
INGULA (BRAAMHOEK) TRANSMISSION INTEGRATION PROJECT, KWAZULU-NATAL

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE INGULA (BRAAMHOEK) INTEGRATION PROJECT: INGULA (BRAAMHOEK) SUBSTATION PRINCIPLES OF ENVIRONMENTAL MANAGEMENT SUPPORTED BY AREA SPECIFIC GUIDELINES

August 2008

Prepared for
Eskom Holdings Ltd
Eskom Transmission
PO Box 1091
Johannesburg
2000



Prepared by
Savannah Environmental (Pty) Ltd
PO Box 148
Sunninghill
2175



PROJECT DETAILS

DEAT Reference No. : 12/12/20/866

Title : Environmental Impact Assessment Process
Environmental Management Plan: Ingula
(Braamhoek) Integration Project, KwaZulu-Natal

Authors : Savannah Environmental (Pty) Ltd
Marius van der Vyver
Jo-Anne Thomas

Specialists : Indiflora Environmental Services cc
Endangered Wildlife Trust
Cave Klapwijk & Associates
eThembeni Cultural Heritage

Client : Eskom Holdings Limited (Eskom Transmission
Division)

Eskom Mamokete Mafumo
Environmental
Advisor

Report Status : Site-Specific Construction EMP submitted to DEAT

Submission date: : August 2008

When used as a reference this report should be cited as: Savannah Environmental (2008) Environmental Management Plan for the Ingula (Braamhoek) Integration Project: Ingula (Braamhoek) Substation in KwaZulu-Natal, for Eskom Holdings Limited

COPYRIGHT RESERVED

This technical report has been produced by Savannah Environmental (Pty) Ltd for Eskom Holdings Limited. No part of the report may be copied, reproduced or used in any manner without written permission from Eskom Holdings Limited or Savannah Environmental (Pty) Ltd.

TABLE OF CONTENTS

	PAGE
1. INTRODUCTION.....	1
2. PROJECT SCOPE OF WORK	3
2.1. Background information	3
2.1.1. <i>Project Execution area</i>	3
2.3. Major Activities of the Project.....	4
3. ACRONYMS.....	5
4. PROJECT TEAM	7
4.1. Reporting Structure	8
4.2. Roles and Responsibilities of the Project Team.....	9
4.2.1. <i>System Planning Engineer</i>	9
4.2.2. <i>Eskom Environmental Advisor (during feasibility stages & construction phases)</i>	9
4.2.4. <i>Project Manager/ Site Manager</i>	9
4.2.5. <i>Environmental Control Officer</i>	10
4.2.6. <i>Contractor</i>	10
4.2.7. <i>Eskom Environmental Advisor (During Operational Stage)</i>	11
4.2.8. <i>Environmental Assessment Practitioners</i>	11
5. ENVISAGED ACTIVITY SCHEDULE AND ASSOCIATED IMPACTS.....	12
5.1. Predicted Environmental Impacts as Identified by the Final EIA Report.....	12
5.2. Project Construction Phase	12
5.2.1. <i>Construction Camps</i>	12
5.2.2. <i>Construction Process for the Substation</i>	12
5.2.3. <i>Potential Environmental Impacts Associated with the Construction Phase</i>	13
5.3. Description of the prescribed Mitigation Measures as set out in the Final Scoping Report	14
5.3.1. <i>Further recommendations as set out in the Final Scoping Report</i>	38
6. OUTLINE OF ROD CONDITIONS	39
7. ENVIRONMENTAL SPECIFICATIONS FOR CONSTRUCTION CAMPS ...	40
7.1. Site Establishment.....	40
7.2. Workshop and Equipment Storage Areas	40
7.3. Storage Areas of Hazardous Substances	41
8. PHYSICAL ISSUES AND THEIR CONTROL	42
8.1. Substation Terrain Area	42
8.1.1. <i>Management objectives</i>	42
8.1.2. <i>Measurable targets</i>	42
8.2. Natural Drainage.....	42
8.2.1. <i>Management objectives</i>	42

8.2.2. Measurable targets	43
8.3. Access Roads to the Site	43
8.3.1. Management objectives	43
8.3.2. Measurable targets	43
8.4. Construction Rubble Disposal	44
8.4.1. Management objectives	44
8.4.2. Measurable targets	44
8.5. Site Clearing.....	44
8.5.1. Management objectives	45
8.5.2. Measurable targets	45
8.6. Fencing Requirements.....	46
8.6.1. Management objectives	46
8.6.2. Measurable targets	46
8.7. Fire Prevention	46
8.7.1. Management objectives	46
8.7.2. Measurable targets	46
8.8. Noise Pollution	47
8.8.1. Management objectives	47
8.8.2. Measurable targets	47
8.9. Claims for Damages	47
8.9.1. Management objectives	47
8.9.2. Measurable targets	47
8.10. Rehabilitation	48
8.10.1. Management objective.....	48
8.10.2. Measurable targets	48
8.11. Material Storage Areas.....	49
8.11.1. Management objectives	49
8.11.2. Measurable targets	49
8.12. Batching Plants	49
8.12.1. Management objectives	49
8.12.2. Measurable targets	49
8.13 Old Equipment	50
8.13.1. Management objectives	50
8.13.2. Measurable targets	50
8.14. Transport of Equipment.....	50
8.14.1. Management objectives	50
8.14.2. Measurable targets	51
9. SOCIAL ISSUES AND THEIR CONTROL	52
9.1. Sanitation	52
9.1.1. Management objectives	52
9.1.2. Measurable targets	52

9.2. Prevention of Disease	52
9.2.1. Management objectives	52
9.2.2. Measurable targets	52
9.3. Interaction with Affected Parties	53
9.3.1. Management objectives	53
9.3.2. Measurable targets	53
9.4. Littering Control	53
9.4.1. Management objectives	53
9.4.2. Measurable targets	53
9.5. Dust Pollution	54
9.5.1. Management objectives	54
9.5.2. Measurable targets	54
9.6. Aesthetics	54
9.6.1. Management objectives	54
9.6.2. Measurable targets	54
10. BIOLOGICAL ISSUES AND THEIR CONTROL	55
10.1. Fauna	55
10.1.1. Management objectives	55
10.1.2. Measurable targets	55
10.2. Flora	55
10.2.1. Management objectives	55
10.2.2. Measurable targets	55
10.3. Herbicide Use	56
10.3.1. Management objectives	56
10.3.2. Measurable targets	56
11. CULTURAL ISSUES AND THEIR CONTROL	57
11.1. Archaeology	57
11.1.1. Management objectives	57
11.1.2. Measurable targets	57
11.2. Infrastructure	57
11.2.1. Management objectives	58
11.2.2. Measurable targets	58
12. REQUIREMENTS DURING CONSTRUCTION PERIOD	59
13. SITE SPECIFIC PROBLEM AREAS.....	Error! Bookmark not defined.
13.1. Estimated Quantities for Special Works on the Site	Error! Bookmark not defined.
14. METHOD STATEMENTS FOR THE CONTRACT	60
15. SITE DOCUMENTATION / MONITORING / REPORTING.....	61
16. APPENDICES	62
Appendix A: Locality Plan	
Appendix B: Eskom Standards	

Appendix C: Record of Decision

1. INTRODUCTION

Eskom Holdings Limited (Eskom) received authorisation from the Department of Environmental Affairs and Tourism (RoD received: 24/04/2006) to construct a new transmission substation and associated 400 kV transmission lines in order to integrate the new Ingula Pumped Storage Scheme (PSS), a power generation facility to be constructed by Eskom Transmission in the Drakensberg on the provincial border between the Free State and KwaZulu-Natal, into the National electricity grid. This development, known as the Ingula (Braamhoek) Integration Project, will comprise:

- » The construction of a **new 400kV substation**, to be called the Ingula (Braamhoek) Substation on a portion of the Farm Zaaifontein 1070, which is owned by Eskom and located adjacent to the properties (Braamhoek 1220 and Bedford 1845) to be occupied by the PSS. The total footprint area required for the new substation site is approximately 160 m x 320 m.
- » The construction of a **400kV transmission power line turn-in** looping in to and out of the Majuba-Venus #2 400kV transmission power line to the new substation (a distance of approximately 10 km). The loop-in lines will be constructed in parallel and each would require a servitude of approximately 55 m.
- » The construction of a **400kV transmission power line** between the new substation and the existing Venus Substation, located near the town of Estcourt (a distance of approximately 80 km). A servitude width of 55 m is required for the establishment of this new transmission power line.

The purpose of this Environmental Management Plan is to establish appropriate environmental management for the construction of the new Ingula (Braamhoek) Substation, as well as the related construction, operation and decommissioning of construction camps and related infrastructure during the construction process.

The construction, refurbishment or upgrading of Transmission Substations can have a major impact on the environment. Construction of a new substation and upgrading of an existing facility is also regulated by legislation under the National Environmental Management Act (NEMA; No 107 of 1998). It is thus imperative that precautions are taken to ensure that environmental damage is minimised. This will take a concerted effort from Eskom and the Contractor and detailed planning is of the utmost importance.

The scope of this document is to give a site-specific Environmental Management Plan to the Contractor constructing the substation in fulfilment of ISO 14001

requirements. This document is part of the contract between Eskom and the construction Contractor and is supplementary to Eskom's TRMSCAAC1 REV 3. The recommendations and constraints as set out in this document are enforceable under the general conditions of the contract.

The objective of this management plan is to ensure that:

- » All anticipated environmental impacts during the construction period are identified and mitigation measures are clearly outlined.
- » The Contractor is able to and shall include any costs of compliance with this EMP into the tender price
- » Precautions against environmental damage and claims arising from such damage are taken timeously,
- » The asset created conforms to environmental standards required by ISO 14001 and Transmission Policy.
- » All Environmental Management conditions and requirements are implemented throughout the project.
- » All landowner special conditions are identified and taken into consideration as the power line traverses private properties.
- » Ensure that Eskom Transmission's Environmental Policy TRMPBAAX3 Rev 3 is underwritten at all times.
- » Ensure that all environmental conditions as stipulated in the Record of Decision (RoD) are implemented.
- » To preserve the natural environment by limiting destructive actions on site.
- » To ensure that all relevant legislation (including national, provincial and local) is complied with during the construction phase.
- » Ensure that problems and claims arising from damage are immediately resolved to ensure a smooth flow of operations.
- » To ensure that there are no significant impacts which could result in the delay of the construction process.

2. PROJECT SCOPE OF WORK

2.1. Background information

2.1.1. Project Execution area

The execution area is limited to the area as demarcated by Eskom and shown on the locality plan (Appendix A). Any area outside the Eskom substation area, required to facilitate access, construction activities, construction camps or material storage areas, shall be negotiated with the affected landowner and written agreements shall be obtained. All construction areas shall be cleared in accordance with the Eskom Standard for Bushclearing ESKASABG3 (refer to Appendix B). Any additional space to be cleared outside the substation site shall be negotiated with the relevant landowner and approved by Eskom and the Environmental Control Officer (ECO). All areas marked as no-go areas inside the substation site shall be treated with the utmost care and responsibility.

