ESKOM HOLDINGS SOC LIMITED

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SITE-SPECIFIC DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE PROPOSED ESKOM 400/132KV ASTERIA MAIN TRANSMISSION SUBSTATION (MTS) (PREVIOUSLY KNOWN AS THE HOUHOEK MTS), INCLUDING THE BACCHUS-PALMIET 400KV LOOP-IN AND LOOP-OUT POWER LINES AND ESKOM DISTRIBUTION POWER LINE INTEGRATION, NEAR BOTRIVIER, WESTERN CAPE PROVINCE

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Eskom Holdings SOC Limited

TITLE	*:*	Site-Specific Draft Environmental Management Programme for the Proposed Eskom 400/132kV Asteria Main Transmission Substation (previously known as the Houhoek Main Transmission Substation), including the Bacchus-Palmiet 400kV Loop-In and Loop-Out Power Lines and Eskom Distribution Power Line Integration, near Botrivier, Western Cape Province
Project Team	*:*	*BKS (Pty) Ltd*
Client	*:*	*Eskom Transmission: Land and Rights Division*
BKS Project No	*:*	*J01289*
Status of Report	*:*	*Draft Revision 03*
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BKS Approval

Compiled by	:	R Swanepoel		20 September 2013
		Initials & Surname	Signature	Date
Reviewed & Approved by	:	PMFG Teurlings		20 September 2013
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Eskom Approval

Reviewed by	:		
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Confirmed by	:		
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Approved by	:		
	Initials & Surname	Signature	Date

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Term	Explanation
Activity	Any action needed for the design, construction and completion of a project.
Alien species	A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities.
Applicant	Means a person who has submitted - a) or intends to submit an application for an environmental authorisation; b) an application for an environmental authorisation simultaneously with his/her application for any right or permit in terms of the Minerals and Petroleum Resources Development Act, 2002.
Environmental aspect	A product's or production process's environmental impact or important issues in the environment that an organisation should take into consideration.
Communication register	A register aimed at tracking all communication activities within the project.
Conductor:	A wire, cable, or other body that is capable of carrying electric current.
Contaminated water	Water containing pollutants from on- or off-site activities; e.g. concrete-laden water and runoff from plant / personnel wash areas. Contaminated water must be treated for appropriate reuse or to ensure that water meets minimum standards and guidelines prior to disposal or being released into the environment.
Department of Environmental Affairs	The national authority responsible for the review and/or approval of an Environmental Management Programme.
Department of Water Affairs	The national authority responsible for and with authority over the nation's water resources and their use, including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters.
Employer	See Eskom
Environment	The surroundings in which humans exist and which comprise: • the land, water and atmosphere of the earth; • micro-organisms, plant and animal life; • any part or combination and interrelationships; and • the physical, chemical, aesthetic, historical, cultural and economical properties and conditions of the foregoing that can influence human health and wellbeing.
Environmental Audit	Systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of the Environmental Management Programme and is complying with statutory requirements and the organisation's Environmental Policy.
Environmental Authorisation	The authorisation by a competent environmental authority for commencement of listed activities in terms of the National Environmental Management Act (Act 107 of 1998).
Environmental Control Officer	An independent person who is responsible for undertaking site inspections to audit and report on compliance with environmental specifications with the Environmental Management Programme.
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially that results from an organisation's activities.
Environmental Impact Assessment	The process of collecting, organising, analysing, interpreting and communicating information in accordance with the environmental legal

Term	Explanation
	requirements set out in GNR. No 543, GNR. 544, GNR. 545 and GNR 546, as published in Government Gazette No. 33411 of 2 August 2010, promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998) for the purposes of obtaining an Environmental Authorisation in accordance with Chapter 5 of the National Environmental Management Act.
Environmental Management Inspector	A person designated as an environmental management inspector in terms of Section 31B or 31C of the National Environmental Management Act (Act 107 of 1998).
Environmental Management Programme	A tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
Environmental objectives	The overall environmental goal arising from the Environmental Policy that an organisation sets itself to achieve, and is quantified where practicable.
Eskom	The Applicant
Fauna	All living biological creatures, usually capable of motion, including insects, and predominantly of protein-based consistency.
Fire danger index	A relative number denoting an evaluation of rate of spread or suppression difficulty of a fire in relation to specific combinations of fuel, fuel moisture and wind speed.
Fire hazard	The relative combination of fuel, oxygen and heat that could lead to the start and spread of a fire.
Fire Protection Association	An association registered in terms of the National Veld and Forest Fire Act (Act 101 of 1998) for the purposes of predicting, preventing, managing and extinguishing veld fires.
Flood line	The line or mark to which a flood could rise every 50 (1:50 year flood line) or 100 (1:100 year flood line) years.
Flora	All living plants, grasses, shrubs and trees typically incapable of easy natural motion and capable of photosynthesis.
Groundwater	Water that fills the natural openings in below-surface rock or unconsolidated sands.
Hazardous waste	Waste that, because of its chemical reactivity, toxic, explosive, corrosive, radioactive or other characteristics, causes danger or is likely to cause danger to health or the environment.
Heritage resources	Any place or object of cultural, archaeological or paleontological significance in terms of the National Heritage Resources Act (Act 25 of 1999).
Induction training	The training provided to new / existing employees to (re)acquaint them with the company structure, their specific job requirements, practical or organisational issues and occupational health, safety and environmental considerations required on the project.
Integrated Environmental Management	Integration Environmental Management is defined as: • the promotion of the integration of the principles of environmental management, as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998) in making decisions that may have a significant effect on the environment; • the identification, prediction and evaluation of the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative

Term	Explanation
	impacts and maximising benefits; • ensuring that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them; • ensuring an adequate and appropriate opportunity for public participation in decisions that may affect the environment; • ensuring the consideration of environmental attributes in management and decision making, which may have a significant effect on the environment; and • identifying and employing the modes of environmental management best suited to ensure that a particular activity is pursued in accordance with the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998).
Interested and Affected Parties (I&AP)	Any person or group of people concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, customers and consumers, environmental interest groups, and the general public (after the Environmental Impact Assessment Regulations of September 1997 and Guideline Document: Environmental Impact Assessment Regulations of April 1998).
Kilovolt	A unit of potential differences equal to 1000 volts
Land Use	The arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. This definition establishes a direct link between the land cover and the actions of people in their environment.
Materials	All kinds of items (other than plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
Mitigate	The implementation of practical measures to reduce any adverse impacts or to enhance the beneficial impacts of an action.
No-go area	An area where construction activities are prohibited.
Non-compliance	Failure to comply with the requirements of the EMPr.
Non-conformance report	A report outlining a deviation from process, procedure or compliance specifications.
Plant	The apparatus, machinery and vehicles used during the Permanent Works.
Pollution	Any change in the environment caused by substances or noise, malodours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
Potentially hazardous substance	A substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances, published in terms of the Occupational Health and Safety Act (Act 85 of 1993).
Precautionary principle	The basic principle that, when in doubt or when there is insufficient or unreliable information, actions must be undertaken that have minimum risk.
Pylon	A large vertical steel tower-like structure supporting high-tension electrical cables

Term	Explanation
Quality management system	A set of interrelated or interacting elements that organisations use to direct and control how quality policies are implemented and quality objectives are achieved.
Rehabilitation	Re-establishment or restoration to a healthy sustainable capacity or state.
Resource recovery	Recycling of waste or the recovery of energy.
Route	The exact servitude in which the Transmission power line could be built
Servitude Right	A real right in favour of the servitude holder allowing the erection and maintenance of structures and cables to transmit electricity over portions of land and restricting any activities that could pose a hazard to the transmission of electricity, the environment and/or the safety of human and other living beings
Solid waste	All solid waste, including construction debris, chemical waste, excess cement / concrete, wrapping materials, timber, steel, drums, wire, nails, food and domestic waste (e.g. plastic bags and wrappers).
Substation	A collection of equipment for the purpose of raising, lowering and regulating the voltage of electricity
Target	The detailed performance requirement, applicable to the organisation, or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Waste minimisation	The reduction of the volume of waste during construction by means of different processes or clean technology.
Waste prevention	The prevention and avoidance of the production of waste.
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Water resource	A watercourse, surface water, estuary or aquifer.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which, in normal circumstances, supports or would support vegetation that is typically adapted to live in saturated soil (as defined in the National Water Act (Act 36 of 1998)).
Works	The Permanent Works and the Temporary Works, or either of them as appropriate.

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Explanation
amsl	above mean sea level
BA	Basic Assessment
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CLN	Customer Load Network
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEA&DP	Western Cape Provincial Department of Environmental Affairs & Development Planning
DMR	Department of Mineral Resources
DoA	Department of Agriculture
DoE	Department of Energy
DoT	Department of Transport and Public Works
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EO	Environmental Officer
EIA	Environmental Impact Assessment
EMF	Electro-Magnetic Fields
EMPr	Environmental Management Programme
FDI	Fire Danger Index
FPA	Fire Protection Association
GIS	Geographical Information System
GN R	Government Notice Regulation
HSA	Hazardous Substances Act (No. 15 of 1973)
HV	High Voltage
I&AP(s)	Interested and affected party (-ies)
km	kilometre
kV	kilovolt
LILO	Loop-in and Loop-out
LM	Local Municipality
m	metre
MSDSs	Material Safety Data Sheets
MTS	Main Transmission Substation
MVA	Mega Volt Amperes
N2	National Road No. 2
NEMA	National Environmental Management Act (No. 107 of 1998) as amended
NEM:BA	National Environmental Management: Biodiversity Act (No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NWA	National Water Act (No. 36 of 1998)
PCO	Pest Control Officer

Acronym / Abbreviation	Explanation
PPE	Personal Protective Equipment
PoS	Plan of Study
QMS	Quality Management System
SAHRA	South African Heritage Resources Agency
SAIEA	Southern African Institute for Environmental Assessment
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SHE	Safety, Health and Environment
SO	Social Officer
SOC	State Owned Company
S/S	Substation
TEM	Transport, Earthmoving and Materials Handling Equipment
TWK	Theewaterskloof

1 STRUCTURE OF SITE-SPECIFIC DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

This Site-Specific Draft Environmental Management Programme (hereafter referred to as the Draft EMPr) report consists of thirteen sections. The broad structure of the EMPr is as follows.

1.1 STRUCTURE OF EMPR

This section describes the structure of the EMPr, based on the requirements of Section 33 of the EIA Regulation R543.

1.2 INTRODUCTION

This section provides a brief project background and description and addresses the broad legal framework. The broad legal framework distinguishes between the core legislative framework and project specific conditions.

1.3 BACKGROUND TO EMPR

This section describes the nature of the Draft EMPr, the aims and objectives of the Draft EMPr and the continuous improvement approach that forms the basis of the environmental management approach.

1.4 EMPR FRAMEWORK

This section describes the Eskom Environmental Policy and similar policies, as well as the institutional and functional framework for the Draft EMPr. In this regard, the institutional and functional framework focuses on the roles and responsibilities of the:

- Applicant
- Independent Environmental Control Officer
- The Eskom Project Manager
- The Contractor
- The Environmental Officer
- The Social Officer

1.5 SUMMARY OF IMPACTS

This section describes the anticipated impacts which may be experienced during the construction and operation of the Transmission power line.

1.6 ASSESSMENT OF IMPACTS

This section identifies anticipated impacts in the study area.

1.7 ENVIRONMENTAL DOCUMENTATION, REPORTING AND COMPLIANCE

This section describes the documentation, reporting and compliance procedures required to ensure the project complies with quality management processes.

1.8 MANAGEMENT OF ENVIRONMENTAL REQUIREMENTS

This section describes the measures the Contractor shall use to record and report upon environmental management measures undertaken to mitigate impact upon the environment.

1.9 TRAINING AND INDUCTION OF EMPLOYEES

This section describes the minimum training requirements prescribed to ensure all persons affiliated with the project work within the constraints of the Draft EMPr.

1.10 SUSPENSION OF WORKS

The section describes measures to be implemented should the Contractor's actions not comply with the requirements contained in the Draft EMPr.

1.11 RESOURCE ALLOCATIONS

The section describes the allocation of resources required by all parties to ensure the contract is completed within the constraints of best management practice.

1.12 EMPR IMPLEMENTATION

This section focuses on the Aspect and Activities Matrix, as well as the respective Draft EMPr Implementation Tables. In this regard, the focus is on:

- Environmental Specifications - Construction Activities - Planning and Design Phase
- Environmental Specifications – Construction Activities – Pre – Construction
- Environmental Specifications - Construction Activities – Site Management
- Environmental Specifications - Construction Activities – Site office establishment
- Environmental Specifications – Tower Specific
- Environmental Specifications – Rehabilitation Activities
- Environmental Specifications – Operational Activities
- Environmental Specifications – Decommissioning Activities

1.13 REFERENCES

The references of sources used in this Draft EMPr are provided in Section 13.

2 INTRODUCTION

An Environmental Management Programme (EMPr) is an environmental management tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development. An EMPr is based on the findings of the Environmental Impact Assessment (EIA) process conducted in terms of the EIA Regulations. In terms of when the project was initiated, all works associated with the EIA process have been undertaken under the prevailing National Environmental Management Act (Act No. 107 of 1998) as amended (NEMA) 2010 EIA Regulations (Government Notice No. 543, 544, 545 and 546 of 18 June 2010). The Draft EMPr has therefore been developed in accordance with Section 33 of the 2010 EIA Regulations (GN R543 of 18 June 2010, as amended).

This Draft EMPr will be submitted with the EIA report to the Department of Environmental Affairs (DEA) for environmental authorisation.

An EMPr describes the measures that need to be taken to ensure the Duty of Care is bestowed upon those who cause, have caused or may in future cause pollution or degradation of the environment, as per Section 28 (1) of NEMA. Non-compliance to Section 28 (Duty of Care) is a criminal offence and may lead to criminal prosecution.

Although the Draft EMPr forms part of the Draft EIA report that is submitted for environmental authorisation, an EMPr is a stand-alone document that is used to guide and regulate environmental performance through all stages of development, including planning, design, construction, rehabilitation and maintenance, and eventual decommissioning.

This Draft EMPr would need to form part of the tender documentation to the Contractor(s) and becomes legally binding on the Contractor(s) and anyone acting on behalf of the Contractor(s) or the Applicant during construction, operation and decommissioning activities.

Eskom Holdings SOC Limited (herein after referred to as Eskom) appointed BKS (Pty) Ltd (BKS) to undertake the EIA process for the construction of the proposed Asteria Eskom Main Transmission Substation (MTS) project. After the scoping phase, the project name was changed by Eskom from the Houhoek Transmission Substation project to (herein after referred to as) the **Asteria Eskom MTS project**. The Asteria Eskom MTS project entails the construction of the proposed Eskom 400/132kV Asteria Eskom MTS, integrating the existing 132kV Eskom Distribution network, and, construction of the loop-in and loop-out (LILO) 400kV connecting power lines into the existing Bacchus-Palmiet 400kV Transmission power line.

This Draft EMPr was compiled during the EIA process and includes the mitigation measures recommended in the EIA Report. Even though in terms of the legislative process this EMPr is referred to as a “draft” version, it is designed to be as site-specific as possible. This approach has been agreed upon by the relevant specialists, Eskom and the EAP to ensure all issues identified are sufficiently mitigated and presented for public comment, thereby ensuring the EMPr presented during the authorisation process does not differ substantially from the EMPr to be implemented during the construction of the proposed Asteria Eskom MTS project.

Once an Environmental Authorisation (EA) has been received from the DEA, the Draft EMPr will need to be finalised to include any additional conditions stipulated by the DEA in the EA. In addition, this Draft EMPr is a dynamic document and may need to be updated on a regular basis, as directed by either the independent Environmental Control Officer (ECO) or the DEA.

2.1 DETAILS OF AUTHORS

As per the requirements of the NEMA, the details and expertise levels of the persons who prepared the EMPr are provided in Table 1 below.

Peter Teurlings, Senior Principal Environmental Specialist of BKS is the EAP and the Project Director and is responsible for reviewing the reports, including this Draft EMPr. Peter is registered as a Professional Natural Scientist (Registration No 400027/95) in the Environmental Science field of practice in terms of Section 18(1) of the Natural Scientific Professions Act (No. 27 of 2003) and is also a member of the Environmental Law Association and the South African Affiliate of the International Association of Impact Assessments (IAIAsa). Peter holds an MSc (Biogeography) and specialises in environmental assessment processes and Project Management. He has been involved in numerous different types of EIA processes including residential developments, Transmission power lines, wastewater treatment projects, water supply projects, dams, roads and airports in Southern Africa. Peter meets the requirements for the independent EAP in terms of Section 17 the EIA Regulations (GN R543 of 18 June 2010, as amended).

Table 1: Authors' Details

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Highest Qualification	MSc (Biogeography)
Professional membership	South African Council for Natural Scientific Professions (Reg No 400027/95) International Association of Impact Assessments – South Africa Affiliate (ID No 1398).
Expertise to carry out review of EMPr	Author, co-author and/or presenter of over 100 reports, presentations and manuals on EIAs, EMPrs, and environmental management and other related studies, including: • Environmental Technical Coordinator for the Gautrain Project for the Gauteng Department of Transport, Roads and Public Works (2007 – present); • Environmental Screening Reports and EMPrs for the safety rehabilitation of 19 large dams in South Africa for the DWA; • Assessment of the various options available for providing sanitation services to the Central Witwatersrand Regional Services Council's region; • EIA Review for the development of Phase 2 of the Mooi Mgeni Transfer Scheme and appurtenant works for DWA; • Conveyance, treatment and disposal of wastewater for Drainage District DD6 for ERWAT; • Upgrading an intersection on Road D374 in the Cradle of Humankind

	World Heritage Site; • Construction of a water reservoir and 3.3km of water supply pipeline in Lekurung near Polokwane; • Development of the Cosmo City Township in northern Randburg for Basil Read / Cosmo City Development Company; • Construction of the Heineken Brewery adjacent to the R25 on the road to Bapsfontein, Kempton Park, for Heineken Supply Company; • Construction of the Umfolozi-Empangeni 765kV Transmission Power Lines and Substation for Transnet Transmission; • Construction of a military installation at the De Aar School of Ammunition for SANABO; • Development of a new landfill site in the Msukaligwa Regional Municipality for the Gert Sibande District Municipality in Mpumalanga; and • Construction of a balancing dam in the Orange-Riet rivers transfer scheme near Jacobsdal in the Free State for the DWA.

Robin Swanepoel, Chief Environmental Scientist: EMPr and ECO of BKS, has been responsible for the compilation and compliance monitoring of numerous EMPrs. Robin has intimate knowledge on the requirements of EMPr implementation and drawing from this experience, has compiled this Draft EMPr.

EMPr Specialist	**BKS (Pty) Ltd**	
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Telephone	021 950 7500	
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Qualifications	B. Tech Nature Conservation B. Tech Environmental Management	
Expertise to carry out preparation of EMPr	Robin has 16 years of experience and has been involved in the implementation of various EMPrs during the construction of the following:	
	Transmission power lines (275 kV, 400 kV and 765 kV) for Eskom: • Beta – Delphi • Mercury – Perseus • Mercury – Zeus • Duvha – Leseding • Majuba – Umfolozi • Hydra – Gama • Spencer – Tabor • Poseidon – Grassridge • Dedisa – Grassridge • Bravo	Construction of substations for Eskom: • Omega • Gamma • Mercury • Perseus • Hydra • Zeus • Majuba • Umfolozi • Dedisa

2.2 SPECIALIST INPUT DURING EIA

Table 2: Specialist input during the EIA Process

Name	Role on Team	Company
Peter Teurlings	Project Director, EAP and Professional Natural Scientist	BKS (Pty) Ltd
Dr David de Waal	Public Participation Facilitator	BKS (Pty) Ltd
Bharat Gordhan	EAP's Project Manager & Environmental Scientist	BKS (Pty) Ltd
Robin Swanepoel	EMPr compilation & Environmental Technician	BKS (Pty) Ltd
Marti le Roux	Public Participation Manager	BKS (Pty) Ltd
Mamokete Maimane	Public Participation Officer	BKS (Pty) Ltd
Elsje Greyling	Project Administrator	BKS (Pty) Ltd
SPECIALISTS		
Dirk van Rooyen	Geotechnical Assessment	Geotechnics Africa
Garry Paterson	Soil and Agricultural Assessment	Agricultural Research Council
Dean Ollis	Freshwater Ecosystems Assessment	Freshwater Consulting
Nick Helme	Ecological Assessment	Nick Helme Botanical Studies
Chris van Rooyen	Avifaunal Assessment	Chris van Rooyen Consulting
Tim Hart	Heritage Impact Assessment	University of Cape Town
Steven Stead	Visual Impact Assessment	VRM Africa
Ingrid Snyman	Social Impact Assessment	Ingrid Snyman Development Consultants
Colin Tichauer	Traffic Impact Assessment	AECOM SA (Pty) Ltd
Nina Otto	Town Planning Requirements	AECOM SA (Pty) Ltd
Vee Cowie	GIS Coordinator	EcoGIS
ESKOM TRANSMISSION		
Rudzani Ranwedzi	Eskom Senior Environmental Advisor	Eskom Transmission
Lindi Haarhoff	Eskom Project Manager	Eskom Transmission
Ndangi Muthadi	Eskom Lines Design Engineer	Eskom Transmission
Adhmed Hansa	Eskom Chief Engineer: Grid Planning	Eskom Transmission
Sipho Shabalala	Eskom Senior Surveyor	Eskom Transmission
Derrick Angrove	Eskom Civil Engineer	Eskom Transmission
Cass Naidoo	Eskom Substation Design Engineer	Eskom Transmission
Solly Phalanndwa	Eskom Senior Civil Design Engineer (Geotechnical)	Eskom Transmission
Pumza Jizana	Eskom Senior Negotiator	Eskom Transmission
Ebrahim Ismail	Eskom Manager Capital Expansion	Eskom Distribution
ESKOM DISTRIBUTION		
Henk Landman	Eskom Project Managering Inputs	Eskom Distribution

Name	Role on Team	Company
Muzafar Ebrahim	Eskom Senior Network Planner	Eskom Distribution
Maritza Rossouw	Eskom Senior Network Planner	Eskom Distribution

2.3 LEGAL AND INDEPENDENT REVIEW

The EMPr has been legally and independently peer reviewed by the reviewers presented in Table 3 below.

Table 3: Legal Review

Name	Role on Team	Company
Gillian Arenstein	Enviro-Legal Review	Warburton Gunn Attorneys
Bryony Walmsley	Independent Peer Review	Southern African Institute for Environmental Assessment

2.4 PROJECT DESCRIPTION

Eskom is divided into Eskom Primary Energy, Eskom Generation, Eskom Transmission and Eskom Distribution divisions. Eskom Generation is responsible for the generation of electricity at power stations, while Eskom Transmission is responsible for the transmission of electricity at high voltages (between 132kV and 765kV) from power stations across the country to MTSs. Eskom Distribution is responsible for the distribution of electricity below 132kV from the MTS to local municipalities and other end-users.

Most cities and municipalities purchase electricity in bulk from Eskom Transmission / Eskom Distribution and sell it to households, industries and other end users within their areas of jurisdiction, while Eskom Distribution also sells electricity directly to bulk end users in some parts of South Africa.

Since electricity cannot be stored, demand and supply of electricity must be balanced instantaneously (Schoefield, 2007). Therefore, power has to be generated and delivered over long distances at the moment it is required. The nature of bulk supply of electricity in South Africa is illustrated in Figure 1.

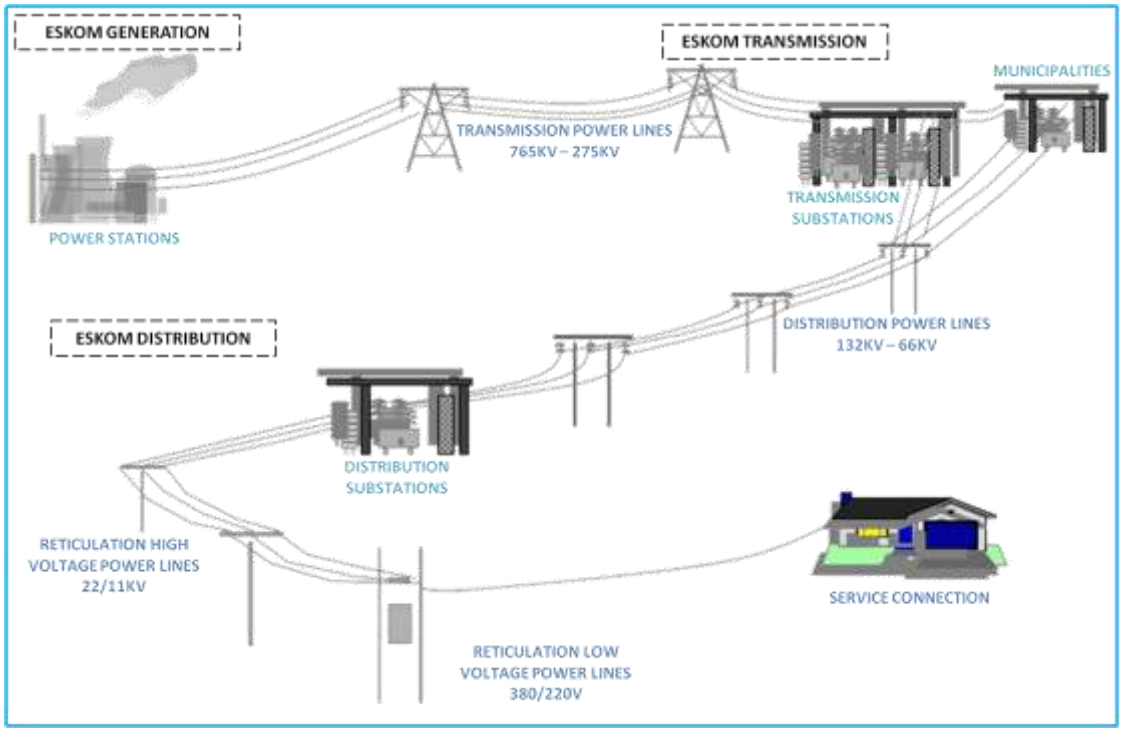


Figure 1: Nature of bulk electricity supply in South Africa

Eskom has a mandate to satisfy potential customer needs as an essential service, which implies certain responsibilities. One of the most significant of these is to find and maintain the balance between satisfying society's needs for electricity without having a detrimental effect on the environment. In order to achieve this, Eskom must continually re-assess its present infrastructure and take new developments into account to ensure that growing needs for electricity are satisfied, without considerably impacting on the environment.

The Customer Load Network (CLN) in the Western Grid of the Western Cape Province is divided into the Cape Peninsular, West Coast, Southern Cape and Namaqualand CLNs. Each CLN is interconnected with an MTS and a distribution network (132kV and below). The Asteria Eskom MTS project area falls within the Southern Cape CLN, which accounts for 21% of the entire load in the Western Grid network, and consists of the following MTSs:

- Bacchus MTS.
- Droerivier MTS.
- Komnsberg MTS.
- Mossel Bay MTS.
- Palmiet MTS.
- Proteus MTS.

The Houhoek area is largely fed by the Bacchus MTS, with electricity supply is also received from the Stikland MTS (via the Firgrove MTS) and Muldersvlei MTS. Figure 2 shows the network layout diagram of the Western and Southern Grid, indicating connectivity with the Bacchus MTS.

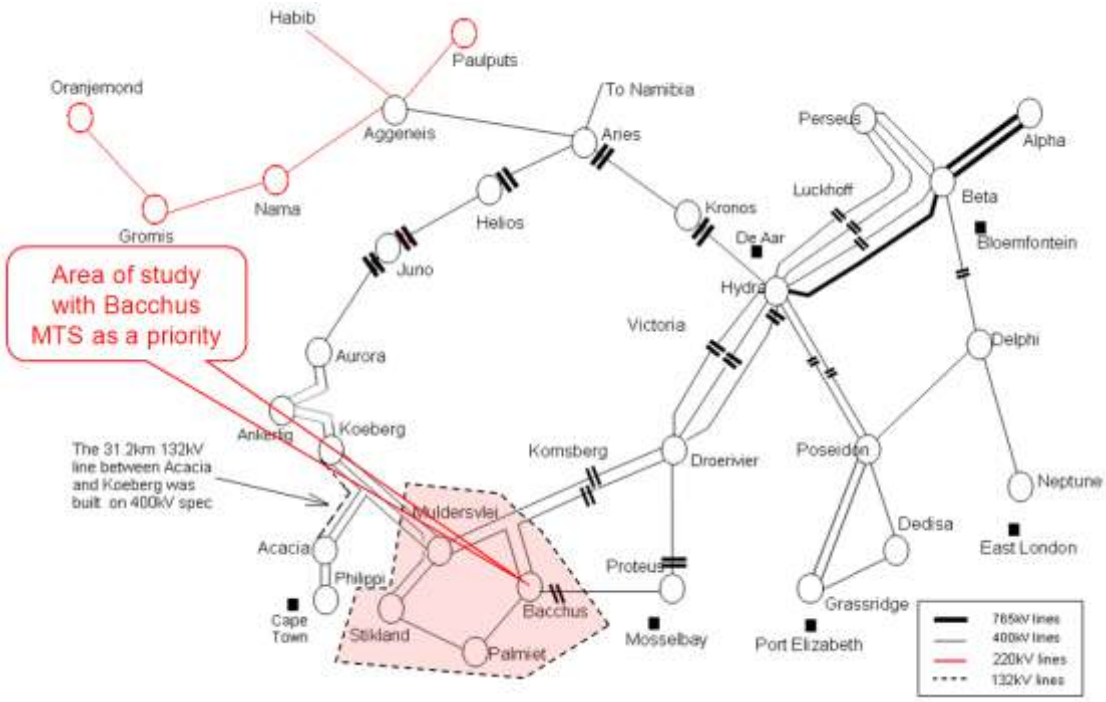


Figure 2: Network Layout Diagram of Western and Southern Grid

The Bacchus MTS is currently at 450 mega volt amperes (MVA) – 90% of the firm capacity of 500MVA. Based on the load forecast (or the anticipated demand for electricity), the Bacchus MTS will reach firm capacity by 2014-2015. The thermal capacity of the 132kV Distribution power lines that supply the Houhoek area will technically be exceeded by 2013. It is possible to operate the distribution network till approximately 2016 by providing supply to the Houhoek area from the Gala Distribution Substation in Grabouw. However, there are still technical limitations that apply to this possible solution. The 132kV distribution network in the Houhoek area would no longer comply with the N-1 criteria (see inset for further detail).

Criteria	Description
N-1	The network can withstand the loss of any element and maintain supply to all customers.
N-1 secure	The network can withstand the loss of any element and maintain supply to all customers. In addition the network can be subsequently re-configured to withstand a further outage. During the time taken to re-configure, the network is at risk.

In order to solve these network constraints, it is proposed that a new 400kV MTS be constructed by 2014 to supplement the existing 132kV Houhoek Eskom Distribution Substation. The new Asteria Eskom MTS would relieve the pressure on the Bacchus MTS as more than 90% of the Houhoek Eskom Distribution network is fed from the latter MTS.

The Asteria Eskom MTS project entails the construction of the 400/132kV Asteria Eskom MTS, linking to the existing 132kV Houhoek Eskom Distribution Substation, and, the loop-in and loop-out (LILO) connecting power lines into the existing Bacchus-Palmiet 400kV Transmission power line (Refer to Figure 3).

The Asteria Eskom MTS project requires the following activities:

- A 2×500MVA, 400/132kV MTS of approximately 12 hectares in area, near the existing 132kV Houhoek Eskom Distribution Substation site.
- LILO Transmission power lines that connect the existing Bacchus-Palmiet 400kV Transmission power line to the proposed Asteria Eskom MTS. This would entail 2 adjoining 400kV Transmission power lines. The distances of these power lines will depend on where the LILO power lines will intersect the Bacchus-Palmiet 400kV Transmission power line (between 1km and 2km from the proposed Asteria Eskom MTS).
- A 132kV Distribution power line that connects the proposed Asteria Eskom MTS to the existing Houhoek Eskom Distribution Substation. The distance of this Distribution power line depends on the location of the proposed Asteria Eskom MTS (between 250m and 300m from the existing Houhoek Eskom Distribution Substation).
- The construction of the LILO 400kV Transmission power lines could require the construction of related access roads.

The existing 132kV Houhoek Eskom Distribution Substation is 4.5 hectares in area, and is located approximately 1km south-west of the town of Botrivier, Theewaterskloof (TWK) Local Municipality (LM) in Western Cape Province. The study area being considered for the development of the MTS is located in close proximity to Botrivier close to the existing Houhoek Eskom Distribution Substation.

In addition, the proposed Asteria Eskom MTS will be able to supply the long-term future load growth anticipated in the Southern Cape CLN. At this stage, Eskom Transmission has not received any applications to connect any wind energy facilities (WEF) to the proposed Asteria Eskom MTS project. Even so, there are 4 feeder bays that are included at the proposed Asteria Eskom MTS specifically for connection of 132kV Distribution power lines.

