Draft scoping Report for the proposed Construction of the +_370km 765kv-Powerline from Gammas/s in Northern Cape to Kappa (Koruson) in western Cape and Associated Substation upgrade.
NEAS Reference DEA/EIA/0001267/2012
DEA Reference14/12/16/3/3/2/353.

March 2013

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NZUMBULULO

Draft Report

Draft scoping Report for the proposed construction of the +-370km 765kv Powerline from Gamma S/S in Northern cape to Kappa (Koruson) s/s in Western cape and associated Substations Upgrades

March 2013

Prepared by: Hellen Mlotshwa

External Review: Quinton Roodt

For and on behalf of
Nzumbululo Sustainability, Energy and Environment (SEE) Division

Approved by: Hellen Mlotshwa

Signed

Date: March 2013

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DEFINITIONS

"**Air pollution** means any change in the composition of the air, caused by smoke, soot, dust (including fly ash), cinders and solid particles of any kind, gases, fumes, aerosols and odorous substances" (Air Quality Act, 2004).

"**Alternative"** means a different means of meeting the general purpose and need of a proposed activity" (National Environmental Management Act, 1998 (Act No. 107 of 1998), Guideline 5, June 2006). A possible course of action, in place of another, that would meet the same purpose and need (of the proposal). Alternatives can refer to any of the following but are not limited to: alternative sites for development, alternative projects for a particular site, alternative site layouts,

"Biodiversity" the structural, functional and compositional attributes of an area, ranging from genes to landscapes.

"Catchment" The area from which any rainfall will drain into the watercourse or watercourses or part of the water course, through surface flow to a common point or common points.

"Environment" The surroundings within which humans exist and that are made up of:

i. the land, water and atmosphere of the earth;

ii. micro-organisms, plant and animal life;

iii. any part or combination of (i) and (ii) and the interrelationships among and between t them; and

iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the

economic, social, cultural, historical and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.

"Environmental Impact Assessment" An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the environment. The EIA includes an evaluation of alternatives. As well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and environmental management and monitoring measures.

"Expansion" means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

"Habitat" An ecological or environmental area inhabited by a particular species or that which supports a typical community of species.

"Hydrogeological" The study of distribution and movement of groundwater.

"Impact" The positive or negative effects on human well-being and / or on the environment.

"Interested and Affected Parties" Individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

"Natural Habitat" Land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the area's primary ecological functions. All natural habitats have important biological, social, economic, and existence value.

"Mitigate" The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

"Phased Activities" means an activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity through interconnected internal vehicular or pedestrian circulation, sharing of infrastructure, or the continuum of design, style or concept by the same proponent or his or her successors.

"**Proponent"** who is applying for an environmental authorisation in terms of the relevant environmental legislation.

"Construction" means the building, erection or expansion of a facility, structure or infrastructure that is necessary for the undertaking of an activity, but excludes any modification, alteration or upgrading of such facility, structure or infrastructure that does not result in a change to the nature of the activity being undertaken or an increase in the production, storage or transportation capacity of that facility, structure or infrastructure;" (National Environmental Management Act, 1998 (Act No. 107 of 1998), Regulation 386 of 2006).

"Interested and affected party"- refers to:

(a) Any person, group of persons or organization interested in or affected by an activity; and

(b) Any organ of state that may have jurisdiction over any aspect of the activity;" (R385, 2006).

"Linear Activity" - means an activity that is undertaken across several properties and which affects the environment or any aspect of the environment along the course of the activity in different ways, and includes a road, railway line, power line, pipeline or canal" (National Environmental Management Act, 1998 (Act No. 107 of 1998) Regulation 385 of 2006).

"Public Participation Process" - means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters."(R385, 2006). A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

"Plan of study for environmental impact assessment"- means a document contemplated in regulation 28(1)(i) which forms part of a scoping report and sets out how an environmental impact assessment must be conducted;"(R543, 2010).

"Scoping" the process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

"Significance" significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an

anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).

"Significant Impact" - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment."(R385, 2006).

ABBREVIATIONS

BID	Background Information Document
DEA	Department of Environmental Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
EMP	Environmental Management Programme Report
EMS	Environmental Management System
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Electrical and magnetic field
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
GN	General Notice
GNR	General Notice Regulation
HeSSA	Nzumbululo Heritage Solutions South Africa
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current

IAPs Interested and Affected Parties

ICNIRP International Commission for Non- ionising Radiation Protection

IRR Issues and Responses Report

kV Kilovolts

kwh Kilowatt hours

MW Megawatt

NEMA National Environmental Management Act 107 of 1998

NEMAQA National Environmental Management: Air Quality Act 39 of 2004

NEMPAA National Environmental Management Protected Areas Act

NEMWA National Environmental Management: Waste Act 59 of 2008

NGL Natural Ground Level

NGO Non Government Organisation

NHRA National Heritage Resources Act 25 of 1999

PPP Public Participation Process

PSP Public Service Provider

PoSEIA Plan of Study for the EIA

TRFR's Transformers

NIRP2 National Integrated Resource Plan

SA South Africa

SAHRA South African Heritage Resources Agency

SHE Safety, Health and Environment

SoER State of the Environment Report

ToR Terms of Reference

1 EXECUTIVE SCOPING SUMMARY

1.1 Background to the Application

This Draft Scoping Report (DSR) has been prepared as part of the Environmental Impact Assessment (EIA) process for the proposed Gamma-Kappa 765kV +/-370km Transmission powerline and associated substation development along the servitude traversing from Northern to Western Cape Provinces. In order to address the existing network constraints, and increased electricity demand in the Western Cape region has necessitated that Eskom Transmission develops a high capacity powerline and associated substations infrastructure. As part of a strategy to achieve this, Eskom has proposed to develop a 765kV transmission line between the existing Gamma (Victoria West) and Kappa substation (Touwsrivier) sites. To integrate the new transmission power line into the Transmission grid, auxiliary and ancillary developments (such as access roads, relocation of existing lines, and construction of new feeder bays, etc.) will form part of the proposed development. These proposed developments would improve the reliability and capacity of the transmission network and stabilise the electricity supply to the Western Cape.