Should water be required from sources other than Eskom supply, a written agreement shall be reached between the Contractor and the landowner. **Should the Contractor be required to use water from a natural source, the Contractor shall supply a method statement to that effect and obtain the required permits.** Strict control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used.

2.3. Major Activities of the Project

- Step 1:** Survey of the substation site
- Step 2:** Site clearing and levelling and construction of access road to substation site
- Step 3:** Construction of terrace and substation foundation, including the installation of stormwater drainage on the surface to dispose of such stormwater on the terrace
- Step 4:** Assembly, erection and installation of equipment (including transformers and control building)
- Step 5:** Connection of conductors to substation infrastructure
- Step 6:** Rehabilitation of any disturbed areas and protection of erosion sensitive areas.

A number of fences will be installed to secure the substation and the substation site. These fences include a 2.4 m high security fence to enclose all assets, a 1.8 m high fence around the yards, and a 1.2 m high boundary fence on the property line.

Construction of the substation is required to be undertaken in accordance with the specifications of this EMP.

The final inspection for the release of the Contractors' guarantee takes place a year after completion of the project. The substation will be in operation immediately after completion of the project and will stay operational for the lifetime of the plant.

3. ACRONYMS

Name of Act / Eskom Specification/ Procedure	Abbreviation
Access to Farms	TRMPVACV2 REV1
Agricultural Pests Act of 1983 (Act No. 36 of 1983)	APA
Air Quality Act of 2004 (Act No 39 of 2004)	NAQA
Animals Protection Act of 1962 (Act No. 71 of 1962)	APA
Atmospheric Pollution Prevention Act of 1965 (Act No. 45 of 1965)	APPA
Biodiversity Act of 2004 (Act No. 10 of 2004)	BDA
Bush Clearing	ESKASABG3
Conservation of Agricultural Resources Act of 1993 (Act No. 43 of 1983)	CARA
Contractor Environmental Control Officer	CECO
Department of Environmental Affairs and Tourism	DEAT
Department of Water Affairs	DWAF
Environment Conservation Act of 1989 (Act NO. 73 of 1989)	ECA
Environmental Control Officer	ECO
Environmental Management Plan	EMP
Eskom Manual on Storage and Handling of Flammable and combustible liquids	ESKAMAAD1
Fencing Act of 1963 (Act No. 31 of 1963)	FA
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)	FFFAS
Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act of 1947 (Act No. 36 of 1947)	FFASA
Game Theft Act of 1991 (Act No. 105 of 1991)	GTA
Hazardous Substances Act of 1973 (Act No. 15 of 1973)	HSA
Labour Relations Act of 1995 (Act No.66 of 1995)	LRA
Mineral and Petroleum Resources Development Act of 2002 (Act No. 28 of 2002)	MPRDA
Mountain Catchment Areas Act of 1970 (Act No. 63 of 1970)	MCAA
National Environmental Management Act of 1998 (Act No. 107 of 1998)	NEMA
National Forests Act of 1998 (Act No. 84 of 1998)	NFA
National Veld and Forest Fire Act 1998 (Act No. 101 of 1998)	NVFFA
National Water Act of 1998 (Act No. 36 of 1998)	NWA
Natural Heritage Resources Act of 1999 (Act No. 25 of 1999)	NHRA
Eskom Nesting Guideline	TRMAGAAZ3

Name of Act / Eskom Specification/ Procedure	Abbreviation
Occupational Health and Safety Act of 1993 (Act No. 85 of 1993)	OHSA
Protected Areas Act of 2003 (Act No. 57 of 2003)	PAA
Protected Areas Amendment Act of 2004 (Act 31 of 2004)	PAAA
Record of Decision	ROD
Skills Development Act of 1998 (Act No. 97 of 1998)	SDA
Transmission Line Towers and Line Construction	TRMSCAAC1 REV3
Water Services Act of 1997 (Act 108 of 1997)	WSA
World Heritage Convention Act of 1999 (Act No. 49 of 1999)	WHCA

4. PROJECT TEAM

Profession/Role	Name	Contact Details	Remarks
System Planning Engineer			
Eskom Environmental Advisor	Mamokete Mafumo	011 800 2621	
Servitude Negotiator	Pieter Steenkamp	011 800 5818	
Project Manager (PM)	Sugan Naidoo	031 792 8627	
Site Manager	Sarel van Zyl	011 8005135	
ECO			Not yet appointed
Contractor			Not yet appointed
CECO (Dedicated person appointed by the contractor)			Not yet appointed
Grids Environmental Practitioner	Pieter Leibbrandt	031 710 5104	
Grid Line & Servitude Manager	Ravi Govender	031 710 5511	
Environmental Assessment Practitioner	Savannah Environmental	(011) 234 6621 joanne@savannahsa.com	
Authorising Department	DEAT		

4.1. Reporting Structure

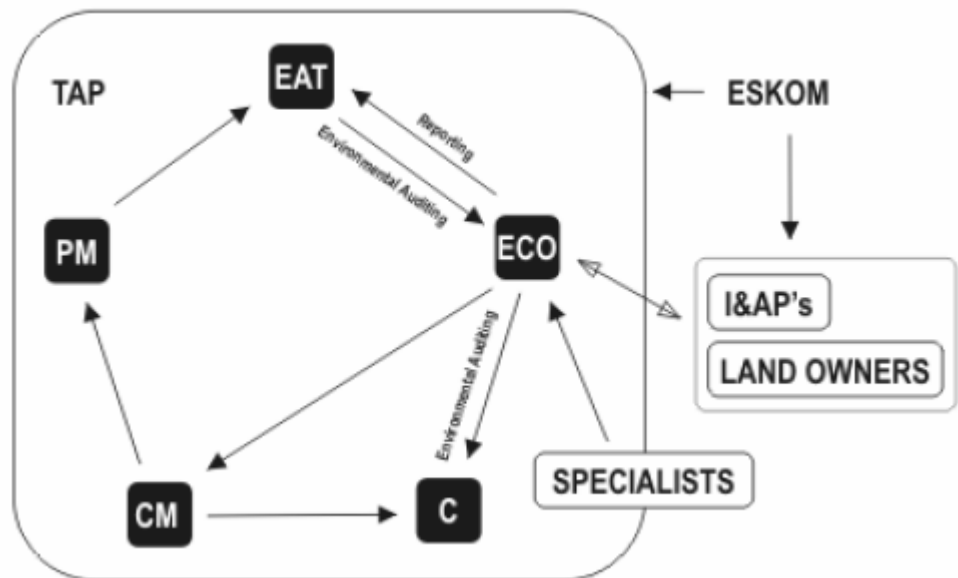
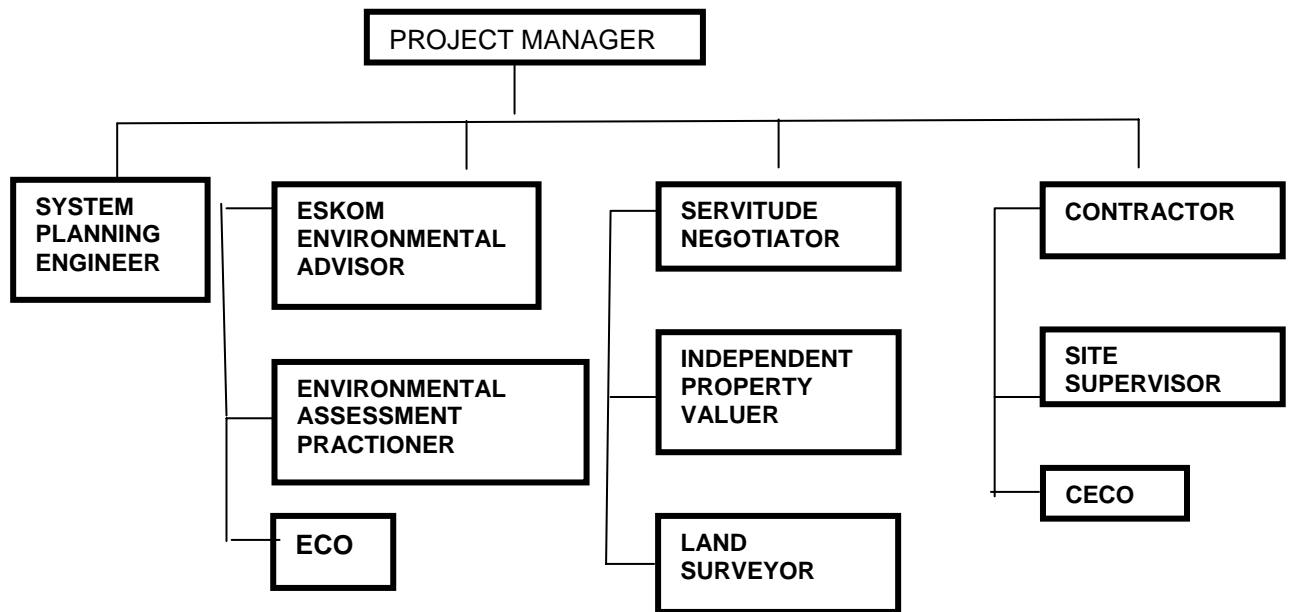


Figure 3: Two diagrams indicating the reporting structure. The bottom diagram emphasises the central role played in the monitoring and reporting process by the ECO

4.2. Roles and Responsibilities of the Project Team

4.2.1. System Planning Engineer

- » To identify the plans that require site and servitude
- » To explain the technical reasons for the preferred option of implementation
- » To present the proposed investment to Eskom Investment Committee

4.2.2. Eskom Environmental Advisor (during feasibility stages & construction phases)

Responsibilities include:

- » To ensure that an un-biased, EIA with a thorough public participation is conducted for the proposed project. Such assessment to be in accordance to the latest legislation and acceptable to all interested and affected parties and to finally be approved by the relevant authority.
- » To project manage the Independent Environmental Consultants and to ensure that a user-friendly, practical, EMP for the construction phase of a project is compiled and approved by the relevant and appropriate government authorities.
- » To ensure that all conditions as stipulated in the RoD are met.
- » To conduct spot audit during construction.

4.2.4. Project Manager/ Site Manager

Responsibilities include:

- » Represents and acts on behalf of Eskom Transmission regarding the administration of contracts.
- » In consultation with the system Planning Engineer, determines the scope of work.
- » To provide scheduling, aspects of co-ordination and estimating
- » Ensure implementation of the project plan within cost, time and quality constraints
- » Ensure that implementation of EMP is executed as planned.
- » Keep the asset owner informed of progress made during the life cycle of the project.

No work shall commence until permission is granted from the Environmental Advisor from Transmission Services. The Project Manager shall ensure that all conditions in the RoD are fulfilled before the Contractor occupies the site. The Grid shall be kept informed of all developments on construction at all times. All the requirements from the Grid must be considered during the construction phase to ensure smooth transition.