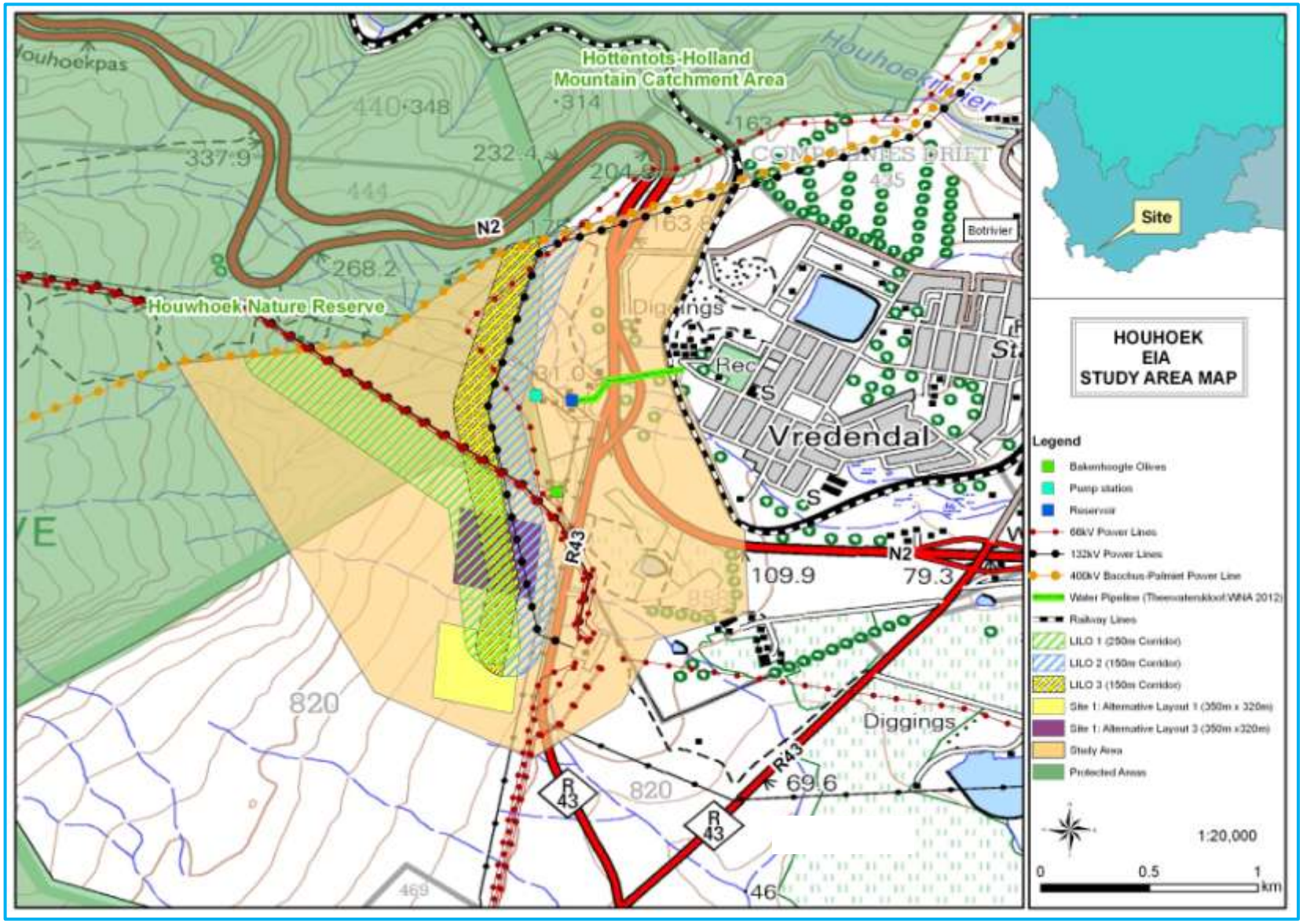


Figure 3: Study Area of Asteria Eskom MTS Project (including LILO and Distribution Power Line Integrations) Locality Map

2.5 TECHNICAL DETAILS

2.5.1 Proposed Asteria Main Transmission Substation

The proposed Asteria Eskom MTS will be approximately 12 hectares, in extent. Two layout alternatives of 320m × 350m (11.2ha) in extent each were considered for the recommended Site Alternative 1. The other 2 location and layout alternatives were dismissed at the end of the scoping phase.

The proposed Asteria Eskom MTS will contain the following infrastructure:

- 4 × 500MVA Transformers (including 2 for future planning);
- 2 × 400kV line bays for the 400kV LILO from the Bacchus-Palmiet 400kV Transmission power line;
- Low-level busbars, bus couplers and bus sections;
- 12 × 132kV feeder bays(including 6 for future planning);
- Foundations, steel structures and equipment;
- Outdoor switchgear in a breaker and half configuration;
- Telecommunication high mast;
- Surge and lightning protection equipment;
- Control and metering equipment;
- Office and ancillary buildings;
- Approximately 3.5m high fencing around the substation site;
- Security lighting in and around the perimeter of the substation site;
- Platforms; and
- Access roads from the R43 to the proposed Asteria Eskom MTS.

There will also be a transformer oil holding dam that is between 10 000 m^3 and 12 000 m^3 capacity. The large capacity includes ⅓ holding capacity to account for safety. The transformer oil will only be stored during the commissioning of the Asteria Eskom MTS, one month before energising of the MTS. This oil holding dam is a emergency and safety mechanism in case of leakage of the oil from the MTS during commissioning. The oil dam does not intend to store oil, if there is no emergency or leakage incident.

2.5.2 Loop-in and Loop-out Transmission Power Lines

The project intends establishing two adjoining 400kV Transmission power lines to LILO of the existing Bacchus-Palmiet 400kV Transmission power line.

The types of pylon towers considered for the LILO 400kV Transmission power lines are determined based on the following criteria:

- Space available to construct the LILO 400kV Transmission power lines and maintain their servitude.
- Generally, the horizontal distance between two pylon towers is approximately 350m to 400m for a typical 400kV Transmission power line. But, owing to the steeper terrain in the study area, the horizontal distance to be used for this project is estimated between 150m to 500m.

- The type of pylon towers adjacent to its horizontal axis.
- The angle created on its horizontal axis by the adjacent pylon towers.
- Visual impact on the affected landowners.

As such, only the Self Supporting Pylon (Refer to Figure 4) will be used for the 400kV LILO Transmission power lines. This type of pylon is required for a bend of more than 2° in the horizontal alignment of the recommended route alignment of the power lines. Typical self-supporting pylons are between 26m and 29m in height.

Figure 4: Self-supporting Pylon

No additional pylon alternatives will be considered because of the technical requirements of the 400kV LILO Transmission power lines.

The existing Bacchus-Palmiet 400kV Transmission power line would need to be split at the intersection with the proposed LILO 400kV Transmission power lines as shown in Figure 5. Temporary by-pass wooden pylons will be inserted into the ground within the existing 55m servitude of the Bacchus-Palmiet 400kV Transmission power line. This is in order to keep the existing Bacchus-Palmiet 400kV Transmission power line live and not to disconnect the power line during construction. The Bacchus-Palmiet 400kV Transmission power line will be split for 60m-80m. Therefore, it is unlikely that more than two temporary by-pass pylons would be required to place the live power line. Once the LILO 400kV Transmission power lines are constructed (over approximately 30 days), the temporary by-pass pylons would be removed from the servitude.

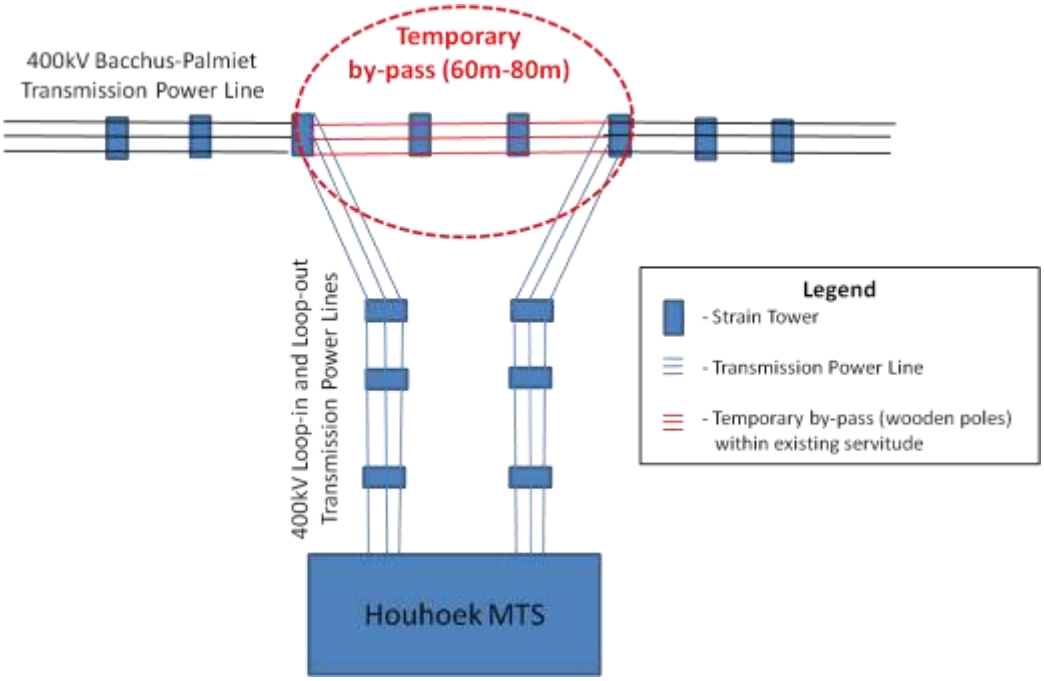
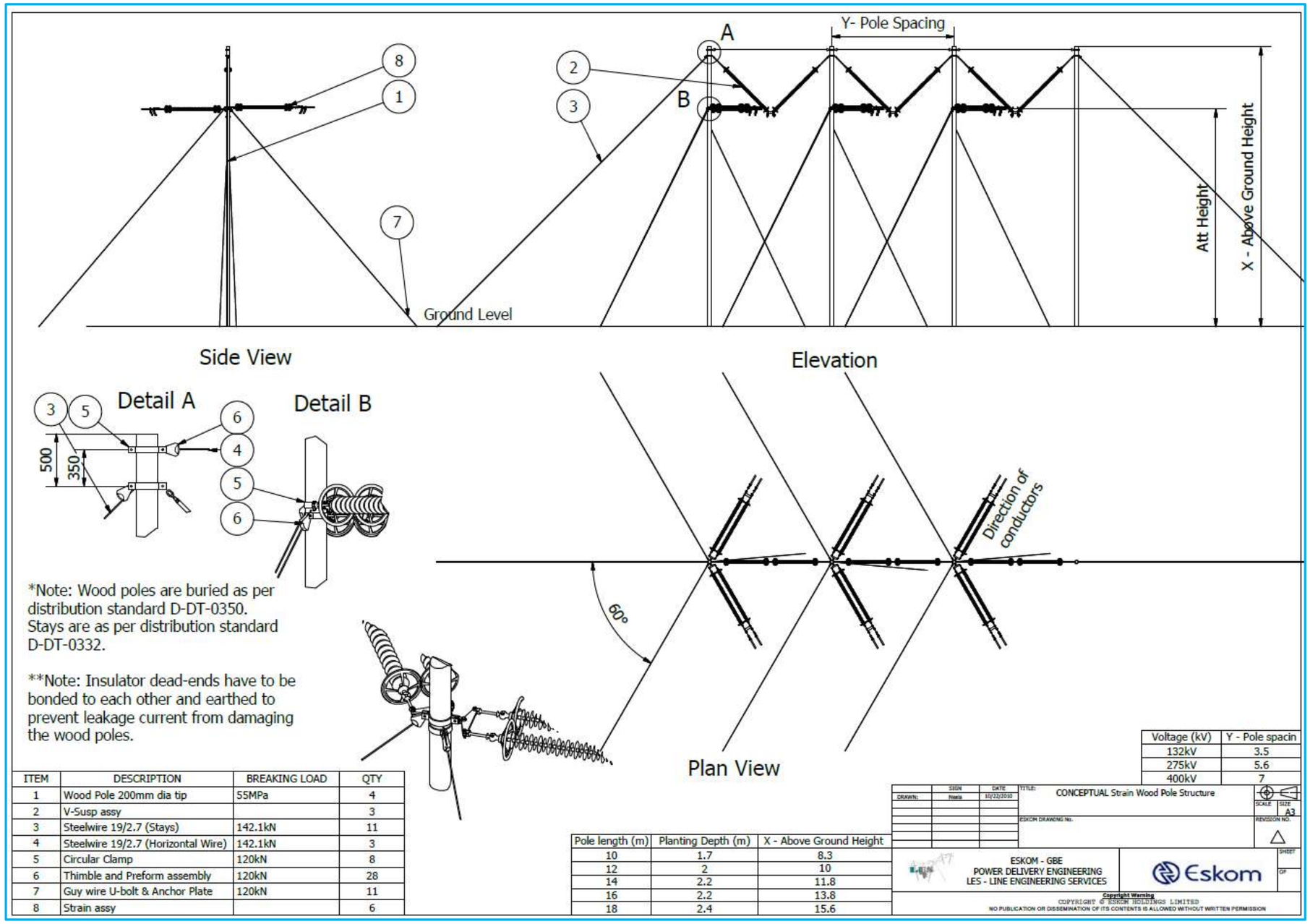


Figure 5: Construction of temporary by-pass

2.5.3 Distribution Power Line

The project intends establishing a 132kV Distribution power line to link the proposed Asteria Eskom MTS and the existing Houhoek Eskom Distribution Substation. The 132kV Distribution power line is estimated between 250m to 300m in length. A standard Eskom Distribution steel monopole pylon would be used, as shown in Figure 6. The height of the pylon above ground ranges from 8m to 15m.



ITEM	DESCRIPTION	BREAKING LOAD	QTY
1	Wood Pole 200mm dia tip	55MPa	4
2	V-Susp assy		3
3	Steelwire 19/2.7 (Stays)	142.1kN	11
4	Steelwire 19/2.7 (Horizontal Wire)	142.1kN	3
5	Circular Clamp	120kN	8
6	Thimble and Preform assembly	120kN	28
7	Guy wire U-bolt & Anchor Plate	120kN	11
8	Strain assy		6

Pole length (m)	Planting Depth (m)	X - Above Ground Height
10	1.7	8.3
12	2	10
14	2.2	11.8
16	2.2	13.8
18	2.4	15.6

Voltage (kV)	Y - Pole spacin
132kV	3.5
275kV	5.6
400kV	7

Figure 6: Typical Distribution Power Line Drawing

2.5.4 Linkage of Proposed Project into Eskom Network

The existing Houhoek Eskom Distribution Substation and High Voltage (HV) Line configuration is indicated in Figure 7 and Figure 8. The context of the proposed development is given in the sections that follow.

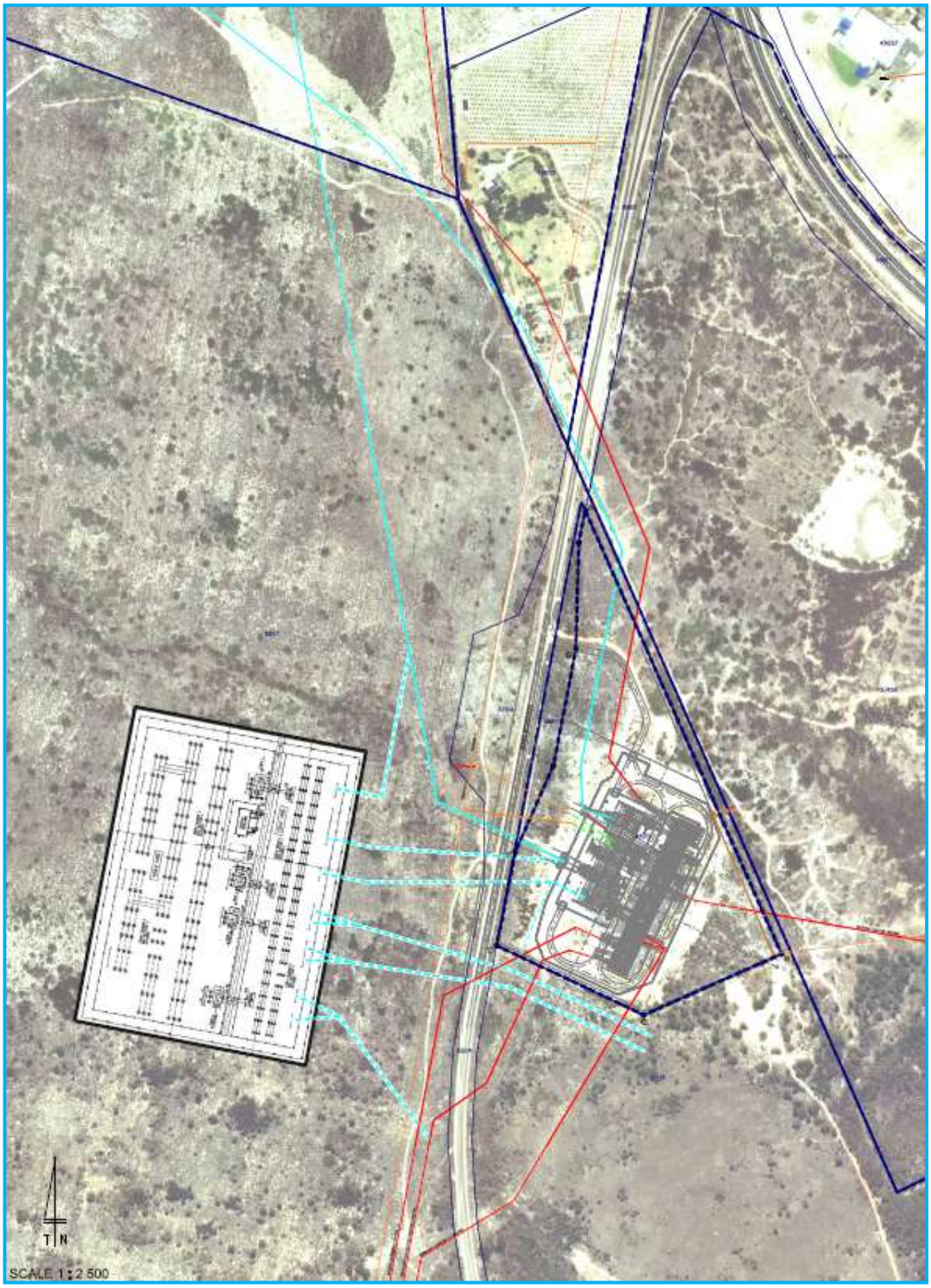


Figure 7: Proposed Asteria Eskom MTS Integration with Eskom Distribution Network

(a) 132kV Lines

The existing Houhoek Eskom Distribution Substation is supplied via the 132kV Bacchus single circuit line, and from the 132kV Lourensrivier circuit.

The 132kV Lourensrivier circuit shares a 132kV double circuit line with the Lebanon Switching 1 circuit which is running at 66kV. This double circuit line runs parallel to the decommissioned Lebanon2 66kV line.

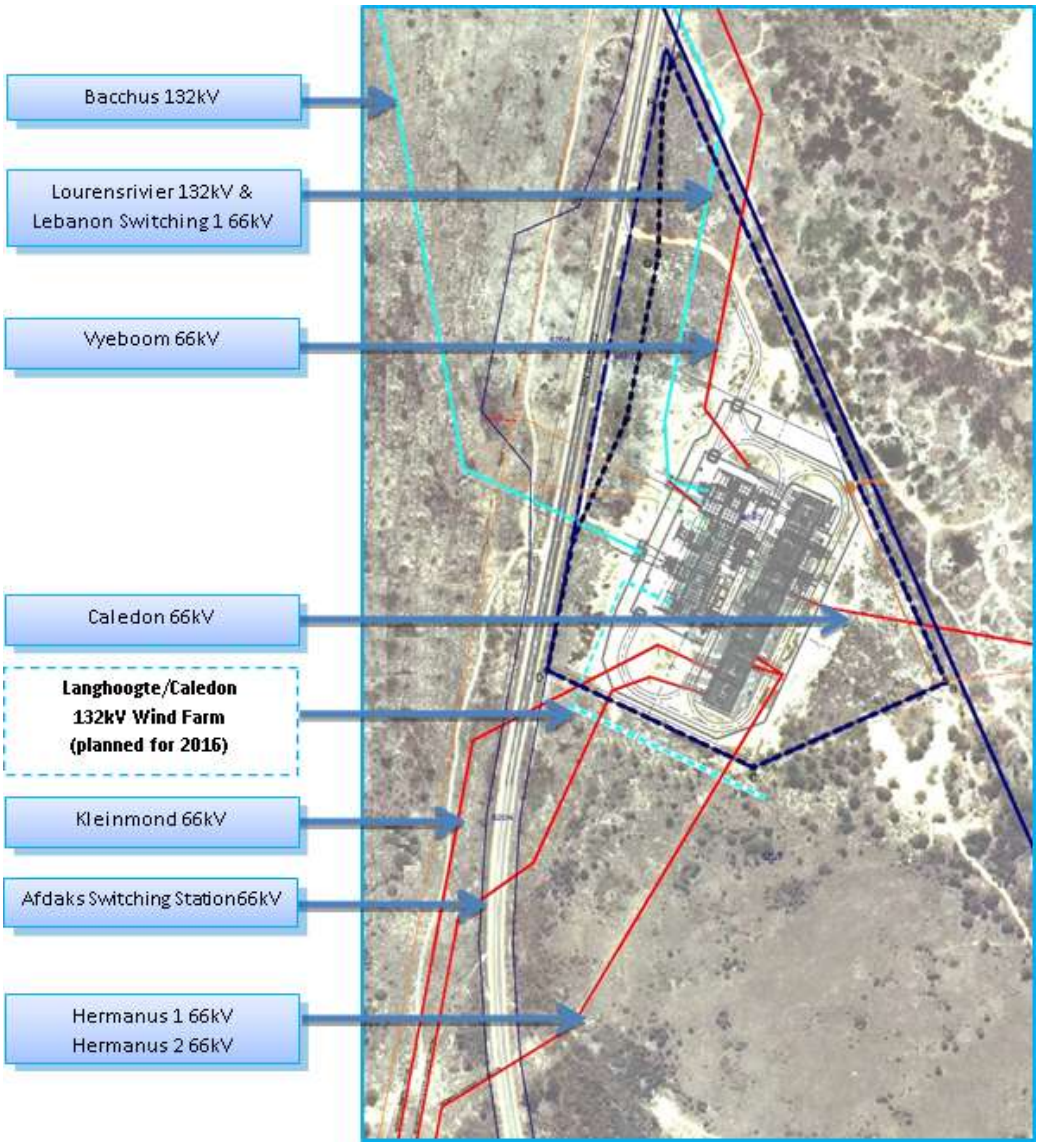


Figure 8: 132kV Power Lines Connected to Existing Eskom Distribution Substation

(b) 66kV Lines

The existing 132/66kV Houhoek Eskom Distribution substation feeds:

- 2x Hermanus circuits via a 66kV double circuit line running South;
- Kleinmond via a 66kV line running South;
- Afdaks Switching via a 66kV line running South;
- Caledon Wind Energy Facility via a 66kV line running East;

- Lebanon Switching 1 @66kV via a 132kV double circuit line running North-West; and
- Vyeboom via a 66kV line running North.

(c) Future Developments

There are two wind farm applications currently awaiting approval; the Langhoogte Wind Farm and Caledon Wind Farm. Both aim to be connected to the grid by 2016 but there is only capacity for one of the wind farms to be connected to the Eskom network as the network stands at this time.

Lebanon Switching 1, running at 66kV on a 132kV line, is expected to be upgraded to 132kV around 2025. A 66kV supply will still be needed in that direction, and the disconnected Lebanon2 66kV line could be brought back into commission to accomplish that.

In the scenarios presented by the development of the new 400/132kV Asteria Eskom MTS on one of the proposed footprints, a total of 12 available 132kV feeder bays will be made available, this will serve:

- 2 lines to the existing Houhoek Eskom Distribution Substation;
- Take in the Bacchus-Houhoek line;
- Take in the Houhoek-Lourensrivier 132kV line, on a double circuit with provision for the 66kV to 132kV upgrade of Houhoek-Lebanon Switching 1;
- Future WEF double circuit, either Caledon or Langhoogte, the other will remain on Houhoek Eskom Distribution Substation;
- Bredasdorp double circuit, future strengthening;
- Hermanus double circuit, future upgrade from 66kV to 132Kv; and
- Space for two future 132kV feeder bays.
- The technically feasible site alternatives shown in Figure 8 were considered as the start of the scoping phase.

2.6 SERVITUDE AGREEMENT

The servitude width required to accommodate the towers on which the 400kV Transmission LILO power lines will be strung is 55m wide each (a combined total of 110m), depending on the type of pylon tower required. The servitude is required in order to ensure safe construction, maintenance and operation of the Transmission power line and Eskom will be entitled to unrestricted access.

For safety reasons, the 400kV Transmission power line requires minimum clearance distances, which are summarised as follows:

- The horizontal clearance to cater for Transmission power line swinging in adverse climatic conditions. The specifications are not known at the time of compilation of this report.
- The minimum vertical clearance distance between the ground and the conductor of the Transmission power lines is 8.1m.
- The minimum vertical clearance to any fixed structure that does not form part of the Transmission power line is 0.4 – 11m.

- The maximum operational height under the tower conductors is 5.5m.
- Most farming activities can be carried out under the conductors, provided that there is adherence to safe working clearances, building restrictions and restrictions to certain crop types, e.g. tree crops.

The servitude width of the 132kV Distribution power line is 22m, but the minimum clearance distance is not known at this stage.

Registration of the servitude would give Eskom the right to erect, operate and maintain the Transmission power lines and to access the land to carry out such activities, but it does not constitute full ownership of the land. In turn, access and the activities must be carried out with due respect to the affected landowners. The servitude required for the project will be registered at the Deeds office and will form part of the title deed of the relevant properties once the environmental authorisation has been obtained. The Servitude Negotiation Process is described in detail in Section 6.14.1 of the EIA Report (BKS, 2013).

2.7 STUDY AREA OF PROJECT

The study area is located approximately 90km east from Cape Town within the TWK LM. TWK is the largest local authority in the Overberg District Municipality, embracing the City of Cape Town on its western boundary and sharing the eastern coastline with the Overstrand Municipality, within the Western Cape Province. See Figure 3 for a locality map of the study area.

The N2 Highway between Cape Town and Caledon borders the northern and eastern sides of the study area, whilst the R43 provincial road to Hermanus bisects the study area through the middle in a north-south direction.

There is a railway line, also running between Cape Town and Caledon that is situated just outside the north and eastern border of the study area.

The eastern section of the study area, adjacent to and into the lower edges of the Houwhoek Nature Reserve, slopes downwards towards the east and thus towards the middle of the study area.

Agricultural activities are noted along the R43 provincial road, toward the middle of the study area dominantly in the form of smallholdings on the western side of the R43, and larger agricultural developments such as vineyards on the eastern side.

The town of Botrivier is to the north-east of the study area and falls within the curve of the N2 highway.

The northern boundary of the study area is the existing Bacchus-Palmiet 400kV Transmission power line.

The study area includes for the proposed Transmission Substation and power line, and the Distribution power line (as described in Chapter 2.5).

2.8 CONSTRUCTION PROCESS

2.8.1 Construction Camps

The Contractor will require a site office/yard for the duration of the contract period. The entire construction workforce is unlikely to be accommodated in a construction camp that will be situated close to the recommended route alignment and substation location (Figure 3). This is especially so for the lesser-skilled contract workers that will potentially be able to be drawn from the local community based at Botrivier.

Aspects such as access to the construction site, access to services and access to materials will be considered for the location of the construction camp. The location of the construction camp will only be determined once a route alignment and substation location is recommended.

The Contractor's site camp shall be located within the development footprint, or on a site appropriately zoned (in terms of the Land Use Planning Ordinance, (No. 15 of 1985) (LUPO)) and/or authorised for such use and approved by the Environmental Control Officer (ECO). The Contractor shall select a location that is easy to access and that has already been cleared or disturbed by previous human activity (e.g. previous construction camps or stockpile areas). The EAP suggests that the construction camp be located within the boundaries of the proposed Asteria Eskom MTS (Remainder of Farm 820 Caledon RD).

All construction activities, materials, equipment and personnel will be restricted to within the area specified. The site camp may not be located on any of the environmentally sensitive areas, such as nature reserves, Critical Biodiversity Areas or wetlands.

All materials are stored at the construction camp, with the exception of concrete and the steel towers (which may come direct from the factory). The rule of thumb is one construction camp per 100km of 400kV Transmission power line. Therefore, only one construction camp will be used for the construction of the proposed Asteria Eskom MTS project. Figure 9 shows photographs of typical construction camps.

Figure 9: Examples of typical construction camps

2.8.2 Construction Process for the Proposed Asteria Eskom MTS

The construction of the Asteria Eskom MTS will be constructed using the following sequence of activities:

- Determine technically feasible alternatives.
- EIA input into alternative locations for substation and route alignments for the 400kV Transmission and 132kV Distribution power lines into the substation.
- Negotiate with affected landowners, including Post-Authorisation negotiations.
- Survey the site.
- Design the substation.
- Issue tenders and award the contract.
- Clear vegetation and construct access roads (where required).
- Construct terrace and foundations, including the Transmission oil pond.
- Assemble and erect equipment.
- Connect conductors to equipment.
- Rehabilitate any disturbed areas and protect erosion-sensitive areas.
- Test and commission.
- Continue maintenance.

Timing

The construction of the proposed Asteria Eskom MTS will be undertaken over 30 months.

Access/Service Roads

Eskom requires access/service roads for the construction and maintenance phases. The access roads for existing infrastructure are shown in Figure 10. An access road would need to be constructed to link the proposed Asteria Eskom MTS to the provincial R43 road.

Ongoing Maintenance

The standard lifespan of an MTS and its associated components is approximately 25 years. Continuous maintenance will be carried out (including the replacement of components).

Figure 10: Google Earth image of the existing power lines and associated access roads

2.8.3 Construction Process for LILO Transmission Power Line

The construction process outlined in Table 4 will be followed for the route of the 400kV LILO Transmission power line to tie into the existing Bacchus-Palmiet 400kV Transmission power line.

Activities will be undertaken in steps so that, at any point, an observer will see a chain of events with different working teams involved. At any time, some or all of the different teams may work at different points along the line.

Construction of this line will take approximately 3 months to complete, and is expected to begin in 2019, after the negotiation process and the construction of the proposed Asteria Eskom MTS has been completed.

Table 4: Project Activities

Activity	± Team Size	± Duration of Activity
Environmental Impact Assessment	15	18 months
Permitting and authorisations for project activities	-	-
Servitude negotiations with the respective landowners	-	-
Expropriation of necessary landowner portions	-	-

Activity	± Team Size	± Duration of Activity
• Determination of the conductor type and selection of best-suited conductor, towers, insulators and foundations • Define final centre line • Determine the coordinates of each bend in the line • Undertake an aerial survey or conventional survey to obtain an accurate profile of the area (the existing power lines would be taken into consideration when determining which survey to undertake) • Identify optimal tower sizes and positions	-	2 months
Final design of power line and placement of towers	-	2 months
Issue tenders and award contract to construction company (-ies)	-	3-6 months
Establishment of a site camp and the transportation of equipment, materials and personnel to site		
• Vegetation clearance centre line (4×4 vehicle access for the shallower slopes and access limited to foot for the steeper areas, is required) • Clear shrubs and trees (as determined by the Environmental Management Programme) along the centre line, with the aid of a surveyor • Undertake vegetation clearing in accordance with the minimum standards to be used for vegetation clearing for the construction of the proposed Transmission power lines	5-15	1-2 days depending on local conditions
Centre line pegging and identification of requirements and locations for the new gate (4×4 vehicle access for the shallower slopes and access limited to foot for the steeper areas, is required)	3	1 day
• Access negotiations (4×4 vehicle access for the shallower slopes and access limited to foot for the steeper areas, is required) • Develop and agree on an access plan (Eskom, Contractor and landowners) • Agree to rehabilitation process • Take photographs of pre-construction conditions off-site • Establish access roads (where required)	1	1 day
New gate installation (4×4 vehicle access for the shallower slopes and access limited to foot for the steeper areas, is required)	5	1 day
• Vegetation clearance (tower positions) • Clear four strips (40m × 40m square for Cross Rope Suspension (CRS) towers and 20m × 20m square for the self supporting towers) for assembly and erection at each marked tower position	5-15	1-2 days depending on local site conditions
• Foundation nominations for main structure and anchors (heavy vehicle access is required) • Check soil types to determine foundation requirements • Dig trial pits at main foundation points (usually uses mechanical back-actor/auger methods, although manual labour may be used)	5	2 days
• Excavation of foundations (heavy vehicle access is required) • Excavate foundations of up to 4m × 4m square and up to 4m deep, depending on soil conditions (mechanically where access to tower sites is readily available, and by hand where access is poor)	15	2 days

Activity	± Team Size	± Duration of Activity
• Cover or fence-off the foundation pit until foundation is poured.		
• Foundation steelwork – reinforcing (heavy vehicle access is required) • Make up steelwork at base camp and transport it to site by truck • Do fitting and wiring on site (limited welding on-site)	10	2 days
• Foundation (concrete) pouring (heavy vehicle access is required) • Shuttering • Use of standard concrete truck • Where there are access problems, mix concrete on site • A 28-day period is required after concrete has been laid • Heavy usage of access / service roads during this stage	20	2 days
• Delivery of tower steelwork (heavy vehicle access; extra long trucks used) • Deliver steelwork in sections and assemble on site • Clearly mark access roads to ensure the correct tower is delivered to each site (towers are designed as unique for each location)	5	1 day
• Assembly team / punching and painting (light vehicle access is required) • Assemble steelwork on the ground • Punch nuts and paint with non-corrosive paint	10	3 days
• Erection (abnormal-load-vehicle access is required) • Final assembly of towers by cranes (minimum of 50 tons).	20	2 days
Temporary by-pass (only if no outages during construction) • Placement of temporary by-pass pylons within the existing 55m servitude of the Bacchus-Palmiet 400kV Transmission power line • Connection of the LILO 400kV Transmission power line to the Bacchus-Palmiet 400kV Transmission power line	20	90 days
• Dynamic Tension Stringing (abnormal load vehicle access required) • Place cable drums within the servitude • Undertake stringing in both directions (5-10km can be strung from one station) • The working area at each drum will be as long as 130m, but will be within the servitude area • Intensive vehicle activity within the working area is likely • Pilot tractor will lay cable on the ground • Pull up pilot cable using a pulley • Ensure conductors never touch the ground • String the conductor	50	7 days
• Sag and tension (heavy vehicle access is required) • Tension the line from each station to ensure minimum ground-clearance heights are achieved (8,4m for 400kV Transmission power lines)	10	3 days

Activity	± Team Size	± Duration of Activity
Rehabilitation (heavy and light vehicle access is required) • **Continuous process throughout the construction phase** • **Typically only commences after the first 100 towers are constructed, but in this instance, will commence after all the towers are constructed** • **There is a one-year guarantee on the contractor's work, during which rehabilitation must be concluded**	5-15	2-10 days depending on local site conditions
Signing off of all landowners		
Handover of the Transmission power line from the Contractor to the Applicant		
Operation and maintenance of the Transmission power line by the Grid		

2.9 ESKOM AGRICULTURAL POLICY

Eskom's Vegetation Management under Power Lines (Vosloo, 2009) has elements that relate to agricultural activities under Transmission power lines, and is therefore applicable to this project. There is no specific guideline document that relates directly to the latter.

Agricultural activities are allowed to be practiced under Eskom Transmission power lines as long as the agricultural crops and equipment do not interfere with the power line infrastructure. The minimum ground clearances and minimum safe distances to trees/structures according to the particular voltages are presented in Table 5.

Table 5: Safe Distance Specifications of Transmission Power Lines (Vosloo, 2009)

VOLTAGE	SERVITUDE WIDTH	GROUND CLEARANCE	SAFE DISTANCE TO TREES
220kV	47m	6,7m	4,2m
275kV	47m	7.2m	4.7m
400kV	55m	8,1m	5,6m
765kV	80m	10,4m	8,5m

The servitude width required depends on the type of pylon tower required. For a 400kV Transmission power line, a servitude width of 55m is required, whereas for a 132kV Distribution power line, a servitude width of 22m is required. The servitude is required to ensure safe construction, maintenance and operation of the Transmission power line and Eskom will be entitled to unrestricted access.