The proposed transmission power line would be associated with construction works of the Kappa and Gamma Substations, which have already received environmental authorisations. However, these substations will require upgrades to accommodate the new high capacity line. Three alternatives will be assessed in order to identify and finally recommend the "best practicable environmental option".

1.2 Motivation for the Development

Electricity cannot be stored, It is therefore necessary to generate and deliver power over long distances at the very instant it is needed. In South Africa, thousands of kilometers of high voltage Transmission power lines transmit power, mainly from the Power Stations located at the Mpumalanga and Limpopo (Waterberg) coal fields, to major substation where the voltage is reduced for distribution to industry, businesses, homes and farms all over the country.

For Eskom Transmission to honor its mandate and commitment to meet the increasing needs of the end users, it has to establish and expand its infrastructure of Transmission power lines and Substations on an ongoing basis. Due to substantial annual load growth, load shifts and step loads, it has become necessary to reinforce the existing electrical infrastructure.

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

MANDATE

Eskom has a mandate to satisfy potential customer needs, which implies certain responsibilities. One of the most significant of these is to find and maintain the balance between satisfying the needs of society and remaining within the capabilities of the environment. In order to achieve this, Eskom must continually re-asses its present infrastructure and take into account new developments to ensure that there is a continued supply of electricity, without significantly impacting on the environment.

THE NEED FOR ADDITIONAL TRANSMISSION CAPACITY IN THE CAPE AREA (Western Cape combined with the growth in the Eastern Cape)

Eskom uses long-distance transmission lines to cater for power transfer capacity into the Cape network. Initially, the 400kV schemes were used and currently also making use of 765kV schemes as well. Based on the load forecast contained in the Transmission Ten-Year Development Plan 2012-2021, the load growth in the cape **(Western Cape combined with the growth in the Eastern Cape)** indicates an increasing demand of power in the region.

The existing Transmission power lines are becoming heavily loaded and are predicated to reach their full capacity very soon. These Transmission power lines and substations currently cannot supply the increased demand in the Cape area. It is becoming very difficult to manage with one power line out of service since the other power lines have to carry some part of the load while the bulk of power will be supplied by Koeberg Nuclear Power Station. This makes it difficult to carry out routine maintenance, the condition of the operating lines can deteriorate and this will result in poor line performance.

It is even more difficult to supply the Cape load without Koeberg Nuclear Power Station generation capacity. Koeberg nuclear station is the only source of generation at present and therefore the increase in power demand will need to be supplied by the existing and emerging coal fired power stations in the Mpumalanga and Limpopo (Waterberg) area which are situated more than thousand kilometers away.

Eskom initiated a study to investigate the options for further 765kV line reinforcement of the Cape network to cater for this power demand increase. The line will be very critical for the supply of power when there is no generation output at Koeberg.

The following major elements are also assumed to form part of the future Cape corridor network

Based on the load forecast of the Cape Network, the completion date for the interconnection of Phase 4 of the Cape corridor should be 2021 with the following scope:

Zeus-Perseus 2nd 765kV line

- Equip 1 x 765kV feeder bay at Zeus substation (extend existing busbar if necessary)
- Equip 1 x 765kV feeder bay at Perseus substation (extend existing busbar if necessary)
- Build a ±400km 765kV line from Zeus to Perseus with 400MVAr line reactors at both ends

Gamma-Perseus 2nd 765kV line

- Equip 1 x 765kV feeder bay at Perseus substation (extend existing busbar if necessary)
- Equip 1 x 765kV feeder bay at Gamma substation (extend existing busbar if necessary)
- Build the 2nd ±400km 765kV line from Gamma - Perseus with 400MVAr line reactors at both ends

Series Compensation on Zeus-Perseus 1st 765kV line

- Install 1 x ±3000MVAr Series Capacitor on the Zeus – Perseus 765kV line, at the Perseus end

Gamma-Kappa 2nd 765kV line

- Equip 1 x 765kV feeder bay at Gamma substation (extend existing busbar if necessary)
- Equip 1 x 765kV feeder bay at Kappa substation (extend existing busbar if necessary)
- Build the 2nd ±400km 765kV line from Gamma - Kappa with 400MVAr line reactors at both ends

Kappa-Sterrekus 2nd 765kV line

- Equip 1 x 765kV feeder bay at Kappa substation (extend existing busbar if necessary)
- Equip 1 x 765kV feeder bay at Omega / Sterrekus substation (extend existing busbar if necessary)
- Build the 2nd ±150km 765kV line from Kappa to Omega/Sterrekus

Sterrekus Ext 2nd 2000MVA 765/400kV transformer

- Equip 1 x 765/400kV transformer bay at Omega / Sterrekus (extend existing busbar if necessary)
- Install a 2nd 765/400kV transformer at Omega / Sterrekus
- Equip 2 x 400kV feeder bays at Omega / Sterrekus
- Loop the existing Koeberg – Stikland 400kV line into Omega / Sterrekus

Further Scope of work

- Extend the Mercury 765kV busbar by 2 x feeder bays
- Equip 2 x 765kV feeder bays at Mercury
- Build 2 x 20km 765kV lines from Mercury to Selemo
- Equip 2 x 765kV feeder bays at Selemo substation

1.3 Alternative Transmission Line Corridors

Technically feasible alternative transmission power line corridors have been identified for investigation within the EIA process.