4.2.5. Environmental Control Officer

Responsibilities include:

- » The Environmental Control Officer (ECO) shall convey the contents of this document, the conditions of the Record of Decision from DEAT as well as the Landowner Special Conditions to the Contractor site staff and discuss the contents in detail with the Eskom Project Manager and Contractor at a pre-construction meeting. This formal induction training is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training date, people who attended and discussion points shall be kept by the ECO.
- » The ECO shall make contact with the local Extension Officer of the Department of Agriculture and the Chairpersons of the Farmers Associations in the areas where the route traverses, as these contacts have valuable information about the area and the local farming community.
- » Landowners shall be informed timeously of the construction programme, duration and any interference with their daily activities.
- » The contact numbers of the ECO and Contractor's Environmental Control Officer (CECO) shall be made available to Landowners.
- » ECO will report progress made on a monthly basis to the Project Manager and Land & Rights EIA Manager. These reports shall be available at all times, on site or in project file and on request by auditors, DEAT and other I&APs.
- ECO shall record all non-conformances and action plans to ensure that measures are put in place to remedy possible impacts.

4.2.6. Contractor

Responsibilities include:

- » To provide all necessary supervision during the execution of the project. He/ She should be available on site all the time.
- » To appoint a competent CECO
- » To implement the projects as per the approved project plan.
- » To ensure that implementation is conducted in an environmentally acceptable manner.
- » To fulfil all obligations as per the agreed contract.
- » To comply with special conditions as stipulated by landowners during the negotiation process.
- » To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

4.2.7. Eskom Environmental Advisor (During Operational Stage)

Responsibilities include:

- » To implement and integrate environmental management systems by ensuring compliance to ISO 14000 and monitoring performance.
- » Report environmental incidents.
- » Provides environmental training.
- » Ensures compliance to legislations and other legally binding documents.

4.2.8. Environmental Assessment Practitioners

Responsibilities include:

- » Investigate and produce assessment of impacts on the environment related to the project
- » Ensure the implementation of a thorough public participation process
- » Draft and submit scoping and EIA Report to relevant Government Departments
- » Draft EMP and submit for approval to the relevant Government Departments.

5. ENVISAGED ACTIVITY SCHEDULE AND ASSOCIATED IMPACTS

5.1. Predicted Environmental Impacts as Identified by the Final EIA Report

Although some impacts of high significance were identified through the EIA process, it was concluded that the majority of these impacts could be successfully mitigated through the implementation of this EMP (refer to Table 5.1).

5.2. Project Construction Phase

5.2.1. Construction Camps

No employees will reside on the construction site at any time during the construction phase. It is expected that all construction workers will be accommodated within a formal construction village shared with the Pumped Storage Scheme (PSS) construction crews.

The construction of the substation will require the establishment of a construction equipment camp at an appropriate location. The exact siting of this construction equipment camp is required to be negotiated with the relevant landowner, and must take cognisance of any no-go and sensitive areas identified by the EIA studies. The location of this construction equipment camp must be approved by the project Environmental Control Officer (ECO).

5.2.2. Construction Process for the Substation

- Step 1: Survey of the substation site
- Step 2: Site clearing and levelling and construction of access road to substation site
- Step 3: Construction of terrace and substation foundation, including the installation of stormwater drainage on the surface to dispose of such stormwater on the terrace
- Step 4: Assembly, erection and installation of equipment (including transformers and control building)
- Step 5: Connection of conductors to substation infrastructure
- Step 6: Rehabilitation of any disturbed areas and protection of erosion sensitive areas.

A number of fences will be installed to secure the substation and the substation site. These fences include a 2.4 m high security fence to enclose all assets, a 1.8 m high fence around the yards, and a 1.2 m high boundary fence on the property line.

Construction of the substation is required to be undertaken in accordance with the specifications of this EMP.

5.2.3. Potential Environmental Impacts Associated with the Construction Phase

Potential impacts identified through the EIA process to be associated with the construction of the substation include:

- » Impacts on flora and fauna as a result of disturbance and/or loss of sensitive species and habitats.
- » Impacts on heritage sites as a result of disturbance or destruction of these sites due to construction activities.
- » Visual impacts associated with the construction phase.
- » Impacts on the social environment as a result of influx of construction workers and job seekers, disruption in daily movement patterns and nuisance impacts (such as noise and dust impacts).

Although some impacts of high significance were identified through the EIA process, it was concluded that the majority of these impacts could be successfully mitigated through the implementation of this EMP.

5.3. Description of the prescribed Mitigation Measures as set out in the Final Scoping Report

Table 5.1: A List of the predicted environmental impacts of the development and the relevant proposed mitigation measures as set out in the Final Scoping Report:

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
1. ECONOMIC ISSUES			
<p>1.1 Local Benefits</p> <p><i>Also refer to: Job Creation EMP</i></p>	<p>Economic benefits that the Transmission line will bring to local communities</p>	<p>Phase of concern: Construction (mainly) & operation Intensity: Low to Moderate Overall significance rating: Low to Moderate (positive)</p> <p>There will be little direct benefit to local communities from the line itself. However, indirect benefits are anticipated and include improved reliability of supply and greater supply capacity, limited job creation during construction & decommissioning, limited local economic growth during construction, etc. Indirect benefits will arise from the improved regional economic growth with which this Transmission line is associated.</p> <p>Mitigation/Optimisation: Maximise use of local skills and services. Significance after Mitigation: Moderate (positive)</p>	<p>Local municipalities, and Emnambithi in particular, are eager that local labour, skills and services are used where possible. They have offered to work with Eskom in identifying local skill and services that may be relevant. Hence the following measures are recommended:</p> <ul style="list-style-type: none"> • Eskom and municipalities to identify key individuals who will co-ordinate these efforts. • Eskom to provide the various municipalities, district councils, etc., of skills and services required for power line and substation construction. • These include: <ul style="list-style-type: none"> * materials, earth moving, concrete supplies * tourism (accommodation) * catering, * vehicle maintenance, * security services * bush clearing and vegetation * rehabilitation • In turn, the authorities may

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
			<p>provide lists of possible service providers.</p> <ul style="list-style-type: none"> • Encourage contractor (by contractual conditions) to utilise local labour in unskilled and low skilled activities. • Eskom and municipalities to co-ordinate and provide training <p><i>See also below.</i></p>
<p>1.2 Job Creation</p> <p><i>Also refer to: Local Benefits Validity of the EMP</i></p>	<p>Employment of local labour (South African citizens and people local to the area) and preference given to a local contractor</p> <p>Local people could be employed to do the following:</p> <ul style="list-style-type: none"> • waste removal • gate installation • bush clearing • catering <p>Local independent Environmental Officer.</p>	<p>Phase of concern: Construction (mainly) & operation</p> <p>Intensity: Low</p> <p>Overall significance rating: Low to Medium (positive)</p> <p>Local labour should be utilised where possible. Due to the specialised nature of the work required, there will be limited opportunity for job creation in the local market during the construction, operation and decommissioning. However, there will be some opportunity for the employment of skilled and unskilled labour during construction, and the contractors will be encouraged to recruit from the local communities. This will form part of the EMP, and therefore the construction contract documentation.</p> <p>In the past, Eskom Transmission Division has awarded the contract for the construction of its Transmission infrastructure to a single</p>	<p>EMP requirements stated above apply here.</p> <p>In addition to the above:</p> <ul style="list-style-type: none"> • Utilise a local contractor to undertake erosion maintenance and rehabilitation (operations phase) • Encourage contractor (by contractual conditions) to utilise local labour in unskilled and low skilled activities. • Provide training <p>General recommendation: It is apparent that the local authorities view this as a high priority issue and have offered their support in giving effect to any initiatives to maximise local input and job creation.</p> <p>Key to maximising local input will be</p>

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>contractor and left it to the discernment of that firm to obtain the necessary sub-contractors. There is now, however, pressure from local stakeholders for Eskom Transmission Division to stipulate in the main contract that local contractors should be used.</p> <p>Training of labour is a responsibility of the contractor. Eskom Transmission Division will bring the issue of training to the attention of the contractor</p> <p>Mitigation/Optimisation: limited Significance after Mitigation: Medium (positive)</p>	<p>advanced warning of the need for skills and services. This will allow local capacity development and preparedness .</p> <p>It is worth re-emphasising that the EIA consultant still sees job creation to be limited within the Transmission infrastructure projects. Opportunities within other aspects of the Braamhoek PSS development have not been assessed here.</p> <p>See also other issues referred.</p>
<p>1.3 Tourism</p>	<p>The line will detract from the aesthetic appeal of the natural environment, and will therefore negatively impact on tourism activities.</p>	<p>Phase of concern: Construction & Operation Intensity: Low Overall significance rating: Low to moderate</p> <p>The study area includes an important tourist corridor centred on the historic battlefields of the Colenso-Ladysmith-Dundee area. These are however, located more in the southern and eastern areas of the study area. The Western Route along the Majuba-Venus #2 line has the least encounter with tourist related areas. The nearest sites are (see Map 3 of the Scoping Report):</p> <ul style="list-style-type: none"> • Chievely Military Cemetery (R103 near Venus) • Zimele Tourist Junction (a proposed development along the N3) 	<ul style="list-style-type: none"> • Construction access roads to avoid these sites and the access to these sites unless agreed with the owners • Rehabilitation of the construction access roads and servitudes must be undertaken as a priority to minimise visual impact • Advise owners of construction programme and activities before construction starts • Advise and agree with owners servitude maintenance requirements.

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<ul style="list-style-type: none"> Vaalkrans battlefield (northern end of Zimele) <p>Chieveley cemetery is still a few kilometres from the route, but the other two are much closer, situated on the western side of the N3 while the existing Majuba-Venus #2 line and proposed Ingula (Braamhoek)-Venus line will run on the eastern side of the N3. The existing M-V#2 line and N3 already affect the scenery of the area, and are both linear developments. Furthermore, it is understood from the layout of the proposed Zimele development, that the primary view is southwest towards the Tugela River – i.e. away from the N# and existing power line. It is therefore considered that the impact of the proposed Ingula (Braamhoek)-Venus line on tourism in this area will be low.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Low</p>	
2. WELL BEING			
<p>2.1 Electromagnetic Fields</p>	<p>Impact of electromagnetic fields (EMFs) on animals, people and vegetation</p>	<p>Phase of concern: Operation</p> <p>Intensity: Low</p> <p>Overall significance rating: Potentially High (perceptive)</p> <p>International research into this issue has been inconclusive and therefore Eskom Transmission adopts the precautionary principle in the control and restriction of activities taking place within a</p>	<ul style="list-style-type: none"> Monitor occupation/activity in the area within Eskom ownership around the line.