Eskom will use existing access/service roads for the construction and maintenance of the Transmission power lines. However, where the former does not exist, the access/service road will be negotiated with the specific landowner.

2.10 ESKOM'S TECHNICAL ASSESSMENT

Eskom expressed the following limitations attached to the infrastructure for the proposed Asteria Eskom MTS project:

- The proposed Langhoogte WEF recommended a connection to the existing Houhoek Eskom Distribution Substation from the south. The proposed Caledon WEF recommended a connection to the existing Houhoek Eskom Distribution Substation from

the north. Both power lines are proposed as 132kV overhead power lines. Of the two WEFs, only one WEF may be connected to the existing Houhoek Eskom Distribution Substation. There is a possibility of connecting the other wind farm to the proposed Asteria Eskom MTS at a later stage (after 2019). But, no application has been received by Eskom Transmission at this stage and the wind farms would need to connect to Eskom infrastructure before 2019.

- In **Chapter 2.5.1** it is stated that the proposed Asteria Eskom MTS would be 11.2 hectares. Eskom actually requires an area of 300m × 270m (8.1 hectares) for the construction of the proposed Asteria Eskom MTS project. The additional 3.1 hectares provides Eskom with the necessary flexibility to place the substation according to the topographical profile and allows sufficient space for the connecting power lines into the substation site. The construction camp would also be located within this additional 3.1 hectares.
- The proposed 400kV Asteria Eskom MTS will be designed for 12 feeder bays. However, there are only 6 feeder bays required at this stage. The other 6 feeder bays are included to cater for possible additional connections in the future.
- Due to the steeper terrain in the area for the LILO Transmission power lines, the horizontal distances between pylon towers would need to be reduced from approximately 350m-400m to 150m-250m.
- A 400kV double circuit Transmission power line (only 55m servitude width) cannot be considered for the LILO Transmission power lines. The main reason provided was the height of the power line would be 24.5m with a ground clearance (including any rocks) of 8.1m, as stated in Chapter 3.3.2 of the EIA Report.
- 2 ×400kV Transmission power lines would be required for the LILO Transmission power lines, amounting to a combined servitude width of 110m. In order to allow Eskom with sufficient flexibility to profile the power line, a larger corridor width was considered in the EIA phase. A 250m corridor width was considered for LILO Route 1 to allow for placement of the LILO power line either adjacent to the existing power lines or away from the existing power lines (to reduce the visual impact caused by cluttering of power lines). In addition, as this corridor width goes through parts of the Houwhoek Nature Reserve, the wider corridor width is suggested to ensure placement of pylons avoid sensitive vegetation communities.

2.11 LEGAL FRAMEWORK

Section 24C(2) of the NEMA indicates that the Minister of Water and Environmental Affairs, or an organ of state with delegated powers, is the Competent Authority in the following circumstances and should be submitted to national DEA for review:

- Implications for international environmental commitments or relations.
- Takes place within an area where South Africa has international environmental obligations, such as international conventions, except for any area falling within the sea-shore, a conservancy, a protected natural environment, a proclaimed private nature reserve, a natural heritage site, or the buffer zone or transitional area of a biosphere reserve or a world heritage site.

- Affects an area that crosses either provincial or international boundaries.
- Is undertaken, or is to be undertaken, by:
  - A national department;
  - A provincial department responsible for environmental affairs;
  - A statutory body, excluding any municipality, which has been delegated the authority from either a national or provincial department to be responsible for a specific activity or set of activities; or
- Will take place within a national proclaimed protected area or other conservation area under control of a national authority.
- When a need for arbitration due to issues specific with respect to a difference or disagreement regarding the protection of the environment in terms of the specific project is considered appropriate.

Since the Applicant (Eskom) is a parastatal, the application for a Scoping/EIA process has been submitted to the DEA as the approving authority. The Western Cape Provincial Department of Environmental Affairs and Development Planning (DEA&DP), the national Department of Water Affairs (DWA) and the Western Cape provincial conservation authority, and Cape Nature therefore act as commenting authorities in the EIA process.

2.11.1 National Environmental Management Act

The NEMA provides a framework for the integration of the environmental management activities of various spheres of government. It promotes integrated management to ensure sustainable resource utilisation and development and requires that the DEA be the lead agent in ensuring effective custodianship of the environment. It also provides that sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where subjected to significant human resource usage and development pressure.

The NEMA principles, as contained in Section 2, essentially guide the interpretation, administration and implementation of the Act and any other law concerned with the protection of the environment. An overarching emphasis of the principle that development must be environmentally, socially and economically sustainable. It is also stated that sustainable development requires the consideration of the following factors:

- Pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- waste is avoided, or where it cannot be altogether avoided, is minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
- the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
- the development, use and exploitation of renewable resources and the eco-systems of which they are part do not exceed the level beyond which their integrity is jeopardised; and

- negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.

An application for development has to conform to the requirements of the NEMA and the regulations promulgated in terms of Section 24(1) thereof. The regulations promulgated under Section 24(1) are currently listed in Government Notice No. 543, 544, 545 and 546 in the Government Gazette of 18 June 2010. All applications listed in the abovementioned regulations shall be subjected to a Scoping/EIA process and will require Environmental Authorisation from the DEA. Section 24C of the NEMA prohibits the undertaking of identified activities except by virtue of a competent authority.

Section 23 of NEMA further determines that Integrated Environmental Management should be employed when any policies, programmes, plans or projects are drawn up to minimise the impact on the environment. The duty of municipal officials to prevent pollution and ecological degradation, to promote conservation and secure ecologically sustainable development and use of natural resources, originates from the Constitution and the NEMA.

When the approving authority (DEA) is satisfied with the proposed development in terms of the NEMA and the 2010 EIA Regulations, the relevant department issues Environmental Authorisation for the development. This Environmental Authorisation may include a list of conditions that must be complied with. These conditions must be strictly adhered to, as they are compiled specifically to ensure that adequate mitigating measures will be taken to minimise the negative effects of the development.

Typical conditions imposed by the approving authority would include, but are not limited to:

- measures to prevent, manage and mitigate environmental impacts to acceptable levels;
- prevention of pollution of water bodies and groundwater;
- rehabilitation programme for disturbed natural and/or heritage areas;
- appointment of an independent Environmental Control Officer (ECO) to oversee the construction phase and to ensure that the development phase is conducted in an environmentally responsible manner;
- conservation management and visitor management plans; and
- requirements of other authorities, such as the DWA, the Department of Energy (DoE), the Department of Agriculture, Forestry and Fisheries (DAFF), the Department of Mineral Resources (DMR) and the South African Heritage Resource Agency (SAHRA) and/or relevant provincial authorities.

The construction of the Asteria Eskom MTS project, falls within the ambit of the list of activities (Table 6) identified in terms of Sections 24(2)(a) and (d) of the NEMA. Note that comments on the listed activities are presented in the table, as identified by being in *italics*.

Table 6: Listed Activities in terms of the NEMA

Activity No	Description of Each Listed Activity	Description of Activities Applicable to Each Listed Activity
LISTING NOTICE 1 (GN R544 of 18 June 2010) – BASIC ASSESSMENT PROCESS		
10	The construction of facilities or infrastructure for the transmission and distribution of electricity: (xi) outside urban areas or industrial complexes with a capacity of more than 33kV but less than 275kV.	*The Asteria Eskom MTS project entails the construction of a 400/132kV Substation, including 400kV Transmission and 132kV Distribution power lines and associated infrastructure, outside of an urban area / industrial complex.*
11	The construction of: (xi) infrastructure or structures covering 50 m^2 or more, where such construction occurs within a watercourse or within 32 m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind a development setback line.	*The Asteria Eskom MTS project entails the construction of a 400/132kV Substation, including 400kV Transmission and 132kV Distribution power lines and associated infrastructure. The associated power lines or access roads, that link to the substation, may cross drainage lines and non-perennial watercourses.*
13	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 m^3 but not exceeding 500 m^3.	*The Asteria Eskom MTS project will have an oil holding dam during the commissioning of the proposed Asteria Eskom MTS. The oil holding dam will store Transformer oil (dangerous good) up to 8 000 m^3 with a holding capacity up to 12 000 m^3. Therefore, this oil holding dam will exceed the 500 m^3 capacity of the listed activity and will be removed from the application. Activity No. 3 of Listing Notice 2 will still apply.*
18	The infilling or depositing of any material of more than 5 m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from: (i) a watercourse.	*The Asteria Eskom MTS project could entail the construction of access roads for use during the construction phase and operational phase (for maintenance purposes) which may cross over drainage lines and non-perennial watercourses occurring in the area.* *The installation of pylons associated with the LILO Transmission power lines may also impact on any cross drainage lines and non-perennial watercourses encountered in the study area.*
22	The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 m. (ii) where no reserve exists where the road is wider than 8 m.	*The proposed Asteria Eskom MTS project would entail the construction of access roads to link the R43 to the proposed Asteria Eskom MTS. Existing access roads and single-lane maintenance tracks will be used during the operational phase (for maintenance purposes).*
24	The transformation of land bigger than 1,000m^2 in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space,	*One of the proposed alternatives being considered falls within the existing Houwhoek Nature Reserve, which is by definition "conservation" in nature. The Asteria Eskom MTS will be approximately 12ha, which is*

Activity No	Description of Each Listed Activity	Description of Activities Applicable to Each Listed Activity
	conservation or had an equivalent zoning.	*significantly larger than 1 000 m^2 (i.e. 0.1 ha). The land use proposed for the Transmission Substation is institutional (Authority Zone: Government (AU)). The combined servitude of the LILO lines would also exceed 1 000 m^2.*
26	Any process or activity identified in terms of Section 53(1) of the National Environmental Management: Biodiversity Act (No. 10 of 2004).	*The proposed Transmission and Distribution power lines fall within areas of importance in terms of NEM:BA. The position of the Transmission Substation itself will also be influenced by the biodiversity status.*
38	The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	*The Asteria Eskom MTS project will link a 132kV Distribution power line from the proposed 400kV Transmission Substation to the existing 132kV Distribution Substation. The Asteria Eskom MTS project could then entail the expansion of the existing Eskom servitudes, which will increase the development footprint.*
40	The expansion of: (iv) infrastructure by more than 50 m^2 within a watercourse or within 32 m of a watercourse, measured from the edge of a watercourse.	*The Asteria Eskom MTS project will not result in the expansion of any infrastructure as described in this activity. However, the construction of infrastructure as described in Activity No. 11 of Listing Notices 1 would still apply. Therefore, this activity is removed from the application.*
47	The widening of a road by more than 6 m, or the lengthening of a road by more than 1 km (i) where the existing reserve is wider than 13.5 m; or (ii) where no reserve exists, where the existing road is wider than 8 m.	*The Asteria Eskom MTS project would entail the expansion of existing roads to use as access roads for use during the construction phase and operational phase (i.e. for maintenance purposes).*
LISTING NOTICE 3 (GN R546 of 18 June 2010) – BASIC ASSESSMENT PROCESS		
4	The construction of a road wider than 4 m with a reserve less than 13,5 m (d) in Western Cape Province: in (ii) all areas outside urban areas.	*The temporary single-lane maintenance tracks and the access road between the R43 and the proposed Asteria Eskom MTS will be more than 4m in width and outside an urban area.*
10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 m^3, (e) in the Western Cape: in (ii) All areas outside urban areas.	*The proposed project will have an oil holding dam during the commissioning of the proposed Substation. The oil holding dam will store Transformer oil (dangerous good) up to 8 000 m^3 with a holding capacity up to 12 000 m^3. Therefore, this oil holding dam will exceed the 80 m^3 capacity of the listed activity and will be removed from the application. Activity No. 3 of Listing Notice 2 will still apply.*
12	The clearance of an area of 300 m^2 or more of vegetation where 75% or more of the vegetative cover constitutes indigenous	*Clearance land of vegetation for the proposed power lines and substation areas will be required. 12 hectares would require clearing of*

Activity No	Description of Each Listed Activity	Description of Activities Applicable to Each Listed Activity
	vegetation: (a) Within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEM:BA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment (2004). (b) Within critical biodiversity areas identified in bioregional plans.	*vegetation for the Asteria Eskom MTS. Vegetation clearance of 300 m^2 may also be required around each Transmission pylon structure.*
13	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for (2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN R No. 544 of 2010. (a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority. (b) National Protected Area Expansion Strategy Focus areas. (c) in Western Cape: (ii) outside urban areas, the following: (aa) A protected area identified in terms of NEMPAA, excluding conservancies. (bb) National Protected Area Expansion Strategy Focus areas. (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority. (ee) Core areas in biosphere reserves. (ff) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEM:PAA or from the core area of a biosphere reserve.	*Clearance land of vegetation for the proposed power lines and substation areas will be required. 12 hectares would require clearing of vegetation for the Asteria Eskom MTS. The LILO Transmission power lines are proposed within 5 km from the Houwhoek Nature Reserve.*
14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation: (a) in the Western Cape: in (i) all areas outside	*Clearance land of vegetation for the proposed power lines and Asteria Eskom MTS areas will be required. 12 hectares would require clearing of vegetation for the proposed Asteria Eskom MTS, which is located outside the urban edge*

Activity No	Description of Each Listed Activity	Description of Activities Applicable to Each Listed Activity
	urban areas.	*of Botrivier.*
16	The construction of: (xi) infrastructure or structures covering 10 m^2 or more, where such construction occurs within a watercourse or within 32 m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind a development setback line (d) in Western Cape (ii) Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies. (bb) National Protected Area Expansion Strategy Focus areas. (dd) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority. (ff) Critical biodiversity areas or ecosystems service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. (gg) Core areas in biosphere reserves. (hh) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	*The proposed Asteria Eskom MTS and LILO pylons will be located outside of the unnamed watercourse and its 50 m buffer area.*
19	The widening of a road by more than 4 m, or the lengthening of a road by more than 1 km (d) in the Western Cape: in (ii) all areas outside urban areas.	*The temporary single-lane maintenance tracks and the access road between the R43 and the proposed Asteria Eskom MTS will be more than 4 m in width and outside an urban area.*
23	The expansion of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 m^3 but not exceeding 80 m^3, (d) in the Western Cape: in (ii) all areas outside urban areas.	*The proposed project will have an oil holding dam during the commissioning of the proposed Substation. The oil holding dam will store Transformer oil (dangerous good) up to 8 000 m^3 with a holding capacity up to 12 000 m^3. Therefore, this is not an expansion of an existing oil holding dam, will exceed the 80 m^3 capacity of the listed activity, and will thus be removed from the application. Although, Activity No. 3 of Listing Notice 2 will still apply.*
24	The expansion of: (d) infrastructure where the infrastructure will be expanded by 10m^2 or	*The proposed project will not result in the expansion of any infrastructure as described in*

Activity No	Description of Each Listed Activity	Description of Activities Applicable to Each Listed Activity
	more where such construction occurs within a watercourse or within 32 m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind a development setback line. (d) in Western Cape (ii) outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies. (bb) National Protected Area Expansion Strategy Focus areas. (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority. (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. (ff) Core areas in biosphere reserves. (gg) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	*this activity. However, the construction of infrastructure as described in Activity No. 11 of Listing Notice 1 would still apply. Therefore, this activity is removed from this application*
LISTING NOTICE 2 (GN R545 of 18 June 2010) – SCOPING/EIA PROCESS		
3	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	*The proposed project will have an oil holding dam during the commissioning of the Asteria Eskom MTS. The oil holding dam will store Transformer oil (dangerous good) up to 8 000 m^3 with a holding capacity up to 12 000 m^3. Therefore, the combined capacity of the storage of the dangerous good exceeds 500 m^3.*
8	The construction of facilities or infrastructure, for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	*The Asteria Eskom MTS project entails the construction of infrastructure for the transmission of electricity with a capacity of 400kV, outside an urban area.*

Activities contained in all three listing notices are applicable to the proposed Asteria Eskom MTS project. As such, a Scoping/EIA process was undertaken. The proposed activity may not commence without Environmental Authorisation from the DEA.

2.11.2 National Heritage Resources Act

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) directs the protection and management of the heritage resources in South Africa. This legislation serves as guidelines to the heritage resource management authorities in South Africa, according to which developers and other authorities must exercise discretion or take decisions in terms of this Act. The NHRA applies to the actions of the State, local authorities and private individuals.

National Estate includes, but is not limited to, places, buildings, structures and equipment of cultural significance, places to which oral traditions are attached or which are associated with living heritage; historical settlements and townscapes, landscapes and natural features of cultural significance, geological sites of scientific or cultural importance, archaeological and paleontological sites, graves and burial grounds, sites of significance relating to South African history and movable objects.

A variety of formal protection measures, ranging from national and provincial heritage sites, protected areas, provisional protection, inclusion on the heritage register of a province, heritage areas and heritage objects have been included in the NHRA. A number of other protection measures, including the legal protection of paleontological and archaeological sites (including rock art) and meteorites, burial grounds and graves, structures older than 60 years and public monuments and memorials are also in place.

Applicants must contact the SAHRA or the relevant authorised provincial agency, Heritage Western Cape (HWC), to ascertain which properties and objects are formally protected by the Act and how any future development would impact on these heritage resources. Applicants should note that formal permit applications or authorisations would be required from the relevant heritage resource management authority to make changes to these heritage resources.

Applicants must note that the provisions of Section 38 of the NHRA provide that they are responsible for contacting the SAHRA at the very earliest stages of initiating a development and for furnishing the SAHRA with details relating to the proposed development in order for the SAHRA to determine if a Heritage Impact Assessment (HIA) is required.

The following activities listed in Section 38 of the NHRA apply to the Asteria Eskom MTS project:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.
- Any development or other activity which will change the character of a site (i) exceeding 5 000m^2 in extent.

The Asteria Eskom MTS project includes a power line that exceeds 300m in length and a substation that exceeds 5 000m^2 in extent.

2.11.3 Hazardous Substances Act

The Hazardous Substances Act, 1973 (No. 15 of 1973) provides for the control of substances which may cause injury or ill-health or death of humans by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure in certain circumstances, and for the control of certain electronic products.

The Act further provides for the division of such substances or products into groups in relation to their degree of danger. The Act also provides for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products. The Act acknowledges that these substances will lose their economic value after use, and would therefore require disposal. Section 29 of this Act therefore makes provision for the promulgation of regulations "authorising, regulating, controlling, restricting or prohibiting the storage, transportation, or dumping and other disposal" of any grouped hazardous substances or class of grouped hazardous substances.

2.11.4 National Water Act

The National Water Act (No. 36 of 1998) (NWA) provides a framework to protect, develop, conserve and manage the nation's water resources. Water use is defined broadly in terms of NWA, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed (in terms of Section 21) unless it is listed in Schedule 1, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. Section 21 of the NWA lists the water uses for which authorisation under the Act is required.

The NWA also provides for pollution prevention measures, with particular emphasis on water resource pollution. In accordance, the licensee shall ensure that activities impacting upon water resources and effluent releases are monitored for compliance with the applicable regulations. Emergency incidents involving water resources are included in the Act, requiring the polluter to remediate and mitigate the impacts of such an emergency incident.

In the context of the proposed project and any potential impact on water resources, there are two aspects of the NWA which are of key importance. The first is the mechanism for authorising various water uses (as detailed in Section 21 of the NWA). If any water uses are to be undertaken as part of the project they will need to be authorised in accordance with one of the mechanisms created under the NWA, which include Schedule 1 water uses, generally authorised water uses and licensing of water uses.

In terms of Section 19 of the NWA "An owner of land, a person in control of land or a person who occupies or uses the land on which … any activity or process is or was performed or undertaken; or … any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring". These measures may include, but are not limited to:

- Measures to cease, modify, or control any act or process causing the pollution.
- Compliance with any prescribed waste standard or management practice.
- Containment or prevention of the movement of pollutants.
- Remediation of the effects of the pollution.
- Remediation of the effects of any disturbance to the bed and banks of a watercourse.

Construction-related activities will impact upon water resources, thereby requiring the issue of a license for such activities in accordance to Section 21 of the NWA. The listed activity in terms of Section 39 of the NWA (GN R26187 of 26 March 2004) is shown in Table 7.

Table 7: Listed activities in terms of NWA (General Authorisation)

Activity No(s)	Description of Each Listed Activity
21 (c)	Impeding or diverting the flow of water in a watercourse.
21 (f)	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
21 (i)	Altering the bed, banks, course or characteristics of a watercourse.
21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

2.11.5 Other Applicable Environmental Legislation

A limited scoping of relevant legislation was undertaken to identify the key legal issues related to the proposed project. Applicable key environmental legislation, which must be considered by Eskom Holdings Limited during the implementation of the proposed project is summarised in Table 8.

Table 8: List of Applicable Legislation and Guidelines

LEGISLATION	SECTIONS	RELATES TO:
The Constitution Act (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
	Section 25	Rights in property
	Section 32	This section provides that every person has the constitutional right of access to information held by the state, including for example a state department such as the DEA, and any information held by another person in so far as that information is required for the exercise or protection of any of their rights, including their environmental right.
	Section 33	The Constitution entitles everyone to administrative action that is lawful, reasonable and procedurally fair and if one's rights have been adversely affected by administrative action one has the right to be given written reasons for the decision.
National Environmental Management Act (No 107 of 1998) as amended[1]	Section 2	The national environmental management principles contained in Chapter 1 of the Act, serve as guidelines by reference to which organs of state shall exercise their functions when taking a decision in terms of NEMA. The principles will furthermore guide the interpretation, administration

1 The EIA Regulations (2010) R543, R544, R545 and R546 may be relevant for certain construction and maintenance activities, such as those that may need to take place in or close to water resources.

LEGISLATION	SECTIONS	RELATES TO:
		and implementation of NEMA and any other law concerned with the protection of the environment. The environmental management principles apply to the actions of all organs of state that may significantly affect the environment. The section 2 principles contain an overarching emphasis of the principle that development must be environmentally, socially and economically sustainable and the principle of sustainable development is referenced at section 2(4).
	Section 24	Chapter 5 of the Act deals with integrated environmental management, including environmental impact assessments. Section 24 requires the Applicant of an environmental authorisation to consider, investigate, assess and report the consequences for or impacts on the environment of the listed activity or specified activity to the competent authority.
	Section 28	Section 28 imposes a duty of care on every person who causes, has caused, or may cause significant pollution or environmental degradation to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring. The Applicant has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
	Section 30	Control of emergency incidents. Section 30 requires that "a responsible person" or, where the "incident" occurred in the course of that person's employment, must take all measures reasonably practicable to contain and minimise the effects of the incident, including' its effects on the environment and any risks posed by the incident to the health, safety and property of persons. There is also a requirement to report such incidents through the most effective means reasonably available. It is an offence to fail to comply with the reporting requirements and obligations to address an incident, as contained in sub-sections 30(3), (4), (5) or (6) of NEMA.
Environment Conservation Act (Act 73 of 1989) and regulations	Althought the ECA has been substantially repealed by the NEMA and NEM:WA, certain Regulations promulgated under the Act remain in effect. Of importance are the National Noise Control Regulations.	
National Environmental Management: Protected Areas Act (No 57 of 2003)	The aim of the Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes. The Act repealed sections 16, 17 & 18 of the Environment Conservation Act (No. 73 of 1989) (ECA). In 2004, the National Environmental Management: Protected Areas Amendment Act (No. 31 of 2004) was promulgated to amend Act 57 of 2003 with regard to the application of that Act to national parks and marine protected areas. The Amendment Act came into operation on 01 November 2005 and it also repeals the National Parks Act with the exception of section 2(1) and Schedule 1. The Act operates in conjunction with the National Environmental Management: Biodiversity Act No. 10 of 2004.	
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA)	Sections 65-69	These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species.
	Sections 71 and 73	These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.
Conservation of Agricultural Resources Act (No 43 of 1983) and regulations	Section 5, 6	Implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas.

LEGISLATION	SECTIONS	RELATES TO:
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution
	Section 20	Control of emergency incidents
	Section 21	DWA will require water use licences for various construction-related activities.
	Section 26	Empowers the Minister to make certain Regulations.
	Section 27	Provides for considerations that must be taken into account by the responsible authority when issuing general authorisations.
	Section 28	Provides the essential requirements that must be contained in a water use licence.
	Section 29	Provides for the discretionary conditions that the responsible authority may include in a water use licence.
	Section 30	Provides the responsible authority with the discretion to request a security in respect of any obligation or potential obligation arising from a licence.
	Section 31	States that the issuing of a water use licence does not guarantee certain matters (such as the availability of water supply).
	Section 32	Provides the definition of existing lawful water use.
	Section 33	Allows for the declaration of water use as existing lawful water use.
	Section 34	Provides Authority to continue with existing lawful water use.
National Heritage Resources Act (No 25 of 1999)	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the SAHRA or a provincial heritage resources authority (Heritage Western Cape in this instance) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such a place.
	Section 38	This section provides for a HIA. The HIA will be approved by the DEA, which is required to take SAHRA's and HWC's comments into account prior to making a decision on the HIA.
Removal of Graves and Dead Bodies Ordinance 7 of 1925	Authorisation for exhumation and re-internment of human remains must be obtained from the relevant local authority where the grave is situated, as well as where the grave is being relocated to.	
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Measures for the control of dust
	Section 34	Measures for the control of noise
	Section 35	Measures for the control of offensive odours
	Chapter 5	Licensing of listed activities
	Schedule 2	Ambient air quality standards
National Environmental Management: Waste Act (No. 59 of 2008)	Section 16	General duty of care relating to waste management
	Section 17	Reduction, re-use, recycling and recovery of waste
	Section 20	No person may commence, undertake or conduct a waste management activity, except in accordance with: • the requirements or standards prescribed by said Act and regulations; and • a waste management licence issued in respect of that activity, if a licence is required.

LEGISLATION	SECTIONS	RELATES TO:
	Section 26	Prohibition of unauthorised disposal of waste
	Section 27	Littering
Minimum requirements for storage, handling and disposal of hazardous waste, DWAF guidelines, 1998	Section 10	Temporary hazardous waste storage: time, volume and other requirements
South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998): **1. Damaging of a National Road**	Section 46(5)(a) and (b)	The Agency may issue a written notice demanding that the owner or occupier prevents or stops any activity that may cause damage to a national road. The demand may include, among others, the removal, filling in, alteration, relocation or establishment of any dam, canal, trench, wall, sluice, pipe, excavation, structure or other works, or the cessation of such an act, on the land.
	Section 46(3)	The owners or occupiers of land adjoining any national road must: • take all measures on their land that are reasonably necessary to prevent the occurrence of any damage to the national road concerned. • Refrain from doing or permitting anything on or below the surface of that land which is likely to cause damage to that national road.
	Section 46(4)	The owner or occupier of any land adjoining a national road will be held liable for any damage to the national road which was or reasonably should have been foreseen.
South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998): **3. Structures and other works on, over or below national roads or certain other land**	Section 48(1)	No person may do any of the following without the Agency's permission: • On or over, or below the surface of, a national road erect, construct or lay, or establish any structure. • Make any structural alteration or addition to a structure situated on or over, or below the surface of a national road. • Give permission for either (a) or (b).
	Section 48(5)	The Agency may give written notice for the removal of any such structure, or may remove the structure and recover the costs from that person.
	Section 48(8)	Any person who contravenes this section is guilty of an offence and liable to one year in prison and/or a fine.
Explosives Act (Act 15 of 2003) and regulations	Provisions for the control of explosives in terms of use, disposal, storage, transportation, dealing, importation, exportation and packaging of explosives.	
Occupational Health and Safety Act (No 85 of 1993) and regulations	General Administration Regulations GN R1449 (Section 7)	Material Safety Data Sheets must be made available at the request of any interested or affected party.
	Section 8	General duties of employers to their employees
	Section 9	General duties of employers and self-employed persons to persons other than their employees
Fencing Act (No 31 of 1963)	Section 17	Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to the protection of flora.
Hazardous Substances Act (No 15 of 1973) and regulations	Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances	

LEGISLATION	SECTIONS	RELATES TO:
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations	Sections 3-10	Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard. Workers handling these remedies must also be registered in terms of the Act.
National Road Traffic Act (No 93 of 1996) and regulations	Section 54	Transportation of dangerous goods
National Veld and Forest Fire Act (No 101 of 1998)	Chapter 2	Promotes and regulates the formation of fire protection associations which aim to manage and coordinate fire protection and fire services in an area.
	Chapters 4 & 5	Organisations are required to make and maintain firebreaks and fire-fighting equipment and personnel should a risk exist that a fire may start or spread from the premises.
Subdivision of Agricultural Land Act (Act 70 of 1970)	To control the subdivision and, in connection therewith, the use of agricultural land.	
SANS 1929	Ambient air quality – limits for common pollutants2	
SANS 10103	The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.	
SANS 10128	Bunding of fuel storage tanks	

2.11.6 Applicable By-Laws

The TWK LM by-laws that may be applicable to the proposed development are listed in Table 9.

Table 9: Applicable By-laws

TWK LM BY-LAWS	SECTION	RELATES TO
By-law relating to control of disposal sites, Gazette 62348, 8 March 2005	Section 3	**Access to Disposal Site** No person shall enter the disposal site or shall be on such a site except on such days and at such times as shall be fixed by the municipality. Only persons wishing to dump refuse who have paid the prescribed fees or who are in possession of a written permission issued by the municipality, shall be entitled to enter the disposal site or to be on the site. It further states; anybody who enters a disposal site or who is found on such a site in contravention of the provisions of this section shall be guilty of an offence.
	Section 5	**Prohibition of dumping of offensive matter** The municipality reserves the right to prohibit the dumping of any offensive or toxic matter at a disposal site.
	Section 7	**Charges** The municipality may determine charges payable for the dumping of any waste.
	Section 8	**Penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, for a fine.

2 Replaced by R1210

TWK LM BY-LAWS	SECTION	RELATES TO
By-law relating to the prevention of public nuisance and the keeping of animals, Gazette No. 62348, 8 March 2005	Section 3	**Behaviour and Conduct** The By-Law prohibits any activity which may lead to interference with the convenience or comfort of other people. It further prohibits any person to deposit, leave, spill, drop any type of waste material likely to cause or contribute to annoyance or endanger any persons.
	Section 27	**Penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, for a fine.
By-Law relating to Electricity supply, Gazette No. 62348, 8 March 2005	Section 11	**Statutory Servitude** The Municipality may within its municipal area make provision of, establish, and maintain or close up and destroy supply services.
	Section 12	**Right of admittance to inspect, test and or do maintenance work** The Municipality can make provision for access to any property to do anything, as authorized by the municipality including inspections, examining and investigating any possible source of electricity supply.
	Section 61	**Penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, for a fine.
By-Law relating to outdoor advertising and signage, Gazette No. 62348, 8 March 2005	Section 2	**Disfigurement** No person shall by means of posters or other signs disfigure the front of any public road, wall, fence, land, tree or other natural feature. The municipality reserves the right to grant permission for the display of a posters
By-Law relating to Public Amenities, Gazette No. 62348, 8 March 2005	Section 5	**Nuisances** No person may cause or allow the burning of rubble or refuse, produce smoke, create any nuisance or cause obstruction or annoyance in any other manner in or at a public amenity.
	Section 6	**Structures** No person may erect or establish any structure in a public amenity prior to obtaining a written consent from the municipality.
	Section 10	**Safety and Order** No person may engage in any activity which may cause damage of anything within such amenity or engage in any other activity which may disfigure or cause damage to such amenity.
	Section 15	**Penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a penalty.
By-Law relating to Refuse Removal, Gazette No. 62348, 8 March 2005	Section 2	**Compulsory use of service** No one, except the municipality may remove any refuse from any premises or dispose thereof unless that person has been authorized by the municipality. The owner of each premises must make use of the service provided by the municipality for the removal or disposal of waste for a fixed tariff as determined by the municipality.
	Section 3	**Refuse Bins** The municipality provides a refuse bin after a written agreement with the owner of the premises. Additional bins may be provided if deemed required by the municipality or on request by the owner.

TWK LM BY-LAWS	SECTION	RELATES TO
	Section 4	**Removal** The municipality shall only remove waste material that has been deposited in refuse bins.
	Section 5	**Utilisation of refuse bins** Any refuse bin provided by the municipality shall remain the property of the municipality. The owner has the responsibility to keep the refuse bins on the premises clean.
	Section 6	**Prohibition on accumulation and dumping** No person shall accumulate, dump, store or deposit or permit the accumulation, storage or depositing of any refuse, hazardous waste, materials and/or waste on any land or premises or in any public place prior to obtaining written consent from the municipality.
	Section 13	**Offences and Penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a penalty.
By-Law relating to water supply, sanitation services and industrial supply, Gazette No. 62348, 8 March 2005	Section 2	**Application for water services** No person shall gain access to water services from the water supply system, sewage disposal system or through any other sanitation services unless the person has made an application to the municipality for such services and the application has been approved.
	Section 3	**Special agreements for water services** The municipality may enter into special agreement for provision of water services provided that specific conditions are imposed and agreed.
	Section 11	**Responsibility for this by-law** Responsibility for this by-law in respect of any installation or services provided lies with the owner of the premises.
	Section 57	**Sewage delivered** No person may discharge sewage into the municipal sewage treatment system prior to obtaining written consent from the municipality and upon payment of prescribed charges.

2.12 POTENTIAL AUTHORISATIONS / PERMITS / LICENCES REQUIRED PRIOR TO PROJECT COMMENCEMENT

Table 10 provides information on additional activities which may require authorisations / permits / licences from relevant government departments. The Contractor is to ensure that prior to the commencement of works, these authorisations / permits / licences have been obtained.

