphaltting and cleared in a manner approved by the Engineer.</p> <p>9. All surfaces hardened due to construction activities are to be ripped and imported material thereon removed.</p> <p>10. All rubble is to be removed from the site to an approved disposal site as approved by the Engineer. Burying of rubble on site is prohibited.</p> <p>11. The construction camp site is to be cleared of all litter.</p> <p>12. The Contractor is to check that all watercourses are free from building rubble, spoil materials and waste materials.</p> <p>13. Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer.</p> <p>14. All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer.</p> <p>15. All residual building materials must be returned to the depot or removed from the site.</p> <p>16. The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management.</p> <p><b>Rehabilitation plan</b></p> <p>17. Rehabilitate and re-vegetate cleared areas with indigenous plant species.</p>	
--	---	--

### 3.4.2 Rehabilitation and Maintenance

Table 26: Rehabilitation and Maintenance

IMPACT	REHABILITATION This section deals with the issues relating to rehabilitation after construction	RESPONSIBILITY
PHASE	OPERATION	Developer
ENVIRONMENTAL MANAGEMENT PLAN		
MITIGATION METHOD STATEMENT	<p data-bbox="512 696 687 723"><b>Rehabilitation</b></p> <ol style="list-style-type: none"> <li data-bbox="512 775 1294 842">1. All damaged areas shall be rehabilitated upon completion of the contract</li> <li data-bbox="512 853 1294 1227">2. A mixture of vegetation seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> <li data-bbox="608 931 1142 958">▪ Annual and perennial species are chosen.</li> <li data-bbox="608 969 999 996">▪ Pioneer species are included.</li> <li data-bbox="608 1008 1046 1034">▪ All the species shall not be edible.</li> <li data-bbox="608 1046 1294 1113">▪ Species chosen will grow in the area under natural conditions.</li> <li data-bbox="608 1124 1254 1151">▪ Root systems must have a binding effect on the soil.</li> <li data-bbox="608 1162 1294 1227">▪ The final product must not cause an ecological imbalance in the area.</li> </ul> </li> <li data-bbox="512 1238 1294 1384">3. To get the best results in a specific area, it is advisable to consult with a vegetation specialist. Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area.</li> <li data-bbox="512 1395 1294 1496">4. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.</li> <li data-bbox="512 1507 1294 1608">5. All natural areas impacted during construction must be rehabilitated with locally indigenous grasses typical of the representative botanical unit.</li> <li data-bbox="512 1619 1294 1686">6. Rehabilitation must take place in a phased approach as soon as possible.</li> <li data-bbox="512 1697 1294 1798">7. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</li> <li data-bbox="512 1809 1294 1843">8. Rehabilitation must be executed in such a manner that surface</li> </ol>	

<b>IMPACT</b>	<b>REHABILITATION</b> <b>This section deals with the issues relating to rehabilitation after construction</b>	<b>RESPONSIBILITY</b>
	<p>run-off will not cause erosion of disturbed areas.</p> <p>9. Planting of indigenous tree / shrub species in areas not to be cultivated or built on must be encouraged.</p> <p>▪</p> <p><b>Maintenance</b></p> <p>10. The servitude needs to be monitored on a monthly basis to identify the emergence of alien species and any erosion concerns.</p>	

### 3.4.3 Operation and Maintenance

Table 27: Operation and Maintenance

<b>IMPACT</b>	<b>OPERATION AND MAINTENANCE</b> <b>This section deals with the potential impacts that could result from the operation and maintenance of the lines</b>	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>OPERATION</b>	<b>ESKOM</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<p><b>Maintenance</b></p> <ol style="list-style-type: none"> <li>1. All applicable standards, legislation, policies and procedures must be adhered to during operation.</li> <li>2. Regular ground inspection of the servitude must take place to monitor their status.</li> <li>3. Landowner conditions for accessing the servitude must be adhered to, and all gates must be kept open / closed subject to landowner requirements</li> <li>4. Only authorised Eskom personnel must access the servitude and properties that are required to be traversed in order to access the servitude</li> <li>5. No new roads to be constructed through any wetland or watercourse .</li> <li>6. The use of helicopters to observe and access the lines in areas of game farming must be done with extreme discretion so as to</li> </ol>	

	not disturb game.	
	<b>Public awareness</b>  7. The emergency preparedness plan must be ready for implementation at all times should an emergency situation arise.	