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>servitude. Outside the servitude the EMF levels drop to internationally accepted limits.</p> <p>Mitigation/Optimisation: monitor occupation of land around line during operation</p> <p>Significance after Mitigation: Low</p>	
<p>2.2 Dust & Noise</p>	<p>Dust & noise control during the construction phase.</p>	<p>Phase of concern: Construction</p> <p>Intensity: Moderate to low</p> <p>Overall significance rating: Low (adjacent to residential areas)</p> <p>There is a risk of some dust and noise generation during the construction and decommissioning phases. These will be of a temporary nature, and can be controlled through good site management. There are few locations where noise of dust emissions will affect people, however at those locations where dwellings are near the line (see Map 3 of the Scoping Report) careful management should be implemented.</p> <p>Mitigation/Optimisation: general site management</p> <p>Significance after Mitigation: Low</p>	<p>At critical sites:</p> <ul style="list-style-type: none"> • Keep intrusive construction and operation of heavy machinery to normal working hours. • Ensure machinery and vehicles in good working order • Any blasting to be done after informing local public • Awareness of windy conditions, residential areas and dust producing operations
<p>2.3 Use of creosote poles</p> <p><i>Also refer to: Impact on fauna and flora</i></p>	<p>Creosote poles may be used during the project and may have a negative health implications and an ecological impact</p> <p>Areas of storage for the creosote poles will need to be appropriately</p>	<p>Phase of concern: Construction</p> <p>Intensity: low</p> <p>Overall significance rating: low</p> <p>Creosote is believed to have carcinogenic properties. Thus, it is possible that creosote may pose a health risk to the construction</p>	<ul style="list-style-type: none"> • Ensure proper handling procedures by the stringing team • Use of PVC sleeves on newly creosoted poles • Avoid use near watercourses and groundwater sources (though none of the latter noted in the

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
	managed.	<p>workers that handle the treated poles and to fauna and flora. However, the use of creosoted poles in construction is very low (stringing process where the transmission lines span roads). These temporary structures will be dismantled within approximately two weeks thus limiting potential for contamination</p> <p>Handling procedures, health and safety standards, pole specifications and ground remediation methods should be presented in the environmental management plan</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Low</p>	study area)
<p>2.5 Fire</p> <p><i>Also refer to: Impact on flora Access roads Erosion</i></p>	<p>The construction and operation of the line may alter the occurrence and management of fires in the area. The change in the nature of fire hazards and events can have safety, economic and ecological implications.</p>	<p>Phase of concern: Construction and operation</p> <p>Intensity: Moderate to High</p> <p>Overall significance rating: Potentially High</p> <p>The route crosses an area of high fire risk. Landowners have expressed concern that both power lines and poor maintenance of servitudes increases the risk of fire hazard in the area. See Section 7.4 (Main Scoping Report) for detailed discussion on this topic. However, the following key points refer:</p> <ul style="list-style-type: none"> • Eskom maintains servitudes to protect electricity supply. • Veld management for fire hazard is the landowners responsibility. 	<ul style="list-style-type: none"> • Servitude maintenance activities may be farm specific and Eskom should agree activities with each landowner. • Eskom should therefore liaise with landowners and agree on servitude maintenance activities. • These agreements should be documented in a servitude maintenance EMP in accordance with Eskom guidelines. <p>Additionally, during construction</p> <ul style="list-style-type: none"> • Construction contractors to be trained in fire fighting in veld and woodland areas (fire beaters and

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<ul style="list-style-type: none"> • However, Eskom's servitude maintenance must integrate with the landowners fire management requirements such that a mutually beneficial management programme is established. • Eskom does not maintain fire fighting capacity, but should participate in local fire fighting associations. • Eskom operates a fire warning system that would be beneficial to landowners with servitudes. <p>There is also fire risk associated with construction and maintenance teams working along the servitude and crossing private land. Strict control of smoking, fire making, welding, etc. is enforced by Eskom.</p> <p>Mitigation/Optimisation: liaise with landowners. Identify 'hotspot' areas during design and raise height of towers and line in these areas. See also EMP requirements</p> <p>Significance after Mitigation: Moderate to Low</p>	<p>backpack sprayers to be made available with each construction team)</p> <ul style="list-style-type: none"> • Maintain vegetation in servitudes, particularly hotspot areas. • Contact telephone number and name of Eskom operations control room to be published for line management (e.g. switching off line) during extreme fire conditions. • Publish reporting procedures for fire fighting and line operations – e.g. names of local fire fighting representatives (e.g. conservancy and game farm representatives, farmers associations) and reporting of location by tower number • Access routes to servitudes to be clearly marked with tower numbers
3. AESTHETICS			
3.1 Visual impact	Visual impacts will be significant in the local area	<p>Phase of concern: Construction & Operation</p> <p>Intensity: High</p> <p>Overall significance rating: Moderate</p> <p>The Visual Absorption Capacity of the area is considered to be low to moderate –i.e. the line will blend into the surrounds only to a limited</p>	<p>Construction Phase:</p> <ul style="list-style-type: none"> • Follow least visually intrusive access routes. Do not scrape new roads where possible. Rather undertake bush clearing only. • Siting of any borrow pits (few, if any, anticipated) to consider

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>extent. However, the impact is reduced by the existence of the parallel Majuba-Venus 400kV line and presence of other lines in the area.</p> <p>For this reason the southern areas of the route are seen to be less sensitive than the northern areas where the mountain backdrop becomes more prominent. In the vicinity of Ingula (Braamhoek), the impact is seen to be significant, but that alternatives are limited as all routes to Ingula (Braamhoek) will cross similarly visually sensitive areas.</p> <p>The cross-rope tower structures that will be used for much of the route are less visually intrusive than the older and more common strain tower style of design. Nevertheless the new line will still be noticeable in the area.</p> <p>Mitigation/Optimisation: construction phase only Significance after Mitigation: Moderate</p>	<p>visual impact</p> <ul style="list-style-type: none"> • Rehabilitation to proceed as early as possible in the construction process. Rehabilitation of access roads, borrow pits, spoil storage areas and eroded areas to be addressed in particular.
4. SOCIAL:			
<p>4.1 Relocation of people</p> <p><i>Also refer to: Compensation</i></p>	<p>Will there be a need to relocate people, and their property/houses? What are the likely impacts? Will they be compensated?</p>	<p>Phase of concern: Construction Intensity: low Overall significance rating: low to moderate</p> <p>A few properties have been noted to be close to or within the servitude – mainly along the N3. There may be other along the route, but these are likely to be few as the vacant servitude exists along much of the route.</p>	<p>Design phase:</p> <ul style="list-style-type: none"> • Compensation payments to give careful consideration to property values of traditional houses • Relocation and compensation to give account for disruption of access to transport, schools, clinics, etc. • All relocations to be undertaken

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>Compensation is negotiated and paid to legal occupants on the route and to those who were present before the servitude was established. Each dwelling will be addressed on a case by case basis.</p> <p>Mitigation/Optimisation: see EMP requirements Significance after Mitigation: low negative to low positive</p>	<p>with landowner support.</p> <ul style="list-style-type: none"> • A formal relocation plan should be drafted and implemented. <p>Construction Phase: Ensure necessary services (water, electricity, access, river crossings, etc) as appropriate are installed prior to the relocation of the families.</p>
<p>4.2 Disruption of social networks and daily movement patterns</p> <p><i>Also refer to: Location of Construction Camps Traffic safety</i></p>	<p>The social routine and social networks may be disrupted during the construction process.</p>	<p>Phase of concern: Construction Intensity: High Overall significance rating: Moderate</p> <p>The presence of construction teams, construction camps, traffic etc could have a significant impact on local community and farming routines. Interaction between the communities and the construction teams can be influential in disrupting local customs and structure (e.g. Bluebank area). The occurrence of this is unpredictable, but needs careful management during construction.</p> <p>Mitigation/Optimisation: see EMP requirements. Significance after Mitigation: moderate to low</p>	<ul style="list-style-type: none"> • Careful planning of construction camps (see below) • Liaison with landowners and community leaders as appropriate • Strict adherence to speed limits. Disciplinary action for reckless and drunk driving • Avoid construction vehicle movements during peak hours, start and end of school time (students on the roads), cultural and worship periods, etc. • Limitation on construction worker movements after hours, and particularly week-ends. • Monitor local security (prevention of theft, etc.)
<p>4.3 Location of construction camps</p>	<p>The siting of construction camps in terms of:</p>	<p>Phase of concern: Construction Intensity: Moderate to High Overall significance rating: Potentially High</p>	<p>Design Phase: Each contractor will have different methods of dealing with site security,</p>

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
<p><i>Also refer to:</i> Disruption of social network Impact on water sources Impact on fauna and flora Poaching of fauna <i>Poaching of flora</i> Impact of construction camps</p>	<ul style="list-style-type: none"> • Social issues • Ecological issues • Camps should be above any 1:100 year flood line. This refers particularly to the placement of toilets. • Waste disposal management 	<p>It is anticipated there may be two large construction camps for the line. Its location is typically decided by the contractor who will negotiate land with the landowner. However, its location may have impacts on a number issues:</p> <ul style="list-style-type: none"> • disruption of the local communities (see above) • traffic disruption (see traffic safety) • security of local communities (see above) • increase in the sex trade and sexually related diseases (see below) • poaching of fauna and flora (see below) • waste disposal (see below) • pollution from spillages (fuel) <p>However there are, as discussed in the sections above, potentially positive impacts such as:</p> <ul style="list-style-type: none"> • the support of local services, shops, etc. • purchase of local materials • use of local skilled and unskilled labour (albeit a limited opportunity given the specialised nature of the construction.) 	<p>staff management, vehicle management, etc. Additionally the site selection will also be dependent on local aspects such as material availability, services required, and specific design criteria for the line. However, it is recommended that Eskom Transmission Division needs to be intimately involved in the site selection process with the contractor.</p> <p>It is suggested that the EMP should be developed to include a plan for the site selection of the construction camp. The plan will guide the contractor in the site selection, and must therefore set key objectives based on the items listed adjacent. The contractor will then indicate in his tender how he will achieve these objectives. The drafting of this element of the EMP therefore needs to be done prior to the tender process – ie during the design phase.</p> <p>It is also suggested to follow the recommendation of the local community and place the camp some distance away from existing residential areas.</p>
<p>4.4 Location of construction</p>		<p>Both the potentially positive and negative impacts are affected by the location of the</p>	<p>Construction phase</p> <ul style="list-style-type: none"> • Close liaison with landowners on

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
<p>camps continued</p>		<p>construction camp, particularly its proximity to populated and economically active areas.</p> <p>With poor planning of the location, and in combination with poor site management, the net impact of all the above issues could be highly significant and negative. With careful planning and management, the outcome could be highly significant and positive.</p> <p>Consultation with the local community has identified that they would prefer the construction camp to be placed away from existing residential areas. In doing so, negative impacts will be minimised. If effectively managed this impact may be changed to a low but potentially positive impact.</p> <p>Mitigation/Optimisation: see EMP requirements Significance after Mitigation: Potentially Low (positive)</p>	<p>this matter</p> <ul style="list-style-type: none"> • Acknowledge local community requirements and keep the construction camp away from residential areas. • Emnambithi Municipality has offered to assist in the locating of construction camps and Eskom should facilitate this. • Implementation of the EMP • Eskom Transmission Division to be part of the site selection process and to approve the final decision.
<p>4.5 Gravesites</p> <p><i>Also refer to: Consultation</i></p>	<p>Protection of gravesites, disinternment of graves</p>	<p>Phase of concern: Construction Intensity: Low Overall significance rating: Low</p> <p>There is the potential for gravesites to be found within the servitude. They will be identified during the archaeological survey during the design phase of the project. These may be left untouched in the majority of cases as the tower may be moved up or down the centre line of the</p>	<p>Design Phase:</p> <ul style="list-style-type: none"> • Survey preferred route and identify all grave sites • Adjust tower locations accordingly • Consultation with landowners and community representatives • Map location of all gravesites along the route <p>Construction Phase:</p>