Table 10: Activities that could require an authorisation / permit / licence

Activity	Type of authorisation / permit/ license required	Requiring institution
Obstacle Application Form	Permit	Civil Aviation Authority
Obstacle Application Form	Permit	Air Traffic and Navigation Services Company
Use of treated wastewater (dust suppression)	Approval	DOH
Application for a licence regarding activities in state forest	Licence	DAFF
Search and Rescue	Permit	CapeNature

Activity	Type of authorisation / permit/ license required	Requiring institution
Veld and Forest Fire	Requirement for a fire management plan	DAFF
Archaeological and paleontological sites and meteorites	Permit	Heritage Western Cape
To destroy, damage, deface, alter, remove from its original position, subdivide or change the planning status of a National Heritage Site	Permit	Heritage Western Cape
Burial grounds and graves	Permit	Heritage Western Cape
Way leave applications for accesses to the provincial roads	Approval	DTPW
Health permits for hostels and sanitation	Permit	DOH
Commencement of Construction Activities	Notify one week before commencement	DEA
Radio Equipment Licence	Site radio submission	ICASA
Outdoor advertising of Activities	South African Manual for Outdoor Advertising Control	DEA&DP
Site Establishment Sewage Disposal	Approval	TWK LM
Site Establishment stormwater & pollution control	Separate report	TWK LM
Fuel storage	Permit	DEA/ TWK LM
Hazardous material route	Approval	DEA/DOT
Other Hazardous substances	Permit	DEA
Project commencement	Notify	DOL
Land use outside current	Special consent approval (LUPO)	TWK LM
Detail design (water, wastewater, roads design)	Approval	TWK LM
Way leave applications – design	Approval	SANRAL

3 BACKGROUND TO ENVIRONMENTAL MANAGEMENT PROGRAMME

3.1 NATURE OF THE EMPR

The EMPr is a legally required and binding document in the same manner as a licence or EA is required prior to undertaking an activity. The document is Eskom's response to ensure that it complies with the requirements of reasonable protection of the environment as imposed by Section 28 of NEMA in particular, which refers to duty of care. The EIA Regulations, 2010, are used as a guideline for the content of the EMPr and in terms of Sec 24N (Environmental Management Programme), an EMPr must include:

(a) details of
- *(i) the person who prepared the Environmental Management Programme; and*
- *(ii) the expertise of that person to prepare an Environmental Management Programme;*

(b) information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of-
- *(i) planning and design;*
- *(ii) pre-construction and construction activities;*
- *(iii) operation or undertaking of the activity;*
- *(iv) rehabilitation of the environment; and*
- *(v) closure, where relevant.*

(c) a detailed description of the aspects of the activity that are covered by the draft Environmental Management Programme;

(d) an identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);

(e) proposed mechanisms for monitoring compliance with and performance assessment against the Environmental Management Programme and reporting thereon;

(f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures;

(g) a description of the manner in which it intends to-
- *(i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;*
- *(ii) remedy the cause of pollution or degradation and migration of pollutants;*
- *(iii) comply with any prescribed environmental management standards or practices;*
- *(iv) comply with any applicable provisions of the Act regarding closure, where applicable;*
- *(v) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;*

(h) time periods within which the measures contemplated in the Environmental Management Programme must be implemented;

(i) the process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;

(j) an environmental awareness plan describing the manner in which-

(i) the Applicant intends to inform his or her employees of any environmental risk which may result from their work; and

(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment;

(k) where appropriate, closure plans, including closure objectives.

The mitigation measures required in terms of Section 28, subsection (1) include measures to –

- investigate, assess and evaluate the impact on the environment;
- inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed to avoid causing significant pollution or degradation of the environment;
- cease, modify or control any act, activity or process causing the pollution or degradation;
- contain or prevent the movement of pollutants or the cause of degradation;
- eliminate any source of the pollution or degradation; or
- remedy the effects of the pollution or degradation.

This EMPr, as a standalone document, shall be used to guide and regulate environmental performance of the project through the construction and rehabilitation stages of the scheme. It contains the following elements:

- goal setting and performance measurement;
- compliance management;
- an assessment and management system;
- community relations;
- roles, responsibilities and accountabilities;
- risk management;
- emergency preparedness and response; and
- incident reporting and investigation.

To achieve these environmental management requirements, a defined and implementable system must be in place. This system comprises the what and the how.

- **The what**: The EMPr indicates to the Applicant what is required by setting objectives with measurable targets in place for the successful management of the scheme.
- **The how**: The Applicant is required to formulate procedures and/or guideline documents in compliance with its Quality Management System (QMS) requirements on how the objectives will be met.

3.2 OBJECTIVES OF THE EMPR

The main objective of the EMPr is to ensure the implementation of environmental practices that are aimed at the best form of environmental protection. The aim is to ensure that the Applicant takes reasonable measures to protect the environment and to remedy impacts to the environment, as required by the Duty of Care introduced by the NEMA, Section 28. The EMPr draws the Applicant's attention to the monitoring, auditing and corrective actions that

may be needed during construction of the construction of the Asteria Eskom MTS project. Therefore, the other objectives[3] of the EMPr are to:

- avoid, minimise or correct the disturbance of ecosystems and loss of biodiversity;
- avoid, minimise or correct pollution and degradation of the environment;
- avoid or minimise waste, to reuse or recycle waste where possible and to dispose of waste in a responsible manner;
- apply a risk-averse and cautious approach; and
- anticipate and prevent negative impacts on the environment and on people's environmental rights. Where impacts cannot be prevented, such impacts must be minimised and mitigated.

3.3 SCOPE OF THE EMPR

The EMPr outlines the impacts and mitigation measures associated with the planning and design, pre-construction and construction, operation, rehabilitation and closure (or decommissioning) of the Asteria Eskom MTS project. The roles, responsibilities and reporting procedures have been identified in the EMPr.

The EMPr also contains a series of environmental specifications designed to avoid, minimise and, ultimately, manage the potential environmental impacts associated with the construction of the Asteria Eskom MTS project.

The EMPr is for the planning and design, pre-construction and construction, operation, rehabilitation and closure (or decommissioning) activities associated with the Transmission power line.

3.4 THE CONTINUOUS IMPROVEMENT APPROACH

The approach adopted for this EMPr is derived from the **Deming Cycle** (Refer to Figure 11), a cycle of continuous improvement that entails the reiterative actions of **plan**, **do**, **check** and **act**.

3.4.1 Plan

The EMPr for the construction works *communicated the Environmental Policy* (**Section 4.1** and **4.2**) and intended environmental governance of the Applicant to all parties. The project will be implemented under this policy, and all parties acting on behalf of the Applicant will adhere to this policy. The organisational relationships required have been illustrated and the roles and responsibilities of each "organisation" have been defined (**Section 4.2**).

Project-specific planning for the replacement works involved listing activities associated with the works and the environmental aspects that may be impacted on. This provided a starting point from which aspect-specific environmental management objectives were established.

3 As defined by the National Environmental Management Act (No. 107 of 1998).

Environmental performance indicators were determined for these objectives and measurable targets were prescribed to monitor the environmental performance of the project.

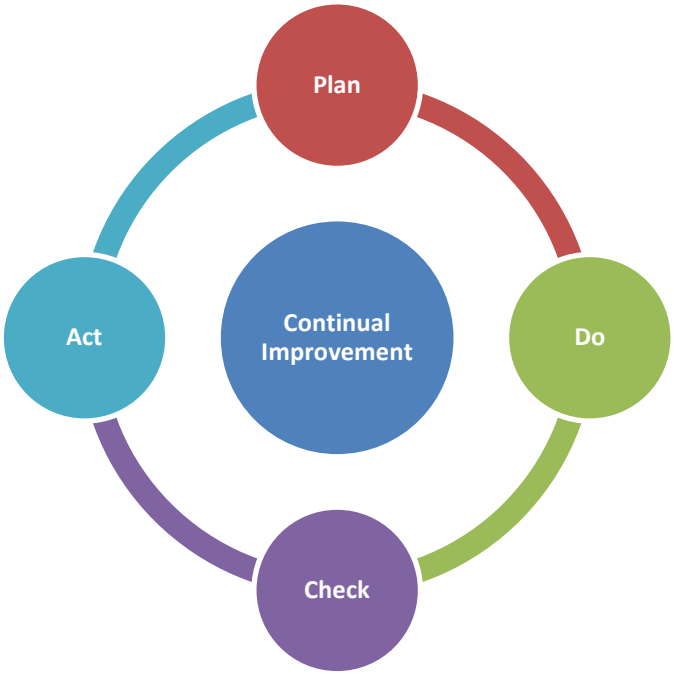


Figure 11: The Deming Cycle

Achieving the targets depends on **compliance with this EMPr** and the legislative requirements that underpin it.

3.4.2 Do

Throughout the construction of the Transmission power line, the Applicant will be required to **develop and maintain a QMS** that is designed to ensure that best management practices are implemented in day-to-day construction management. Such a QMS should include at least the following information:

- location and extent of associated infrastructure;
- associated activities, such as the transportation of people and equipment;
- resources and experience required (staffing);
- materials and equipment to be used;
- management actions;
- human resources used;
- construction-monitoring activities;
- emergency / disaster incident and reaction procedures; and
- rehabilitation procedures for the impacted environment.

Including these information topics in the Contractor's procedures and/or guideline documents will ensure that aspect-specific environmental management (based on this EMPr) forms an integral part of the construction works. It is, therefore, important for the

Contractor to integrate the environmental management requirements into the construction activities by way of set procedures that are set out in its QMS.

The **incorporation of the how and what** (Refer to Figure 12) will ensure that the Applicant understands what is required of it and that it allows systems to be put in place to ensure that the execution of the requirements is monitored. **The Applicant should also develop a programme for monitoring aspect-specific indicators in terms of the targets provided in the EMPr**.

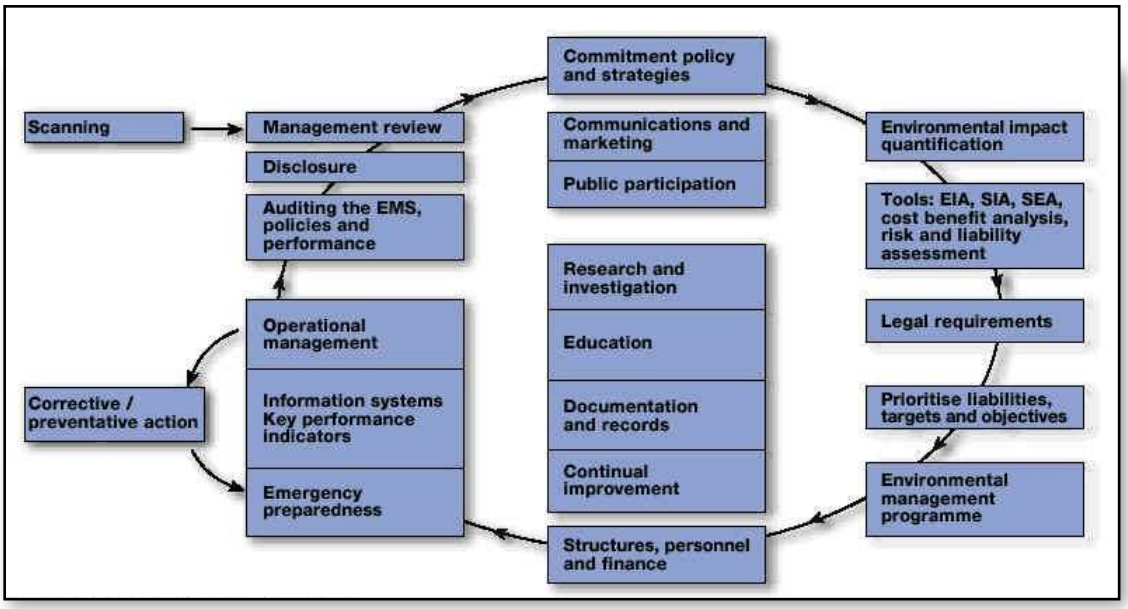


Figure 12: Eskom's EMS (based on ISO 14001[4])

3.4.3 Check

A system of **assessing monitoring results** has been developed (**Section 4.2**) to check the Applicant's environmental management performance. Continuous assessment facilitates **proactive management of environmental issues**. Mitigation measures can then be successfully implemented on an ongoing basis to keep environmental indicators within their target thresholds. Moreover, the assessment system also enables the **assessment of the efficacy of the EMPr**.

Regular auditing of environmental performance (**Section 4.2**) is prescribed to prove and preserve accountability in a legislative context.

3.4.4 Act

The assessments and monitoring of the results and findings of the regular audits must be **documented within a reporting system** (**Section 4.2**). Precautionary mitigation measures and corrective actions will be prescribed and instructions will be given in order to implement these in the field.

4 http://www.eskom.co.za/Enviro%20data%202002/report01/EMSdiagram.htm

The findings of monitoring and auditing programmes **can also be used to update the EMPr**. Although the EMPr is a project-specific document, it is dynamic and should be updated regularly to address the changing circumstances of the scheme.

3.5 ESKOM'S ENVIRONMENTAL MANAGEMENT SYSTEM

Eskom's Environmental Management System (EMS) is based on the ISO 14001 standard. This EMPr forms an integral part of the cyclical structure (Deming Cycle) of the EMS, as shown in Figure 12.

4 EMPR FRAMEWORK

4.1 ESKOM'S ENVIRONMENTAL POLICY

Eskom's Environmental Policy statement defines the principles by which the project will be guided. Eskom is committed to mitigating negative environmental effects associated with the construction of the Transmission power line, ensuring that activities are implemented in an environmentally responsible manner, and to promoting safe procedures for construction, operation and decommissioning.

Eskom will:

- establish appropriate management systems to address safety, occupational health, and environmental issues with a view to minimising risk and ensuring duty of care and the management of pollution and environmental degradation, performance monitoring, and continuous improvement;
- comply with all legislative and policy requirements and, in the absence of appropriate principles, set standards to meet the objectives of this policy;
- promote open communication on SHE issues with employees and all stakeholders;
- educate, train, motivate, and develop its employees in terms of occupational health, safety, and environmental issues;
- provide and maintain a safe and healthy work environment and protect individuals against risk associated with occupational health and safety arising out of Eskom's business; and
- contribute towards sustainable development through cost-effective resource use and efficient production, distribution, and use of energy.

4.1.1 Management systems

Management systems are used for establishing appropriate management systems to address safety, occupational health, and environmental issues with a view to minimising risk and ensuring continual improvement. This will include the prevention of pollution and environmental degradation and, where sustainable, will be supported by:

- ensuring compliance with SANS ISO 14001 or other appropriate quality standards;
- integrating SHE issues into all aspects of the organisation;
- determining, managing, and measuring the SHE impacts of Eskom activities;
- monitoring, managing, and reporting incidents, accidents, and events;
- setting and reviewing SHE performance targets;
- ensuring that compliance audits are conducted;
- ensuring the thorough investigation of accidents and incidents and taking appropriate corrective actions in case of deviations to prevent recurrence of similar incidents;
- researching and instituting ways to improve SHE operations and impacts;
- including environmental and safety considerations in procurement processes;
- reporting on performance in terms of this policy;
- benchmarking performance against other utilities; and

- divisions will establish and implement procedures for identifying significant risks and impacts along the extended electricity value chain, as appropriate, in order to communicate and encourage continual improvement in SHE practices beyond the traditional boundaries of the Eskom group, for example, with contractors.

4.1.2 Legislative and policy requirements

Complying with all legislative and policy requirements and, in the absence of appropriate principles, setting standards to meet the objectives of this policy will be supported by:

- ensuring that all legally required occupational health and safety and environmental factors and modern practices are taken into account in the design, construction, operation, and maintenance of all plant, machinery, equipment, and places of work;
- taking best practice and local needs and conditions into account when setting standards;
- while operating outside of South Africa (SA), local legislation or other mandatory standards will be applied if these exceed Eskom policy, without derogating from the local laws;
- while operating outside of SA, where standards imposed by local legislation are lower than those specified by Eskom, Eskom standards and policies and SA legislation will be used, without derogating from the local laws;
- in the absence of local legislative requirements while operating outside of SA, applying Eskom policy and South African legislative requirements to operations;
- ensuring that the required statutory appointments are in place and that these appointees fulfil their duties in terms of the relevant legislation and standards; and
- ensuring that incidents and events are reported to the necessary authorities as required by legislation and when appropriate.

4.1.3 Communication

Promoting open communication on Safety, Health and Environmental (SHE) issues with employees and other stakeholders will be supported by:

- communicating with employees, communities, and other concerned parties and stakeholders about Eskom's SHE programmes and performance; and
- publishing verified SHE-related information, including major incidents or legal contraventions, in the Eskom Annual Report.

4.1.4 Training

Educating, training, motivating, and developing its employees about safety, occupational health, and environment issues will be supported by:

- ensuring that employees are aware of safety, occupational health, and environmental standards, rules, procedures, regulations, codes, and guidelines;
- communicating on lessons learnt from incidents from a SHE perspective and revising procedures or policy where appropriate;
- encouraging staff to develop a sense of SHE responsibility; and

- giving due recognition to individuals and business units for exemplary occupational health, safety, and environmental performance.

4.1.5 Health and safety

Providing and maintaining a healthy and safe work environment and protecting individuals against risk to occupational health and safety arising out of Eskom's business will be supported by:

- providing, evaluating, and maintaining all operational procedures and methods of work in light of experience and new knowledge to proactively improve the management of occupational health, safety, and environmental risks;
- ensuring that all the risks are identified and that measures are taken and implemented as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to employees before resorting to personal protective equipment;
- maintaining discipline; and
- ensuring that managers are accountable.

4.1.6 Sustainable development

Contributing to sustainable development through efficient resource use and efficient production, distribution, and use of energy will be supported by:

- striving for cost-effective and efficient production, transport, and use of energy, by monitoring performance, setting targets, and highlighting the impact of inefficient operations;
- promoting the efficient use of materials, products, and services; and
- sharing lessons learnt and striving for continual improvement.

4.2 ESKOM AGRICULTURAL POLICY

Eskom's *Vegetation Management under Power Lines* (Vosloo, 2009) has elements that relate to agricultural activities under Transmission power lines, and is therefore applicable to this project. There is no specific guideline document that relates directly to the agricultural activities under any power lines.

Agricultural activities are allowed to be undertaken under Eskom Transmission power lines as long as the agricultural crops and equipment do not interfere with the power line infrastructure. The minimum ground clearances and minimum safe distances to trees/ structures according to the particular voltages are presented in Table 11.

Table 11: Safe Distance Specifications of Transmission Power Lines (Vosloo, 2009)

Voltage	Servitude Width	Ground Clearance	Safe distance to Trees
220kV	47m	6.7m	4.2m
275kV	47m	7.2m	4.7m
400kV	40 – 55m	8.1m	5.6m
765kV	80m	10.4m	8.5m

Eskom will not allow overhead irrigation under any power lines. Although not relevant to this project, it is interesting to note that it would not be possible to use pivot irrigation if a power line intersects the pivot circle. Drip and micro-irrigation are possible under a power line, but Eskom needs to confirm this in the servitude agreement with the specific landowner (see Section 2.6 for the Servitude Negotiation Process).

The servitude is required to ensure safe construction, maintenance and operation of the power line and Eskom will be entitled to unrestricted access, following negotiations with the landowners. The servitude width required to accommodate the towers on which the power lines depend on the type of pylon tower required and the space available for the servitude. For a 400kV Transmission power line, a servitude width of 55m is required, whereas for a 132 kV Distribution power line, a servitude width of 22m is required.

Eskom will need to use access/service roads for the construction and maintenance of the proposed substation and power lines. Where there are no access/service roads they will be negotiated with the specific landowner.

4.3 INSTITUTIONAL AND FUNCTIONAL ARRANGEMENTS[5]

The institutional and functional arrangements indicate the role players and institutional linkages in the Eskom construction of the Asteria Eskom MTS project (refer to **Sections 4.2.1 – 4.2.6**). The details are explained in this section.

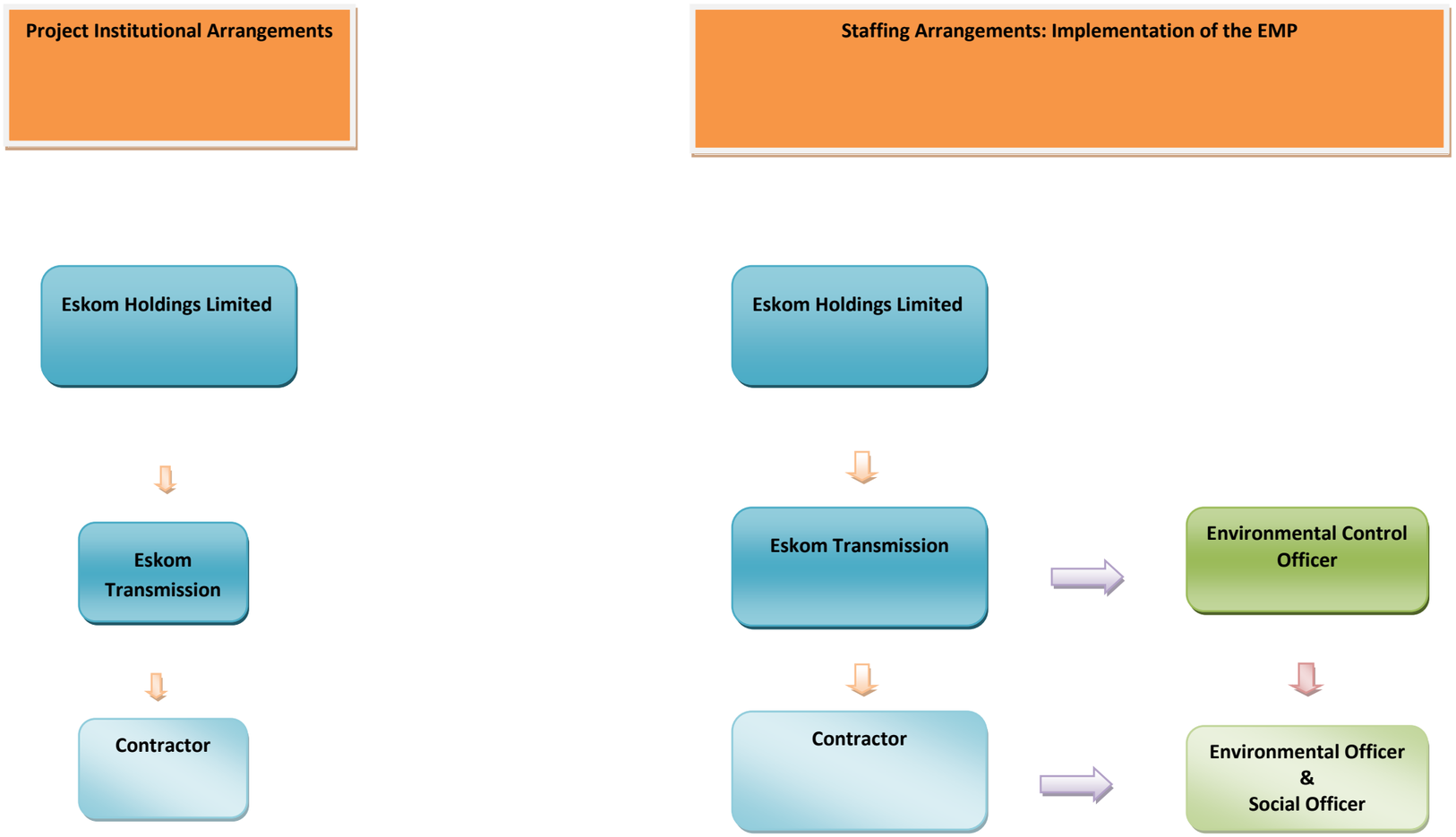


Figure 13: Institutional arrangements

[5] In the context of the Construction of the 400/132kv Houhoek Transmission Substation including the Bacchus-Palmiet Loop-In and Loop-Out Power Lines.

The following section should be read using Figure 13 as a reference.

During the construction phase it is the Applicant's (Eskom) responsibility to ensure that the Eskom Project Manager and Contractors involved in the construction of the Asteria Eskom MTS project receives a copy of the EMPr and ensure compliance with it. The EMPr is to be included as part of all tender documents. The appointed Contractor will be required to comply with the construction management regulations set out in this Draft EMPr. The Construction Manager will be responsible for ensuring that all construction staff adhere to the Draft EMPr specifications. A copy of the EMPr and EA from the DEA will be kept on site at the construction site office and made available to all Contractor staff, regulatory authorities and I&APs upon request. The roles and responsibilities of all role players are presented below.

4.3.1 Applicant roles and responsibilities

The Applicant (Eskom) will be responsible for overall environmental control on the project site during the construction, operation, maintenance, decommissioning and rehabilitation phases. The Applicant's responsibilities will include:

- appointing an independent ECO for the duration of the Contract;
- being fully familiar with the EIA Report, EA conditions and the EMPr;
- communicating the contact details of the ECO to the DEA prior to the Contract commencing;
- forwarding monthly audit reports (prepared by the ECO) to the DEA;
- notifying the DEA of changes in the developments that result in significant environmental impacts;
- notifying the DEA within 30 days of change of ownership/Applicant;
- notifying the DEA of any change of address of the owner/developer;
- the overall implementation of the EMPr;
- ensuring compliance, by all parties, and the imposition of penalties for non-compliance through the Eskom Project Manager and ECO;
- implementing corrective and preventive actions, where required;
- preventing pollution and actions that will harm or may cause harm to the environment;
- ensuring the activity does not commence within 30 days of the EA being issued;
- notifying the DEA within 30 days that construction activity will commence;
- notifying the DEA in writing within 24 hours if any condition in the EA cannot be or is not adhered to; and
- notifying the DEA 14 days prior to commencement of the operational phase.

4.3.2 Eskom Project Manager roles and responsibilities

The Eskom Project Manager will be responsible for the implementation of the EMPr throughout the construction phase and will report directly to the Applicant (or its appointed representative). The responsibilities of the Eskom Project Manager will include:

- being fully familiar with the EIA Report, EA conditions and the EMPr;
- ensuring that all Contractors and Sub-Contractors adhere to the EMPr;

- maintaining a register of complaints and queries;
- responding to any project-related complaints; and
- maintaining an environmental incident book of all incidents occurring on site.

4.3.3 Contractor roles and responsibilities

The Contractor will:

- be responsible for the construction activities for the duration of the contract (so will Sub-Contractors and contract workers);
- be responsible for ensuring work conducted is done within the framework of the EA, EMPr and applicable legislation;
- ensure that all Sub-Contractors have a copy of and are fully conversant with the contents of the EMPr;
- be required to compile and provide Method Statements setting out, in detail, how management actions contained in the EMPr will be implemented;
- appoint suitable professional service providers to undertake environmental monitoring as per Section 8.3 below;
- be required to monitor construction related impacts upon the surrounding environment as per the Environmental Monitoring Method Statement; and
- appoint an Environmental Officer (EO) and Social Officer (SO) for the duration of the contract (including the one year defects liability period).

4.3.4 Environmental Control Officer roles and responsibilities

The construction activities must be monitored by an independent Environmental Control Officer (ECO). The ECO must be well versed in environmental matters and have a minimum of two years of relevant on-site construction experience. The ECO should have a relevant environmental degree or other relevant tertiary qualification. The ECO should be a mature, level-headed and firm person with above-average communication and negotiating skills, and be able to handle and address conflict management.

The ECO's responsibilities include:

- monitoring compliance with the environmental requirements set in the EMPr and EA;
- reviewing a weekly environmental monitoring report that is submitted by the EO;
- advising the Applicant and Eskom Project Manager about the interpretation, implementation and enforcement of the EMPr;
- liaising with an archaeologist or heritage resources practitioner in the case of unearthing of artefacts and/or graves;
- recommending rectification of non-compliances with the EMPr before significant impacts occur (e.g. debilitating injury or death) occur in consultation with the EO and SO;
- ensuring the Communications Register is maintained and all such complaints are dealt with within 10 days;
- reporting any significant environmental incidents to DEA or other relevant regulatory authorities as may be required;

- ensuring an environmental incident book of all incidents occurring on site is maintained and that corrective measures have been undertaken;
- reviewing and approving Environmental Method Statements;
- inspecting and reporting on the efficiency of the method statements' management and mitigation programme; and
- ensuring environmental awareness training is offered to all site personnel.

The ECO is responsible for providing an independent evaluation of compliance with the EMPr and not for enforcement of conditions of the EMPr. The Applicant is responsible for enforcement of the conditions of the EMPr.

The Contractor and the Environmental Officer are accountable to the ECO for non-compliance with the EMPr. The ECO provides feedback to the Eskom Project Manager who, in turn, reports to the Applicant and I&APs, as required. Issues of non-compliance raised by the ECO must be taken up by the Eskom Project Manager and resolved with the Contractor as per the conditions of his/her contract.

The ECO will remain employed for the full duration of the contract until all snag items have been resolved, rehabilitation measures have been completed, and the site is handed over to the Applicant, thereby indicting the start of the operational phase.

4.3.5 Environmental Officer roles and responsibilities

The Environmental Officer must be appointed by the Contractor and is responsible for managing the day-to-day on-site implementation of the EMPr, and for the compilation of weekly environmental monitoring reports. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ECO when necessary, and ensure that any complaints received from I&APs (and communicated via the Eskom Project Manager) are duly processed and addressed and that conflicts are resolved in an acceptable manner and within 10 days. The EO shall be full-time dedicated member of the Contractor's Team and must be approved by the Eskom Project Manager.

The following qualifications, qualities and experience are recommended for the individual appointed as the EO:

- a relevant environmental diploma or degree in natural sciences, as well as a minimum of three years' experience in construction-site monitoring, excluding health and safety;
- a level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and
- relevant experience in environmental site management and EMPr compliance monitoring.

The EO's responsibilities include:

- monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr;
- keeping a register of compliance / non-compliance with the environmental specifications;

- identifying and assessing previously unforeseen, actual or potential impacts on the environment;
- ensuring that a weekly environmental monitoring report is submitted to the ECO within 2 calendar days of the end of each week;
- conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ECO and Contractor;
- advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land;
- attending site meetings (scheduled and ad hoc);
- presenting the environmental awareness training course to all staff, Contractors and Sub-Contractors and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor;
- ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times;
- ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the DEA;
- assisting the Contractor in drafting Environmental Method Statements and/or the Environmental Policy where such knowledge/expertise is lacking;
- maintaining a photographic record;
- maintaining a record of all waste manifests;
- undertaking daily environmental monitoring to ensure the Contractor's activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and
- maintaining the following on site:
- a weekly site diary,
- a non-conformance register, and
- a register of audits.

The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Applicant.

4.3.6 Social Officer roles and responsibilities

The Social Officer(s) shall be employed by the Contractor and will be responsible for managing the day-to-day on-site implementation of the social aspects of the EMPr. The Social Officer(s) shall liaise with landowners and relevant I&APs regarding construction activities for the duration of construction and will ensure that any discussions and complaints received from the public are addressed and that conflicts are resolved in an acceptable manner within 10 days.

The Social Officer(s) shall be full-time dedicated member(s) of the Contractor's Team and must be approved by the Eskom Project Manager. The Social Officer shall report to the Contracts Manager, seeking advice from the ECO when necessary.

The following qualifications, qualities and experience are recommended for the individual appointed as the Contractor's Social Officer:

- a relevant social diploma or degree with 3 years of construction experience;
- mature, level-headed and firm person with communication and negotiating skills;
- report writing skills;

The responsibilities and functions of the Construction Social Officer will include:

- implement and manage the day-to-day social and communication aspects of the construction process according to the Specifications;
- liaise and maintain good relations with I&APs;
- monitor social aspects in terms of the specifications;
- implement mitigation and corrective measures;
- submit a monthly environmental report to the ECO;
- conduct site inspections during the defects notification period, and bring any social concerns to the attention of the ECO and Contractor;
- attend site meetings (scheduled and ad hoc);
- maintain a filing system meeting the project's Quality Management Plan;
- remain employed until the end of the Defects Notification Period (DNP), not necessarily full time during the DNP;
- assist the contractor in the drafting of Social Method Statements where such knowledge/expertise is lacking;
- maintain the following on site:
- a weekly site diary;
- a public complaints and communications register; and
- a register of audits.

5 SUMMARY OF IMPACTS

All construction activities will be limited to the construction site, lay-down areas and construction site office / yard. All activities outside these areas need to be approved by the Eskom Project Manager prior to the commencement of construction works.

All interactions between the Contractor and I&APs will be via the Eskom Project Manager. The Contractor may not enter into agreements with I&APs or undertake work on private property in lieu of favours, payment or any other means where either party may benefit from the activities / permissions of the other party.

If the Contractor requires changes to the construction programme, these must be communicated via the Eskom Project Manager to the affected I&APs.

The identification and summarisation of impacts and risks associated with the construction of the Transmission power line are set out in this section.

5.1 CONSTRUCTION: DIRECT IMPACTS

The impacts from the construction of the proposed development will only be for the duration of the construction phase and should be limited to daylight hours. During the construction phase, overall activity within the project area will be increased. The placement of the construction site office will be within the site demarcated for the proposed development and access will be gained from designated routes only. Contractor employees shall be accommodated within existing accommodation and no placement of a construction camp to accommodate the construction workers shall be allowed. The contractor(s) will need to comply with all security measures detailed by Eskom.

Activities during construction, such as driving on gravel roads, the clearing of vegetation, construction of access roads and the excavations for the towers will generate windblown dust. For all the afore-mentioned, however, the construction period is for a relatively short time and any potential impacts associated with construction will be temporary.

5.2 OPERATIONS-RELATED IMPACTS

The impacts associated with the operation will include noise, health and safety, hazardous substance storage and emergency incidents. In addition, the substation will require routine maintenance. During this period, activities associated with the substation such as painting and cleaning would become more frequent.