#### 3.4.4 Air Quality

Table 28: Air Quality

<b>IMPACT</b>	<b>AIR POLLUTION</b> This section deals with the issues relating to air pollution during operation	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>OPERATION</b>	<b>Developer</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<b>Dust management</b>  1. Any dirt roads utilised to access the sites must be regularly maintained to ensure that dust levels are controlled.  <b>Litter management</b>  2. Remove unwanted materials and litter on a regular basis to avoid potential odours.	



### 3.4.5 Biodiversity

Table 29: Biodiversity

IMPACT	BIODIVERSITY (FAUNA AND FLORA) This section details with the issues relating to biodiversity during operation	RESPONSIBILITY
PHASE	OPERATION	Developer
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION METHOD STATEMENT</b>	<p><b>Vegetation</b></p> <ol style="list-style-type: none"> <li>1. Indigenous vegetation must be maintained and all exotics be removed as they appear; these must be disposed of appropriately.</li> <li>2. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.</li> <li>3. Vegetative re-establishment shall, as far as possible, make use of indigenous or locally occurring plant varieties within the servitude.</li> <li>4. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation.</li> <li>5. No streams, wetlands or riparian areas outside of agreed access routes must be traversed as part of operational work unless emergency access to the servitude in the areas is required.</li> <li>6. Herbicides to clear emergent bushy vegetation under the lines must not be used; instead vegetation control must be through mechanical means. No herbicides must be used within 150m of any surface water feature.</li> </ol> <p><b>Other fauna</b></p> <ol style="list-style-type: none"> <li>7. No faunal species must harmed by maintenance staff during any routine maintenance at the development.</li> </ol>	
<b>Site Specific Mitigation Measures</b>		

	<ol style="list-style-type: none"> <li>5. Monthly monitoring of these sensitive areas must take place during the first year after construction to ensure that rehabilitation is successful.</li> <li>6. These monitoring exercises must ensure that no erosion is taking place as a result of the development.</li> <li>7. Six monthly checks of the area must take place for the emergence of invader species.</li> <li>8. Mitigation measures mentioned for the construction phase above must be implemented for any maintenance of the development that may be undertaken during the operation phase.</li> <li>9. Correct rehabilitation with species which are locally indigenous.</li> <li>10. Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion and the edge effect are avoided.</li> <li>11. Constant maintenance of the area to ensure re-colonisation of floral species.</li> <li>12. Regular removal of alien species which may jeopardise the proliferation of indigenous species.</li> <li>13. Monitoring of height of vegetation.</li> </ol>	
--	--	--

### 3.4.6 Waste Management

Table 30: Waste Management

<b>IMPACT</b>	<b>WASTE MANAGEMENT</b> This section deals with the issues relating to waste management during operation	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>OPERATION</b>	<b>Developer</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<i>Recycling and litter management</i>  1. The servitude must be kept clear of litter at all times	

### 3.4.7 Khoisan Heritage

Table 31: Khoisan Heritage

<b>IMPACT</b>	<b>KHOISAN HERITAGE</b> This section deals with the issues relating to waste management during operation	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>OPERATION</b>	<b>Developer</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION / METHOD STATEMENT</b>	<ul style="list-style-type: none"> <li>The development of a social engagement plan that serves as a management framework for the following key activity (1) capacity and skills development to assist KhioSan people record their oral history. This would be best achieved in partnership within the Nelson Mandela Bay and Coega Metropolitan Spatial Development Framework and Integrated Policy Development Framework. (Long term)</li> </ul>	