Three alternative powerline corridors have been identified for this project, each planning and environmental studies for the proposed powerline development corridors are 2000m (2km) in width. The final servitude would be a corridor required to accommodate 110m wide servitude for the construction of the 765kV power line transmission towers (Refer to map attached Appendix 2).

The three alternatives were selected on the basis of the local topography, terrestrial environment, powerline construction viability as well on technical criteria. Through the EIA process, the most preferred transmission power line corridor will be nominated for consideration in the decision-making process by the National Department of Environmental Affairs (DEA), the competent authority for this project. Should the proposed project be authorised by the DEA, Eskom will enter into a negotiation process with each affected landowner, to engage and start the land acquisition process. The acquisition process is independent of the EIA process, and will be undertaken directly by the relevant unit of Eskom Transmission.

1.4 Legislative Requirements

The proposed construction of the 765kV transmission powerline, including associated infrastructures, is an activity identified in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), in respect of the Environmental Impact Assessment (EIA) Regulations No. R543 of 2010, which stipulates that such developments, may not commence without Environmental Authorisation (EA) from the National Department of Environmental Affairs (DEA).

The National Department of Environmental Affairs (DEA) is the competent authority for this project. An application for authorisation has been acknowledged by DEA (under Application Reference number NEAS Reference DEA/EIA/0001267/2012 and DEA Reference14/12/16/3/3/2/353. (See attached appendix 1) Through the decision-making process, the Northern Cape will support DEA and Western Cape Environmental Affairs and Development Planning, which will be a commenting authority in this project.

1.5 Plan of Study

In line with applicable legislative and regulatory requirements for the proposed powerline development, Eskom Holdings SOC Limited (Transmission) appointed Nzumbululo Heritage Solutions (Independent Environmental Management Consultants) to conduct a full EIA process for the project. The EIA study comprises three key phases and process: (i) Scoping Phase (Phase 1); Public Participation Process (Phase 2 which will run concurrently with Phase 1 and 3) and the EIA phase (Phase 3). The Scoping process, which commenced in August 2012, consisted of:

- Desktop data review
- Reconnaissance data collection and, organising,
- Preliminary field survey of the proposed powerline servitude and associated alternatives
- Data analysing and interpreting, and
- Public Participation Exercise which included:

    - Stakeholder database development,
    - Public announcement of the proposed development
    - Communicating with key stakeholders and I&APs all information that is relevant for the consideration of the environmental application.
    - Public Notices and Advertisement of the project

The purpose of the Scoping Study is to describe the project-receiving environment and identify the physical, biological, socio-economic and cultural aspects of the environment that may be affected by the proposed activity.

A Plan of Study (PoS) for the EIA phase is included in this Scoping Report. The PoS provides information on the methodology that would be adopted in assessing the potential impacts that would be identified as part of the EIA process for the proposed development. The PoS include details of any specialist studies that would be undertaken to obtain information that is more comprehensive and specific and anticipated or predicted impacts on the receiving terrestrial and socio-cultural

environments within the project area. Overall the Scoping study is considers feasible and reasonable alternatives for the proposed developmental activities.

1.6 Public Participation Process

Public Participation Process is a legislated and regulated mandatory exercise that forms part of the EIA exercise. The process runs concurrently with both scoping and EIA phases of the entire EIA exercise of the proposed development. The process kicks off with the identification of Interested and Affected Parties (I&APs). This identification exercise will continue as the study proceeds. At this stage I&APs, are being identified, contacted and informed about the project through electronic mailing system and hard copies mailed letters and the publication of the Background Information Document (BIDs). Copies of the BIDs will be distributed through out the study area and they could also be accessed from different key public area and an on-line platform. Furthermore, notices of the project and invitation to register on the I&AP Register were posted at different places along the proposed power line routes and the entire project area particularly in towns and farms located within close proximity to the proposed alternative powerline routes.

As per legislated procedures, the Draft Scoping Report (DSR) will be circulated to key stakeholders for their review and commenting. The I&APs will be able to access the report at public libraries and municipalities along the affected project areas. The commenting authorities in the Western Cape and Northern Cape Provinces, including Western Cape Provincial Environmental Affairs and Development Planning, Heritage Western Cape, the South African Heritage Resource Agency, Farmers Unions and the Department of Agriculture, Forestry and Fisheries will also receive the report for their commenting.

All I&APs will be afforded an opportunity to raise objections, issues and comments

on the Draft Scoping Report and send these comments and issues via a dedicated e-mail, fax; telephone or post office to the Environmental Assessment Practitioner (EAP) at Nzumbululo Heritage Solutions whose contact details will be published along these notices about the study.

All comments and issues that may be raised by key stakeholders and I&APs will be recorded and considered by the EAP in finalising the Scoping Report. The final Scoping Report will be compiled and submitted for evaluation and consideration of the Department of Environmental Affairs (DEA). The Next Phase of the study would consist of the EIA Phase, which can be undertaken after the DEA has issued their response and approval on the Scoping Report. Therefore, the decision on the proposed development will be made after the DEA has considered the scoping and the final Environmental Impact Assessment Report (EIAR) following which they may grant permission or Environmental Authorisation. Thereafter, I&APs will have yet another opportunity to consider the DEA decision and make their representations where necessary in an appeal process if they so choose. The final approval of the development may be considered after all appeals have been successfully dealt with and the final pronouncement is made by the DEA.

1.7 Preliminary Scoping

Naturally, any new development or installation that alters the status quo of any given area has potential to impact the receiving environment. Similarly, the present scoping study has identified potentially significant detrimental environmental issues associated with the proposed Gamma-Kappa 765kV transmission powerline and auxiliary infrastructure development. However, none of the issues are considered permanent barriers or unmitigatable to the proposed development especially considering that the line will traverse through landscape and receiving environment with existing similar linear and spatial developments and other prior varied land uses. The line may run parallel to another 765kV line approved for construction from Gamma to Kappa. Subject to further impact assessment study, a conclusive decision will be made after:

- Taking into consideration stakeholders and I&APs' concerns;
- Results and recommendation from Independent specialist studies; and
- Identification of viable and suitable options for the proposed development.