6 SUMMARY OF ASSESSED IMPACTS

The impacts identified in the EIA Report for the study area are as follows:

- Biophysical impacts
  - Air Quality impact
  - Geotechnical impact
  - Impact on the agriculture
  - Impact on the fresh water ecosystems
  - Impact on the avifauna
- Social impacts
  - Impact on the heritage resources
  - Impact on the traffic
  - Impact on the visual integrity
  - Safety risks
  - Potential social conflict
- Potential cumulative impacts

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
Air Quality	-	Corrosive properties of the air pollution within the study area could affect Eskom infrastructure	Corrosive properties of the air pollution within the study area could affect Eskom infrastructure
	-	Corrosive properties of the air pollution due to the veld fires within the study area could affect Eskom infrastructure	Corrosive properties of the air pollution due to the veld fires within the study area could affect Eskom infrastructure
Geotechnical Impacts	Asteria Eskom MTS: Minimise the risk of differential settling occurring LILO Corridor: Depths to founding stratum to confirm satisfactory bearing capacities for pylon foundations	Excess material derived from areas in-cut	-

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
Impact on Agriculture	-	Loss of low to medium agricultural potential soils	None anticipated
		Increased soil erosion due to construction activities	
Impact on Freshwater Ecosystems	Direct physical disturbance of river ecosystems from power line towers and/or development of access roads	Destruction/damage of river and riparian areas through construction-related activities	Hydrological alteration of rivers at points where access roads cross rivers
		Physical destruction or damage of rivers and/or riparian vegetation through the storage of building materials, the temporary lay-down of equipment (sand, soil, bricks, steel, pipes, etc.), and/or the establishment of temporary access roads in or adjacent to rivers and/or riparian areas	
		Pollution of freshwater ecosystems resulting from the runoff of fuel and oil from vehicles and machinery, and from construction-related activities	Alteration of the hydrology of rivers at road crossings associated with the proposed project
		Pollution of rivers through: • leakage of fuel, oils etc. from construction machinery; • from washing equipment; • flushing concrete mixers and other vehicles; or • sediments from de-watering of excavations.	Stormwater runoff-related impacts from the proposed Asteria Eskom MTS
		Increased disturbance to aquatic and semi-aquatic fauna Increased disturbance of aquatic and semi-aquatic fauna – the presence of construction teams and their machinery will lead to noise pollution in the area, which will disturb aquatic and terrestrial fauna, and potentially disrupt breeding cycles for some species.	Leakage of pollutants from the proposed Asteria Eskom MTS into rivers
Ecological Impacts: **Vegetation Impacts**	-	Total loss of existing vegetation habitat within site	
		Further fragmentation of habitat in the region	
		Loss of ecological connectivity across the site with associated ecological impacts, such as overall reduction in viability of remnant habitats	
		Possible suboptimal fire regimes have negative impacts on Fynbos functioning	
		Possible facilitated spread of invasive aliens	

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
	-	Loss of existing vegetation habitat within pylon footprints and access roads	Erosion an habitat damage in access tracks
		Possible loss of portions of local populations of certain plant SCC	
Ecological Impacts: **Faunal Impacts**	-	Total loss of existing vegetation and faunal habitat within site	
		Displacement of faunal species in area	
		Possible loss of site populations of certain faunal species with low mobility	
		Loss of existing vegetation and faunal habitat within pylon footprints and access roads	Erosion an habitat damage in access tracks
		Possible loss of portions of local populations of certain faunal species with low mobility (notably frogs), and of certain plant SCC	
Impact on Avifauna: **Loss of Habitat**	-	Mortality of Red Data species through collisions with the earth wire of the LILO 400kV Transmission power lines	
		This impact has the potential to displace Red Data species due to habitat transformation associated with the construction and operational activities	
		This impact is the potential displacement of Red Data species due to disturbance during a critical time in the breeding cycle caused by construction activities	-
Impacts on the Visual Integrity: **Experience of Viewer**	-	Potential visual impact relating to the toll site receptors and users of the N2	
		Impact upon the sense of place from a tourism perspective	
Impact on Heritage Resources	-	The Impact Of The Transmission Power Line Infrastructure On Palaeontology No impact The Impact Of The Transmission Power Line Infrastructure On Archaeology No impact The Impact Of The Transmission Power Line Infrastructure On The Context Of Elements Of The Landscape That Have Historical Significance.	The Impact Of The Transmission Power Line Infrastructure On Palaeontology No impact The Impact Of The Transmission Power Line Infrastructure On Archaeology No impact The Impact Of The Transmission Power Line Infrastructure On The Context Of Elements Of The Landscape That Have Historical Significance.

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
		No impact	No impact
Social Impacts: Inflow of Temporary Workers	-	Limited intrusion impact. Increased pressure on limited services and resources	None anticipated
Social Impacts: Inflow of Jobseekers	-	Added pressure on service delivery and the existing infrastructure with resultant additional socio-economic burdens for the local municipalities and surrounding property owners during the construction phase Increased impact on the larger area should other construction projects such as the construction of the wind farms be undertaken concurrently with this project. Possible inflow of additional job seekers to the area once the proposed Donderboskop Industrial Development has been initiated and once the construction associated with the proposed toll gate and road upgrading would be undertaken. This could result in added pressure on service delivery and the existing infrastructure with resultant additional socio-economic burdens for the TWK LM and surrounding property owners	Possible inflow of additional workers to the area once the proposed Donderboskop Industrial Development has been completed
Social Impacts: Impact of Construction Camp and Equipment Yards	-	None anticipated	
Social Impacts: Employment Creation	-	Possible conflict and social unrest due to dissatisfaction with employment creation and recruitment process due to previous tension experienced in the area	
Social Impacts: Infrastructure	-	Potential access impact upon proposed toll plaza	None anticipated
Social Impacts:	-	None anticipated	

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
Accommodation Of Workforce And Impact Of Construction Yard			
Social Impacts: Local Economic Benefits	-	None anticipated	None anticipated
Social Impacts: Tourism	-	Potential noise and dust impacts	
Social Impacts: Property Value	-	None anticipated	None anticipated
Social impacts: Health Impacts	-	Potential increase in STD's like HIV. Potential traffic accidents due to the proximity of the N2.	Possible electromagnetic frequency (EMF) impacts
Social Impacts: Development	-	Proposed Donderboskop Industrial Development. Proposed residential development.	
Social Impacts: Daily Living and Movement Patterns	-	Disruption in daily living and movement patterns & proximity of homesteads.	
Social Impacts: Agricultural Activities	-	None anticipated	
Social Impacts: Sense of Place	-	Construction activities would impact upon the sense of place	The MTS and Loop in Loop out lines would impact upon the sense of place
Social Impacts: Land Use	-	Potential impediment of development potential of the town.	
Social Impacts: Donderboskop	-	None anticipated	None anticipated
Social Impacts:	-	Possible intrusion if developed at the same time.	

IMPACT	DESIGN	CONSTRUCTION	OPERATIONAL
Residential development			
<u>Social Impacts:</u> Safety and Security	-	Increase in veld fires; traffic accidents and perceived increase in crime due to the presence of "outsiders"	
<u>Traffic Impact:</u>	-	**The Impact That The Road Network Improvements Will Have On Access To The Location Alternatives:** Sight distance is inadequate due to the vertical & horizontal alignment of the R43 in the vicinity of the site. Proximity of toll plaza will also prohibit access. Upgrading of the R43, in the future, could result in the need by the Western Cape Government to expropriate land.	**The Impact That The Road Network Improvements Will Have On Access To The Location Alternatives:** The vertical and horizontal alignment requires that the access to this site be provided opposite the access to the existing substation through the toll plaza site.

7 ENVIRONMENTAL DOCUMENTATION, REPORTING AND COMPLIANCE

7.1 DOCUMENTATION

The following documentation must be kept on the project site for the full duration of the contract:

- Environmental Management Programme approved by the DEA;
- environmental Authorisation issued by the DEA;
- environmental Policy of the Contractor;
- environmental Method Statements compiled by the Contractor;
- weekly environmental monitoring reports;
- minutes and record of attendance of all environmental meetings;
- environmental incident book;
- communications Register;
- register of audits;
- non-conformance reports;
- waste manifests; and
- relevant legislation referred to in Table 8.

7.2 RESPONSIBILITY MATRIX AND ORGANOGRAM

The Contractor must have a Responsibility Matrix and Organogram,, approved by the ECO and the Eskom Project Manager, displayed in an appropriate location. This will identify responsible parties, their contact details, and highlight their roles and responsibilities. This document must be updated on a regular basis to ensure that information is correct.

7.3 ENVIRONMENTAL INSPECTIONS AND AUDITS

Audits will be conducted to monitor compliance with the EMPr and EA conditions. Photographic records of the site will support the visual assessment. The ECO will submit all audits to the Eskom Project Manager, who in turn shall submit the audits to the DEA. These findings will be kept on file on the project site.

External auditing may take place at unspecified times by the DEA and/or other relevant authorities. The DEA may, from time to time, also ask to view copies of audit reports drafted by the ECO.

7.4 WEEKLY ENVIRONMENTAL MONITORING REPORT

The EO will be required to provide the ECO with a weekly environmental monitoring report covering the events of the past week. This will highlight key performance areas and provide feedback on corrective and preventive actions taken. The EO will have the weekly reports signed off by the Contractor's Manager prior to submission to the ECO.

7.5 ENVIRONMENTAL SITE MEETINGS

An Environmental Site Meeting shall take place on a bi weekly basis. This meeting shall be chaired by a Senior Eskom Site Representative with the ECO, Contractor(s), the EO ('s) and SO's in attendance.

7.6 NON-CONFORMANCE REPORT

A Non-Conformance Report (NCR) will be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be requested by the ECO and issued via the Eskom Project Manager to the Contractor in writing. Preceding the issuing of the NCR, the Contractor will be presented with an opportunity to rectify the outstanding issue.

Preceding requirements to the submitting of the NCR will entail an issue that has been highlighted to the Contractor in the audits for corrective action. Should this issue not be corrected or completed to the satisfaction of the Eskom Project Manager and ECO, the issue is escalated to an NCR.

Should the ECO assess an incident / issue and find it to be significant (e.g. non-repairable damage upon the environment), it will be reported to the DEA and immediately escalated to the level of an NCR. This will be done in consultation with the Eskom Project Manager.

The following information should be recorded in the NCR:

- details of non conformance;
- any plant or equipment involved;
- any chemicals or hazardous substances involved;
- work procedures not followed;
- any other physical aspects;
- nature of the risk;
- actions agreed to by all parties following consultation that should adequately address the identified non-conformance. This may take the form of specific control measures and should take the hierarchy of controls into account. This must accompany the NCR for filing purposes;
- the agreed timeframe by which the Contractor should have implemented the actions documented in the NCR; and
- the ECO should verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the ECO and Contractor should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

7.7 ENVIRONMENTAL EMERGENCY RESPONSE

The Contractor's environmental emergency procedures must ensure that there will be an appropriate response to unexpected or accidental actions or incidents that could cause environmental impacts. Such incidents may include:

- accidental discharges to water (i.e. into a water resource) and land;

- accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- accidental toxic emissions into the air; and
- specific environmental and ecosystem effects from accidental releases or incidents.
- the Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding to environmental incidents and must ensure and include the following:
- construction employees shall be adequately trained in terms of incidents and emergency situations;
- details of the organisation (manpower) and responsibilities, accountability and liability of personnel;
- a list of key personnel and contact numbers;
- details of emergency services (e.g. the fire department, spill clean-up services) shall be listed;
- internal and external communication plans, including prescribed reporting procedures;
- actions to be taken in the event of different types of emergencies;
- incident recording, progress reporting and remediation measures to be implemented; and
- information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor(s) will comply with the environmental emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act (Act No. 85 of 1993), the National Environmental Management Act (Act No. 107 of 1998), the National Water Act (Act No. 36 of 1998), and/or any other relevant legislation listed in Table 8.

7.8 METHOD STATEMENTS

It is a statutory requirement to ensure the wellbeing of employees and of the environment. Therefore, the Contractor must submit a Method Statement to the Eskom Project Manager and the ECO for approval prior to the commencement of construction works.

A Method Statement is a document detailing how a particular process will be carried out. It should detail the possible dangers/risks associated with the particular part of the project and the methods of control to be established and to show how the work will be managed in a safe and environmentally responsible manner. The method statement shall also include the following applicable information:

- the type of construction activity;
- timing and location of the activity;
- construction procedures;
- materials and equipment to be used;
- transportation of the equipment to and from site;
- how the equipment/material will be moved while on site;
- location and extent of construction site office and storage areas;
- identification of impacts that might result from the construction activity;

- population impacts;
- community/institutional arrangements;
- conflicts between local residents and newcomers;
- individual and Family level impacts;
- community infrastructure needs;
- intrusion impacts;
- methodology and/or specifications for impact prevention or containment and for environmental monitoring;
- emergency/disaster incident and reaction procedures (required to be demonstrated); and
- rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor will be required to submit, as a minimum, the Method Statements listed in Table 12 for approval by the Eskom Project Manager and the ECO (Please refer to Annexure E) prior to the start of construction activities.

Table 12: List of Method Statements required prior to Construction

Method Statement	Objective	Target	Criteria
Access	To institute adequate access agreements and measures to ensure the safety of landowners and integrity of the gates/fences.	No damage to existing gates and fences. All gates equipped with locks to prevent unauthorised access. No complaints about open gates. Compliance with regulatory requirements.	Access agreements between Contractor and landowner. Implementation of suitable access and fencing requirements.
Aesthetics	Reduce construction impacts upon the aesthetics of the surrounding environment.	No complaints from I&APs.	Implementation of measures to reduce impacts upon the aesthetics of the surrounding landscape.
Bunding	To contain and manage all hazardous substance releases into the environment.	Zero spills No environmental pollution occurring. Management according to agreed procedures.	Method of bunding and covering for static and mobile plant.
Construction Site and Office / Yard Establishment	To ensure site infrastructure, plant, materials and equipment are contained within a suitably secure locality that is adequately zoned and authorised in terms of regulatory requirements.	No complaints from landowners No damage to private property Compliance to regulatory requirements. No unplanned disturbance to construction related activities.	Site office/yard layout and preparation. Method of installing fences required for no-go areas, working areas and construction areas. Preparation of the working area. Removal of vegetation.
Cement Mixing / Concrete Batching / Bentonite Mixing	Provide measures to contain cementitious products impacting upon the surrounding environment.	All cementitious mixing to occur within demarcated localities. No indiscriminate spoiling of cementitious products in non-designated areas. No impacts upon receiving water resources.	Location, layout and preparation of cement / concrete batching facilities, including the methods employed for mixing concrete and the management of run-off water from such areas.
Construction in rivers and wetlands	Minimise the impact and maintain integrity of affected water resources.	Less than 10 % change between values measured 50 m upstream and within 300 m downstream of construction activities.	The construction methodology through rivers and wetlands.
Contaminated Water	Ensure no contamination or pollution of water impacted upon by construction related activities.	All waste and contaminated water must be monitored and comply with regulatory requirements.	Contaminated water management, including the containment of run-off and polluted water.
Dust	Reduce construction related dust impacts on the surrounding environment. Prevent dust nuisance and health impacts on people and animals in the area.	No complaints from I&APs. Dust emissions must be monitored and comply with regulatory requirements.	Dust control and monitoring measures.

Method Statement	Objective	Target	Criteria
Environmental Monitoring	Implement a programme whereby impacts upon the surrounding can be monitored and implement measures to mitigate such impacts.	Compliance with regulatory requirements. Ensure no incidents or accidents occur which negatively impact upon the surrounding environment.	Monitoring construction-related impacts upon the surrounding environment is kept within the environmental specifications and applicable legislation. The following variables are to be monitored: • Dust (e.g. by using reused water). • Noise (increase of 7dB above ambient is considered disturbing noise). • Contaminated water (through dewatering operations, etc). • Waste: waste manifests for waste disposal including waste sent for recycling.
Erosion control	Prevent erosion and reduce potential impacts upon the surrounding environment.	Slopes > 1:1 must have additional anti-erosion mechanisms. No evidence of erosion. No evidence of disturbance outside of project area.	Method(s) of erosion control, including erosion of spoil material.
Fire, Hazardous and Poisonous Substances	Impose a "no fire" rule on the entire project unless otherwise indicated in writing by the Eskom Project Manager. Reduce potential impacts in the event of a fire incident. To manage, mitigate and control the potential occurrence of an incident / accident involving hazardous and poisonous substances.	Zero (0) fires. Proof of annual update and approval of the fire management Method Statement. Proof of management review of fire preparedness and response before onset of the fire season. Storage of hazardous/flammable materials and substances to comply with national, provincial and local regulatory requirements.	Handling and storage of hazardous substances. Emergency spillage procedures and compounds to be used. Fire management plan and emergency procedures in case of fire. Use of herbicides, pesticides and other poisonous substances. Methods for the disposal of hazardous building materials. Material Safety Data Sheets to be included where applicable.

Method Statement	Objective	Target	Criteria
Flora and Fauna	Preserve fauna and flora through control of construction activities, particularly in sensitive environments, and through search and rescue operations. Reduce the impact of the project on the surrounding vegetation during construction. Prevent infestation of alien species during construction.	No evidence of disturbance outside of project area. All sensitive environments are to be demarcated as no-go areas unless otherwise indicated by the Eskom Project Manager. No construction related activities or facilities allowed within sensitive environments, unless prior approval is attained from the Eskom Project Manager. Proof of monthly removal of alien invasive species.	Implementation of measures to protect the flora and fauna identified within the project footprint.
Fuels and Fuel Spills	Manage and contain all refuelling activities to prevent and mitigate potential impacts.	All refuelling to occur within designated areas. All hydro carbons to be contained within approved bunded facilities. Identified staff to undergo suitable spill cleanup training.	Methods of refuelling vehicles. Details of methods for fuel spills and clean up operations.
Heritage	Limit and mitigate potential heritage impacts on chance findings should they occur.	No damage to heritage structures, unless proof of consultation with a heritage specialist and approval from the SAHRA is in place. Records of chance finds must be kept. Where chance finds are unearthed, proof of work being stopped immediately and proof of consultation with a heritage specialist and the SAHRA must be kept on site.	Measures to be implemented to identify, manage and protect “chance finds” and known items of historical or cultural value.
Noise	Reduce construction related noise affecting the surrounding environment.	Noise levels shall be monitored to ensure they comply with regulatory requirements. Noise generating activities shall not increase by more than 7dB above ambient noise levels. No complaints from I&AP’s.	Implement measures to reduce noise impacts generated through construction related.

Method Statement	Objective	Target	Criteria
Open Space	To ensure construction related activities do not impact upon the "sense of place". To provide for detailed sensitivity map indicating levels of access to areas of sensitivity. To provide for construction related activities which support the greater community. To provide for detailed overview of the construction related footprint.	Identify all areas of sensitivity and demarcate. All access routes and services to have least impact upon the environment and surrounding community.	Implement measures to lessen construction related activities impact upon the environment and the surrounding community.
Rehabilitation	To rehabilitate impacted areas to a suitable land capability class similar to that of the surrounding environment. Rehabilitation will take existing land uses into consideration. Rehabilitation should start immediately after work is completed.	Reinstatement of areas affected through construction related activities. Proof of monthly removal of alien invasive species re-establishing on cleared areas. The final placement of layers of soil on the wetland bed must match the pre-construction profile. A 50% grass cover shall be achieved within 1 month of the onset of the next growing season following hydroseeding and 80% cover within 2 months thereafter. • Minimum of 60% **mature** vegetation cover being achieved during the first growth season. • Minimum of 80% mature vegetation cover achieved at the end of the maintenance period.	Rehabilitation of disturbed areas and re-vegetation after completion of construction related activities.

Method Statement	Objective	Target	Criteria
Solid and Liquid Waste Management	Implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency.	Ensure all waste products are disposed of at a registered waste landfill site designed to cater for said waste product. Proof of waste generated, reused, recycled and disposed of, including disposal certificates, must be kept on site. Contain all waste with in approved designated areas and stored in marked containers. Containers of hazardous waste and waste oils must be stored in a bunded, covered area. No evidence of contamination by waste. Bins provided at regular intervals. No evidence of litter.	Solid and liquid waste control and removal of waste from site. Methods for the disposal of vegetation, paper and plastics and/or building materials. Methods for the recycling of oils etc.
Social	Maximise social benefits and minimise negative social impacts	No complaints from affected landowners No project delays due to landowner interference All landowners signing release forms within 1 month of completion of the contract.	Methods for avoiding danger and causing the least possible inconvenience to the public (including pedestrians), traffic and vehicle traffic.
Sources of Materials	Source materials which have been legally mined or manufactured.	Provision of all Material Safety Data Sheets (MSDSs) for all products used on site.	Details of materials imported to the site. MSDS are to be included.
Topsoil and Subsoil Management	Manage the removal and stockpiling of topsoil and subsoil during the contract for use during rehabilitation.	Soil horizons (stockpile separately). Stockpiles should not be higher than 2 m. Stockpiles will be kept free of alien invasive species. No stockpiles shall be located within the 1:100 floodline. No stockpiles shall be located outside of areas indicated in the construction servitude diagrams.	Removal of topsoil and subsoil. Storage of topsoil and subsoil, including erosion prevention methods.

Method Statement	Objective	Target	Criteria
Traffic	Minimise the impacts and extent of construction related traffic on the surrounding road network and environment, whilst maximising road user safety.	No accidents or incidents. No complaints from the public. Proof of notification of landowner for closure of access roads. Alternative access roads always provided at partial road closures and other traffic disruptions. Compliance with regulatory requirements.	To ensure construction related transport activities do not impact upon landowners and the surrounding environment. Activities associated with the transport of materials and staff are not negatively upon by construction related requirements.
Training	Foster construction related skills transfer, environmental awareness, health and safety awareness, and materials and equipment skills.	Proof of training provided, including training materials that meet the requirements of the Eskom Project Manager. Proof of attendance of staff at training. Records of training evaluation results. Results must reflect that training has been effective.	Logistics for the environmental awareness course for all of the Contractor's employees and temporary labour, as well as for the Contractor's management staff.
Wash Areas	To ensure plant and equipment used on site are kept clean whilst containing and preventing the release of potential contaminants into the receiving environment.	No contamination of the receiving environment through the washing and cleaning of equipment and plant. Compliance with regulatory requirements.	Location, layout, preparation and operation of all wash areas, including vehicle washing, workshop washing, paint washing and clearing Method for the treatment of wastewater prior to discharge.
Water	To provide for watercourse protection, together with storm water management; the maintenance or exceed of water quality standards; and the minimization of flooding.	Maintain or exceed water quality standards. No incidence of water contamination. No threat of flooding. Redirection of stormwater from site to areas of low impact.	To ensure construction related activities do not negatively impact upon water resources and quality thereof. Method for storm water management and flood prevention.

7.9 COMMUNICATIONS REGISTER

All complaints or communications that are received from I&APs or any other stakeholder must be recorded in a Communications Register. These complaints and communications will be brought to the attention of the Eskom Project Manager, whereupon it will be investigated and a response to the Complainant, I&APs or stakeholder will be given within 10 days.

The Communications Register shall include the following information:

- record the time and date of the complaint/communication;
- a detailed description of the complaint/communication;
- action and resources used to correct the complaint;
- photographic evidence of the complaint (where possible);
- a written response to the Complainant indicating rectification of the complaint; and
- information regarding the relevant authority that was contacted or notified in writing (person, time and date).

The relevant authorities include:

- Department of Water Affairs (e.g. for any incidents involving the contamination of water resources);
- Department of Agriculture, Forestry and Fisheries (e.g. uses of appropriate herbicides for eradication of alien invasive species, and permits for trees of special concern);
- Department of Health (e.g. for incidents such as contamination of water resources, accidental spill of hazardous substances);
- Department of Labour (e.g. for labour disputes);
- Western Cape: Department of Environmental Affairs and Development Planning (DEA&DP) (e.g. for any significant incident of pollution of the soil and air);
- Western Cape: Department of Transport and Public Works (e.g. for the diversion of traffic due to construction activities);
- Western Cape: Department of Agriculture;
- CapeNature (e.g. for Biodiversity Permits);
- Overberg District Municipality;
- TWK LM Disaster Management Services (e.g. for fire prevention);
- TWK LM: Electricity (e.g. impacts upon electricity provision);
- TWK LM: Stormwater (e.g. issues pertaining to drainage and stormwater management);
- TWK LM: Transport (e.g. road closures and diversions); and
- TWK LM: Waste Management (e.g. waste derived from demolition activities).

7.10 PHOTOGRAPHIC RECORD

The ECO, EO and SO will be required to compile a photographic record of all activities on site prior to construction related activities starting, during the construction process and on completion of construction related works. This will include photographs for:

- monthly Environmental Audit Reports;
- weekly Environmental Monitoring Reports;

- corrective action;
- progress of environmental works; and
- Non-conformance Reports.

7.11 WASTE MANIFESTS

The Contractor shall ensure that all solid (including any hazardous) waste removed from site is disposed of at a registered landfill site or nearby waste transfer station with capacity to accept the project generated waste. The waste manifest shall be kept on record for auditing purposes.

7.12 GOOD HOUSEKEEPING

The Contractor is to practice good housekeeping throughout the construction phase. This should eliminate disputes about responsibility, facilitate efficient and timeous running of the project. Over and above practising accepted construction methods in accordance with SANS 10120, this should include measures to preserve the environment inside the work area. Records of such actions taken to ensure the maintenance and management of housekeeping must be recorded.

7.13 FINAL ENVIRONMENTAL COMPLIANCE REPORT

A Final Environmental Compliance Report will be compiled by the ECO for submission to the Applicant at the end of the construction phase. The report will include details of:

- the completion of all environmental conditions and mitigation measures listed in the EMPr and the EA;
- all environmental incidents and completed corrective actions;
- the findings of the Environmental Audits;
- conclusions as to whether environmental constraints, guidelines, norms and stipulations have been met and, if not, reasons why they have not been met;
- An indication of the outcomes of the environmental monitoring conducted;
- all Monthly Environmental Monitoring Reports (as an attachment);
- a copy of all Method Statements (as an attachment);
- a copy of the environmental Incident Book (as an attachment); and
- a copy of the Communications Register.

8 MANAGEMENT OF ENVIRONMENTAL REQUIREMENTS

The Contractor shall record and report upon environmental management measures undertaken to mitigate assessed impacts upon the environment (Please refer to Annexure C).

8.1 MANAGEMENT AND CONTROL

The Contractor is to implement environmental management in a reasonable manner and should such management not prove effective, shall implement measures to the satisfaction of the Eskom Project Manager.

Appropriate measures shall include:

- appointment of necessary resources to monitor and manage environmental requirements;
- implement aspect specific method statements to deal with emergency situations.
- provision of adequate emergency response equipment to mitigate and manage an incident or emergency; and
- provision of specific training related to implementation of environmental management requirements.

8.2 RECORDING AND REPORTING

The Contractor shall maintain detailed records of parameters monitored. These detailed records shall demonstrate the effectiveness of the management actions implemented to mitigate potential impacts.

The Contractor shall submit a monthly database/report of management works implemented to the Eskom Project Manager, as part of the Contractors monthly report.

8.3 MONITORING

The Contractor shall submit an Environmental Monitoring Method Statement which details the scope, nature, process, schedule and templates for environmental monitoring.

The monitoring results shall be used to determine the effectiveness of the management programme.

All complaints, compliments or other comments relating to environmental management parameters are to be recorded in the site issues register of the Contractor for inclusion in the project issues register held by the Applicant.

Monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractors Monthly Report.

The daily and weekly reports are to detail observations and information relating to requested management actions and their effectiveness.

The Contractor shall monitor and maintain the following on an ongoing basis:

- re-growth of alien invasive vegetation;

- validity of the Pest Control Officer certificate;
- fire break requirements associated to construction related activities;
- stormwater systems;
- topsoil and backfill volumes;
- access road condition;
- dust generated from stockpiles;
- noise;
- water quality;
- erosion prevention;
- landscaping requirements for rehabilitation;
- spoil management;
- BBBEE compliance;
- employment equity;
- skills development;
- preferential procurement; and
- enterprise development.

The Contractor shall submit a monthly database of *inter alia* the following works to the Eskom Project Manager. This data base is to include as a minimum:

- extent of alien invasive clearing operations;
- volumes of herbicide used on the project;
- stockpile volumes of chipped material, topsoil, fertile soil and sub soil;
- volume of recyclable waste removed from site;
- water volumes recycled and used for dust suppression; and
- maintenance of chemical toilets.

All complaints, compliments or other comments relating to construction related works are to be recorded by the Contractor in the Communications Register of the receiving party for inclusion in the project issues register.

Site clearance monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractors Monthly Report.

The weekly report and daily reports are to detail observations and information relating to requested management actions and their effectiveness.

The Contractor must submit detailed terms of reference for the appointment of a professional service provider (PSP) to undertake the environmental monitoring programme for water quality, dust and noise monitoring. The PSP must meet minimum professional requirements for:

(i) qualifications;
(ii) professional registration;
(iii) experience and track record;
(iv) demonstrated proficiency in use of relevant monitoring and sampling equipment;

(v) equipment requirements and tolerances for detection limits;
(vi) reporting and analysis; and
(vii) confirmation of laboratory accreditation, capacity, delivery and performance within reasonable timeframes

9 TRAINING AND INDUCTION OF EMPLOYEES

The Eskom Project Manager and Contractor are to take responsibility for the management of staff on the project site during the construction phase and supervise them closely at all times. The onus is on the Eskom Project Manager and the Contractor to make sure that all staff and Sub-Contractors fully comprehend the contents of the EMPr. The environmental awareness training programmes should, therefore, be targeted at the two levels of employment: management and labour. Environmental awareness training programmes need to be formulated for these levels and must comprise:

- a record of all names, positions and duties of staff to be trained;
- a framework for the training programmes;
- a summarised version of the training course(s); and
- an agenda for the delivery of the training courses.
- such programmes will set out the training requirements, which need to be conducted prior to any construction works occurring and will include:
- acceptable behaviour with regard to flora and fauna;
- management and minimising of waste, including waste separation;
- maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, cement, mortar and other chemicals;
- responsible handling of chemicals and spills;
- environmental emergency procedures and incident reporting; and
- general code of conduct towards I&APs.

The ECO may be requested to provide additional training (in a first language) on-site regarding environmental aspects that are unclear to the construction personnel. A translator may be required and requested to assist in this additional training. The cost for the translator will be borne by the Contractor.

10 SUSPENSION OF WORKS

If the Contractor has not complied with one or more of the clauses of the EMPr the ECO may recommend the withholding of the payment certificate or the suspension of construction works to the Eskom Project Manager and the Applicant. This may be conducted after having served the Contractor with a NCR and until the Contractor complies with the clauses of the EMPr. All delays resulting from such suspension shall be at the Contractor's expense.

11 RESOURCE ALLOCATIONS

Financial implications for items and activities mentioned in the EMPr must be recognised by the Applicant (for all phases except construction) and the Contractor (for the construction

phase) and provision for these costs must be made. Such costs can include (but may not be limited to) mitigation actions, environmental awareness training, monitoring and auditing requirements and measures for rectification and rehabilitation, management of archaeological / heritage findings unearthed during construction, including any equipment or specialists required for these items.

12 IMPLEMENTATION OF THE EMPR

The EMPr provides an integrated approach to environmental management. This approach is designed to guide the appropriate allocation of human resources, assign responsibilities, develop procedures and ensure project compliance with regulatory and best practice requirements.

12.1 ESKOM GUIDELINE DOCUMENTS

The Contractor shall be required to implement the Eskom specific requirements contained within the guideline documents, as listed in Table 13 below, where required in **Section 12.3 Implementation Tables below**.

Table 13: Eskom Guideline Documents

Guideline Document	Reference No#
Eskom Environmental Policy	ESKPBAAD4
Generic Environmental Management Plan	EPC 32-96
Safety, Health, and Environment (SHE) Policy	EPC 32-94
Transmission Environmental Policy	TPL 41-435
Transmission Bird Perch Guideline	TGL41-332
Vegetation Management	TGL 41-334
Transmission Bird Collision Prevention Guideline	TGL41-335
Fire Protection Association Guideline	TGL 41-336
Soil Erosion Guideline	TGL 41-337
Transmission Servitude Gates Standard	TGL41-338
Bush Clearance Policy	ESKASA-BG3
Herbicide Management Policy	ESKPBAA-D4
Safe Use of Herbicides and Pesticides	ESKASAA-L0
Fire Risk Management	TLL 32-124
Access to Farms Guideline	TPC 41-340
Waste Management Policy	ESKPBAAC4
Transmission Power Line Towers and Line Construction	TRMSCAAC1

Where conflict exists between these guideline document and the environmental specifications in this EMPr, the environmental specifications shall take precedence over these guideline documents because the EIA has identified site-specific mitigation measures that are not included or may be in conflict with the measures in the guideline documents.

12.2 ASPECT AND ACTIVITIES MATRIX

Environmental aspects identified during the site visit, literature review and EIA process, as well as aspects generally associated with construction-related activities have been identified and listed in Table 14.

Construction-related activities could have an impact on one or more of the aspects identified, as indicated by a tick mark in Table 14. The Applicant will be required to check which aspects may be affected by which construction-related activity and to put measures in place to mitigate or reduce the impacts on each aspect.

The Contractor will have to monitor, implement and demonstrate to its performance in environmental management and impact mitigation. Thus, **aspect-specific performance measures (indicators and targets) have been provided** in the implementation tables in **Section 12.3** to which the Contractor must adhere.

Table 14: Aspects / Activities

ACTIVITY / ASPECT	Aesthetics	Dust	Earthworks	Erosion	Fauna and flora	Fire	Hazardous materials	Heritage	Land use	Noise	Rehabilitation	Soil management	Traffic	Training	Waste management	Water management
Access tracks			✓						✓							
Basic environmental awareness training	✓	✓	✓		✓	✓		✓		✓			✓			
Dust management	✓	✓	✓			✓			✓	✓			✓	✓	✓	✓
Emergency response		✓	✓	✓	✓			✓	✓	✓			✓	✓		
Erosion management	✓	✓	✓			✓			✓	✓			✓	✓	✓	✓
Fauna and Flora		✓		✓	✓	✓					✓	✓				
Fire management		✓			✓				✓	✓			✓	✓		
Hazardous substances	✓	✓	✓		✓	✓	✓			✓		✓	✓	✓	✓	✓
Monitoring, auditing and incident reporting		✓	✓			✓	✓	✓	✓	✓			✓	✓		
Noise management	✓	✓	✓	✓	✓						✓			✓	✓	✓
River crossings		✓	✓		✓	✓	✓		✓	✓	✓					
Rehabilitation	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Social		✓	✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓
Storm water management	✓		✓			✓	✓		✓		✓	✓	✓	✓	✓	✓
Traffic management		✓	✓	✓			✓		✓		✓			✓	✓	✓
Waste and effluent management	✓	✓	✓	✓	✓		✓		✓		✓	✓		✓	✓	✓
Water management			✓	✓	✓		✓		✓		✓	✓		✓	✓	✓

12.3 IMPLEMENTATION TABLES

The Implementation Tables describes the aspect-specific objectives for achieving environmental best practice. The tables present performance indicators for each aspect and give a target threshold (qualitative and/or quantitative) that must be met for each indicator.