### 3.4.8 Visual Impact

Table 32: Visual Impact

<b>IMPACT</b>	<b>VISUAL IMPACT</b> This section deals with the issues relating to visual impacts during operation	<b>RESPONSIBILITY</b>
<b>PHASE</b>	<b>OPERATION</b>	<b>Developer</b>
<b>ENVIRONMENTAL MANAGEMENT PLAN</b>		
<b>MITIGATION METHOD STATEMENT</b>	<b>Maintenance and lighting</b> <ol style="list-style-type: none"> <li>1. High standards of maintenance and management of the landscaping must be carried out in accordance with the best possible practice to ensure that the landscaping ensures that the power lines blend in with the current visual environment, by enhancing natural features such as trees and vegetation as much as possible.</li> <li>2. The servitude and surrounds must be kept clean, tidy and well maintained to reduce negative visual impacts;</li> <li>3. Rehabilitation of surrounding areas must take place with indigenous species;</li> <li>4. Surrounding roads must be well maintained;</li> <li>5. Regular maintenance of the associated infrastructure must be undertaken.</li> </ol>	

### 3.5 Decommissioning phase

Mitigation measures implemented during the construction phase (with regards to the construction camp and equipment) will remain the same for the decommissioning phase when a construction camp will need to be established again.

## **4 CHAPTER 4: CONCLUSION**

The environmental biophysical and social impacts of the project have been assessed to be spread through the four project phases. Both positive and minor negative project-related impacts were identified through the EIA, but the EIA concluded that all of the negative impacts could be ameliorated to acceptable levels or made negligible through the implementation of the mitigation measures contained within this EMP. The following section briefly describes some of the major impacts and proposed mitigation measures within each of the project phases.

### **4.1 Pre-Construction Phase**

The first site activities, before mobilisation of equipment, will be a survey required for final design of substation foundations and power line structures. It is critical that all walk downs as specified by the faunal, floral, avifaunal, surface water and heritage specialists be undertaken, and be used to inform the final tower locations prior to the finalisation of tower positions. There could be negative impacts on land associated with the construction of camps (temporary loss) and storage of construction materials especially if such construction is carried out on agriculturally productive land. Expectations of improvement in livelihood among locals must be addressed through public participation. Construction contracts will include environmental monitoring and management procedures and requirements. These must be in place prior to the commencement of any construction activities.

### **4.2 Construction Phase**

This phase of the project could result in both positive and negative impacts. The positive impacts are employment opportunities offered to the construction workers and any other labourer who will be hired to provide his/her services during the construction phase. The negative impacts would include wastes generated, accidents, health and safety, air, dust and noise pollution, vegetation clearance, soil erosion, socio-environmental issues, loss of trees, and compaction of soil, disturbance of fauna and damage to habitat of highly sensitive or endangered species.. Most of the negative impacts are minor and temporary. However, on mitigating negative impacts, the contractor shall ensure that all staff have adequate protective clothing and are adequately trained. The whole range of mitigation measures are however, outlined in the EMP in this regard.

### **4.3 Operational Phase**

The proposed project will have minimal negative effects which mainly relate to loss of aesthetic value and habitat and nuisance to affected landowners.

### **4.4 Decommissioning Phase**

As with any project, the facilities used in this project will have a lifespan after which time they may no longer be cost effective to continue with operation or may degrade and become inoperable. At that time, the transmission infrastructure would be decommissioned (removed) and most likely replaced. The mitigation measures highlighted in the construction phase will once again become applicable as the construction of new infrastructure would essentially be associated with similar activities and would likely result in similar impacts.

Based on the above information, it is unlikely that the Project will have significant adverse social and biophysical environmental impacts. Most adverse impacts will be of a temporary nature during the construction phase and will be able to be managed to acceptable levels with implementation of the recommended mitigation measures for the Project such that the overall benefits from the Project will greatly outweigh the few adverse impacts. All the negative impacts will either be moderate or lesser in rating and will be able to be easily mitigated.