2 ENVIRONMENTAL AUTHORISATION PROCESS

2.1 Scoping And Impact Assessment Process

This EIA process comprises of two serial study phases namely, Scoping Phase and a detailed Environmental Impact Assessment Phase respectively. Running parallel to these study phases will be the Public participation Process which runs throughout the entire EIA exercise. Scoping is executed to determine the environmental issues to be addressed in relation to the project's receiving environment, the information to be collected, and the analysis required to assess the environmental impacts of a project. This Scoping process applied the following methods to:

- Identify concerns of the public and scientists about a proposed project or action;
- Evaluate these concerns to determine the key issues for the purposes of the EIA (and to eliminate those issues which are not significant); and
- Organise and communicate these to assist in the analysis of issues and the ultimate decision making by the compliance authority, Department of Environmental Affairs.

In brief, there are two key concepts that this Scoping exercise addressed:

- Consultation with stakeholders and I&APs to identify issues and concerns; and
- Evaluation and prioritisation of these issues.

2.2 Objectives Of Scoping Phase

The Scoping phase of the EIA determines the baseline environment and the manner in which the biophysical and the socio-economic environment may be affected by the proposed development. It also addresses technical constraints that the biophysical environment could place on the routing, construction and operation of the transmission powerline. As highlighted above, Scoping is meant to

identify the potential issues associated with the proposed development and define the nature and extent of the studies required at the EIA stage. To summarise the objectives of the Scoping study are:

- Identify potential environmental impacts of the proposed development;
- Examine the sustainability of the proposed development in terms of the biophysical, ecological, socio-economic environment;
- Identify environmental issues that require further investigation;
- Identify Interested and Affected Parties (I&APs), inform them of the proposed development and identify any key concerns to be considered in decision making;
- Provide relevant governmental and non-governmental authorities and agencies with the necessary information to make informed decisions regarding the proposed development at the scoping level;
- Consider alternatives, which could be in terms of:
    - site selection,
    - layout,
    - construction materials,
    - processes,
    - engineering solutions, and
    - designs and sustainability best practice; and
- Outline the methodology employed to date and proposed activities to be undertaken during the Environmental Impact Assessment (EIA) stage. Information gathering was carried out through:
    - Review of baseline desk survey of existing literature;
    - Correspondence with specialists and local residents;
    - Geographic Information System (GIS);
    - Interaction with individuals; and
    - Interaction with authorities and key stakeholders.

The public participation process (PPP) was initiated at the beginning of the Scoping phase, and will continue throughout the EIA process. All issues raised or identified during the PPP will be recorded in the Final Scoping Report. The process would also assist the EAP in identifying ways of optimising positive impacts on the community and the receiving environment.

2.3 Specialist Studies for the Detailed EIA Phase

The following specialist studies will be undertaken as part of the detailed EIA Phase of the process:

- Ecological impacts,
- Avifaunal impacts
- Heritage Impact assessment study including:
    - Archaeological and Cultural Heritage resources
    - Built environment heritage
    - Cultural landscape and culture history
    - Colonial / historical heritage
    - Palaeontological heritage
- Wetland and River crossing study
- Tourism study
- Visual impact Assessment study
- Social impact Assessment study
- Agricultural / land capability study
- Socio and Economic study

2.4 Way Forward

The issues raised and matters identified during the Scoping Phase will be addressed in detail during the EIA Phase of the EIA process. Reconnaissance and preliminary field survey and alternative powerline route determination field survey indicates that the proposed project area consists largely of a mixture of previously developed and developed landscapes generally heavily disturbed from previous and current commercial and subsistence farming with a mixture of game and cattle husbandry and crop cultivation as well as rural and urban settlements. The identified project routes and associated alternatives will traverse through local authority lands and commercial farmlands as well as portions of conservancies

There are three potential corridors or servitude routes that were identified within the broader study area.

As highlighted in the discussion above, by its nature, the proposed powerline development of the 765 kV is defined as a listed activity in accordance with EIA Regulations. In terms of the NEMA, this means the project is considered to have potential to be detrimental to the environment and therefore require Environmental authorisation from the relevant authority, in this case the DEA. In order to effectively assess the potential impacts on the receiving environment, Eskom identified the following three possible alternative powerline route options for the project:

- The Alternative Route Option 1,
- Alternative Route Option 2; and
- Alternative Route Option 3.

The detailed way forward for the project will be outlined in the Plan of Study for EIA. This Plan provides the terms of reference for independent specialists studies, the impact assessment methodology to be used to rate impacts and the deliverables of the EIA Phase.

3 INTRODUCTION- SCOPING FOR GAMMA-KAPPA TRANSMISSION POWERLINE

3.1 Background

Nzumbululo Heritage Solutions was appointed by Eskom Holdings SOC Limited (Transmission) to conduct an Environmental Impact Assessment (EIA) study for the proposed construction of a +/-370km 765kV transmission powerline, infrastructures and associated auxiliary and substation infrastructure. The powerline will traverse from the Gamma Sub Station outside Victoria West Town in the Northern Cape Province to Kappa Substation close to Touwsrivier in the Western Cape Province.

The proposed powerline and associated auxiliary and substation works are all listed activities as defined by GNR 545 (Listing Notice 1) of 18 June 2010 of the National Environmental:

Activity 8 (I): "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."

List other activities that are on the application form as well.

The above-defined activities require a full Environmental Impact Assessment (EIA) study, in line with the 2006 Regulations. The EIA is specifically conducted in order to acquire the environmental authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The application for environmental authorisation for the proposed development was lodged in May 2012 with the lead environmental authority, the Department of Environmental Affairs (DEA). The DEA Application Reference for this study is 14/12/16/3/3/2/353) and NEAS: DEA/EA/0001267/2012 (Acknowledgement letter is attached in Appendix 1).