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>servitude. However, the cultural acceptability of this will need to be explored with the owners of the grave, if they can be traced. Management guidelines will be set up by the archaeologist on completion of the site survey.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Low</p>	<ul style="list-style-type: none"> • Contractor to be informed of all gravesites • Access roads, camps, storage areas, etc to avoid gravesites – minimum 100m clearance is suggested. • Any damage to gravesites must be reported to the Environmental Officer and the 'owner' immediately.
<p>4.6 Traffic Safety</p> <p><i>Also refer to: Access to Properties Location of Construction Camps</i></p>	<p>Road traffic safety, particularly relating to construction traffic.</p>	<p>Phase of concern: Construction</p> <p>Intensity: Moderate to high</p> <p>Overall significance rating: Moderate to High</p> <p>General maintenance and operation traffic will be limited and intermittent and is not expected to have any significant impact on local traffic. On private land, landowners should be advised before the time.</p> <p>Construction traffic will be greater in volume and it will be experienced in phases at any one point. Most of the construction traffic will use the servitude access roads, but use of the local farm and district roads will be required. Construction traffic will need to abide by the associated speed limits and traffic by-laws and regulations for the area. Abnormal loads will need the necessary authorisations. Particular care in the populated rural areas will be required.</p>	<ul style="list-style-type: none"> • Construction traffic to comply with national traffic laws and local by laws. • All vehicles to be in good working order, particularly brakes as there are many pedestrians and animals in the area. • All drivers to have full drivers licences • Traffic movements for heavy and abnormal vehicles must be planned and agreed with the ECO. • Construction traffic to be confined to normal working hours. However, particular care to be given at school opening and closing times. • Damage caused by construction traffic to be repaired immediately to prevent damage/accidents to road users. • Traffic access routes on private

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>On private land, agreements for access must be secured with landowners before work on site starts.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Low to moderate</p>	<p>land should be mapped, marked on site, and agreed with the landowner.</p>
5. LAND ISSUES:			
5.1 Compensation	<p>Details about compensation</p> <p>If land is being leased, who is compensation paid to?</p> <p>Will Eskom compensate for cattle or other property that are stolen by workers residing in the construction camps?</p>	<p>Eskom Transmission Division will engage with each landowner and discuss any new servitude or widening of a servitude. This is a private matter between the two parties.</p> <p>Eskom Transmission Division negotiates directly with the Landowner and compensation is paid to him/her.</p> <p>Eskom holds the contractor responsible for proven theft. Eskoms site supervisor and environmental control officer will monitor site activities, and any cases of theft may be reported to them.</p> <p>An additional concern is that the construction camps could be seen as an ideal opportunity for locals to commit crime under the guise of it being the construction workers. The private contractor should have security mechanisms in place to cater for any such potential problems.</p>	<ul style="list-style-type: none"> The EMP should outline Eskom Transmission Division and Contractor responsibilities in these instances
6. NATURAL ENVIRONMENT:			
6.1 Erosion	<p>Erosion on access roads may become a problem.</p>	<p>Phase of concern: Operation and construction</p>	<p>Construction Phase:</p> <ul style="list-style-type: none"> All access roads to be carefully

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
<p><i>Also refer to: Access roads Auditing of EMPs</i></p>		<p>Intensity: Moderate Overall significance rating: Moderate to low</p> <p>The soils in the area and the generally undulating terrain result in a relatively moderate risk of water or wind erosion. There are some existing areas of erosion in the area. Steeper slopes in the middle of the route and in the northern areas are at more risk of erosion.</p> <p>Erosion due to heavy traffic in wet or waterlogged conditions is a potential problem if the main access road is not well constructed (e.g. vehicles create new paths around waterlogged areas).</p> <p>Wetlands are particularly sensitive areas in this respect. Any draining of wetlands (e.g. created by vehicle tracks) could result in permanent damage to wetland habitat and result in the development of erosion gulleys. Upland and hillslope wetlands are particularly sensitive to vehicle track disturbances. Careful planning and management can avoid damage and construction monitoring will enable rapid rehabilitation to limit damage.</p> <p>Mitigation/Optimisation: see EMP requirements Significance after Mitigation: Low</p>	<p>planned and selected – where possible use existing access roads</p> <ul style="list-style-type: none"> • A soils specialist should be consulted during this exercise. All upland and hillslope wetlands near the route to be mapped. • Rehabilitate all existing erosion areas along access routes used for construction and operation • Avoid all wetland areas • Crossing of all streams and drainage lines to be stabilised immediately. Rehabilitation to take place as soon as possible. • Environmental Officer to inspect all roads with landowner before contractor leaves site. A revisit before the end of the 12 month contract period is also recommended so that the contractor can repair any unstable areas. <p>Operation Phase</p> <ul style="list-style-type: none"> • An independent Environmental Officer should be employed to monitor the environmental status of the line. • Agreements for maintenance between Eskom Transmission Division and the landowner must be clearly stated

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
			<ul style="list-style-type: none"> Due to the nature of this area, the new line and access roads should be inspected twice in the wet season. Any necessary repairs to be effected by the Eskom Transmission Division regional office immediately
<p>6.2 Impact on fauna</p> <p><i>Also refer to: Season for construction activities Erosion Fire Impacts on flora</i></p>	<p>Impacts on the natural fauna in the area</p>	<p>Phase of concern: Construction and Operation Intensity: Moderate to low Overall significance rating: potentially high</p> <p>A number of Red Data fauna may occur in the corridor of the proposed line. These include Dobson's golden mole, two frog species and a number of butterfly species. Particularly sensitive habitats include:</p> <ul style="list-style-type: none"> rock outcrops Watercourses Wetland areas <p>It has been determined that the habitat of these Red Data species should not suffer permanent damage if a detailed survey of the route is carried out once a preliminary design of the line and tower structures has been done. These habitats may be avoided by careful placement of towers and access roads.</p> <p>Mitigation/Optimisation: see EMP requirements</p>	<p>Design Phase:</p> <ul style="list-style-type: none"> Undertake a walk-through ecological survey during the detailed design phase and review placement of towers and access roads See recommendations under 'Impacts on flora' <p>Construction Phase</p> <ul style="list-style-type: none"> Avoid wetlands and watercourse crossing with access roads Minimise cutting of bushveld areas inside the servitude. Keep activities within the servitude during construction. Spoil storage areas outside the footprint to be carefully selected with the assistance of an ecologist (see 'Impact on flora'). No open fires on site All workers to be aware of fire risk. Provide a 'smoking area' on site for better control. Rehabilitation to begin as early as

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		Significance after Mitigation: Low	<p>possible.</p> <ul style="list-style-type: none"> • No cutting of trees or collecting of firewood. • Rehabilitate potential erosion sites immediately during wet season. <p>Operation Phase</p> <ul style="list-style-type: none"> • Monitor site rehabilitation <p>See also rehabilitation opportunities under 'Impact on flora'.</p>
<p>6.3 Impact on flora</p> <p><i>Also refer to: Season for construction activities Erosion Fire Impacts on fauna</i></p>	<p>General impacts on flora.</p> <p>(for impacts on wetlands, see below)</p>	<p>Phase of concern: Construction and operation</p> <p>Intensity: Moderate</p> <p>Overall significance rating: Moderate</p> <p>The route crosses a mix of grasslands (Highland sourveld and tall grasslands), thornveld and wetlands. In the far northern sections of the route there are stands of Moist tall grassveld that are still undisturbed by farming land uses, but in general agricultural practices and development have impacted on the natural state of the flora in the study area.</p> <p>The vegetation in the area is therefore seen to be low to moderately sensitive to development disturbance. Significant damage by scraping the surface material (e.g. for access roads) may permanently affect the grasslands as they are difficult to rehabilitate back to their original state, but these grasslands are fairly robust and</p>	<p>Design Phase:</p> <ul style="list-style-type: none"> • Ecologist must undertake a 'walk through' survey to assist in selection of tower placements. • Ecologist to assist in preparation of a rehabilitation plan for the site, including: <ul style="list-style-type: none"> * consideration of most suitable locations for temporary spoil storage, * protection of indigenous species for re-establishment and propagation within the site * removal of alien species * rehabilitation programme • A map is to be prepared showing the critical areas and any specific management interventions.

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>can withstand temporary vehicle passage during construction.</p> <p>It is expected there will be limited need for the cutting of trees within the servitude as most of the natural species are sufficiently low in height. However, there is opportunity to thin out some of the existing vegetation through the removal of woody species in overgrown sections.</p> <p>There are a number of possible Red Data species that may exist along the route. These would need to be identified in a walk through survey during detailed design, but are understood to be relocatable if they cannot be avoided during construction.</p> <p>Mitigation/Optimisation: refer to EMP requirements Significance after Mitigation: low</p>	<p>Construction Phase</p> <ul style="list-style-type: none"> • Ensure the bush clearing contractor is qualified to identify protected species and is able to remove the appropriate trees from the servitude site. • It is recommended that the bush be cleared to a width of 4m. Trees damaged by the pilot cable during stringing will be preferable to the loss of the entire tree. • As far as possible, protected species are to be left in the servitude unless they threaten the operation of the power line. • The construction programme should address programmed rehabilitation throughout the construction phase. This should be updated as the construction progresses. Rehabilitation should be implemented as soon as possible. • Wetland management – see below.
<p>6.4 Impact on wetlands</p>	<p>Potential damage to wetlands in during construction and maintenance</p>	<p>Phase of concern: Construction & Maintenance Intensity: Moderate Overall significance rating: Moderate to potentially high</p>	<p>Design phase:</p> <ul style="list-style-type: none"> • Review preliminary siting of towers. If possible move them outside of wetland areas. • Plan access roads to avoid wetlands, especially hillslope