12.3.1 Environmental Specifications – Construction Activities – Planning and Design Phase

Planning and Design Phase			
Activity/Issue		**Action required**	**Responsible Party**
1.	**Appointments**	Appointment of an independent Environmental Control Officer.	Applicant
2.	**Aspects to be included in the design**	Development activities must be included within the design to ensure environmental resources are not unduly impacted upon during construction. An experienced and competent ECO shall review all designs prior to design finalisation. All construction activities are to be completed within the DEA approved footprint (comprising the Transmission substation, servitude width and the individual pylon tower footprints). The design of construction-related works associated with the project implementation shall aim to minimise the loss of environmental functioning and integrity. Planning and design shall take cognisance of current and future developments and any such considerations being included within the planning and design of the Transmission substation and loop in and loop out power lines. Existing services shall not be impacted upon. All footings, chambers, poles, fences or services shall be placed a minimum of 1.5 metres away from all existing services.	Applicant
3.	**Land Acquisition**	Eskom should discuss the layout of the Asteria Eskom MTS site with the TWK LM to limit any possible negative impacts on the potential future land use and immediate surrounding property owners.	Applicant
4.	**Residential Developments**	Eskom should be obliged to consult with the developers and representatives of the TWK LM during the negotiation phase of the project to ensure a route alignment which would ensure the protection of the land value and resources and which would also be to the socio-economic benefit of the communities.	Applicant
5.	**Employment creation**	Ward councillors and officials from the TWK LM could assist in determining local sub-contractors and/or labourers that should be considered for possible employment e.g. those sub-contractors residing in the affected areas with the necessary skills, local labourers who are on the Indigent List or who have family members on the local Indigent Lists. The tender documentation should stipulate the use of local labourers or enterprises, where feasible. The use of local labour should be maximised, where feasible. Where local skills are not available for the operation and maintenance of the Transmission substation and loop in and loop out power lines, Eskom should consider capacity building and training to ensure that locals are employable. It is recommended that Eskom should implement a skills audit and develop a skills database. It should be ensured that contractors use local skills, or train semi-skilled people or re-skill appropriate candidates for employment purposes where possible. On-site training should focus on the development of transferable skills (technical, marketing of their own skills and entrepreneurial skills) to ensure long term benefits to the individuals involved. The number of job opportunities available as part of the proposed project and the recruitment process should be clearly communicated The recent social unrest within Botrivier could emphasise the need for a transparent and all inclusive communication and recruitment process. All written and verbal communication shall also take place in Xhosa as requested by the public. The communication strategy should ensure that unrealistic employment expectations are not created.	Eskom Project Manager, Contractor, EO, SO, ECO
6.	**Inflow of workers**	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process The recruitment process and the use of contractors should be clearly communicated to the local communities A representative of Eskom could liaise with the local councillors to either attend key community meetings arranged within the various wards to discuss the employment and recruitment process; or liaise with the local councillors to ensure that the correct information regarding this issue is portrayed to the communities via the councillors. Eskom personnel should preferably not access private properties without prior notification of the property owners. Eskom personnel should behave properly at all times. Before construction commences, representatives from the TWK LM and community leaders (e.g. councillors) and community-based organisations, should be informed of the details of the contractors, size of the workforce and construction schedules. Should a large number of temporary workers not form part of the local community members, the contractor should make certain that the “outside” workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the high density settlements do not create conflict within these surrounding communities. Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant).	Eskom Project Manager, Contractor, EO, SO, ECO
7.	**Tender process**	The Final EMPr will be included in the tender documents for contractors. The Contractor should indicate in the tender bidding process which skills are not available within the area.	Applicant
8.	**Freshwater Ecosystems**	Ensure Transmission power line tower placement outside river channels and their 50m buffer areas. Formalisation of road crossings using structures that minimise the alteration of flows (e.g. box culverts with a wide span), for unavoidable road crossings of rivers. Preferably, the establishment of new access roads across rivers or within the recommended 50m buffer area of rivers should be avoided altogether, where practically possible.	Eskom Project Manager, Contractor, EO, SO, ECO

Planning and Design Phase			
Activity/Issue		**Action required**	**Responsible Party**
9.	**Aesthethics – Visual Impact**	**Substation** Rotate the proposed site in a clockwise direction, so as to align more with the terrain and hence to reduce the scale of the earthworks and visible scarring. Cut in two benches and support with gabion type structure filled with grey-brown and dark grey coloured rocks to give a mottled, dark shadow effect Retain the existing alien vegetation surrounding the site and along the R43. This must be replaced with trees endemic to the Western Cape. The services of a certified landscape architect are required to assist in the design, construction and rehabilitation of the five metre wide berm surrounding the MTS. This must tie into the surrounding terrain and appear natural. The berm is to be planted with fynbos type vegetation and medium sized shrubs. (E.g. *Buddlica, Saligna, Pittosporene, Tarcomanthos, Protea, Leucospermum, Thamnochantas*) Locate structures to the eastern side of the site where they will be partially screened by the screening berm. The access road should be routed as close as possible to the existing substation. The possible placement of a Transmission line link to the substation under the ground should be investigated, thereby reducing the massing effect of multiple lines crossing the road. The possibility of using wooden poles for the transmission line crossing the R43 should be investigated to reduce visual intrusion. **Loop In Loop Out** Route off skyline as much as possible. Stay off rocky outcrops. The lattice type towers (self-supporting structures) for the 400kV LILO Transmission power lines should be used.	Applicant
10.	**Traffic**	Place access at toll plaza on R43 and construct access road. Relocate location westwards by 100 metres.	Applicant

12.3.2 Environmental Specifications – Construction Activities – Pre-Construction

Pre - Construction			
Activity/Issue		**Action required**	**Responsible Party**
1.	**Effects of electromagnetism**	Eskom shall inform all affected parties of the potential effects of electromagnetism and corona noise during the land negotiation process.	Applicant
2.	**Aesthetics**	Eskom shall identify and use least visually invasive pylons in areas prone to visual impacts.	Applicant
3.	**Timing of construction related activities**	The Contractor shall appoint the EO and SO prior to the commencement of works and their names shall be provided to the Applicant 30 days prior to the commencement of construction related works. The Contractor shall be required to undertake activities within sensitive environments during periods when least impact is anticipated (November to April). The Contractor shall also be required to provide training to all personnel regarding the potential impact of construction related activities upon these environments.	Contractor
4.	**Defining works procedures**	The Contractor shall compile method statements for all activities / tasks to be undertaken during the implementation of the required works.	Contractor
5.	**Flora and Fauna**	The ECO shall be provided with a list of all known bird nesting sites. This shall form part of the Contractors pre construction survey.	
6.	**Pre-construction survey**	The pre-construction survey must be conducted prior to the commencement of the construction works. It must be attended by the Land owner (or designated representative), the ECO and the Contractor. The following must be established, agreed and recorded. • communication protocol for future communication between the parties (introduce all parties, roles and functions) • contact details • sensitive receptors immediately adjacent/close to the servitude. • activities usually undertaken in the construction servitude area, particularly in agricultural areas (e.g. typical depth of scarifying practices) • impacted services e.g. telephone, electricity, water supply lines and others, and the protection of these services • fire protection and fighting measures • fencing and gate requirements (any special requirements for special livestock, type of stock proof fencing, no of wire strands, location of gates, opening and closing of gates etc.) • interim access requirements to rivers and streams • security issues (traversing rights, collection of firewood, access to potable water, toilet facilities etc. will not be allowed on private properties by construction staff) Information and agreements to be captured in a document for the affected land portions (copy of which is to be submitted to the Eskom Project Manager): • Existing services, buildings and structures: Position, type, condition and other details of existing services (fencing, gates, roads, telephone lines, power lines etc), buildings and structures within the construction site including the pipeline servitudes. This survey must include photographical records, documented per cadastral portion. • A Freshwater Ecologist, as appointed by the Contractor, is to “ground truth” the extent of the watercourses affected by the pylon positions. • A Botanical Specialist, as appointed by the Contractor, shall determine prior to the commencement of works, the appropriate seed mix to be used during the rehabilitation and operational phases of the project. • Access issues. The Contractor shall appoint an experienced botanist / horticulturalist to undertake a search and rescue operation of the site prior to the commencement of site clearance activities. All flora and fauna of conservation worthy status shall be removed and relocated to a site as identified by the ECO. Depending on the time of year the specimens may have to be bagged up and kept in a nursery for transplanting the following winter. Details pertaining the search the rescue shall be contained within the Contractors Flora and Fauna Method Statement. The Contractor appointed Botanical Specialist shall assist the EO in compiling the method statement.	
7.	**Daily living and movement patterns**	Property owners that would be affected by the construction should be consulted prior to the construction phase with regards to the construction schedules, transportation routes, construction of additional access roads and construction methods to be used. Eskom should keep the construction of access roads to a minimum and rather use the existing infrastructure, as the construction and maintenance of these roads is very costly, impact on the residents’ daily living and movement patterns, and create a potential for erosion. Rehabilitation of new access roads for construction vehicles should be undertaken as soon as the construction process allows. Speed limits shall be adhered to when using local roads and when travelling through residential areas. Access routes and access points for heavy construction vehicles should be indicated to warn motorists of the movement of these vehicles. Limit the movement of construction vehicles to off-peak periods (where possible) and where sensitive receptors are situated e.g. schools and pedestrians. Machinery and vehicles should be in good working order to limit excessive noise pollution. Construction activities must adhere to all relevant legislation. Construction activities should be limited to normal working hours (e.g. 7 am until 5 pm) and should preferably not be undertaken during weekends. Construction vehicles should keep to the speed limits. Speeding on gravel access roads should also be avoided to limit any excess dust pollution. Clear warning signs should be erected at strategic places along the R43. Expected difficulties with regards to access to properties should be clarified with the affected property owners prior to construction commencement. Construction sites should be fenced off prior to construction to limit unauthorised entry.	Eskom Project Manager, Contractor, EO, SO, ECO
8.	**Local economic benefits**	Local sourcing of materials would assist in providing more economic and employment opportunities for the local people. Local procurement could result in indirect economic spin-offs and benefits such as increased income, and expansion of other local economic sectors. Maximise the use of local labour even if the number of locals that would be employed would be limited. Accommodate, but regulate the activities of vendors in the vicinity of the construction areas and at the construction camps.	Contractor

Pre - Construction			
Activity/Issue		**Action required**	**Responsible Party**
9.	**Training and induction of employees**	The Contractor must ensure that all people involved (including Sub-Contractors, casual labour, etc.) are aware of and familiar with the environmental requirements. The Contractor's EO is responsible for providing at least one hour of environmental training to each member of the construction staff. If required, further training may be conducted by the ECO. The Contractor's EO must monitor the performance of the construction staff to ensure that the training and induction have been understood and is being followed. Eskom, in conjunction with the contractors, should continue and extend HIV/AIDS awareness and support programmes amongst the contractors and sub-contractors.	Contractor, EO, ECO, SO

12.3.3 Environmental Specifications – Construction Activities – Site Office Establishment

Construction Activities – Site office Establishment			
Activity/Issue		**Action required**	**Responsible Party**
1.	**Construction site office/yard and site**	The Contractor will require a site office / yard for the duration of the contract period. The Contractor's site office shall be located within the existing Houhoek Eskom Distribution Substation development footprint (but should stay at least 50m away from the edge of the river that flows through the northern part of the substation), or on a site appropriately zoned and/or authorised for such use and approved by the ECO. The Contractor shall select a location that has easy access and which has already been cleared or disturbed by previous human activity (e.g. previous construction camps or stockpile areas). All construction activities, materials, equipment and personnel will be restricted to within the area specified The construction camp should be located near support services, and ideally not in the vicinity of residential dwellings or the local school. The site office / yard selected will minimise nuisance impacts on neighbours (e.g. visual intrusion, lights at night, noise, dust, movement of people and vehicles, safety and security risks). The perimeter will be clearly demarcated with fences to prevent site creep. The Contractor must fence off its construction camp areas with 2 m high diamond mesh fence. All temporary fencing must be removed on completion of the Contract. The camps may be used for the working hours activities of the Contractor's and the Employer's personnel and for all related facilities required by the Contractor and the Employer such as workshops, stores, testing laboratories, etc. The Contractor shall take all necessary steps required to comply fully with public legislation and regulation and all specification clauses governing the environment, health, transport, safety and public disturbance impacts. Accommodation of labour at camp sites will not be allowed. Should at any stage of the Contract the Applicant and/or the Eskom Project Manager be of the opinion that the camp sites of the Contractor is causing disturbance or inconvenience to land or lease owners or to nearby residents, then the authority granted by this clause for the Contractor may be withdrawn, either partially or entirely. The Contractor shall at all times conform to all requirements contained in law or bylaws, as well as any other requirements set by the controlling land and local authorities. The Contractor may not remove or damage any trees or shrubs on the site of the construction camps or depots without the permission of the Eskom Project Manager and where required it shall be done in accordance with the environmental requirements. The Contractor shall water all access roads to construction camps and depots, as well as working areas used by vehicles inside camps, as required or as may be directed by the Eskom Project Manager, to prevent dust being entrained by vehicles or wind. At completion of construction work the Contractor must break and remove all concrete slabs etc. in construction camps and at batching plants, remove to approved spoil sites only all rubble from camp sites and depots and hand over the sites in a clean and tidy condition. No Taking-Over-Certificate shall be issued for the Works unless the site cleaning is done to the satisfaction of the Eskom Project Manager. Rehabilitation of impacted areas shall be done in accordance with the specifications included in EMPr. The Contractor shall submit a method statement for the establishment of his camp site, including a drawing with the position, layout and type of facilities. <u>Accommodation of employees</u> The Contractor shall make his own arrangements to house his employees and to transport them to site. No accommodation at camp sites will be allowed. No informal housing or squatting will be allowed. All accommodation shall be within appropriately zoned areas within the urban fringe. The standard of the accommodation provided by the Contractor shall be subject to the approval of the Eskom Project Manager. The location of the construction camp (if required) where workers could be housed and equipment yard should be carefully considered to limit any possible negative social impacts. The construction camp should be located near support services, and ideally not in the vicinity of residential dwellings or the local school. Construction camp management should adhere to the EMPR guidelines. Construction workers should be supervised at all times. <u>Power supply, water and other services</u> The Contractor shall make his own arrangements regarding the supply of electrical power, water and all other services. No direct payment will be made for the provision of electricity, water and other services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required, or in the Contractor's preliminary and general items. The Contractor will not obtain water from third parties without the permission of the Eskom Project Manager. The Contractor shall pay all consumption charges, and at his cost provide all connections, consumption meters, pipe work, storage tanks, transformers, cables, transport and other items associated with the supply of water and electricity for the Works. All connections to services of a LM (or its provider) shall be at points and to standards approved by the Eskom Project Manager and the LM or designated provider. During the construction of the Transmission power line, it is anticipated that satellite site offices may be required, which shall comprise a portable toilet, sheltered eating area and refuse bins. These should be no larger than 30m² and shall be approved by the Eskom Project Manager and ECO. The site office location shall have easy access and should preferably already be cleared or disturbed by previous human activity (e.g. previous construction camps, stockpile areas, parts of the existing road that forms part of the construction servitude or existing turning circles). All construction activities, materials, equipment and personnel will be restricted to within the area specified. <u>General</u> The Contractor will not be permitted to paint / mark or deface natural features in an attempt to demarcate the site. Hazard tape may not be used to demarcate the external boundaries, as this easily breaks, littering the surrounding environment. Pre-construction photographs will be taken by the ECO to determine the condition of the site before construction begins. This will provide a benchmark for rehabilitation as rehabilitated areas must match the pre-disturbance state. The site office / yard and construction footprint will be kept clean, neat and tidy at all times, and all construction materials will be stored in a neat and organised manner. Workers are not to be accommodated on site. Security guards are to be provided for after hours. Residents close to the campsite office / yard shall be informed of the procedure for lodging complaints with regard to the Contractor's behaviour.	Contractor, EO, ECO

Construction Activities – Site office Establishment			
Activity/Issue		**Action required**	**Responsible Party**
		Local police services should be kept informed of the planned developments to ensure that they are able to adequately deal with any disruptive behaviour. All natural veld outside the development footprint should be marked as no-go areas during the construction. Should construction start at the end of the year and construction activities be stopped for the festive season in December, the construction camp should not be left vacant to avoid security risks and possible unauthorised entry.	
2.	**Designated vehicle and plant cleaning and maintenance areas**	All vehicles and equipment requiring maintenance and servicing shall be taken off site and must be parked on an impermeable surface. Alternatively, drip trays must be placed below all vehicles / plant. Plastic sheets are not to be used as drip trays. Maintenance of vehicles may be done at the construction site office / yard. Leaking equipment shall be repaired immediately or removed from the site. Spills from such leaks or breakages (e.g. hydraulic pipe bursts etc) shall be reported to the Eskom Project Manager and treated immediately. Washing of vehicles may not be done at the construction site, and all vehicles requiring washing and servicing must be taken off site to a car wash / service station.	Contractor, EO, ECO