4 EXPERTISE OF THE ENVIRONMENTAL ASSESSEMENT PRACTITIONERS

4.1 Introduction

The Environmental regulation specifically requires practitioners involved in the EIA process to be identified and further stipulates that their qualifications and expertise should also be listed in the report. An Environmental Assessment Practitioner (EAP) appointed in terms of regulation 17 (1) is required to:

- Be independent
- Have expertise in conducting environmental impact assessments including knowledge of the Act, these regulations and any guidelines that have relevance to the proposed activity
- Perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- Comply with the Act, these regulations and all other applicable legislation
- Take into account, to the extent possible, the matters listed in regulation 13 when preparing the application and
- Disclose to the applicant and the competent authority all material information in the possession of the EAP that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority in terms of these regulations or the objectivity of any report, plan or document to be prepared by the EAP in terms of these regulations for submission to the competent authority.

Nzumbululo Heritage Solution, the independent consultants and their designated project EAP have met the above directives. The table below lists the EAP study team involved in this project. These will work with other independent scientists and specialists.

4.2 Details of the EAP

Table 1: Details of EAP (H. Mlotshwa)

Name	Hellen S. Mlotshwa (B.Sc. Environmental Health (2005); PGDBA, cand. 2012).
Company	Nzumbululo Heritage Solutions
Physical Address	4 Berger Road, Vorna valley Midrand
Postal Address	P. O. BOX 4106; HALFWAY HOUSE 1685
Telephone Number	011 021 4937
Fax Number	086 544 2177
E-mail	info@nzumbululo.com/mlotshwah@nzumbululo.com
Role in Project	Environmental Consultant/Practitioner

Hellen Mlotshwa is a qualified and experienced environmental practitioner with almost 10 years of experience on various environmental impact assessment studies authorisation projects (For further details Please refer to attached curriculum vitae (CV) in Appendix 8).

4.3 Detail of Applicant

Table 2: Details of the proponent.

Name	Kentridge Makhanya (Representative of Proponent)
Company	ESKOM Holdings SOC Limited

Postal Address	P.O. Box 1091,Megawatt Park Maxwell Drive Sunninghill Johannesburg 2000
Telephone number	011 800 8111
Fax number	011 800 2122
Email	makhankk@eskom.co.za
Role in Project	Project Manager

5 DESCRIPTION OF THE PROPOSED PROJECT

5.1 Introduction

The proposed project will include the construction of a new +/-370km-long 765kv transmission powerline from Gamma Substation to Kappa Substation in the Northern and Western Cape Provinces respectively. The development will include auxiliary works such as upgrade of substations, access roads, construction camps and equipment or material storage sites along the proposed powerline servitude.

5.2 Project Location

The proposed project area is located in the Northern Cape and Western Cape Provinces. The powerline will traverse through the following towns:

- Victoria West in the Northern Cape, and
- Beaufort West,
- Three sisters,
- Merweville,
- Murraysburg,
- Prince Albert,
- Laingsburg,
- Touwsriver and
- Ceres in the Western Cape.

The proposed preferred powerline servitude and associated alternative routes will traverse through the following listed farm properties: The list of individual farms affected by the proposed powerline is attached on appendix 2 with the map.

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These farms are distributed across the Northern Cape and Western Cape Provinces. The land-use activities on these farms comprises of commercial animal husbandry, conservancies areas, plantations and vineyards, urban and rural settlements, agro-industrial areas with associated infrastructures as well as vast networks of national regional and local roads, exiting transmission and distribution powerlines, bulk and reticulation subsurface water supply networks and such other auxiliary infrastructures.

5.3 Layout And Design

The proposed project includes the following activities:

- Equip 1 x 765kV feeder bay at Gamma substation (extend existing busbar if necessary)
- Equip 1 x 765kV feeder bay at Kappa substation (extend existing busbar if necessary)
- Build the 2nd ±400km 765kV line from Gamma Kappa with 400MVAr line reactors at both ends.

5.4 Project Motivation

Electricity cannot be stored, It is therefore necessary to generate and deliver power over long distances at the very instant it is needed. In South Africa, thousands of kilometers of high voltage Transmission power lines transmit power, mainly from the Power Stations located at the Mpumalanga and Limpopo (Waterberg) coal fields, to major substation where the voltage is reduced for distribution to industry, businesses, homes and farms all over the country.

For Eskom Transmission to honor its mandate and commitment to meet the increasing needs of the end users, it has to establish and expand its infrastructure of Transmission power lines and Substations on an ongoing basis. Due to substantial annual load growth, load shifts and step loads, it has become necessary to reinforce the existing electrical infrastructure.

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

MANDATE

Eskom has a mandate to satisfy potential customer needs, which implies certain responsibilities. One of the most significant of these is to find and maintain the balance between satisfying the needs of society and remaining within the capabilities of the environment. In order to achieve this, Eskom must continually re-asses its present infrastructure and take into account new developments to ensure that there is a continued supply of electricity, without significantly impacting on the environment.