# Appendix A

## ENVIRONMENTAL INCIDENTS

## LOG Environmental Incident Log

[illegible]

# COMPLAINTS RECORD SHEET

Complaints Record Sheet

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page .... of ....	.....
COMPLAINT RAISED BY:		
CAPACITY OF COMPLAINANT:		
COMPLAINT RECORDED BY:		
COMPLAINT:		
PROPOSED REMEDIAL ACTION:		
ECO: _____ Date: _____		
NOTES BY ECO:		
ECO: _____ Date: _____ Site Manager: _____ Date: _____		



## Annexure B

# MANAGEMENT OF SOILS: GUIDELINES

### Topsoil

#### Source of topsoil

- Topsoil shall be stripped from all areas that are to be utilised during the construction period and where permanent structures and access is required. These areas will include temporary and permanent access roads, construction camps, and lay down areas. Topsoil shall be stripped after clearing of woody vegetation and before excavation or construction commences.
- The topsoil is regarded as the top 300mm of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.

#### Topsoil stripping

- Soil shall be stripped to a minimum depth of 150mm and maximum depth of 300mm or to the depth of bedrock where soil is shallower than 300mm. Herbaceous vegetation, overlying grass and other fine organic matter shall not be removed from the stripped soil.
- No topsoil which has been stripped shall be buried or in any other way be rendered unsuitable for further use by mixing with spoil or by compaction using machinery.
- Topsoil shall preferably be stripped when it is in a dry condition in order to prevent compaction.

#### Topsoil stockpiling

- The Consulting Engineer or Environmental Control Officer shall stockpile stripped topsoil in areas, which have been approved. Soil stockpiles may take the form of windrows.
- To prevent erosion, material stockpiled for long periods (2 weeks) must be retained in a bermed area.
- Topsoil, mulch and subsoil stockpiles must be placed in higher-lying areas of the site, and must not be positioned within stormwater channels or areas of ponding.
- Topsoil stripped from different soil zones shall be stockpiled separately and clearly identified as such. Under no circumstances shall topsoil obtained from different soil zones be mixed.

- Soil stockpiles shall not be higher than 2m or stored for a period longer than one year. The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal.
- No vehicles shall be allowed access onto the stockpiles after they have been placed. Topsoil stockpiles shall be clearly demarcated in order to prevent vehicle access and for later identification when required.
- Soil stockpiles must not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation in the soil.
- After topsoil removal has been completed, the Contractor shall apply soil conservation measures to the stockpiles where and as directed by the Consulting Engineer or Environmental Control Officer. This may include the use of erosion control fabric or grass seeding.

#### Topsoil replacement

- Topsoil shall be replaced to a minimum depth of 75mm over all areas where it has been stripped and over disused borrow pits, after construction in those areas has ceased. Topsoil placement shall follow as soon as construction in an area has ceased.
- All areas onto which topsoil is to be spread shall be graded to the approximate original landform with maximum slopes of 1:25 and shall be ripped prior to topsoil placement. The entire area shall be ripped parallel to the contours to a minimum depth of 300mm.
- Topsoil shall be placed in the same soil zone from which it had been stripped. However, if there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil may be brought from other soil zones at the approval of the Consulting Engineer or Environmental Control Officer.
- Where topsoil that has been stripped by the Contractor is insufficient to provide the minimum specified depth, the Contractor shall obtain suitable substitute material from other sources at no cost to the employer. The suitability of the substitute material shall be determined by means of soil analyse, which are acceptable to the Consulting Engineer or Environmental Control Officer.
- No vehicles shall be allowed access onto or through topsoil after it has been reinstated.
- After topsoil reinstatement is complete, cleared and stockpiled vegetative matter shall be spread randomly by hand over the top soiled area. The vegetative material must be replaced on the areas from where it has been removed.



**SiVEST Environmental Division**

51 Wessels Road, Rivonia. 2128. South Africa  
PO Box 2921, Rivonia. 2128. South Africa

Tel + 27 11 798 0600  
Fax +27 11 803 7272  
Email [info@sivest.co.za](mailto:info@sivest.co.za)  
[www.sivest.co.za](http://www.sivest.co.za)

Contact Person: Paul da Cruz  
Cell No.: +27 84 224 0088  
Email: [pauld@sivest.co.za](mailto:pauld@sivest.co.za)