12.3.4 Environmental Specifications – Construction Activities – Site Management

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
1.	**Aesthetics Management**		
	Aesthetics	The Contractor will ensure all components associated with site establishment are designed and positioned to limit the nuisance factor affecting surrounding land owners/users. All walls and roofs of buildings will be painted with a non-reflective matt paint of which the colour will be approved by the Eskom Project Manager. Lighting will be of a downward facing spill off type to a maximum height of 3 m and should be so positioned to provide adequate lighting for Health and Safety requirements, without being a nuisance to adjacent neighbours. No natural features may be defaced. Shade-cloth shall be placed on perimeter fencing to reduce visual impact of camp sites. Waste should be removed regularly to a registered landfill Site. Daily litter patrols must be conducted and record of these patrols kept. Bins must be provided at intervals agreed with the ECO within the camp and construction areas. **Substation:** • Consider the stockpiling of topsoil offsite to the north for use in rehabilitation and of the screening berm • The colour of structures should be grey-green with shallow roof of mid-grey colour • Colour of security fence should be dark grey and not made of cement pillar, but be of a more transparent nature/type. • Security lights at night should ensure that the visual influence is limited to the substation, without jeopardising operational safety and security. • No external up-lighting of any parts of the structures visible from the N2 south receptors. • Immediate rehabilitation and restoration post construction to ensure that the berm is stabilised and soil erosion does not take place. **Loop in Loop Out:** • Utilisation of existing tracks and access routes as much as possible and implement an intensive soil erosion prevention program to limit visual linear scarring • Immediate rehabilitation and restoration	Contractor, EO, ECO, SO
	Visual intrusions	All portable toilets shall be screened from public view with a shade cloth enclosure. Screening of the substation site (if possible) should be considered to limit the visual impacts on Bakenhoogte Olives and/or other properties.	Contractor, EO, ECO, SO
2.	**Dust Management**		
	Air quality	Vehicles and machinery will be maintained in good running condition. Stockpiles (e.g. soil) should be maintained for as short a time as possible and should be enclosed by wind-break enclosures of a similar height to the stockpile. Stockpiles should be situated as close as possible to the construction footprint for re use in rehabilitation and away from the site boundary, water resources and nearby receptors, and should take the predominant wind direction into account. During the transfer of material to stockpiles, the drop heights should be minimised to control the dispersion of materials. The Contractor will solely be responsible for the management and mitigation of dust generation. The Contractor shall routinely spray all dust-generating surfaces with water, a dust suppressing agent or similar substance to prevent dust generation. Potable and contaminated water will not be used as a dust-suppressing agent and only recycled and/or rain water is to be used, when available. Handling of soils is not to be conducted during winds in excess of 35 km/h.	Contractor, EO, ECO, SO
3.	**Earthworks Management**		
	Transport, earthmoving and materials handling equipment (TEM)	The Contractor shall ensure compliance with the Occupational Health and Safety Act and the relevant regulations for the operation and maintenance of TEM equipment. The Contractor shall ensure all TEM, vehicles and equipment are maintained in good working condition to maximise efficiency and minimise pollution. All TEM and other equipment shall only be washed in designated washing areas to minimise water pollution and soil contamination. The designated washing areas are to be located away from the watercourses and its buffer zones. Soil / gravel material being transported to site by trucks will be covered to ensure that dust is not blown off the material. The Contractor shall inform all suppliers that all materials are appropriately secured to ensure safe passage to and from site.	Contractor, EO, ECO, SO
	Excavations and trenches	The Contractor must take all necessary precautions to prevent injuries or fatalities of people or animals occurring when accessing excavations and trenches. The Contractor shall ensure all areas are adequately sign-posted and fenced, to prevent unauthorised access to the site. Trenches may not be left open during the builder's holidays. Safe trench-crossings shall be provided where required. When working in wet areas, the Contractor shall return the profile of the watercourse to one similar to the pre-construction profile. The majority of the flow of the water in wet areas must be allowed to pass down the stream (i.e. no damming must be allowed to take place). In-stream diversions should be used rather than the construction of new channels.	Contractor, EO, ECO, SO
4.	**Erosion Management**		
	Erosion	The Contractor shall be responsible for the prevention of erosion in areas impacted upon by their activities. All erosion repairs must be implemented at the first signs thereof. The Contractor must present the site in an erosion-free state before the issuing of the Taking-over Certificate.	Contractor, EO, ECO, SO
5.	**Fauna and Flora Management**		
	Flora and fauna	The ECO must be informed of all animals found on site in order to ensure proper capture, translocation and release. Trapping, collection, poisoning and/or shooting of any animals by construction personnel is forbidden. The Contractor shall not keep domesticated animals on site and shall take every possible precaution to prevent domesticated animals belonging to I&APs from entering the site. Permits must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF) prior to the removal and pruning of or damage to any nationally protected trees. A comprehensive alien vegetation eradication programme must be implemented, with the removal of all alien vegetation from within the development footprint (as legally required). This shall extend 100 m around the boundary of the MTS and shall take place within one year of project commencement. Care must be taken during the alien vegetation removal process to ensure that no unnecessary fires are created through the stacking of biomass. Imported materials must be free of alien vegetation species.	Contractor, EO, ECO, SO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		Rehabilitation of areas disturbed during project activities (and other rehabilitation or replanting as may be specified) shall be undertaken to reinstate natural flora and prevent the expansion of weeds and invasive alien species. All material brought in must be from a reliable source and free of alien seeds or grass runners. The Contractor shall ensure all areas rehabilitated are kept weed free during the defects notification period. To avoid avi-faunal impacts with the Transmission power line, the Contractor shall install bird guards (at isolator localities) and bird diverters (on earth wires) at all localities identified by the avi-faunal specialist. Construction crews shall be notified of nests on adjacent lines and be made aware of potential negative impacts associated with the construction related activities. The South Western Cape Raptor Project of the Endangered Wildlife Trust shall be notified of these nests. The construction of the line in certain areas (steep, rocky or some high sensitivity areas) may necessitate the use of helicopters instead of terrestrial access, and this should be determined by the Contractor appointed Botanist, in consultation with the Eskom Project Manager and ECO. All movable and low mobility fauna (such as tortoises) must be translocated at the same time.	
	Vermin	The site must be kept clean and tidy at all times to ensure no vermin is attracted to it. The use of pesticides is prohibited unless approved through the submission of a Method Statement to the Eskom Project Manager and ECO.	Contractor, EO, ECO, SO
	Environmental Auditing	During construction, activities will be monitored and recorded by the EO and audited against the EMPr by the independent ECO. Monitoring and incident information will be communicated to the relevant authorities. Any complaints will be recorded and investigated. After construction, the site needs to be inspected and monitored to ensure that the rehabilitation activities have been successful and are maintained.	Contractor, EO, ECO, SO
	Bird Diverters	The sections of the proposed Transmission power line to be marked with Bird Flight Diverters (BFD's) must have them placed on both earth wires, 10 metres apart, staggered, alternating black and white. The recommended diverter is the Double Loop Bird Flight Diverter.	Contractor, EO, ECO
	Ecologically sensitive areas	A detailed site-specific survey of the pylon positions by an experienced Fynbos botanist during the optimum season (August-September) to identify potential occurrences of threatened plant species. If existing access roads are present, these must be used during construction to minimise the construction of new roads. Disturbance footprints for pylons in sensitive areas should be minimised to 10m × 10m ($100m^2$). All areas of high sensitivity or natural vegetation outside the immediate construction footprints must be regarded as no-go areas. These areas may not be accessed by people or vehicles. No ancillary activity, such as temporary housing, temporary ablution, storing of equipment or waste disposal may be permitted in the areas mapped or classified as ecologically sensitive. Due to the extreme sensitivity of the remaining natural vegetation along these route alignments it is recommended that these parts of the selected route be rehabilitated and maintained as conservation areas, as suggested by Section 8 of the Eskom Transmission Vegetation Management Guideline Document (2006)(TGL 41 334) (Table 13 above). If the Transmission power line servitude is re-vegetated with appropriate fynbos species and alien invasive vegetation is eradicated and well managed, the servitudes could provide valuable ecological corridors, connecting important fragments of natural vegetation. However, it is recognised that Eskom is unlikely to engage in Fynbos rehabilitation as this is not their core business, and more feasible recommendations are made below. Any new Transmission powerline servitudes associated with this project may not be brushcut at a level lower than 1.5 m above mean ground level, in order to prevent degradation of the vegetation in this area. The only plant species that may be removed at ground level from within servitudes are alien invasive species (as per NEM:BA and CARA legislation). Servitude brushcutting must thus be undertaken by hand (using hand held brushcutters), and may not be undertaken using tractors and bossieslaners (which disturb the soil surface). Brushcutting should not be undertaken in any one area more often than once every eight years. All servitudes should be cleared of woody invasive alien vegetation on an annual basis, using appropriate methodology. Work should be undertaken by well-trained teams who are familiar with the DWA approved alien clearing methodology. All woody alien invasive vegetation in the servitudes should be cut as close to ground level as possible, using hand tools or chainsaws, and the cut stumps must be hand painted with an appropriate Triclopyr herbicide (containing a dye so treated stumps can be seen) within ten minutes of felling, in order to prevent re-sprouting. Felled material should be stacked in a pyramid, with cut ends facing upwards, or removed from site, or chipped. Small seedlings may be hand pulled. No herbicide should be sprayed unless alien vegetation cover is greater than 80%, and then only under appropriate conditions (no wind or rain), as collateral damage of non- target plants may be significant. Identified ecologically sensitive areas should not be brushcut, as this encourages alien vegetation and damages the remaining Fynbos, effectively increasing the fire threat rather than reducing it. Brushcutting in areas that have no sensitive wetlands or natural vegetation should not be a problem. Operational access tracks should not be created in areas mapped as being ecologically sensitive, and existing tracks used during the construction phase should instead be used. The creation of tracks should be minimised throughout servitudes.	Contractor, EO, ECO, SO
	Freshwater ecosystems	Construction camps should be located at least 50m from freshwater ecosystems. Freshwater ecosystems should be treated as "no-go" areas and appropriately demarcated as such. No vehicles, machinery, personnel, construction material, fuel, oil, bitumen or waste should be allowed into these areas without the express permission of and supervision by the ECO. Workers should be made aware of the importance of not destroying or damaging the vegetation along rivers, and this awareness should be promoted throughout the construction phase. Freshwater ecosystems located close to the construction areas should be inspected on a regular basis by the ECO for signs of disturbance from construction activities. If signs of disturbance are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures. Toilets must be located at least 50m from the freshwater ecosystems. No fuel storage, refuelling, vehicle maintenance or vehicle depots should be allowed within 50m of freshwater ecosystems. Re-fuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, should be located on impervious bases and should have bunds around them. Bunds should be sufficiently high to ensure that all the fuel kept in the area will be captured in the event of a major spillage. Vehicles and machinery should not be washed within 50m of freshwater ecosystems. No discharge of effluents or polluted water should be allowed into any freshwater ecosystems. If construction areas are to be pumped of water (e.g. after rains), this water should be pumped into an appropriate	Contractor, EO, ECO, SO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		settlement area, and not allowed to flow into any watercourses. No spoil material, including stripped topsoil, should be temporarily stockpiled within 50m of freshwater ecosystems. There should be little disturbance to surrounding vegetation as possible when construction activities are undertaken, as intact vegetation adjacent to construction areas will assist in the control of sediment dispersal from exposed areas.	
6.	**Fire and Emergency Management**		
	Safety and Security	Construction property and equipment are to be clearly marked with identification tags. Access to the construction site must be restricted and guarded. Construction workers will wear clothing marked with the logo of the construction company and will carry identification cards. The Contractor will maintain a consistent workforce that is familiar with the rules, practices and attitudes towards the misappropriation of property. Personal protective equipment (PPE) and clothing shall be given to workers and the usage thereof shall be enforced to avoid construction-related accidents. The Contractor shall implement measures to ensure the safety of pedestrians crossing the roads used by construction vehicles. Potential hazardous areas must be demarcated and clearly marked. No unauthorised firearms or dangerous weapons are permitted on site. Security (infrastructure and personnel) on-site at the MTS should be implemented during the construction period.	Contractor, EO, ECO, SO
	Health Risks	A Health and Safety Officer is to be appointed for the duration of the construction period, and his contact details are to be made available to the adjacent land owners and the ECO. Eskom, in conjunction with the contractors, should continue and extend HIV/AIDS awareness and support programmes amongst the contractors and sub-contractors. Adequate water supply and sanitation-related facilities shall be provided to the workers at the construction sites. This shall typically include 1 toilet to every 15 workers. The toilets shall be located no more than 50 m away from any work front. Emergency response processes should be in place, and communities and adjacent land owners development footprint should be notified of the correct procedures for dealing with serious emergencies. Adequate water supply and sanitation related facilities should be provided to the workers at the construction sites. Construction waste should be disposed of properly to prevent any surface and groundwater pollution. Construction sites should be fenced off to avoid unauthorised entry by individuals and animals. Eskom should take a strong stance with regards to the illegal squatting within the servitude areas. For safety reasons these dwellers should be moved out of the servitude areas on an on-going basis	Contractor, H&S Officer
	Environmental emergency response	In the event of actions that may result in significant environmental damage, an environmental emergency response plan must be in place to limit the extent of environmental damage. Procedures and policies will be established to ensure that an incident does not recur. Incidents will be reported immediately to the responsible person. All incidents will be documented in the environmental incident book. The relevant authority will be informed after an incident.	Contractor, EO, ECO, SO
	Incident management	The Contractor shall identify the types of environmental incidents that are likely to occur on site and ensure measures are put in place to prevent or mitigate the effects of such incidents. The Contractor is required to put in place an effective management system that will prevent or mitigate the occurrence of an incident. The method statement for this must be submitted to the Eskom Project Manager for approval prior to the commencement of the works. This method statement must be reviewed and updated on a six monthly basis. All the SHE incidents must be reported by the Contractors employees to the Contractor. The Contractor shall immediately report the incident to the Eskom Project Manager and put into place management mechanisms to deal with the incident as quickly as possible. Once the incident has been stabilised and initial notifications have been issued to the relevant parties, a full incident investigation is required complete with detailed corrective and preventative measures. The Contractor is required to provide an incident report to the Eskom Project Manager, which, as a minimum, must include the following: • Nature of incident. • Damages, injuries or fatalities sustained and the parties involved. • Any risks such incident poses. • Toxicity of the substances involved. • Steps taken to avoid or minimise the effects of the incident and any future incidents. • Clean-up procedures, remedial actions and assessment of immediate and long term effects. A formal report must be submitted within seven days to the Eskom Project Manager, including all remediation measures undertaken to repair any damage caused and to prevent the incident from re occurring.	Contractor, EO, ECO, SO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
	Fire management	The Contractor shall prepare and implement a Fire Management Method Statement to reduce fire-associated risk and thereby maintain a safe working environment and reduce negative impacts on the natural and social environment. This method statement shall be cognisant of the requirements as contained within the Eskom documents of Table 13. The Contractor shall prepare the Fire Management Method Statement for approval by the Eskom Project Manager within the first month of site establishment. The method statement is to include the following as a minimum: • Measures to reduce the risk of fires starting and spreading. • Details on how the Contractor is to manage and control fires during construction. • Fire prevention equipment and where it will be located • The format and means for recording and reporting on fire mitigation, management and monitoring. The Contractor will, ultimately, be responsible for fires that break out as a result of his activities during the implementation of the project, as well as the containment thereof. The Applicants' liability with regards to fire is transferred to the Contractor for the duration of the Contract. The Contractor shall take reasonable measures to reduce the risk of fires during construction. The Contractor shall limit the risk of fires through a combination of the methods below: • The Contractor shall assign the fire management duties to the EO. The EO shall be competent and adequately trained to fulfil the position. The EO shall be responsible for ensuring immediate and appropriate action in the event of a fire and shall ensure that employees are aware of the procedures to be followed. • All perimeter boundaries adjoining neighbouring properties must have fire breaks in place. The fire break width maintenance requirements and responsibilities will be determined by the Contractor in conjunction with the land owner. Fire breaks shall be monitored by a Professional Services Provider or by the local Fire Protection Association. The fire management method statement must include but not be limited to the following: o A list of the major workplace fire hazards o Proper handling and storage procedures, o Potential ignition sources (such as welding and smoking), o Control procedures, and o Type of fire protection equipment or systems to be used for control. • The daily Fire Danger Index shall be displayed prominently on site at all times. • All staff shall receive training on fire hazards as a part of the site induction training by the Contractor before commencing work on the site. • Suitable fire fighting resources must be placed at all fronts. The Contractor shall ensure compliance with the Occupational Health and Safety Act and the relevant regulations regarding fire-fighting equipment. In the event of a fire on site, the Contractor shall mobilise all nearby personnel and do everything possible to extinguish or contain the fire until the TWK LM Fire Brigade arrive. Proof of construction workers training on fire hazards and fire fighting is to be kept on file and shown to the ECO on request. Any fires that occur shall be reported upon discovery to the Eskom Project Manager and to the relevant authority. No open fires shall be permitted on or off the site or for the preparation of meals within designated eating areas. No on-site burning of waste materials, litter or refuse shall be permitted. Smoking shall not be permitted on site, except in designated smoking areas. Designated smoking areas are not to include those areas where there is a fire hazard. Fire hazard areas include the workshop and fuel storage areas and any areas where the material supports the rapid spread of an initial flame. The Contractor shall be required to monitor the following on an on-going basis: • Regular drills, at least twice per year, should be performed to ensure adequate response by all Contractors' staff. • Annual revision of Fire Management Method Statement.	Contractor, EO, ECO, SO
7.	**Hazardous Substance Management**		
	Cement / concrete mixing	The Contractor will submit a Method Statement for the mixing of cementitious and related products, and this must include remedial actions for spillages of cement and concrete, the cleaning of concrete mixers / truck-mounted cement mixers, recycling of cementitious products and management and the disposal of waste / spoil. Used cement bags shall be disposed of in weatherproof bins on site to prevent the generation of windblown cement dust and to prevent the bags from blowing away. During construction, the Contractor(s) must ensure that concrete is mixed in appropriate structures to prevent the contamination of the surrounding environment. All visible remains are to be removed and disposed of as waste and all surplus material is to be removed. Plastic sheets and the bare ground are not to be used for mixing purposes. Inert concrete can be disposed of at the registered landfill site only after approval has been obtained from the Eskom Project Manager. Waste manifests must be obtained by the Contractor for the disposal of inert concrete to a registered waste landfill site. All visible remains of excess concrete shall be physically removed and disposed of on completion of construction. Concrete spoil from foundation pours, shall not be discarded into the surrounding environment. Excess concrete and wash water from the concrete truck's drum shall be placed within the foundation's selected back fill.	Contractor, EO, ECO
	Chemical spill control	If a spill of any kind occurs, corrective action will be taken (notification of incident, isolation of contaminated material and safe disposal). Spills shall be controlled with the following actions: • Method statements will be developed for potential hydrocarbon and chemical spill incidents. • Spillage control will be provided by impervious bunding or collecting spills to a sump for disposal or controlling by absorbent material on standby. • Capacity of impervious bund structures should be 110% of the capacity of the largest tank within the bund structure. • Spill containment facilities, such as impermeable or lined bunds (concrete is not impermeable) or drip trays will be provided in oil and chemical storage sites and vehicle maintenance areas. • Material from lined bunded areas will not be buried during rehabilitation. • Re-fuelling and handling of chemicals will occur only in a designated area. • Spill kits will be available on site and staff will be trained in their use. • The spill will immediately be cleaned up and disposed of at a registered hazardous waste landfill site. • All spills and actions will be reported in the site Environmental Incident Book. • Where cement powder has been spilled onto the bare soil, the contaminated soil shall be removed, placed into an appropriate container and disposed of at a registered hazardous landfill site.	Eskom Project Manager, Contractor, EO, SO and ECO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		• Leakages must be repaired on mobile equipment and containment / drip trays must be placed underneath immobile equipment until the leakage has been repaired. The drip tray will have a small spill sock placed in it to capture small spills. • All generators will be permanently placed on drip trays to contain any spillages that may occur. • A spill response team should be brought onto the site to clean the affected area in the event of a spill greater than 100 litres.	
	Chemical storage	Hazardous materials include diesel, petroleum, oil, cement, bentonite, solvent-based paints, drilling fluids, pesticides, herbicides and LPG. All chemicals will be stored in specifically designed, lockable and lined storage areas where reactive substances are classed and segregated. All hazardous substances must be stored in a lined bunded area and sufficient spill absorbent material must be provided for the type of hazardous substance stored. The chemicals will not be stored within 100 meters of water courses. The chemicals will be labelled according to the chemical hazard rating and, as such, adequate signage must be displayed indicating the appropriate management measures to be implemented in the event of a spill / fire. Material Safety Data Sheets of chemicals used must be kept on file on site at all times. The Contractor must use the least environmentally harmful chemical in undertaking specific duties / requirements. Storage of diesel / petrol in excess of 200 litres requires approval from the TWK LM Fire Chief.	Contractor, EO, ECO
8.	**Heritage Management**		
	Heritage resources/human remains	The Contractor and workers should be notified that archaeological finds may be exposed during the construction work. Should a find of heritage importance be unearthed, construction activities will stop immediately at the site of discovery. The area will be fenced off with a radius of 20m around the unearthed item, demarcated as a no-go area and access will be prohibited. Should there a risk of the find being violated, whether intentionally or inadvertently, the Contractor shall be required to appoint a guard to enforce the no-go area policy. The ECO and Eskom Project Manager shall be notified immediately. The ECO will advise the Applicant to contact an archaeologist to undertake further studies and determine the importance of such a find. All related activities will be undertaken by the archaeologist, or under his/her supervision, to ensure no unnecessary damage takes place on the site. During this period, work will not take place in the demarcated area. Work will be continued further along the site at a distance which is clearly well out of the area that may be affected by the findings. Should the findings be clearly limited to a particular area the ECO and Eskom Project Manager, in consultation with the archaeologist, will be free to determine what can reasonably be deemed a safe no-work distance, which will be kept clear of activities. Work will only recommence on the written consent of the archaeologist and/or the Heritage Western Cape. Finds containing human remains shall immediately be reported by the Eskom Project Manager to the South African Police Services (SAPS). All parties concerned shall respect the potentially sensitive and confidential nature of the heritage resource, particularly human remains. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on site. The Contractor and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in Section 51(1) of the NHRA. Any extension to the project footprint shall require assessment by a qualified heritage practitioner prior to commencement of works.	Contractor, EO, ECO, SO
9.	**Infrastructure Management**		
	Storage facilities	The Contractor will provide storage facilities for equipment, plant and materials in such a way as to prevent damage to either the environment or to the stored item. Such items stored will be in a damp and weatherproof, well ventilated and bunded facility that is raised sufficiently above ground level to prevent the ingress of storm water. All chemicals, lubricants and fuels will be stored in secondary containment units that are capable of storing 110% of the contents stored. These secondary containment units will be impermeable, fire proof and constructed to approvals as obtained from the Eskom Project Manager.	Contractor, EO, ECO
	Eating areas	The Contractor shall provide staff with suitable eating areas that are weatherproof and away from construction related nuisance e.g. dust and noise. These designated eating areas must be for normal working hours only. The Contractor is to provide refuse bins and lids which are cleaned on a daily basis. The Contractor must ensure staff do not leave food items laying around after breaks. The Contractor shall ensure a dedicated cleaning function at the eating areas after every meal. Fires will not be allowed anywhere in construction and associated project areas.	Contractor, EO, ECO, SO
	Lay-down areas	The Contractor shall set aside suitably sized areas for the storing of construction and associated materials. These areas must have a firm substratum and adequate drainage to ensure rapid drying out of the areas. The Contractor shall be responsible for keeping all areas of the site for which he is responsible in a neat, clean, sanitary and orderly condition in accordance with the specifications.	Contractor, EO, ECO, SO
	Temporary site closure	In the event of temporary site closure (e.g. during pay weekends and annual shutdown period), the Contractor shall check the site, ensure that the following conditions pertain and report on compliance with this clause: <u>Fuels / flammables / hazardous materials stores</u> • Every effort should be made to ensure that fuel stores are as low in volume as practicable. • There are no leaks. • The outlet is secure and locked. • The bund is empty. • Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision and the like. • Emergency and contact numbers are available and displayed. • There is adequate ventilation in enclosed spaces. • There are no stores or containers within the 1:100 year flood line. <u>Erosion</u> • Wind and dust mitigation measures such as brush packs, irrigation are in place. • Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows. • There are sufficient detention ponds or channels in place.	Contractor, EO, ECO, SO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		Water contamination and pollution • Hazardous fuel stores are secure. • Cement and materials stores are secure. • Toilets are empty and secured. • Refuse bins are empty and secured. • Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. • Drip trays are empty and secure.	
	Fencing at foundation sites	The Contractor shall ensure all foundation excavations are adequately secured at the close of work each day. Fences capable of keeping livestock, domesticated animals and people out shall be used. These fences shall be clearly demarcated with safety mesh – no hazard tape or netting may be used. The Contractor shall remove all temporary fencing upon completion of works.	
	Sourcing of materials	Commercial sources for concrete will be used. Permits received from suppliers must be kept at the construction site camp office.	Contractor, EO, ECO
	Substation	The Contractor shall ensure the site is kept visually and aesthetically pleasing during construction works. The site shall be screened from public view using shade clothe or similar of a matt earth toned colour. The Contractor shall implement measures to ensure dust generation from site clearing operations do not impact upon the surrounding community and environment. The Contractor shall undertake all earthworks operations during the dry summer months to avoid contamination of runoff water leaving the site. The Contractor shall undertake all works in a manner which prevents the ingress of water onto the site and implementing measures to stabilise the soil thereby decreasing the incidence of erosion. The Contractor shall implement measures and undertake his operations in a manner which does not pose a fire threat. The Contractor shall ensure the storage of transformer oil is undertaken within secure impermeable bunds for the duration it is stored on site. The Contractor shall ensure adequate fire fighting and spill preventative and containment measures are in place. The design for the upgrading of the transformer oil holding facilitates at Philippi substation shall be approved by the ECO prior to the commencement of construction related works. The Contractor shall be aware that chance finds may be made during construction related activities. The Contractor shall implement measures to mitigate the damage or removal of these chance finds should they be discovered. The Contractor shall ensure all works undertaken at the substation are not impacting upon neighbouring communities and the environment. The Contractor shall ensure measures are in place to manage and mitigate concerns and complaints raised by I&AP's and the surrounding community. The Contractor shall implement measures to mitigate and manage against construction related noise generation impacting upon the surrounding environment. The Contractor shall implement measures to re-use natural resources identified on the substation footprint for rehabilitation purposes elsewhere on the project. The Contractor shall ensure topsoil stockpiles are protected and kept separate from other contaminants. The Contractor shall ensure works within the substation precinct do not impact upon the traffic flow on the N2. The Contractor shall also ensure that entrained soils / mud from vehicles exiting site, do not impact upon the roads. The Contractor shall be required to keep the road in front of the substation free from any such deposits. The Contractor shall implement training programmes for all levels of staff to ensure all works undertaken are done in a manner which complies with the requirements of the environmental authorisation and the EMPr. The Contractor shall institute effective waste management measures on site. This shall entail waste reduction, re-use and recycling. The Contractor shall ensure all general waste is taken to a registered landfill Site and all hazardous waste taken to a registered hazardous waste landfill site. The Contractor shall ensure waste generated on site does not litter the surrounding environment. The Contractor shall ensure natural drainage channels are instated. These drainage channels shall be in consultation with the TWK LM to provide for the natural draining of stormwater. The Contractor shall place a blanket layer (G6) for protection of the substation platform against wind and water erosion. This shall be in consultation with the Eskom Project Manager.	Contractor, EO, ECO, Eskom Project Manager
10.	**Land Use**		
	I&APs relations	The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified by the Eskom Project Manager. Such boards shall include general information of the activity and contact details for complaints by I&APs in accordance with details provided by the Eskom Project Manager. The Social Officer is to liaise with the Community with regard to comments and queries by I&APs.	Eskom Project Manager, Contractor, ECO, SO
	Proposed Developments	Should the construction phase of the Donderboskop Industrial Development overlap with the construction phase of the proposed Asteria Eskom MTS project, mitigation measures to deal with the larger influx of workers to the area should be developed. Should the construction phase of the residential developments overlap with the construction phase of the proposed Asteria Eskom MTS project, mitigation measures to deal with the larger influx of workers to the area should be developed.	Contractor, ECO, SO
	Landowner interactions	Interactions with landowners, local communities and other affected parties need to be done by the Contractor's Social Officer. All interactions with Landowners/Residents must be recorded in a Communications Register, which shall be made available to the Eskom Project Manager on a monthly basis. The Contractor shall respect the property and rights of landowners and communities at all times and shall treat all such persons with courtesy. The Contractor shall keep records of all communication in a Property File for each property. The Contractor shall ensure disruptions to Land owners/Residents and I&APs affected shall be minimised. The Contractor shall ensure private property adjoining the site is not damaged due to construction related activities. Access to and from private property shall also not be affected by construction related activities. The Contractor shall absolve the Eskom Project Manager of any and all risk and liability in this regard. Prior to property access, the Social Officer will arrange a meeting between the Contractor, Landowner/Resident and the ECO. This meeting will be held on the property affected and is aimed at determining Landowner/Resident, Contractor, Environmental and Social requirements. Aspects identified in the specifications for the pre-construction survey must be recorded. In addition, the Fencing Act (Act 63 of 1963) regulates activities associated with fencing and gates. Therefore, in terms of	Eskom Project Manager, Contractor, ECO, SO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		this Act, it is critical for the Contractor and the Land owner to agree on fences and gates that need dismantling/erection. Where existing fences have to be dismantled and re-erected, they shall be erected to the same design as the original and to the satisfaction of the landowner, but with such modifications as may be required by the Eskom Project Manager. All incidents occurring during the completion of the Contractors duties shall be reported to the Eskom Project Manager in writing, by the Contractor. The Eskom Project Manager will then assess the incident, concern or claim with the assistance of the ECO and determine the compensation/corrective action required by the Contractor. The Contractor will take all actions required to ensure no re-occurrence of the incident/claim or concern occurs again. The Contractor shall adhere to the timeframes for dealing with Land owner/I&AP concerns below: • Record concern in the Communications Register and verbally notify the ECO – immediate. • Respond to the concern – within 1 day of concern being raised. • Rectify/mitigate concern – within 3 days of concern being raised. • Respond in writing on "close out" of concern – within 5 days of concern being raised. • Submit to the Eskom Project Manager a detailed report – within 7 days of concern being raised.	
	Communications Register	All complaints received will be investigated and a response given to the complainant within 10 days. Complaints and positive feedback received from I&APs must be recorded in the Communications Register. The complaint will be brought to the attention of the Eskom Project Manager, who will respond accordingly.	Eskom Project Manager, Contractor, EO, SO, ECO
	Inflow of workers	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process The recruitment process and the use of contractors should be clearly communicated with the local communities The communication strategy should ensure that unrealistic employment expectations are not created. A representative of Eskom could liaise with the local councillors to either attend key community meetings arranged within the various wards to discuss the employment and recruitment process; or liaise with the local councillors to ensure that the correct information regarding this issue is portrayed to the communities via the councillors. Eskom personnel should preferably not access private properties without prior notification of the property owners. Eskom personnel should behave properly at all times. Before construction commences, representatives from the TWK LM and community leaders (e.g. councillors) and community-based organisations, should be informed of the details of the contractors, size of the workforce and construction schedules. Should a large number of temporary workers not form part of the local community members, the contractor should make certain that the "outside" workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the high density settlements do not create conflict within these surrounding communities. Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant). A transparent and all inclusive communication and recruitment process should be implemented by the contractor Eskom should introduce contractual obligations for contractors to use local labour as far as possible Accommodation facilities should be adequate and should be able to deal with the requirements set by the contractor Construction workers should be supervised at all times Property owners affected by the power lines and those surrounding the MTS area should be informed of the construction schedules and activities Security (infrastructure and personnel) on-site at the MTS should be implemented during the construction period	Eskom Project Manager, Contractor, EO, SO, ECO
	Safety and security	The movement of construction vehicles through the local communities should be limited to off-peak periods (if possible) to minimise adverse impacts on the movement of pedestrians (schoolchildren and individuals walking to and from work) and to a lesser extent on private vehicular traffic. Signs must be erected at strategic locations throughout the area, warning residents and visitors about the hazards around the construction site and the presence of heavy vehicles. Employing local community members could minimise the potential for criminal activity or perceived perception of an increase in criminal activity due to the presence of an outside workforce. Screening of workers that apply for work could be useful to lessen perceived negative perceptions about the outside workforce. The servitude management should be monitored on an ongoing basis. Eskom should take a strong stance with regards to the illegal squatting within the servitude areas. For safety reasons these dwellers should be moved out of the servitude areas on an ongoing basis. Eskom should, in conjunction with the TWK LM, develop an emergency management plan to specifically deal with the increased risk of fires.	Eskom Project Manager, Contractor, EO, SO, ECO
11.	**Noise Management**		
	Noise	Noise sources include construction machinery, power tools and compressors, vehicle movements, general construction activity and drilling. To limit noise levels, the following actions will be taken: Vehicles and machinery will be kept in good working order and equipped with silencers. Noisy activities will only be undertaken only during normal working hours: 07h00 to 17h00 on weekdays, Saturdays from 07h00 to 13h00 and no work on Sundays or public holidays. Work may not be conducted outside this period without the written authorisation of the Eskom Project Manager. The speed of delivery and construction vehicles in construction areas will be limited to 25km/h. Any complaints will be investigated and corrective action implemented and documented.	Contractor, EO, ECO, SO
12.	**Rehabilitation Plan**		
	Rehabilitation	See **Environmental Specifications – Rehabilitation Activities**.	
13.	**Soil Management**		
	Soil management	Compaction by vehicles or poor storage methodology or careless handling of topsoil can cause erosion or contamination. The objective is to prevent compaction and the loss of soil structure, the following soil handling techniques shall be employed: Soil stockpiles should not be higher than 1m with slopes of 1m vertical to 2,5m horizontal Soil will not be handled during windy conditions (else it will be dampened to reduce dust production) All stripped soil will be stockpiled for use in rehabilitation	Contractor, EO, ECO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		The soil will be stockpiled: • at a sheltered site protected from wind erosion; • outside the working area where it will not be compacted by traffic; • away from watercourses so there is no risk of wash-away; and • to promote runoff, soil stockpiles will be rounded off (convex) at the top. Repeated handling of soil will be avoided. Overburden must be removed and stockpiled separately from topsoil stockpiles. Overburden stockpiles may not be permitted to overflow and contaminate topsoil stockpiles. All polluted soils shall be replaced by the Contractor(s) at his own cost.	
	Agriculture	Adding organic matter and fertiliser to the sandy soils can often make them productive. Farming practices can still continue within the power line servitudes in between the pylon positions. The maximum operational height under the conductors is 5.5 metres. Eskom should select tower types and construction approaches to have the minimum impact on agricultural practices. Noise and dust should be kept to a minimum. Eskom should keep the construction of access roads to a minimum and rather use the existing infrastructure, as the construction and maintenance of these roads is very costly, impact on the residents' daily living and movement patterns, and create a potential for erosion. Rehabilitation of new access roads for construction vehicles should be undertaken as soon as the construction process allows. Should any of the towers negatively impact on the agricultural production capacity of Bakenhoogte Olie Farm, it should be calculated and taken into consideration when compensation is negotiated. Tower positions should, where possible, be placed on the borders of properties.	Contractor, EO, ECO, SO
	Spoil	Excess material obtained from the foundation footprint, shall be spoilt off site at the registered landfill site.	Contractor, EO, ECO, SO
14.	**Traffic Management**		
	Traffic management	The Contractor shall provide safe points for pedestrian and vehicular crossing at designated points. These points will be "stop-and-go" systems manned by flag persons. Orange safety fencing / netting must be utilised by the Contractor to keep pedestrians away from the construction work area. Danger tape must not be used, as this breaks easily and could litter the surrounding environment. Appropriate notification signs shall be erected by the Contractor at entrances to the construction site to warn visitors and pedestrians about the hazards around the construction site and the presence of heavy vehicles, where appropriate. Construction vehicles are to keep to the speed limits (25km/h on the construction site).	Contractor, EO, ECO, SO
	Access	Residents shall be allowed access to their properties at all times. In cases where residents have no vehicular access to their properties, safe parking shall be arranged. All access roads for construction vehicles shall be properly rehabilitated. Advertising boards displaying road safety messages focused on pedestrians shall be erected. Proactive warning signs shall be erected in the case of traffic disruption or diversion and along access roads. Existing tracks and roads shall be used. Due to the requirement of placing poles in new localities, access to these sites shall be required. The Contractor shall identify a suitable route and ensure all vehicular access follows that route. This route shall be the shortest and most direct route with the least impact upon sensitive environments. These routes shall not be cleared and grubbed with the natural vegetation remaining *in situ*. No new access roads shall be constructed in watercourses with the respective 1:100 year flood line. Helicopters should be used to erect towers in sensitive areas.	Contractor, EO, ECO, SO
15.	**Training Programmes**		
	Construction personnel information posters	The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the EMPr. Such posters shall be erected at the site access area, eating areas, and any other locations specified by the Eskom Project Manager.	Contractor, EO, ECO, SO
16.	**Waste Management**		
	Waste management	A waste sorting facility will be established at the construction site office / yard. Solid waste will be separated into recyclable and non-recyclable waste. Timber, metal, oil, paper, bricks, tyres, batteries and any other major recyclable wastes will be stored in safe, secure areas prior to disposal. Proof of disposal must be kept on file and presented to the ECO on request. General non-recyclable refuse will be collected in appropriate bins with secure lids to be disposed of at a registered waste landfill Site or at the nearest transfer station with capacity to accept the waste generated by the project. Proof of disposal must be kept on file and presented to the ECO on request. The Contractor will provide weather- and vermin-proof bins, which shall be cleaned on a daily basis. The Contractor must ensure that staff do not leave food lying around after breaks. A separate oil container will be used to ensure that oil wastes are contained. All chemical drums will be transported to a designated and lined bunded area when full, empty or when the contents of the drum are unusable or unknown. All drums will be appropriately disposed of at a registered hazardous waste landfill site. Proof of disposal must be kept on file and presented to the ECO on request. No burning, burying or dumping of any solid waste materials will be permitted on site. This includes temporary dumping or storage outside the designated and fenced off development area. The Contractor will supply temporary ablution facilities (e.g. non-chemical or composting toilets) of an acceptable standard, with a minimum of one facility per 15 workers. The use of the surrounding areas for ablutions is strictly prohibited. The temporary ablution facilities will be monitored on a regular basis to ensure that the toilets are cleaned and emptied on a regular basis. The temporary ablution facilities will be secured to the ground to prevent them from being blown over in high winds. Ablution facilities should be placed within 50m of work areas.	Contractor, EO, ECO
17.	**Water Management**		
	Surface and groundwater	Construction activities should take place during the dry season to reduce the risk of contamination through runoff. Storm water runoff must be prevented from coming into contact with waste or contaminants on the site. Discharge of effluents or polluted water into the water resources shall not be allowed. All TEM shall be refuelled off-site.	Contractor, EO, ECO

Construction Activities Site Management			
Activity/Issue		**Action required**	**Responsible Party**
		Water emanating from the mixing of cementitious products must be contained and prevented from entering the environment. The Contractor shall prevent the discharge of any pollutants, such as bentonite, cements, concrete, lime, chemicals and fuels into any water resource. High levels of safety need to be applied to the construction of the pipeline so that groundwater quality is not negatively impacted. Water released by the Contractor into the environment must comply with the attached DWA water standards (Refer to Annexure B).	
	Natural Drainage	The Contractor shall ensure all works undertaken do not negatively impact upon drainage lines, either natural or man-made. Should the Contractor be required undertake works and impact upon a drainage line, the ECO shall be notified and the requirement discussed with the affected landowner. The Contractor shall be required to make good on all damage upon completion of construction related works.	Contractor
	Health and safety	Adequate water supply and sanitation related facilities should be provided to the workers at the construction sites.	Contractor

12.3.5 Environmental Specifications – Rehabilitation Activities

Rehabilitation Activities			
Activity /Issue		**Action required**	**Responsible Party**
1.	**Rehabilitation**	The Contractor shall utilise the EMPr together with Eskom's Rehabilitation Guideline documents as the basis against which all rehabilitation works shall comply. Disturbed areas that are no longer in use will be rehabilitated. If areas had topsoil removed and stockpiled prior to use, the surface will be ripped and the topsoil will be replaced. All soils and topsoil material must be bought from a reliable source, and must be free of alien seeds or grass runners. Fences, barriers and demarcations associated with the various construction phases and activities must be removed (unless the Eskom Project Manager has stipulated otherwise). The site will be cleared of all litter. The Contractor must repair any damage that the construction works have caused to neighbouring properties. All remaining construction materials must be removed from the site. Once construction activities are completed, the area must be rehabilitated and all vegetation (i.e. trees and grass) must be restored. A meeting must be held on site between the Applicant or representative, the ECO and the Contractor to approve all rehabilitation activities and to ensure that the site has been restored to a condition that is acceptable and approved by the Applicant. Rehabilitation will be conducted in a progressive manner (i.e. once construction in an area has been completed the area will be rehabilitated). The rehabilitation of the area with indigenous vegetation must coincide with the rainfall events and all alien invasive vegetation shall be removed. **Seed acquisition** The Contractor shall purchase seed from a South African National Seed Organisation (SANSOR) accredited dealer. Seed used for rehabilitation shall not be older than one season. Purchased seed must be of the correct species and of known origin, dried and packed, conforming to all legal requirements for seed. Proof of compliance must be provided to the Eskom Project Manager prior to commencement of works. The most suitable seed mix for disturbed areas to be used in rehabilitation must include indigenous species. **Seed Mix** A local Botanical Specialist shall be appointed by the Contractor prior to the commencement of works to identify a suitable seed mix required for rehabilitation purposes. An appropriate mix of the following pioneer, sub-climax and climax grasses may include the following and must be confirmed with the ECO: 1kg/Ha *Chloris gayana* – Rhodes grass 3kg/Ha *Cenchrus ciliaris* – Foxtail buffalo grass, Bloubuffel grass 3kg/Ha *Digitaria eriantha* – Common finger grass, Smutsvinger 1kg/Ha *Panicum maximum* – Guinea grass. **Methodology and Recommendations** The blend should be seeded using the hydro-seeding method, gel seeded with a fluid-driller or gel seeded by hand. Alternatively the seed can be mixed in with locally occurring river sand at a ratio of 1:4 (seed: sand). A tackifier (viz. Hydropam) shall be added to the seed/sand mix at the recommended dosage rate per volume used. As the recommended seed species vary greatly in size, weight and shape, they cannot effectively be dry-seeded. This leads to segregation and unsatisfactory establishment and the formation of unnatural appearing differentiation and 'colonies'. The gel mixture allows a more consistent blend of the species and consequent diverse and random establishment of the veld. Seed after the first rain onwards (April – September). If the average rainfall pattern for the area is experienced, no additional irrigation will be required. In the event of a dry period where no precipitation is received for longer than 21 days during the first six weeks after seeding, irrigation of 20mm per week will assist in successful establishment. However, it is recommended that resources be applied to using the hydro gels or water-absorbing super polymers. It is recommended that a tackifier (*viz.* Hydropam) be included in the seeding mix or applied immediately after gel seeding to reduce desiccation, wind dispersion and fauna foraging losses. Till the soil surface before seeding. This is best achieved by shallow parallel ripping or scarification along the contour or linear to the ditches. The rills or small windrows formed should be no more than 150mm apart. It is good practice to apply a mulch of harvested straw from natural grassland or veld in the vicinity. This is most effective in the period from December – February when many of the local species will be holding viable seed, which will add to the seeded blend resulting in a more diverse and locally natural veld. If there is no rainfall and subsequent germination for a period of five weeks (35 days) after sowing, the seeded area should be retreated with a tackifier and watered. Irrigation and fertilisation with nitrogen and potassium is not essential, but will accelerate establishment and growth. The critical phase is the period 14-30 days after seeding, when the grass seed has germinated and is producing its first leaves. This can be applied at 15kg of Actual N per hectare and 5kg of Actual K per hectare. It can be applied in a liquid form or conventional granular form. The recommended blend is designed to have a germination period or 'window' from 7-90 days. Lack of evidence of germination after six weeks does not indicate complete failure but a change in the population densities of the various species. It is recommended to seed an area once per season and reassess in the following season to determine whether reseeding is necessary. **Seed Availability** The recommended seed species and varieties are all freely commercially available and can be sourced by most agricultural suppliers and co-ops. They are used as forage crops by stock farmers. A local agricultural supplier should be able to source them all. They can also purchase directly from the following seed importer and supplier, who can also advise on local agents and representatives: Agricol: (021) 981 1226 The rehabilitation of the area with indigenous vegetation must coincide with the rainfall events and all alien invasive vegetation shall be removed. Rehabilitation measures for the site are to include the following: **Re-contouring** Subsoil stockpiles should be used to re-contour construction affected areas. The Contractor shall restore the profile, soil condition and landform to as close as possible state to the pre-construction state. **Scarification and ripping** All areas where rehabilitation interventions are required shall be cross-ripped before topsoil placement. Topsoil	Applicant, Contractor, ECO, EO

Rehabilitation Activities			
Activity /Issue		**Action required**	**Responsible Party**
		and fertile soil shall be uniformly scarified to allow for vegetation growth. **Fertilising** The Contractor shall be required to perform soil analysis tests on the top 75mm of prepared surface prior to re-vegetation / seeding to determine the required fertiliser levels for permanent cover. **Schedule of works** The Contractor shall schedule works for placing of topsoil once the pipeline has been successfully commissioned. Seeding can take place after the first rains of the season and should be concluded one month before the end of the growing season. **Re-vegetation** The Contractor shall appoint a reputable rehabilitation company to undertake this work. All details of the company shall be forwarded to the Eskom Project Manager prior to the commencement of the works. The seed mix required for re-vegetation will comprise a selection of species that are indigenous and locally occurring and capable of growing under natural conditions. **Control of weeds and invader plants during rehabilitation** The Contractor shall maintain rehabilitated areas free of weeds and invader plants until the end of the Defects Notification Period applicable to rehabilitation. Control of weeds and invader plants must be done in accordance with the specifications stipulated in the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA). **Rehabilitation of the watercourses.** Watercourses shall be rehabilitated immediately after the works have been completed as these are sensitive habitats and disturbance must be kept to a minimum. The bed of the watercourse shall be restored to a similar state, in terms of the soil profile, as well as physical and chemical properties as established in the pre-construction survey. All temporary infrastructure shall be removed and the areas of disturbance reinstated. The contours and edges of the watercourses will be reshaped in accordance to the photographic and topographical survey to tie in with the surrounding landscape. The bed of the watercourse will be restored to contain the same bedding material as prior to the commencement of pipe removal activities.	
2.	**Monitoring**	After construction, the site needs to be inspected by the ECO to ensure that the rehabilitation activities have been successful and to monitor alien vegetation re-growth. The ECO will report the condition of rehabilitation to the Applicant. The Applicant is responsible for clearing alien vegetation within the rehabilitated areas.	ECO, Applicant

12.3.6 Environmental Specifications – Operational Activities

The operational activities reflected in the table below highlight specific requirements which need to be implemented by the Applicant during the operational phase of the development. In addition, the Eskom Guideline Documents (and their respective Eskom reference number) are included which provide Eskom specific procedures associated with each of the activities / issues. In the event the Eskom Guideline Documents do not adequately provide for management and mitigation pertaining to the below management plans, then the Applicant shall compile these site specific management plans prior to operation:

- Plant Rescue and Protection Plan
- Open Space Management Plan;
- Re-vegetation and Habitat Rehabilitation Plan;
- Storm-water Management Plan
- Hazardous Substances Management and Monitoring Plan;
- Erosion Management Plan;
- Traffic Management Plan;
- Environmental Sensitivity Map; and
- Hydrological Protection Management Plan.

General Issues					
Activity /Issue		**Action required**	**Guideline Document**	**Reference No#**	**Responsible Party**
1.	**Aesthetics Management**	The Applicant shall reduce operational and maintenance impacts upon the aesthetics of the surrounding environment. **Substation** • On-going management of security lights at night • Continued maintenance of screening vegetation **Loop In Loop Out** • Continued rehabilitation and maintenance of erosion control programs	Transmission Environmental Policy Programme	TPL41-435	Applicant
2.	**Dust Management**	The Applicant shall preserve air quality levels to an extent that public health; safety and environmental protection are assured.	Environmental Management Transmission Environmental Policy Programme	EPC 32 – 96 TPL41-435	Applicant
3.	**Earthworks Management**	The Applicant shall minimise impacts on the receiving environment and disturbances to flora, fauna and affected landowners.	Transmission Environmental Policy Program Transmission Line Towers and Line Construction me	TPL41-435 TRMSCAAC	Applicant
4.	**Erosion Management**	The Applicant shall implement measures to prevent erosion and reduce potential impacts upon the surrounding environment.	Soil Erosion Guideline Transmission Environmental Policy Programme	TGL 41 337 TPL41-435	Applicant
5.	**Fauna and Flora Management**	The Applicant shall preserve fauna and flora through control of operational and maintenance activities. Prevent infestation of alien species during operational and maintenance activities. The CARA states that no person shall disperse any weed in the country (including an urban area) and a fine not exceeding R5 000 and/or two years imprisonment can be imposed. The Applicant shall continue to monitor and implement, if required, the Rehabilitation Plan and Alien Invasive Species Control Plan on the site.	Vegetation Management Guideline Transmission Bird Collision Prevention Guideline Transmission Bird Perch Guideline Bush Clearance Policy Transmission Environmental Policy Programme	TGL 41 334 TGL41-335 TGL41-332 ESKASA BG3 TPL41-435	Applicant
6.	**Fire and Emergency Management**	The Applicant shall restrict the occurrence of fires and ensure all role players can respond efficiently and effectively, thereby reducing potential impact. Orange safety fencing must be used around any area that requires the digging of a trench for maintenance purposes. The standard specifications for municipal civil engineering works must be followed for emergency maintenance purposes.	Fire Protection Association Guideline Fire Risk Management Transmission Environmental Policy Programme	TGL 41 336 TLL 32 124 TPL41-435	Applicant
7.	**Hazardous Substance Management**	The Applicant shall minimise the impact of hazardous substance storage, handling and disposal on the receiving environment Accidental pollution incidents shall be reported to the Applicant immediately when they occur. The Applicant shall notify the relevant authorities as well as arrange appropriate amelioration. All potential hazardous waste generated at the site including diesel, petroleum, oil and lubricants; pesticides; and effluent disinfectants shall be removed and disposed by an approved subcontractor to an approved disposal site. Potentially hazardous raw and waste materials shall be handled and stored on-site in accordance with the manufacturer's specification and in accordance with the Act. Should pesticides be used for controlling weeds or vegetation at any place adjacent to the pipeline, the Fertilisers, Farms Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) apply. Should subcontractors apply pesticides, the Applicant shall ensure that their operators are registered according to the Act. Should the TWK LM staff be used for this application, the Applicant shall ensure that they are properly trained.	Herbicide Management Policy Safe Use of Herbicides and Pesticides Transmission Environmental Policy Programme	ESKPBAA D4 ESKASAA L0 TPL41-435	Applicant

General Issues					
Activity /Issue		**Action required**	**Guideline Document**	**Reference No#**	**Responsible Party**
8.	**Heritage Management**	The Applicant shall limit and mitigate potential heritage impacts and chance findings should they occur.	Transmission Environmental Policy Programme	TPL41-435	Applicant
9.	**Infrastructure Management**	The Applicant shall reduce impacts of the infrastructure on air quality, aesthetics, land access and the surrounding environment.	Transmission Environmental Policy Programme	TPL41-435	Applicant
10.	**Land Use**	The Applicant shall minimise disturbances to landowners; land use rights and associated impacts upon commercial activities. Eskom maintenance personnel should be in possession of the required identification documents when undertaking maintenance work.	Access to Farms Guideline Transmission Servitude Gates Standard Transmission Environmental Policy Programme	TPC 41 340 TGL41-338 TPL41-435	Applicant
		The Applicant shall respond to queries and complaints from the public and documenting the details of such communications.			
		No soil erosion or invasion of declared weeds and/or invader plant(s) takes place, especially on rehabilitated areas. The Applicant shall continue to monitor and implement, if required, the Rehabilitation Plan and Alien Invasive Species Control Plan on the site, especially the rehabilitated areas. The requirements of CARA and NEM:BA shall apply.			
		No activities associated with the operation of the substation site should negatively impact on the borehole used by the Wildekrans Wine Estate No activities should negatively impact on the production of olives to the north of the substation sites It is imperative that the construction of additional access roads be undertaken in full consultation with the property owners. Land to be used for future agricultural activities should not be negatively impacted on			
		Maintenance schedules of the power lines should be communicated and clarified with the property owners The MTS should be maintained and operated according to relevant regulations and guidelines			
		The mitigation measures as part of the Town Planning Study should be noted. To limit the impact on the land use in the area, the development should remain as close to the existing infrastructure as possible.			
		New business development should be encouraged by means of the project to enhance the local economy			
		Eskom should ensure that no one is allowed to live within the servitude. In no cases should the regulated servitude widths which function as buffers be relaxed			
11.	**Noise Management**	Reduce operational and maintenance related noise affecting the surrounding environment.	Environmental Management Transmission Environmental Policy	EPC 32 – 96 TPL41-435	Applicant
		Noise emanating from operational activities shall not be disturbing noise. The sound level from the site measured at the nearest dwelling must not exceed the ambient noise level by more than 7dBA.			
12.	**Rehabilitation Plan**	To rehabilitate impacted areas to a suitable land capability class similar to that of the surrounding environment. Rehabilitation will take existing land uses into consideration. Rehabilitation should start immediately after work is completed.	Transmission Environmental Policy Program Vegetation Management Guideline	TPL41-435 TGL41-334	Applicant
13.	**Social**	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the maintenance and operational phase The recruitment process and the use of contractors should be clearly communicated to the local communities The communication strategy should ensure that unrealistic employment expectations are not created. A representative of Eskom could liaise with the local councillors to either attend key community meetings arranged within the various wards to discuss the employment and recruitment process; or liaise with the local councillors to ensure that the correct information regarding this issue is portrayed to the communities via the councillors. Eskom personnel should preferably not access private properties without prior notification of the property owners. Eskom maintenance personnel should be in possession of the required identification documents when undertaking maintenance work. Eskom personnel should behave properly at all times. Local labourers should be employed, where possible. Before construction commences, representatives from the TWK LM and community leaders (e.g. councillors) and community-based organisations, should be informed of the details of the contractors, size of the workforce and construction schedules. Should a large number of temporary workers not form part of the local community members, the contractor should make certain that the “outside” workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the high density settlements do not create conflict within these surrounding communities. Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant). Eskom shall implement mechanisms to control the establishment of informal settlements below the Transmission power line. Eskom personnel should preferably not access private properties without prior notification of the property owners.			Applicant

General Issues					
Activity /Issue		**Action required**	**Guideline Document**	**Reference No#**	**Responsible Party**
		Property owners should be notified if alien vegetation clearing would be undertaken. Maintenance and emergency activities on private properties should be strictly supervised. When accessing private properties, general good conduct of workers should prevail.			
14.	**Soil Management**	The Applicant shall manage the removal and stockpiling of topsoil and subsoil during the maintenance and operation phase of the scheme for use during rehabilitation.	Transmission Environmental Policy Programme	TPL41-435	Applicant
15.	**Traffic Management**	The Applicant shall minimise the impacts and extent of related traffic on the surrounding road network and environment, whilst maximising road user safety.	Transmission Environmental Policy Programme	TPL41-435	Applicant
		Vehicles used for the maintenance of the Transmission line must use existing access roads only. New access roads may not be used for this purpose. Access to the Transmission line servitude from the existing access road must be the most direct route possible to the servitude.			
		The maintenance of the Transmission line servitude that goes through watercourses must be undertaken with caution. Access through watercourses must be limited by maintenance vehicles.			
16.	**Training Programmes**	The Applicant shall foster skills transfer, environmental awareness, health and safety awareness and materials and equipment skills.	Safety, Health, and Environment (SHE) Policy Transmission Environmental Policy Programme	EPC 32 – 94 TPL41-435	Applicant
17.	**Waste Management**	The Applicant shall implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency.	Waste Management Policy Transmission Environmental Policy Programme	ESKPBAAC4 TPL41-435	Applicant
18.	**Water Management**	The Applicant shall minimise the impact and maintain integrity of affected water resources.	Environmental Management Transmission Environmental Policy	EPC 32 – 96 TPL41-435	Applicant
		Precaution shall be taken that no surface or groundwater becomes polluted either through seepage or natural flow. Any deliberate or unplanned pollution of water is an offence according to the NWA and punishable with an undetermined fine, and/or five years imprisonment.			
		Operational and maintenance staff shall not be permitted to use watercourses for the purpose of bathing, washing of clothes, vehicles, operational and maintenance equipment nor disposal of any other waste.			
		Should an incident occur, which can cause water pollution, especially if it affects watercourses, the office of the Department of Water Affairs (Western Cape Region) shall be contacted immediately (see requirements in the NWA). Cleaning up shall take place in consultation with the Department.			
		No person shall discard or dump any litter within or adjacent to the servitude. At all times operation and maintenance staff should ensure that litter is discarded in appropriate containers.			
		Any solid waste derived during operation and maintenance shall be disposed at registered landfill site.			
		Employ a stormwater management system that follows the principles of a sustainable urban drainage system, with input from a freshwater ecologist on the design.			
		A cut-off drain with sumps should be constructed around the proposed Asteria Eskom MTS facility and regular maintenance inspections of the facility should be undertaken to ensure that machinery containing liquid contaminants (e.g. oil and fuel) is free of leakage.			