THE NEED FOR ADDITIONAL TRANSMISSION CAPACITY IN THE CAPE AREA (Western Cape combined with the growth in the Eastern Cape)

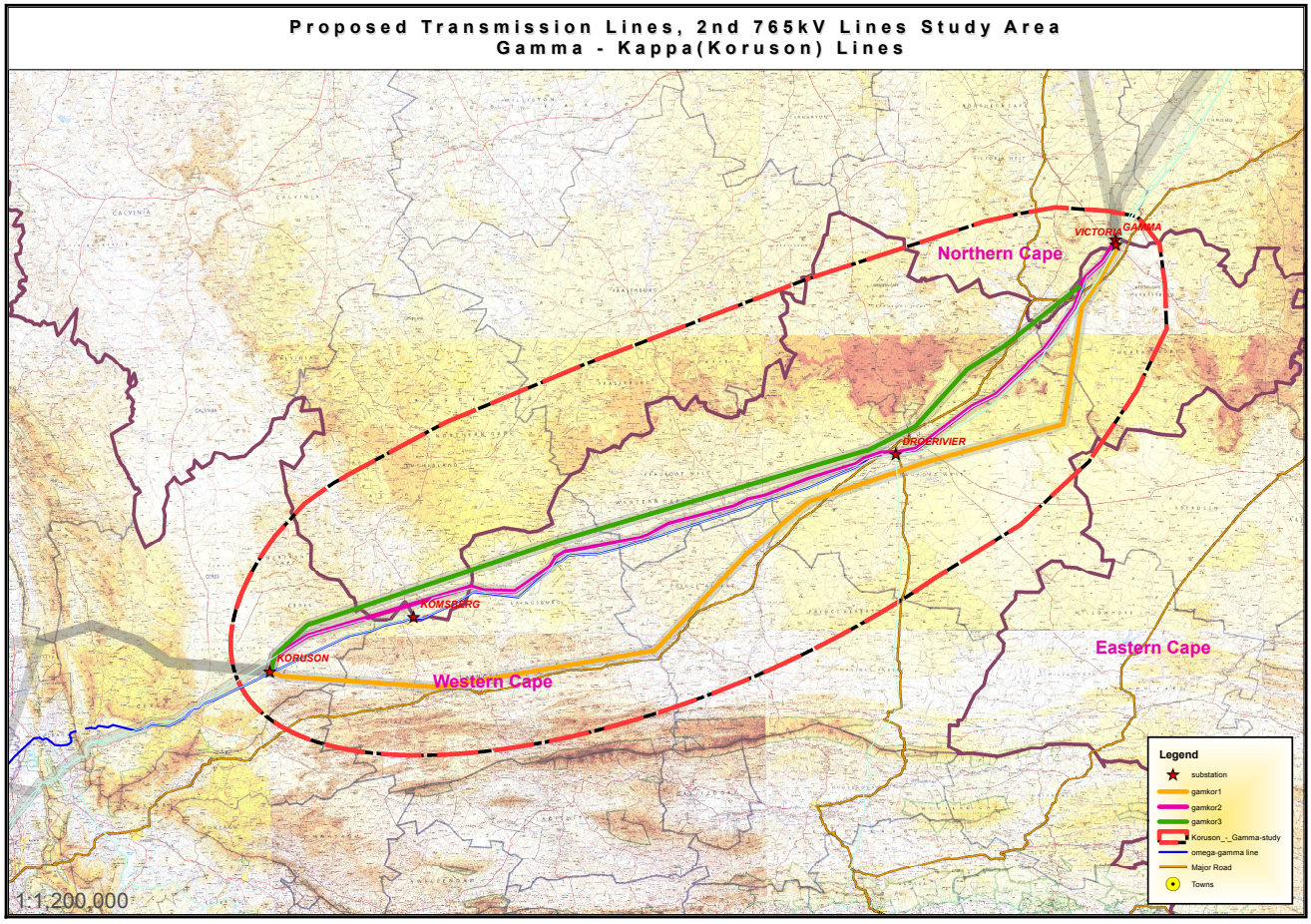
Eskom uses long-distance transmission lines to cater for power transfer capacity into the Cape network. Initially, the 400kV schemes were used and currently also making use of 765kV schemes as well. Based on the load forecast contained in the Transmission Ten-Year Development Plan 2012-2021, the load growth in the cape **(Western Cape combined with the growth in the Eastern Cape)** indicates an increasing demand of power in the region.

The existing Transmission power lines are becoming heavily loaded and are predicated to reach their full capacity very soon. These Transmission power lines and substations currently cannot supply the increased demand in the Cape area. It is becoming very difficult to manage with one power line out of service since the other power lines have to carry some part of the load while the bulk of power will be supplied by Koeberg Nuclear Power Station. This makes it difficult to carry out routine maintenance, the condition of the operating lines can deteriorate and this will result in poor line performance.

It is even more difficult to supply the Cape load without Koeberg Nuclear Power Station generation capacity. Koeberg nuclear station is the only source of generation at present and therefore the increase in power demand will need to be supplied by the existing and emerging coal fired power stations in the Mpumalanga and Limpopo (Waterberg) area which are situated more than thousand kilometers away.

Eskom initiated a study to investigate the options for further 765kV line reinforcement of the Cape network to cater for this power demand increase. The line will be very critical for the supply of power when there is no generation output at Koeberg.

Figure 1: Locality map in 1: 50 000 showing the 3 Powerline routes and main roads and substations around the project area. Attached as Appendix 2



5.5 Technical Details Of The Proposed Powerline

The proposed powerline will be approximately 370km long traversing from the Gamma Substation to the Kappa Substation. Various tower structures on which powerlines will be suspended are being considered for use during the construction in different sections of the line subject to landscape, engineering and biophysical environment of the receiving areas.

765kv Tower types

Towers for the proposed powerline would be between 42.0 and 44.0m in height. The total footprint area for each tower would be around 40m x 50m. The distance between each tower would be approximately 400m. The actual number of towers, the type of towers and other support structures associated with the proposed powerline would be confirmed and detailed following approval of final corridor for the proposed development. In general, the type of towers to be used would consider weight, the area (e.g. topography characteristic), height, costs and erection time. In addition, from an engineering perspective, transmission powerline routes are planned with as few bends as possible.