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>There are many wetland areas along the length of the proposed route. Wetlands are generally seen to be sensitive habitats that should be avoided. This is true if the water regime of the wetland is altered (e.g. by drainage). Vehicle tracks across a wetland can create preferential flow paths that may result in drainage and erosion is likely to follow. Hillslope and upland wetlands are the most sensitive to these disturbances, and there are many of these along the study route.</p> <p>Where the water regime is not affected, wetlands are robust environments and are among the quickest and easiest to rehabilitate. Placement of towers in wetlands will not necessarily affect the stability or function of the wetland if properly designed and constructed. There may be instances in this project where towers in wetlands may be required. Provided other environmental issues are adequately addressed, construction in a wetland may be done with minimal impact.</p> <p>Mitigation/Optimisation: refer to EMP requirements Significance after Mitigation: low</p>	<p>wetlands. Unavoidable wetland crossings must be engineered for stability.</p> <ul style="list-style-type: none"> • Map wetlands along the route of the power line and all access roads. • Prepare a management plan for the wetlands along these routes for implementation in construction. <p>Construction:</p> <ul style="list-style-type: none"> • Monitor and update all wetlands in contact with the project. • Undertake rehabilitation as soon as damage occurs. Temporary measures to be undertaken if further impact is likely. • Review construction programme from a seasonal perspective. It is better to undertake work on wetlands during the drier winter periods.
<p>6.5 Importation of alien vegetation</p>	<p>Importation of alien vegetation through building materials</p>	<p>Phase of concern: Construction Intensity: Moderate Overall significance rating: Moderate to high</p> <p>This is seen to be an issue that can be</p>	<p>Construction Phase:</p> <ul style="list-style-type: none"> • Contractor to be made aware of invader species in the area. • Operation in these areas to include the eradication of the alien

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>minimised through careful management during the construction and rehabilitation process. This should therefore be addressed in the EMP. Enhancement may be achieved through the eradication of existing alien species with the area of ownership.</p> <p>Mitigation/Optimisation: refer to EMP requirements</p> <p>Significance after Mitigation: low</p>	<p>plants and treatment of stumps, etc.</p> <ul style="list-style-type: none"> • Importation of materials that may be contaminated by alien plant seed etc. is to be obtained from controlled sources. • Storage/stock piling of materials should not be in alien plant areas for fear of disturbance and spreading. <p>Operation phase:</p> <ul style="list-style-type: none"> • Monitor alien plant areas and control further spreading.
<p>6.6 Impact of construction camps</p> <p><i>Also refer to: Location of construction camps</i></p>	<p>The construction camps may have an impact on the natural environment</p> <ul style="list-style-type: none"> • should be at least a hundred meters away from any water source • should be above the 1:100 year flood line. This refers particularly to the placement of toilets. 	<p>Phase of concern: Construction</p> <p>Intensity: High</p> <p>Overall significance rating: Potentially High</p> <p>The location of the camp is normally at the discretion of the contractor who will reach an arrangement with a landowner. This issue is discussed in more detail above in <i>Location of Construction Camps</i></p> <p>Impacts on the physical environment will be focussed on</p> <ul style="list-style-type: none"> • drainage (stormwater) • erosion • wastewater (vehicle washing, etc.) • sewage • solid waste – wind blown and litter (rubble, plastic, steel, etc.) 	<p>Design phase</p> <p>Eskom Transmission Division to be actively involved with the contractor in the selection of the construction camp. Refer to <i>Location of Construction Camp</i> for more detail. It is recommended that an ecologist and soils specialist be consulted at this stage.</p> <p>Construction phase</p> <ul style="list-style-type: none"> • site to be located above the 1:100 year floodline and at least 100m away from a watercourse or borehole • a formal stormwater drainage system to be put in place (can use infiltration methods)

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<ul style="list-style-type: none"> • fire (spreading from camp fires) • pollution – fuel spillages, broken cement bags, etc. <p>The impact of all the above can be highly significant dependent on location, but all can be managed and mitigated.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: moderate to low</p>	<ul style="list-style-type: none"> • erosion protection and sediment traps to be placed at stormwater outfalls from the camp • wastewater needs to be treated before discharge to any water source (settlement treatment may suffice dependent on initial water quality) Use of detergents, chemicals, etc to be avoided. • Chemical toilets to be provided if waterborne services not available. • A solid waste service must be put in place. Disposal of solid waste at licensed waste dumps only. Wind blown waste to be controlled • Open camp fires to be avoided if in sensitive areas. • Fuel storage and material storage areas to be secure from unauthorised access. Provision of spillage bunds or sumps for fuel spillage or leakage. • Environment Officer to be appointed to monitor construction camp and to implement EMP. Contact details to be made available to general public. • Camp site to be rehabilitated after completion of construction.
7. CULTURAL AND ARCHAEOLOGICAL SITES:			
7.1 Palae-ontological Sites	Impact on fossils.	No fossil sites have been identified in the study area	

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
<p>7.2 Archaeology</p>	<p>Impact on late stone age and possible iron age sites.</p>	<p>Phase of concern: Construction and Operation Intensity: moderate Overall significance rating: Moderate to low</p> <p>There are possible Late Stone Age and even Iron Age sites in the study area, though the latter are understood to be less likely. However, these are likely to be small in area and easily avoided by careful placement of the towers.</p> <p>Mitigation/Optimisation: see EMP requirements Significance after Mitigation: Low</p>	<p>Design Phase:</p> <ul style="list-style-type: none"> • Appoint archaeologist to carry out a survey of the preferred route, giving attention to proposed tower locations. • Report back to SAHRA/AMAFA and agree way forward. • Shift tower locations where necessary • Update EMP requirements for the construction phase <p>Construction phase</p> <ul style="list-style-type: none"> • If any sites are found, undertake site excavations by an approved specialist at tower locations as required prior to excavation of the foundations. • Log results and send data back to SAHRA • Follow requests by specialist archaeologist.
<p>7.3 Cultural, Historical and National Heritage Sites</p>	<p>Impact on Battlefield sites.</p>	<p>Phase of concern: Construction Intensity: Low Overall significance rating: Potentially high</p> <p>The southern part of the route near Venus is closest to the Battlefield sites, and three are relevant to the study; Bloukrans battlefield, Chievely cemetery and Vaalkrans Battlefield (near the middle of the route). Each of these</p>	<ul style="list-style-type: none"> • Review construction traffic access routes. • Mark sensitive sites. • Instruct construction traffic drivers on the sensitivities of these areas. • Monitor the sites and surrounding roads on a regular basis.

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>are seen to be avoided by the new line and construction traffic should be able to avoid damaging them. Access past Chievely Cemetery may be necessary, and if so the site should be marked so that construction traffic knows to take care in the vicinity.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Low</p>	
8. MANAGEMENT ISSUES			
<p>8.1 Environmental control officer</p>	<p>Appointment of environmental control officers (or Environmental Officer)</p> <p>Liaison with Landowners</p> <p>The environmental liaison officer must have a formal education.</p>	<p>An environmental control officer should be appointed for the construction phase and a regional environmental manager should be appointed for operation. The roles, responsibilities and contact details should be set out in the EMP</p> <p>Landowners should have access to an environmental control officer with whom they can lodge grievances during construction.</p> <p>As above.</p>	<p>Further to the points adjacent, it is recommended that the EMP is developed and implemented to cover the life of the project from environmental authorisation to decommissioning. Hence the EMP should cover:</p> <ul style="list-style-type: none"> • Design • Construction • Operation • Decommissioning <p>The EMP is a working document, and need only address the current phase in any detail. It will therefore evolve and need to be reviewed at regular intervals.</p> <p>The role if the Environmental Control Officer will form an important part of the development of the document,</p>

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
			<p>and different officers may be involved for each phase, or just over time.</p> <p>The contact details of the Environmental Control Officer needs to be published to all affected parties.</p>
9. CONSTRUCTION CAMP ISSUES:			
<p>9.1 In-migration of construction workers</p>	<p>In-migration of construction workers may lead to:</p> <ul style="list-style-type: none"> Increased theft and poaching – fruit, stock, farming implements, irrigation pipes due to improved access to farms. Increased social problems – drinking, violence, prostitution and HIV/Aids. 	<p>Phase of concern: Construction Intensity: High Overall significance rating: Potentially moderate to high</p> <p>The specialised skills required for the construction of a transmission line will mean that most of the construction workers will be brought in from outside the local area, and quite possibly outside the region.</p> <p>The social implications of this can be significant and is discussed under the issues mentioned above.</p> <p>An associated issue is the possibility of a sharp increase in the sex trade and the associated risk of sexually transmitted diseases, including HIV/AIDS. It is reported that prostitution is present in the area and control will need to be given to the involvement of construction workers in the local communities.</p> <p>There issue needs to be given particular attention in the selection of a camp site. It is</p>	<ul style="list-style-type: none"> Eskom Transmission Division to be involved in the planning of the location of the construction camp. Movements of construction workers to be carefully monitored, especially after hours and week-ends Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community. This programme to be repeated during the construction programme. Medical support to be available (sensitivity to local customs to be upheld) Contractor and Environmental Officer to maintain contact with community representatives (eg regular/scheduled meetings) to monitor conditions.

ISSUE	DETAILS	COMMENT	EMP REQUIREMENTS AND MITIGATION MEASURES
		<p>recommended that community officials be consulted of the intended location of the camp as part of the construction planning process.</p> <p>Mitigation/Optimisation: see EMP requirements</p> <p>Significance after Mitigation: Moderate to low</p>	
10. GENERAL			
<p>10.1 Potential temporary and long-term disruption of infrastructure and services</p>	<p>Potential disruption of:</p> <ul style="list-style-type: none"> • Local services (water, electricity) • The local irrigation canal network. • Local traffic • Waste dump site 	<p>Disruption of local services (water, electricity, etc.) due to the construction process is expected to be of low probability as most of the construction activity will be away from most services and will remain 'off-line' from the local electricity network until start of operation.</p> <p>Eskom should negotiate with the Dept of Transport in terms of registration of road servitudes and access points.</p> <p>Permission is required from the Dept of Transport to:</p> <ul style="list-style-type: none"> • Access off existing provincial roads • Cross existing provincial roads <p>For impacts on local traffic see 'Traffic Safety' above</p> <p>A Petronet pipeline passes through the study area, but is not seen to affect the construction approach or programme. However Petronet should be advised of the proposed route and construction programme.</p>	<p>Eskom Transmission Division to contact the Dept of Transport and local Irrigation Board to get the necessary permits for access.</p> <p>A wider services search will need to be undertaken by the design team.</p> <p>Any likely crossing of the canals in the area should be first reported to the Eskom Transmission ECO.</p> <p>Eskom Transmission designers to liaise with the local authority regarding the tower locations and line height at the dump site.</p>

5.3.1. Further recommendations as set out in the Final Scoping Report

A number of recommendations were set out in the final scoping report, particularly in the Impact Tables in Appendix 2 of the final Scoping Report (an EMP applicable part of which is set out in Table 5.1 above), and these are considered relevant to the future implementation of the project. However, a number of general recommendations were also made:

- » Liaise with local municipalities regarding availability of local goods and services relevant to the construction of the transmission infrastructure, and the location of construction camps. Emnambithi Municipality in particular has offered assistance in this regard.
- » The construction programme should set out anticipated rehabilitation activities and timing. Emergency rehabilitation measures should also be identified (e.g. for spillage containment, erosion, plant damage, etc.).
- » It is important that Eskom appoints a full time Environmental Control Officer (ECO) for the construction planning and construction phase. This ECO must be able to initiate specialist surveys in the design phase (archaeology and ecology) and construction phase.
- » In support of this, it is recommended that the KwaZulu-Natal Department of Agriculture and Environmental Affairs monitor the construction planning and the construction programme.