12.3.7 Environmental Specifications – Decommissioning

The decommissioning activities reflected in the table below highlight specific requirements which need to be implemented by the Applicant during the decommissioning phase of the development. In addition, the Eskom Guideline Documents (and their respective Eskom reference number) are included which provide Eskom specific procedures associated with each of the activities / issues.

General Issues					
Activity /Issue		**Objective**	**Guideline Document**	**Reference No#**	**Responsible Party**
1.	**Aesthetics Management**	The Applicant shall reduce decommissioning impacts upon the aesthetics of the surrounding environment.	Transmission Environmental Policy Programme	TPL41-435	Applicant
2.	**Dust Management**	The Applicant shall preserve air quality levels to an extent that public health; safety and environmental protection are assured.	Environmental Management Transmission Environmental Policy Programme	EPC 32 – 96 TPL41-435	Applicant
3.	**Earthworks Management**	The Applicant shall minimise impacts on the receiving environment and disturbances to flora, fauna and affected landowners.	Transmission Environmental Policy Program Transmission Line Towers and Line Construction me	TPL41-435 TRMSCAAC	Applicant
4.	**Erosion Management**	The Applicant shall prevent erosion and reduce potential impacts upon the surrounding environment.	Soil Erosion Guideline Transmission Environmental Policy Programme	TGL 41 337 TPL41-435	Applicant
5.	**Fauna and Flora Management**	The Applicant shall preserve fauna and flora through control of decommissioning activities. Prevent infestation of alien species during decommissioning activities.	Vegetation Management Guideline Transmission Bird Collision Prevention Guideline Transmission Bird Perch Guideline Bush Clearance Policy Transmission Environmental Policy Programme	TGL 41 334 TGL41-335 TGL41-332 ESKASA BG3 TPL41-435	Applicant
6.	**Fire Management**	The Applicant shall restrict the occurrence of fires and ensure all role players can respond efficiently and effectively, thereby reducing potential impact.	Fire Protection Association Guideline Fire Risk Management Transmission Environmental Policy Programme	TGL 41 336 TLL 32 124 TPL41-435	Applicant
7.	**Hazardous Substance Management**	The Applicant shall minimise the impact of hazardous substance storage, handling and disposal on the receiving environment	Herbicide Management Policy Safe Use of Herbicides and Pesticides Transmission Environmental Policy Programme	ESKPBAA D4 ESKASAA L0 TPL41-435	Applicant
8.	**Heritage Management**	The Applicant shall limit and mitigate potential heritage impacts and chance findings should they occur.	Transmission Environmental Policy Programme	TPL41-435	Applicant
9.	**Infrastructure Management**	The Applicant shall to reduce impacts of decommissioning the infrastructure on air quality, aesthetics, land access and the surrounding environment.	Transmission Environmental Policy Programme	TPL41-435	Applicant
10.	**Land Use**	The Applicant shall minimise disturbances to landowners; land use rights and associated impacts upon commercial activities.	Access to Farms Guideline Transmission Servitude Gates Standard Transmission Environmental Policy Programme	TPC 41 340 TGL41-338 TPL41-435	Applicant
		During decommissioning of any part of the Transmission power line, the following steps shall be undertaken to ensure that the decommissioning and resulting rehabilitation is undertaken as effectively and responsibly as possible. Upon the decision for decommissioning, the Applicant shall inform the DEA, or, should this department be no longer in operation, the relevant authority in charge of such affairs, in writing, stating the proposed closure date and the reasons for such action, within 30 days of the decision being made. At all times during the decommissioning phase the Applicant will ensure that all relevant regulations, national and local legislation are adhered to and that the relevant authorities are informed and involved in the process as much as possible. Any additional recommendations or requirements made by the DEA in relation to this activity shall be recorded and adhered to at all times during the decommissioning phase. All equipment and materials relating to the operation and maintenance of the Transmission power line shall be removed from the site in accordance with recommendations of DEA or other relevant authority.			

General Issues					
Activity /Issue		**Objective**	**Guideline Document**	**Reference No#**	**Responsible Party**
11.	**Noise Management**	The Applicant shall reduce decommissioning related noise affecting the surrounding environment.	Environmental Management Transmission Environmental Policy	EPC 32 – 96 TPL41-435	Applicant
12.	**Rehabilitation Plan**	To rehabilitate impacted areas to a suitable land capability class similar to that of the surrounding environment. Rehabilitation will take existing land uses into consideration. Rehabilitation should start immediately after decommissioning is completed. All excavations must be rehabilitated with soil and topsoil, which should not contain invasive plant species (in compliance with the CARA and NEM:BA, as amended), to the satisfaction of the ECO. All building materials must be removed from the site. All compacted surfaces must be ripped and re-vegetated as per the re-vegetation specifications. • A meeting must be held on-site between the Applicant or representative, the ECO and the appointed Contractor to approve all rehabilitation activities and to ensure that the site has been restored to a condition that is acceptable and approved by the Applicant and the DEA. • The most suitable seed mix for disturbed areas to be used in rehabilitation would include indigenous species. • Rehabilitation will be conducted in a progressive manner (i.e. once construction in an area has been completed the area will be rehabilitated). The rehabilitation of the area with indigenous vegetation must coincide with the rainfall events and all alien invasive vegetation shall be removed. Rehabilitation measures for the site are to include the following: • Re-contouring Subsoil stockpiles should be used to re-contour construction affected areas. The Contractor shall restore the profile, soil condition and landform to as close as possible state to the pre-construction state. • Scarification and ripping All areas where rehabilitation interventions are required shall be cross-ripped before topsoil placement. Topsoil and fertile soil shall be uniformly scarified to allow for vegetation growth • Fertilising The Contractor shall be required to perform soil analysis tests on the top 75mm of prepared surface prior to re-vegetation/seeding to determine the required fertiliser levels for permanent cover. • Seed acquisition The Contractor shall purchase seed from a South African National Seed Organisation (SANSOR) accredited dealer. Seed used for rehabilitation shall not be older than one season. Purchased seed must be of the correct species and of known origin, dried and packed, conforming to all legal requirements for seed. Proof of compliance must be provided to the Eskom Project Manager prior to commencement of works. • Schedule of works The Contractor shall schedule works for placing of topsoil once the Transmission power line has been successfully decommissioned. Seeding can then take place after the first rains of the season and should be concluded by one month before the end of the growing season. • Re-vegetation The Contractor shall appoint a reputable rehabilitation company to undertake this work. All details of the company shall be forwarded to the Eskom Project Manager prior to the commencement of the works. The seed mix required for re-vegetation will comprise a selection of species that are indigenous and locally occurring and capable of growing under natural conditions. The grass cover requirements at the end of the growing seasons following the rehabilitation work and hydro seeding are: ○ 60% cover of the approved seed mix species diversity after the first growing season. ○ 80% cover of the approved seed mix species diversity after the second growing season. ○ The Defects Notification Period applicable to rehabilitation will commence when the 60% grass	Transmission Environmental Policy Program Vegetation Management Guideline	TPL41-435 TGL41-334	Applicant

General Issues					
Activity /Issue		**Objective**	**Guideline Document**	**Reference No#**	**Responsible Party**
		cover is achieved and end when 80% grass cover is achieved. The seed mix for use in rehabilitation must be an approved mix of indigenous grass species common to the area. The Contractor must inform the Eskom Project Manager to deviations from this seed mix prior to purchase of seed. • Control of weeds and invader plants during rehabilitation The Contractor shall maintain rehabilitated areas free of weeds and invader plants until the end of the Defects Notification Period applicable to rehabilitation. Control of weeds and invader plants must be done in accordance with the specifications stipulated in the CARA and NEM:BA. • Erosion control The Contractor shall be responsible for the prevention of erosion in areas impacted upon by their activities. All erosion repairs must be implemented at the first signs thereof and no erosion shall be allowed to develop on a large scale. The Contractor must present the site in an erosion free state before the issuing of the Performance Certificate. • Water course crossings All temporary infrastructure shall be removed and the areas of disturbance reinstated. The banks and contours of the water course will be reshaped in accordance to the photographic and topographical survey to tie in with the surrounding landscape. The bed of the watercourse will be restored to contain the same bedding material as prior to construction activities taking place. At the time of decommissioning, the appointed Contractor or the Applicant must submit a method statement to the DEA to manage and rehabilitate the work in the watercourses in accordance with the specification. The watercourses shall be rehabilitated immediately after the works have been completed as these are sensitive habitats and disturbance must be kept to a minimum. The beds of the watercourses shall be restored to a similar state, in terms of the soil profile, as well as physical and chemical properties as established in the pre-construction survey.			
13.	**Soil Management**	The Applicant shall manage the removal and stockpiling of topsoil and subsoil during the decommissioning phase of the scheme for use during rehabilitation.	Transmission Environmental Policy Programme	TPL41-435	Applicant
14.	**Traffic Management**	The Applicant shall minimise the impacts and extent of related traffic on the surrounding road network and environment, whilst maximising road user safety.	Transmission Environmental Policy Programme	TPL41-435	Applicant
15.	**Training Programmes**	The Applicant shall foster skills transfer, environmental awareness, health and safety awareness and materials and equipment skills.	Safety, Health, and Environment (SHE) Policy Transmission Environmental Policy Programme	EPC 32 – 94 TPL41-435	Applicant
16.	**Waste Management**	The Applicant shall implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency. All recyclable rubble and solid waste (e.g. scrap metal, cables, bottles, cans, and plastic residues) shall be collected and disposed of through a registered recycling company. Waste manifests will be kept by the Contractor and shown to the ECO on request. All non-recyclable rubble and solid waste shall be collected and disposed of at a registered landfill site). Waste manifests will be shown to the ECO on request.	Waste Management Policy Transmission Environmental Policy Programme	ESKPBAAC4 TPL41-435	Applicant
17.	**Water Management**	The Applicant shall minimise the impact and maintain integrity of affected water resources.	Environmental Management Transmission Environmental Policy	EPC 32 – 96 TPL41-435	Applicant

13 REFERENCES

BKS. 2013. Draft Environmental Impact Assessment (EIA) Report for the Proposed Eskom 400/132kV Asteria Main Transmission Substation (Previously Known as the Houhoek Main Transmission Substation), including the Bacchus-Palmiet Loop-In and Loop-Out Power Lines and Eskom Distribution Power Line Integration, Western Cape Province. DEA Reference Number: 14/12/16/3/3/2/401. Pretoria.

City of Cape Town. 2007. Environmental Management Plan - Specification EM – 02/07: Environmental Management, Version 6 (2007).

DEAT. 2002. Screening, Information Series 3, Department of Environmental Affairs and Tourism, Pretoria.

DEAT. 2004a. EMPs, Integrated Environmental Management, Information Series 12, Pretoria.

DEAT. 2004. Environmental Auditing, Integrated Environmental Management, Information Series 14, Pretoria.

DWAF. February 2005. Environmental Best Practice Guidelines: Construction. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.

DWAF. February 2005. Environmental Site Management and Rehabilitation Awareness Course: General Level. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.

DWAF. February 2005. Environmental Monitoring and Auditing Guideline. Integrated Environmental Management Sub-Series No. IEMS 1.7. Third Edition. Pretoria.

Lochner, P. 2005. Guideline for EMPs. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, DEA & Development Planning, Cape Town.

Schoefield, N. C., 2007 Commodity Derivatives: Market Applications. West Sussex: John Wiley & Sons Ltd.

Vosloo, H. F., 2009. Transmission Vegetation Management Guideline. Eskom Transmission.

ANNEXURE A:

Route Alignment Diagram

ANNEXURE B:

NATIONAL WATER STANDARDS

GENERAL AND SPECIAL STANDARDS

DISCHARGE OF WASTE OR WATER CONTAINING WASTE INTO A WATER RESOURCE THROUGH A PIPE, CANAL, SEWER OR OTHER CONDUIT; AND

DISPOSING IN ANY MANNER OF WATER WHICH CONTAINS WASTE FROM, OR WHICH HAS BEEN HEATED IN, ANY INDUSTRIAL OR POWER GENERATION PROCESS

[Sections 21(f) and (h)]

Purpose of this authorisation

3.1. The authorisation permitted in terms of this Schedule replaces the need for a water user to apply for a licence in terms of the National Water Act provided that the discharge is within the limits and conditions set out in this authorisation.

Exclusion

3.2. This authorisation does not apply to a person who discharges wastewater-

a) through sea outfalls;

b) to an aquifer;

c) any other groundwater resource; or

d) or any water resource with a closed drainage system.

Compliance with National Water Act and other laws

3.3.(1) This authorisation does not-

a) apply to any water use under Schedule 1 of the National Water Act;

b) replace any existing authorisation that is recognised under the National Water Act;

c) exempt a person from compliance with section 7(2) of the Water Service Act, 1997 (Act No. 108 of 1997);

d) exempt a person who uses water from compliance with any other provision of the National Water Act unless stated otherwise in this notice, or any other applicable law, regulation, ordinance or by-law; or

e) apply to a category A mine .

(2) A person who uses water in terms of this authorisation is exempt from compliance with section 22(2)(e) of the National Water Act.

Area of applicability

3.4 This authorisation is applicable throughout the Republic of South Africa, except as excluded in paragraph 3.2 above.

Duration of authorisation

3.5 This authorisation will be applicable for a period of five years from the date of this notice, unless-

a) it is amended at any review period, which period shall be at intervals of three years from the date of publication of this notice;

b) the time period is extended by a further notice in the Gazette;

c) it is replaced with an authorization in relation to a specific water resource or within a specific area; or

d) the water user is required to apply for a licence in terms of the National Water Act.

Definitions

3.6 In this authorisation unless the context indicates otherwise, any word or expression to which a meaning has been assigned in terms of the National Water Act shall have that meaning, and-

"**category A mine**" means-

a) any gold or coal mine;

b) any mine with an extractive metallurgical process, including heap leaching; or

c) any mine where sulphate producing or acid generating material occurs in the mineral deposit;

"**commercial activity**" means those activities identified in the Standard Industrial Classification of All Economic Activities (5th Edition), published by the Central Statistics Service, 1993, as amended and supplemented, under the following categories-

a) wholesale and retail trade,

b) transport, storage and communication,

c) business services,

d) community, social and personal services,

e) personal and other services;

"**complex industrial wastewater**" means wastewater arising from industrial activities and premises, that contains-

a) a complex mixture of substances that are difficult or impractical to chemically characterise and quantify, or

b) one or more substances, for which a wastewater limit value has not been specified, and which may be harmful or potentially harmful to human health, or to the water resource (identification of complex industrial wastewater will be provided by the Department upon written request);

"**domestic wastewater**" means wastewater arising from domestic and commercial activities and premises, and may contain sewage;

"**domestic wastewater discharge**" means a wastewater discharge consisting of 90% or more domestic wastewater, by volume, that is collected, treated and subsequently disposed of;

"**industrial activity**" means those activities identified in the Standard Industrial Classification of All Economic Activities (5th Edition), published by the Central Statistics Service, 1993, as amended and supplemented, under the following categories-

a) mining and quarrying,

b) manufacturing,

c) electricity, gas and water supply,

d) construction;

"**industrial wastewater discharge**" means a wastewater discharge consisting of more than 10% industrial wastewater, by volume, that is collected, treated and subsequently disposed of;

"**intake**" is water taken from a water resource, and excludes water taken from any source that is not a water resource;

"**monitoring programme**" means a programme for taking regular measurements of the quantity and/or quality of a water resource, waste or wastewater discharge at specified intervals and at specific locations to determine the chemical, physical and biological nature of the water resource, waste or wastewater discharge;

"**listed water resources**" are those water resources listed in Table 3.3 and include any tributary of a listed water resource, and any water resource draining the catchment area of a listed water resource;

"**wastewater**" means water containing waste, or water that has been in contact with waste material;

"**wastewater limit value**" means the mass expressed in terms of the concentration and/or level of a substance which may not be exceeded at any time. Wastewater Limit Values shall apply at the last point where the discharge of wastewater enters into a water resource, dilution being disregarded when determining compliance with the wastewater limit values. Where discharge of wastewater does not directly enter a water resource, the wastewater limit values shall apply at the last point where the wastewater leaves the premises of collection and treatment.

Discharging of domestic and industrial wastewater into water resources

3.7. (1) A person who-

a) owns or lawfully occupies property registered in the Deeds Office as at the date of this notice;

b) lawfully occupies or uses land that is not registered or surveyed, or

c) lawfully has access to land on which the use of water takes place.

may on that property or land outside of the areas excluded in paragraph 3.4 above,

(i) discharge up to 2 000 cubic metres of wastewater on any given day into a water resource that is **not** a listed water resource set out in Table 3.3, provided the discharge-

a) complies with the general wastewater limit values set out in Table 3.1;

b) does not alter the natural ambient water temperature of the receiving water resource by more than 3 degrees Celsius; and

c) is not a complex industrial Wastewater.

(ii) discharge up to 2 000 cubic metres of wastewater on any given day into a listed water resource set out in Table 3.3, provided the discharge -

a) complies with the special wastewater limit values set out in Table 3.1;

b) does not alter the natural ambient water temperature of the receiving water resource by more than 2 degrees Celsius; and

c) is not a complex industrial wastewater,

if the discharging of wastewater-

(aA) does not impact on a water resource or any other person's water use, property or land; and

(aB) is not detrimental to the health and safety of the public in the vicinity of the activity.

(2) A person may not discharge stormwater runoff from any premises containing waste, or water containing waste emanating from industrial activities and premises, into a water resource.

TABLE 3.1: Wastewater limit values applicable to discharge of wastewater into a water resource

SUBSTANCE/PARAMETER	GENERAL LIMIT	SPECIAL LIMIT
Faecal Coliforms (per 100 ml)	1 000	0
Chemical Oxygen Demand (mg/l)	75 (i)	30(i)
pH	5,5-9,5	5,5-7,5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	6	2
Nitrate/Nitrite as Nitrogen (mg/l)	15	1,5
Chlorine as Free Chlorine (mg/l)	0,25	0

SUBSTANCE/PARAMETER	GENERAL LIMIT	SPECIAL LIMIT
Suspended Solids (mg/l)	25	10
Electrical Conductivity (mS/m)	70 mS/m above intake to a maximum of 150 mS/m	50 mS/m above background receiving water, to a maximum of 100 mS/m
Ortho-Phosphate as phosphorous (mg/l)	10	1 (median) and 2,5 (maximum)
Fluoride (mg/l)	1	1
Soap, oil or grease (mg/l)	2,5	0
Dissolved Arsenic (mg/l)	0,02	0,01
Dissolved Cadmium (mg/l)	0,005	0,001
Dissolved Chromium (VI) (mg/l)	0,05	0,02
Dissolved Copper (mg/l)	0,01	0,002
Dissolved Cyanide (mg/l)	0,02	0,01
Dissolved Iron (mg/l)	0,3	0,3
Dissolved Lead (mg/l)	0,01	0,006
Dissolved Manganese (mg/l)	0,1	0,1
Mercury and its compounds (mg/l)	0,005	0,001
Dissolved Selenium (mg/l)	0,02	0,02
Dissolved Zinc (mg/l)	0,1	0,04
Boron (mg/l)	1	0,5

(i) After removal of algae

Registration of discharges into water resources

3.8. (1) A person who discharges wastewater into a water resource in terms of this authorisation must submit a registration form for registration of the water use before commencement of the discharge.

(2) On written receipt of a registration certificate by the Department, the person will be regarded as a registered water user.

(3) All forms for registration of water use are obtainable from the Regional offices of the Department, as well as from the Departmental web-site at http:\\www.dwaf. gov.za

Record-keeping and disclosure of information

3.9. (1) The water user must ensure the establishment of monitoring programmes to monitor the quantity and quality of the discharge prior to the commencement of the discharge, as follows-

a) the quantity of the discharge must be metered and the total recorded weekly; and

b) the quality of domestic wastewater discharges must be monitored monthly by grab sampling and analysed for specific substances and parameters as required by the responsible authority. as set out in Table 3.2.

TABLE 3.2: Monitoring requirements for domestic wastewater discharges

DISCHARGE VOLUME ON ANY GIVEN DAY	MONITORING REQUIREMENTS
10 to 100 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml)
100 to 1000 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml) Chemical Oxygen Demand (mg/l) Ammonia as Nitrogen (mg/l) Suspended Solids (mg/l)
1 000 to 2 000 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml) Chemical Oxygen Demand (mg/l) Ammonia as Nitrogen (mg/l) Nitrate/Nitrite as Nitrogen (mg/l) Free Chlorine (mg/l) Suspended Solids (mg/l) Ortho-Phosphate as Phosphorous (mg/l)

c) the quality of industrial wastewater discharges must be monitored weekly by grab sampling-

(i) for all substances which have been added to the water through any industrial activity;

(ii) for all substances which have been concentrated in the water through any industrial activity;

(iii) for all substances which may be harmful or potentially harmful to human health or to the water resource quality; and

(iv) as set out in paragraph 3.9(1)(b) above, if the wastewater contains any domestic wastewater.

(d) The methods for the measurement of specific substances and parameters in any wastewater must be carried out-

(i) by a laboratory that has been accredited under the South African National Accreditation System (SANAS) in terms of SABS Code 0259 for that method; or

(ii) as approved in writing by the responsible authority .

(2) Upon the written request of the responsible authority the registered user must-

a) ensure the establishment of any additional monitoring programmes; and

b) appoint a competent person to assess the water use measurements made in terms of this authorisation and submit the findings to the responsible authority for evaluation.

(3) Subject to paragraph 3.9. (2) above, the water user must submit the following information on a monthly basis to the responsible authority -

a) the quantity of wastewater discharged;

b) the quality of wastewater discharged;

c) details of the monitoring programme/s;

d) details of failures and malfunctions in the discharge system and details of measures taken, and

such information must be made available upon written request to the responsible authority.

(4) Any information on the occurrence of any incident that has or is likely to have a detrimental impact on the water resource quality must be reported to the responsible authority.

Precautionary practices

3.10. (1) The water user must follow acceptable construction, maintenance and operational practices to ensure the consistent, effective and safe performance of the discharge.

(2) All reasonable measures must be taken to provide for mechanical, electrical, operational, or process failures and malfunctions of the discharge system.

Inspections

3.11. Any property or land in respect of which a water use has been authorised in terms of this notice must be made available for inspection by an authorised person in terms of section 125 of the National Water Act.

ANNEXURE C:

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMPr

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMPr

1 PRIOR TO COMMENCEMENT

1.1 (a) Method Statements

The Contractor shall submit project and task specific method statements to the Eskom Project Manager within 14 days of receipt of the Letter of Acceptance.

Activities shall only be allowed to commence once the method statements have been approved by the Eskom Project Manager.

1.2 (b) Environmental Awareness Training preparation

The Contractor shall be required to present the Environmental Awareness Training to all personnel within 7 days of the project commencing. The Contractor shall manage and implement all the requirements associated with the presenting the training programme with the Eskom Project Manager before the Commencement Date.

2 TWO WEEKS AFTER COMMENCEMENT

2.1 Demarcation of the Site

The Contractor shall be required to establish a site office within the project footprint or alternatively at a locality appropriately zoned and/orauthorised for such use and approved by the ECO. The Contractor shall be required to erect and maintain a temporary fence along the boundary perimeter and at all sites identified as “no-go” areas, to the satisfaction of the Eskom Project Manager.

The Contractor shall select a location that has easy access and which has already been cleared or disturbed by previous human activity (e.g. previous construction camps or stockpile areas). All construction activities, materials, equipment and personnel will be restricted to within the area specified.

2.2 Environmental Awareness Course

The Contractor shall ensure all staff attend the environmental awareness training to be held in or before the first week after the commencement date.

Follow-on from the Environmental Awareness Course

The contractor shall be responsible for presenting follow up training on a six monthly basis.

During construction, if new personnel come onto site, the Contractor shall be responsible for providing awareness training and thus ensure these personnel are aware of the environmental specifications on site.

2.3 Method statement awareness

Where applicable, the Contractor shall provide task-specific training on an *ad hoc* basis when workers are engaged in activities, which require method statements.

2.4 Emergency preparedness

The Contractor shall ensure all measures required to prevent, mitigate, manage and control an emergency situation are implemented. This activity shall require regular review during construction.

3 DURING CONSTRUCTION

3.1 Contractor Familiarisation Of The EMPr

The Contractor shall ensure a copy of the EMPr and its relevant Project Specification clauses are available on Site, and shall ensure that all the personnel associated with the project (including sub-contractors and suppliers), are familiar with and understand the specifications contained in the EMPr.

3.2 Method Statements

All other task specific method statements required during the course of construction, shall be submitted to the Eskom Project Manager for approval 14 days prior to the proposed commencement of the activity.

3.3 Site Security

The Contractor shall, where applicable, ensure that measures are implemented to secure the site during all nonworking hours, including public holidays.

3.4 Materials Handling, Use and Storage

The Contractor shall ensure all materials delivered, handled, used or stored are done in compliance with the requirements of the EMPr. Additionally, the Contractor shall ensure all measures are in place to manage, mitigate and control an emergency situation should one arise.

The Contractor shall ensure all staff are adequately trained in all elements pertaining to such materials.

4 AFTER CONSTRUCTION-RELATED ACTIVITIES ARE COMPLETE

4.1 Site Cleanup

Within 7 days of the completion of construction related activities, the Contractor shall commence with the clearing and cleaning of the site, ensuring everything not forming part of the permanent works is removed from site.

4.2 Re-vegetation and Rehabilitation

The Contractor shall be responsible for rehabilitating and re-vegetating all areas impacted upon by construction related activities to the satisfaction of the Eskom Project Manager, as required within the rehabilitation specification. The commencement of these activities will be agreed to with the Eskom Project Manager prior to their commencement.

ANNEXURE D:

HOW TO WRITE A METHOD STATEMENT

METHOD STATEMENTS

The Contractor shall be required to undertake various tasks / activities in order to fulfil the conditions as stipulated in the contract. Therefore, in order for the Eskom Project Manager to be satisfied that the Contractor has a comprehensive understanding of the requirements of the task / activity, the Contractor shall submit method statements to the Eskom Project Manager for approval prior to the commencement of the task / activity.

The method statement is a dynamic document integrating all facets of the task / activity, thereby ensuring the reader a comprehensive understanding of the actions associated with implementing the task / activity.

The method statement shall be submitted to the Eskom Project Manager for approval a minimum of 14 days prior to the commencement of the task / activity. During this period, the Eskom Project Manager shall consult with other members of the project management team to ascertain the Contractors knowledge and understanding of the requirements. Should the Eskom Project Manager ascertain there to be gaps within the Contractors understanding, the method statement shall be returned to the Contractor for review and re-submission.

Upon approval of the method statement, both the Eskom Project Manager and the Contractor shall sign the method statement denoting mutual agreement that the contents thereof meets the minimum requirements to successfully complete the task / activity. By signing the method statement, the Contractor commits to working in accordance the agreed method.

Due to the method statement being a dynamic document, regular amendments may be required to ensure the implementation thereof corresponds with how the task / activity is actually being implemented; and in accordance to potentially changing requirements.

- Purpose

The purpose of the method statement is to:

- Outline the safe manner in which the task / activity is to be undertaken
- Provide induction material for all undertaking the task / activity to understand
- Meet legal requirements – hazard identification and control
- Provide a programme against work, material, time, staff and anticipated problems are to be managed
- Act as a tool in quality assurance
- Scope

A method statement describes the scope of the intended task / activity in an easy to understand step – by – step manner. This is particularly important to reduce potential confusion and ambiguity of the contents by those personnel required to implement it.

The method statement should clearly indicate:

- What – a brief concise description of the task / activity to be undertaken;
- Who – a brief concise description of the personnel involved with undertaking the task / activity;

- When - a brief concise description of the sequence of actions with due commencement and completion dates of the task / activity to be undertaken;
- Where - a brief concise description and map / drawing of the locality of the task / activity to be undertaken;
- Why - a brief concise description of the importance and requirement of the task / activity to be undertaken; and
- How - a brief concise description of the methods to be implemented, materials and equipment to be used for the task / activity to be undertaken.
- Language use

The method statement must be written in plain English so that they are understood by all. Therefore a well thought through and well written method statement providing clear and concise specific work plans, can save much time and money and potentially prevent the occurrence of incidents and accidents.

The implementation therefore of the method statements shall be audited by the ECO. Consequently the method statements must contain sufficient information and detail to satisfy the Eskom Project Manager and ECO that the works will be implemented correctly and that potential incidents / accidents shall mitigated and managed.

Please remember to:

- Consider the reader
- Communicate a clear message
- Use clear and concise language
- Consider how the information is portrayed
- Site Specific Requirements

The method statement must be site and project specific. Method statements copying information contained within the EMPr, specifications or other documents shall not be considered as they do not indicate to the person responsible for approving the document, that the Contractor has a clear understanding of what is required.

- Minimum Requirements

The method statement should as a minimum address the following:

i. Description

Provide a brief and concise description of the task at hand.

ii. Personnel Qualifications and Experience

- List all the details of qualifications and experience required for the completion of the task.
- Experience may cover previous work done in the area that may not require certificates or licences.

iii. Personnel, Duties and Responsibilities

Give details of the duties and specific responsibilities of supervisors and other personnel. For example, describe such things as daily toolbox talks and guidance provided by the Environmental Officer.

iv. Training Required to Complete Work

Make sure that all workers and their Supervisors are trained in the procedures needed to complete the job safely and in an environmentally responsible way, especially when undertaking task for the first time or where new or changed work methods are utilised.

v. Programme

Provide a clear and concise programme indicating all phases and time frames associated with the task.

vi. Construction sequence and method

Indicate all steps associated with task at hand. This must be done in a manner which is easily understandable and leaves no uncertainties to staff that are required to implement the task in the field.

vii. Possible Hazards

Include all possible hazards such as:

- Hazardous substances, explosives, dust, etc
- Hazards to others in area
- Rubbish, electrical, fills

viii. Resources/Plant/Equipment

List resources, plant and equipment that you will use on the job, e.g. ladders, scaffold etc.

ix. Environmental

Indicate Environmental management responsibilities

Provide Environmental guidelines

Specify Employee training and involvement

Indicate the following:

- Material consumption
- Energy consumption
- Water consumption
- Buildings, machinery, soil
- Residual materials and waste
- Atmospheric emissions, noise and odour pollution
- Wastewater
- Accidents and accident prevention
- Transport

x. Health and Safety

List all safety controls such as:

- MSDS
- Warning Signs
- Personal protective equipment
- Storage of materials and equipment
- Fellow workers/public safety provisions
- Housekeeping

xi. Monitoring Systems

How will the execution of the task be monitored?

xii. Emergency/disaster incident and reaction procedures

Procedures must be included indicating how incidents/accidents will be dealt with and what steps are in place to prevent such an incident/accident from occurring.

xiii. General

Explanation of important technical/environmental terms

ANNEXURE E:

MAPS OF ECOLOGICALLY SENSITIVE AREAS

ANNEXURE F:

MAPS OF THE PROJECT AREA