Two design alternatives have been proposed for this project, the Cross-Rope Suspension type and the Guyed Suspension type. However Self-Supporting Strain and Suspension towers will be required for bend points. These are illustrated on Appendix 3. It is important to note that the topography will largely dictate the type of tower that will be used on a specific locality along the servitude. From this perspective, it should be noted that through more difficult terrain and when the route changes direction at a 3° degree angle, there will be need to use self-supporting towers as illustrated in Appendix 4.

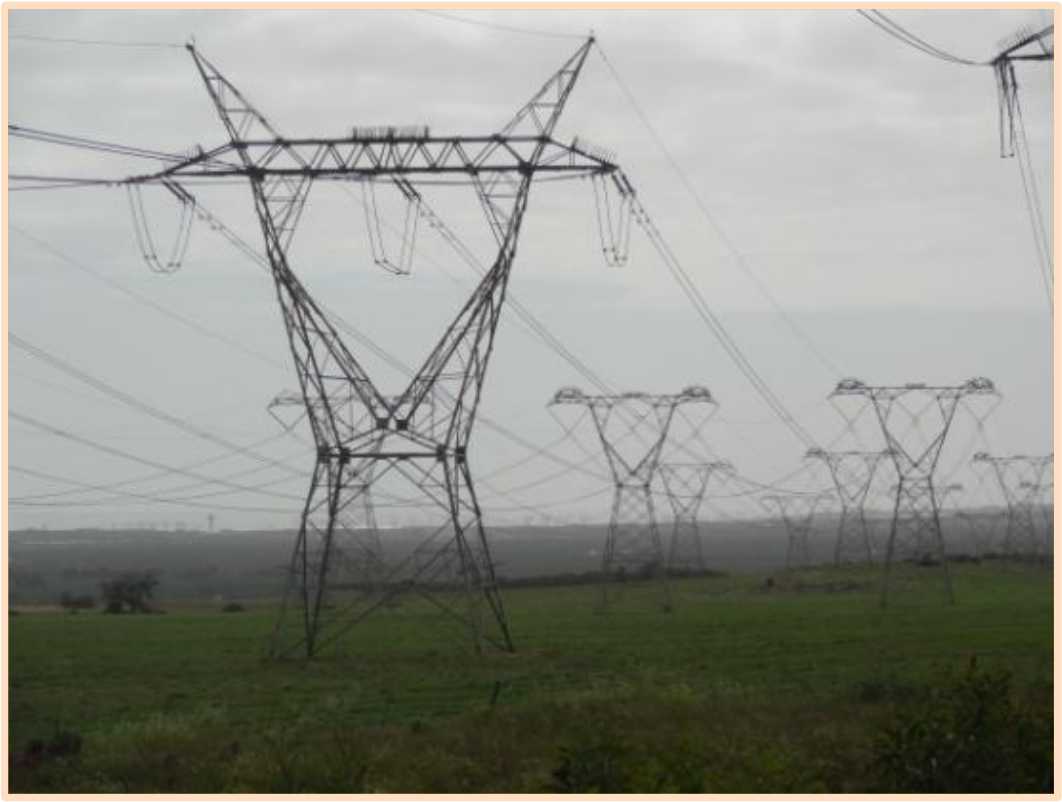


Plate 1: View of an example of self-supporting strain tower powerline.

5.6 Proposed Activities And Project Timeline

The activities for the construction and operation will be finalised during EIA phase. Design details of the powerline will also be finalised during EIA phase. However, in order to meet the power demand and supply network requirements, the powerline is expected to be operational by 2020.

5.7 Pre-Construction

The Gamma-Kappa Transmission Powerline project is currently in the pre-construction planning phase where the EIA studies and relevant authorisations are conducted. This study includes describing the project, determining the project alternatives, environmental management plan for the proposed project that would be reported in the EIA Report. Permissions or consents from landowners (through EIA

study) would be acquired. These will be incorporated into EIAR to be evaluated by the compliance authorities in making their decision. When the project EIAR is approved and assessed accordingly with the Record of Decision issued, the project ROD will be advertised. The notice will give IAPs a 30-day period for them to lodge appeals to the DEA regarding the ROD. Should all parties be satisfied and the ROD stands, then the project will proceed to construction phase.

5.8 Construction

As illustrated above, construction will commence once pre-construction studies are completed. Construction is estimated to take about 12 months. Details of activities and the environmental management process associated with the construction phase will be detailed in the EMP to be incorporated in the EIAR. We currently envisage construction to begin in 2017. The construction activities for the proposed development will include:

5.8.1 Access roads

Creation of access roads and construction camps form part of the proposed project. Access road will enable transportation of the material and construction teams to the site and facilitate post construction maintenance. The access road will be gravel. These access roads will be along the entire length of proposed powerline servitude. They will be used for construction phase and operation, mainly for maintenance. The information about the access point and exact route for the access roads will be negotiated and finalised with the landowners after completion and approval of the EIA study.

5.8.1 Construction Camp

The construction camps will be located at the nearest appropriate areas, preferably within the approved servitude corridor of proposed location of power lines. In case the construction camp cannot be within the corridor, the closest practical option

will be considered. The exact locations will be negotiated and finalised with relevant landowners.

5.8.2 Construction of transmission powerlines

The primary construction activity for this project is to install a series of towers suspending +/-370km long transmission powerline line cables. The following activities form the core part of constructing the transmission powerlines:

- Survey of the route for the powerline
- Selection of best-suited structures and foundations
- Final design of powerlines and placement of towers
- Issuing of tenders and award of contract to construction companies
- Vegetation clearance and construction of access roads (where required)
- Pegging of structures
- Construction of foundations
- Assembly and erection of structures
- Stringing of conductors
- Rehabilitation of disturbed area and protection of erosion sensitive areas
- Testing and commissioning.