6. OUTLINE OF ROD CONDITIONS

The respective RoDs issued for the Ingula (Braamhoek) – Venus main line and turn-ins are attached as Appendix C.

Good relations with the Landowner / legal occupier (hereafter referred to as Landowner), Grid staff and Communities need to be established and sustained. This will help in the solving of problems and the prevention thereof. Lines of communication should always be open to ensure proper and timeous reaction to complaints. The contact numbers of the ECO and / or Eskom Site Supervisor shall be made available to the Landowner (for new substation sites and extensions) and Grid staff (for all sites). The reputation of both the Contractor and Eskom is at stake and should be the drive for everybody involved to perform in excellence.

During the construction period for new substations and extensions environmental personnel shall monitor the works, to measure compliance with the recommendations of the EMP and conditions of the ROD. The Grid Environmental Advisor shall inspect refurbishment and upgrading projects upon completion of the contract. If satisfied the works shall be taken over by the Grid.

7. ENVIRONMENTAL SPECIFICATIONS FOR CONSTRUCTION CAMPS

7.1. Site Establishment

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

Where Eskom facilities are available the Contractor shall make use of such facilities where it is viable and negotiated with the Grid. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities.

The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered waste dump. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burned on site unless a suitable incinerator is available.

7.2. Workshop and Equipment Storage Areas

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

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

The following shall apply to hazardous substance spills:

- » All contaminated soil/yard stone shall be removed and be placed in containers. Contaminated material can be taken to one central point where bio-remediation can be done.
- » Smaller spills can be treated on site.
- » A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.
- » All spills of hazardous substances must be reported to the ECO and appointed Transmission Engineering Environmental Advisor (Transmission Key Performance Indicator requirement).

7.3. Storage Areas of Hazardous Substances

All hazardous substances shall be stored in suitable containers and storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid. A register shall be kept on all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Any leaking containers shall be repaired or removed from site (See above for actions after spills).

8. PHYSICAL ISSUES AND THEIR CONTROL

8.1. Substation Terrain Area

Where terracing is required, topsoil shall be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone. Such areas include terrace embankments and areas outside the high voltage yards. Where required, all sloped areas shall be re-vegetated and stabilised to ensure proper rehabilitation is effected. These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of steep embankments. The contract design specifications and Environmental Impact Report (EIR) recommendations shall be adhered to and implemented strictly.

The retained topsoil shall be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion. Where required, re-vegetation can also be enhanced using an indigenous vegetation seed mixture.

8.1.1. Management objectives

- » Minimise scarring of the soil surface and land features other than on site
- » Minimise disturbance and loss of topsoil from site
- » Rehabilitate all disturbed areas in the substation area

8.1.2. Measurable targets

- » No visible erosion scars once construction is completed
- » All disturbed areas successfully rehabilitated

8.2. Natural Drainage

Under no circumstances shall the contractor interfere with any watercourses in the vicinity of the site. Should deviation of such watercourses be required as part of the contract design specification, the specifications shall be adhered to strictly. The Environmental Control Officer shall ensure that all watercourses are adequately protected to prevent downstream siltation due to erosion on site. Rubble from the construction process shall be removed from site and may under no circumstances be dumped into any natural drainage channels. The normal flow of runoff water must not be impeded, as this will enhance erosion.

8.2.1. Management objectives

- » Avoid damage to natural drainage channels

- » Avoid damage to river and stream embankments
- » Minimise erosion of embankments and subsequent siltation of rivers and streams

8.2.2. Measurable targets

- » No damage to natural drainage channels
- » No damage to river and stream banks
- » No visible erosion scars on embankments once construction is completed

8.3. Access Roads to the Site

Planning of access routes to the site for construction purposes shall be done in conjunction between the Contractor, Eskom and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall properly mark all access roads. Roads not to be used shall be marked with a " NO ENTRY " sign.

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

Where necessary suitable measures shall be taken to rehabilitate damaged areas next to the newly constructed road.

8.3.1. Management objectives

- » Minimise damage to existing access roads
- » Minimise damage to environment due to construction of new access roads
- » Minimise loss of topsoil and enhancement of erosion
- » Minimise impeding the natural flow of water

8.3.2. Measurable targets

- » No claims from Landowners due to damage on existing access roads
- » No erosion visible on access roads three months after completion of construction
- » No loss of topsoil due to runoff water on access roads

- » No interference with the natural flow of water

8.4. Construction Rubble Disposal

The Contractor shall dispose of all excess material on site in an appropriate manner and at a registered landfill. All packaging material shall be removed from site and disposed of and not burned on site. A negotiated landfill may be used but when it is closed up, the rubble shall be compacted and there shall be at least 1 m of soil covering the waste material. No landfill may be used without the consent from the Landowner. No non-biodegradable materials shall be disposed of in any unregistered waste site.

No material shall be left on site that may harm man or animals. Broken, damaged and unused spares such as porcelain, glass, nuts, bolts and washers shall be picked up and removed from site. Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner. Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately.

8.4.1. Management objectives

- » To keep the site neat
- » Disposal of construction rubble in an appropriate manner
- » Minimise litigation
- » Minimise Landowner complaints

8.4.2. Measurable targets

- » No construction rubble left lying around on site
- » No incidents of litigation
- » No complaints from Landowners

8.5. Site Clearing

Vegetation clearing to allow for site establishment as well as construction purposes will sometimes be required. Vegetation can be cleared mechanically with a bulldozer where terracing is required, but should be cleared by hand on other areas. All alien vegetation shall be eradicated from site during the project. Indigenous vegetation that does not pose any risks to the operation of the substation upon completion of the contract should be retained for esthetical purposes. Such vegetation shall be identified during design and clearly indicated on the site plans.

Protected or endangered species of plants shall be retained where possible. Where such species have to be removed due to interference with structures, the necessary permission and permits shall be obtained by the ECO from Provincial Nature Conservation, prior to commencement of site works. Search, rescue and replanting of indigenous, valuable and protected species is highly recommended where possible and viable.

The use of herbicides shall only be allowed after a proper investigation into the type to be used, the long-term effects and the effectiveness of the agent. Eskom's guidelines regarding the use of herbicides (TRR/S91/032) shall be adhered to strictly. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the Supplier's specifications.

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

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

Natural features shall be taken into consideration during design and where possible these shall be protected unless they will interfere with the operation of the substation.

8.5.1. Management objectives

- » Minimise unnecessary damage to vegetation
- » Keep site as natural looking as possible
- » Minimise possibility of erosion due to removal of vegetation
- » Minimise removal of plant material on river and stream embankments
- » Minimise damage to natural features

8.5.2. Measurable targets

- » Only vegetation cleared as required for site construction purposes
- » No vegetation interfering with structures and statutory requirements upon completion of the contract
- » No de-stumping of vegetation on river and stream embankments
- » No visible erosion scars three months after completion of the contract due to vegetation removal

- » No visible damage to the vegetation outside the site one year after completion of the contract due to herbicide leaching
- » No litigation due to unauthorised removal of vegetation
- » No unnecessary damage to natural features

8.6. Fencing Requirements

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

8.6.1. Management objectives

- » Properly installed gates to allow access to the site
- » Minimise damage to private fences
- » Limit access to Eskom and Contractor personnel

8.6.2. Measurable targets

- » No transgressions of the fencing act and therefore no litigation
- » No damage to fences and subsequent complaints from Landowners
- » All gates kept locked at all times to limit access to construction staff

8.7. Fire Prevention

No open fires shall be allowed on site under any circumstance (The Forest Act, No 122 of 1984). All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. The Contractor shall have operational fire-fighting equipment available on site, especially during the winter months.

8.7.1. Management objectives

- » Minimise risk of runaway veld fires
- » Minimise damage to private property

8.7.2. Measurable targets

- » No veld fires started by the Contractor's work force
- » No claims from Landowners for damages due to veld fires

- » No litigation

8.8. Noise Pollution

The Contractor shall ensure that noise levels remain within acceptable limits, especially in built up areas. This applies especially after working hours and during the night.

8.8.1. Management objectives

- » Prevention of noise pollution
- » Minimise nuisance factor of construction activities

8.8.2. Measurable targets

- » No complaints from landowner or community
- » No litigation

8.9. Claims for Damages

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 should be directed to the ECO for appraisal. The Contractor shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from the Landowner, Grid or community. All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

8.9.1. Management objectives

- » Minimise complaints from Landowners and communities
- » Prevent litigation due to outstanding claims
- » Completion of the contract on time

8.9.2. Measurable targets

- » No claims from the Landowner or communities
- » All claims investigated and settled within one month
- » No litigation due to unsettled claims

8.10. Rehabilitation

All damaged areas shall be rehabilitated upon completion of the contract in accordance with design specifications. In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Extra seed shall be sown on disturbed areas as directed by the ECO (see below for specifications). Other methods of rehabilitating disturbed sites may also be used at the discretion of the Project Manager to comply with the conditions of the ROD and EMP, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slopes. The type of soil shall also be taken into consideration.

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

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

To get the best results in a specific area, it is a good idea to consult with a vegetation specialist or the local Extension Officer of the Department of Agriculture. Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area. Re-seeding will always be at the discretion of the Project Manager, unless specifically requested by a Landowner / Grid staff.

8.10.1. Management objective

- » Minimise damage to topsoil and environment
- » Successful rehabilitation of all damaged areas
- » Prevention of erosion

8.10.2. Measurable targets

- » No loss of topsoil due to construction activities
- » All disturbed areas successfully rehabilitated within one year of completion of the contract
- » No visible erosion scars one year after completion of the contract

8.11. Material Storage Areas

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

8.11.1. Management objectives

- » Minimise disturbance of topsoil
- » Successful rehabilitation of disturbed areas

8.11.2. Measurable targets

- » No remaining disturbance to vegetation outside the substation area
- » No loss of topsoil
- » All disturbed areas successfully rehabilitated one year after completion of the contract

8.12. Batching Plants

In remote areas where batching plants have to be established, these sites shall be negotiated with the Landowner / Grid staff depending on their location. These sites shall be cleared of all excess material upon completion of the contract. Such areas shall be rehabilitated to their natural state. Any spilled concrete shall be removed and soil compacted during construction shall be ripped, levelled and re-vegetated.

8.12.1. Management objectives

- » Minimise complaints from Landowners / Grid staff
- » Successful rehabilitation of disturbed areas

8.12.2. Measurable targets

- » No complaints from Landowners / Grid staff
- » All disturbed areas successfully rehabilitated one year after completion of the contract

8.13. Old Equipment

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

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

8.13.1. Management objectives

- » To prevent pollution of the environment
- » Prevention of litigation due to illegal dumping

8.13.2. Measurable targets

- » No complaints from Landowners / Grid staff / Communities
- » No pollution of the environment
- » No litigation due to illegal dumping

8.14. Transport of Equipment

All equipment moved onto site or off site during a project is subject to the legal requirements as well as Eskom specifications for the transport of such equipment. Oil filled equipment such as CT's, VT's and capacitor cans have specific safety requirements regarding their handling, transport and storage. The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.

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

8.14.1. Management objectives

- » Safe handling and transport of equipment

- » Safe handling and transport of hazardous substances
- » Minimise environmental pollution and damage

8.14.2. Measurable targets

- » All equipment delivered to site in tact
- » No spillage of hazardous substances
- » No litigation due to environmental pollution

9. SOCIAL ISSUES AND THEIR CONTROL

9.1. Sanitation

The Contractor shall install mobile chemical toilets on. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate excretion or urinating on site shall be allowed. Ablution facilities shall be within 100 m from workplaces but not closer than 50 m from any natural water bodies. There should be enough toilets available to accommodate the workforce (minimum requirement 1: 20 workers). Toilets shall be serviced regularly and the ECO shall inspect toilets regularly to ensure compliance to health standards.

9.1.1. Management objectives

- » Ensure that proper sanitation is achieved
- » Prevent spreading of disease

9.1.2. Measurable targets

- » No complaints received from Landowners or Grid staff regarding sanitation
- » No litigation or compensation claims

9.2. Prevention of Disease

The Contractor shall take all the necessary precautions against the spreading of disease such as measles, foot and mouth, etc. especially under livestock. A record shall be kept of drugs administered 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.

9.2.1. Management objectives

- » Prevent litigation due to infestation of livestock
- » Prevent spreading of sexually transmitted diseases

9.2.2. Measurable targets

- » No complaints from Landowners / Communities
- » No litigation

9.3. Interaction with Affected Parties

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

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

The affected parties shall always be kept informed about any changes to the construction programme should they be involved. If the ECO is not on site the Contractor should keep the affected parties informed. The contact numbers of the Contractor and the ECO shall be made available to the affected parties. This will ensure open channels of communication and prompt response to queries and claims.

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

9.3.1. Management objectives

- » Maintain good relations with affected parties

9.3.2. Measurable targets

- » No delays in the project due to interference from affected parties

9.4. Littering Control

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 (See also 9.3).

9.4.1. Management objectives

- » Neat workplace and site

9.4.2. Measurable targets

- » No complaints from affected parties

9.5. Dust Pollution

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

9.5.1. Management objectives

- » Site works does not cause a nuisance to other people in the area

9.5.2. Measurable targets

- » No formal complaints or claims arising due to dust pollution

9.6. Aesthetics

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

9.6.1. Management objectives

- » Aesthetically pleasing works area, campsite and storage areas

9.6.2. Measurable targets

- » No complaints from affected parties on or around the site

10. BIOLOGICAL ISSUES AND THEIR CONTROL

10.1. Fauna

The Contractor shall under no circumstances interfere with livestock without the Landowner or Community members being present. This includes the moving of livestock where they interfere with construction activities. Should the Contractors workforce obtain any livestock for consumption, they must be in possession of a written note from the owner. The transportation of meat for consumption shall take into consideration any legal requirements regarding the spreading of disease. No poaching shall be tolerated under any circumstances.

10.1.1. Management objectives

- » Minimise disruption of farming activities
- » Minimise disturbance of animals
- » Minimise complaints and litigation

10.1.2. Measurable targets

- » No stock losses where construction is underway
- » No complaints from Landowners and Communities
- » No litigation concerning stock losses and animal deaths

10.2. Flora

Protected or endangered species may occur on the site. Special care should be taken not to damage or remove any such species unless absolutely necessary. Permits for removal must be obtained from Provincial Nature Conservation should such species be affected. All plants not interfering with the operation of the substation shall be left undisturbed, clearly marked and indicated on the site plan. Collection of firewood outside the site area is strictly prohibited (refer also to conditions of the ROD where applicable)

10.2.1. Management objectives

- » Minimal disturbance to vegetation where such vegetation does not interfere with construction and operation of the substation
- » Prevention of litigation concerning removal of vegetation

10.2.2. Measurable targets

- » No litigation due to removal of vegetation without the necessary permits

10.3. Herbicide Use

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

10.3.1. Management objectives

- » Control over the use of herbicides

10.3.2. Measurable targets

- » No signs of vegetation dying due to leaching of herbicides one year after completion of the contract
- » No Landowner complaints and litigation

11. CULTURAL ISSUES AND THEIR CONTROL

11.1. Archaeology

The position of any known sites shall be shown on the final design plans. Such areas shall be marked as no go areas. Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage Resources Association (SAHRA) should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.

Should any archaeological sites be uncovered during construction, their existence shall be reported to Eskom immediately.

11.1.1. Management objectives

- » Protection of archaeological sites and land considered to be of cultural value
- » Protection of known sites against vandalism, destruction and theft
- » The preservation and appropriate management of new archaeological finds should these be discovered during construction

11.1.2. Measurable targets

- » No destruction of or damage to known archaeological sites
- » Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist

11.2. Infrastructure

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

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

Any possible disruptions to essential services must be kept to a minimum and should be well advertised and communicated to the Landowners and surrounding Communities. 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. The position of all pipelines and irrigation lines in the vicinity of a site must be obtained from the Landowners or local Community and clearly marked. Where required such lines shall be deviated.

11.2.1. Management objectives

- » The control of temporary or permanent damage to plant and installations
- » Control of interference with the normal operation of plant and installations
- » Securing of the safe use of infrastructure, plant and installations

11.2.2. Measurable targets

- » No unplanned disruptions of services
- » No damage to any plant or installations
- » No complaints from Authorities, Landowners and Communities regarding disruption of services
- » No litigation due to losses of plant, installations and income

12. REQUIREMENTS DURING CONSTRUCTION PERIOD

1. Proper and continuous liaison between Eskom, the Contractor and Landowners to ensure everyone is informed at all times.
2. The Landowners shall be informed of the starting date of construction as well as the phases in which the construction shall take place.
3. The Contractor must adhere to all conditions of contract including the Environmental Management Programme and landowner special conditions.
4. Proper planning of the construction process to allow for disruptions due to rain and very wet conditions.
5. Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary some repairs should be done to prevent damage to equipment and plant.
6. All manmade structures shall be protected against damage at all times and any damage shall be rectified immediately.
7. The Contractor shall ensure that all damaged areas are rehabilitated to the satisfaction of the ECO, Eskom and each and every property owner and that outstanding claims are settled.
8. Proper documentation and record keeping of all complaints and actions taken.
9. Regular site inspections and good control over the construction process throughout the construction period.
10. Appointment of an Environmental Control Officer on behalf of the Contractor to implement this EMP as well as deal with all Landowner related matters.
11. Environmental Audits to be carried out during and upon completion of construction (at least two for the project).

13. METHOD STATEMENTS FOR THE CONTRACT

The Contractor shall supply method statements for all works required as per specific contract requirement. All agreements regarding extra works for environmental compliance shall be in writing and well documented. Work shall only commence upon approval by Eskom.

The ECO shall ensure that all works are in accordance with method statements and contract specifications.

15. SITE DOCUMENTATION / MONITORING / REPORTING

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legal. Regular monitoring of site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the Contract Manager/Site Supervisor shall keep abreast of all works to ensure no problems arise.

Regular monthly environmental compliance reports shall be forwarded to the Transmission Engineering Environmental Advisor (appointed per project) with all information relating to environmental matters. The following Key Performance Indicators must be reported on a monthly basis by the ECO:

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

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

1. Site daily dairy.
2. Complaints register.
3. Records of all remediation / rehabilitation activities.
4. Copies of monthly reports to the Transmission Engineering Environmental Advisor for auditing purposes.
5. Copy of the Environmental Management Programme.
6. Copy of ROD.
7. Minutes of site meetings including discussions on environmental issues.

16. APPENDICES

Appendix A: Locality Plan

Appendix B: Eskom Standards

Appendix C: Record of Decision

**PRO FORMA TO BE SIGNED BY THE CONTRACTOR AND ESKOM PROJECT
MANAGER AT CONTRACT AWARD**

CONTRACT NAME: _____

CONTRACT NUMBER: _____

ENVIRONMENTAL COMPLIANCE

I _____ ON BEHALF OF _____(C)

I _____ ON BEHALF OF ESKOM

DECLARE AS FOLLOWS:

1. I AM AWARE THAT CONSTRUCTION, REFURBISHMENT OR UPGRADING ACTIVITIES CAN HAVE A MAJOR IMPACT ON THE ENVIRONMENT.
2. I UNDERTAKE TO ADHERE TO THE REQUIREMENTS OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND THE RECORD OF DECISION FROM DEAT.
3. I PLEDGE TO INFORM ALL SITE STAFF OF THEIR INVOLVEMENT IN MANAGING ENVIRONMENTAL IMPACTS ON SITE.
4. I COMMIT TO IMPLEMENTING ENVIRONMENTAL BEST PRACTISE ON SITE AT ALL TIMES DURING THE CONTRACT.

SIGNED: _____ DATE: _____

CONTRACTOR

SIGNED: _____ DATE: _____

ESKOM

Questionnaire to be completed during tender stage by the contractor for evaluation purposes of the tender for substation construction:

PLEASE TICK APPROPRIATE BOX (All yes answers to be accompanied by proof)	YES	NO
ENVIRONMENTAL MANAGEMENT SYSTEM - GENERAL		
1-Is your company ISO 14001 certified?		
2-Is your company ISO 14001 compliant?		
3-Does your company have an Environmental Management System in place?		
4-Does your company have an Environmental Policy?		
5-Does your company have an Environmental Statement?		
6-Is your company in the process of implementing any of the above?		
7-Will you be using sub-contractors during the project?		
8-Does any of your proposed sub-contractors comply with 1-6 above?		
ENVIRONMENTAL MANAGEMENT PROGRAMME - GENERAL		
1-Do you understand the contents and context of this EMP attached to the tender document?		
2-Do you agree to implement the requirements of the EMP on site?		
3-Did you allow for the appointment of a specific person to act as the dedicated Contractor Environmental Control Officer (CECO) on site for the duration of the contract? (As per responsibility matrix on page 5 of the EMP)		
4-Is your CECO qualified to implement the EMP conditions? Please attach CV.		
5-Have you allowed sufficient funds for implementing the requirements of the EMP? (Environmental management requirements)		
ENVIRONMENTAL MANAGEMENT PROGRAMME - SPECIFIC		
1-Did you supply a method statement for water supply?		
2-Did you supply a method statement for solid waste management?		
3-Did you allow for camp wastewater management?		
4-Did you allow for camp and site ablution management?		
5-Did you allow for the installation of sealed and bunded fuel storage areas?		
6-Did you allow for a contained workshop area for servicing of vehicles?		
7-Did you allow for signage to mark access roads to the site?		
8-Did you allow for emergency spill kits to address possible spills of fuel and oil to prevent pollution?		
9-Does the vegetation-clearing contractor comply with section 10 of the EMP?		
10-Did you allow for suitable means and materials to safeguard excavations?		