5.8.3 Stringing of Conductors

Eskom Holdings SOC Limited has strict international best-practice methods of building powerlines similar to the proposed Gamma Kappa Transmission Power line. For example, the construction teams would use guide wires, to string the conductors between towers. This can be undertaken mechanically or by hand. The line will generally be strung in sections in a progressive manner until the entire cables are suspended. There will be cable drums placed at 2 km intervals during this stringing

process.. The construction phase would be considered complete once all the cables are suspended and strung between the Gamma and Kappa Substations and ready to transmit electricity from one end to the other.

5.8.4 Operation and maintenance

Upon construction completion, the powerline will be commissioned into operation. The operation and maintenance of the transmission powerline will be an on-going process for the planned life span for Gamma Kappa powerline. The Powerline will be monitored and managed according to Environmental Management Plan that will be provided in EIA phase and post-construction Operational EMPs. In addition, Eskom has established and approved international practices guides for operating and managing such transmission lines.

6 STATUTORY REQUIREMENTS

6.1 Introduction

Different sections above have eluded in enough details that the proposed development is guided and governed by Legislative Acts and Ministerial Guidelines (also see Table 5). In addition, EIA studies for electricity generation; transmission and distribution projects are also guided by additional internal Eskom Guidelines and Policies which derive from universal industry best practice (also see www.eskom.co.za).

6.2 Legislations related to the Project

6.2.1 Constitution of South Africa (Act 108 of 1996)

The Constitution (Act No. 108 of 1996) provides the legal basis for allocating powers to different spheres of Government and contains a number of rights. Primary to this study are those right specifically relevant to the national energy policy. The Constitution states that Government must establish a national energy policy to ensure that national energy resources are adequately tapped and delivered to cater for the needs of the nation. Energy should be made available and affordable to all citizens, irrespective of geographic location. The production and distribution of energy should be sustainable and lead to an improvement in the standard of living of citizens (DME, 2003b:6). Section 24 of the Bill of Rights provides that:

> "Everyone has the right:
>
> a) to an environment that is not harmful to their well being and
>
> b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that:

- prevent pollution and ecological degradation;

- promote conservation; and
- secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.".

6.2.2 Energy Policy

The White Paper on Energy Policy (DME, 1998) sets out Government Policy with regard to the supply and consumption of energy for given decade intervals. The policy strengthens existing energy systems in certain areas and calls for the development of underdeveloped systems and demonstrates a resolve to change in a number of energy supply and consumption areas. The policy addresses most elements of the energy sector.

Furthermore, the White Paper on Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between the energy demand and resource availability, whilst taking into account the health, safety and environmental parameters. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach to provide a long-term cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

6.2.3 Electricity Regulation Act of 2006

The proposed development is aligned to the following objectives (DME, 2006b:6):

- Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;
- Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply

industry within the broader context of economic energy regulation in South Africa;

- Facilitate investment in the electricity supply industry;
- Promote the use of diverse energy sources and energy efficiency; and

Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public.

In addition, the Electricity Regulation Act (Act No 4 of 2006) in terms of section 46 (2c) projects involving new generation capacity that is needed to ensure the continued uninterrupted electricity supply would require authorisations or exemptions in terms of NEMA (No 107 of1998) or as may be required by any other law for the purpose of authorisation for proposed Eskom developments (DME, 2006).

6.2.4 Integrated Energy Plan (IEP) – 2003

The Department of Minerals and Energy (DME) commissioned the IEP to provide a framework in which specific energy policies, development decisions and energy supply trade-offs could be made on a project-by-project basis. The framework was intended to create a balance in providing low cost electricity for social and economic development, ensuring a security of supply and minimizing the associated environmental impacts. The IEP projected that as the years accumulate the additional demand in electricity would necessitate an increase in electricity generation capacity in South Africa. Therefore, contemporary concerns relate to electricity capacity to accommodate growth in demand (DME, 2003a).

6.2.5 Integrated Resource Plan (IRP) – 2010-2030

The Department of Energy, under the New Generation Capacity regulations has authorised the System Operations and Planning Division in Eskom to produce the IRP

for electricity in consultation with the Department and the National Energy Regulator of South Africa (NERSA) (DOE, 2011). The objective of the IRP is to develop a sustainable electricity investment strategy for generation capacity and transmission infrastructure for South Africa over the next 25 years. In summary, the IRP is intended to:

- Improve the long term reliability of electricity supply through meeting adequacy criteria over and above keeping pace with economic growth and development
- Ascertain South Africa's capacity investment needs for the medium term business planning environment;
- Consider environmental and other externality impacts and the effect of renewable energy technologies.
- Provide the framework for Ministerial determination of new generation capacity (inclusive of the required feasibility studies) as envisaged in the New Generation Capacity regulations.

6.2.6 The National Heritage Resources Act (No. 25 of 1999)

The proposed development comprises certain activities (e.g. changing the nature of a site exceeding 5 000m^2 and linear development exceeding 300m or river crossing for more than 50m in length) that require authorisation in terms of Section 38 (1) of the NHRA, Act 25 of 1999. Section 38 (8) of the Act states that if heritage considerations are taken into account as part of an application process undertaken in terms of the ECA, there is no need to undertake a separate application in terms of the National Heritage Resources Act (NHRA). The requirements of the National Heritage Resources Act can thus be addressed as an element of the EIA process, specifically by the inclusion of a Heritage Impact Assessment (South African Heritage Resource Agency, 1999) and other compliance and commenting authorities such as the Heritage Western Cape and the Northern Cape Provincial

Heritage resources Authority. In addition, for instance, NEMA section 24 (4) (b) (iii) appears to reinforce the provisions of NHRA by requiring that procedures for assessing impacts including heritage impacts for most of NHRA sections 38 (1) activities be addressed in an application for Environmental Authorisation.

6.2.7 Minerals and Petroleum Resources Development Act (No. 28 of 2002)

In terms of the Act, the sourcing of material for road construction purposes (i.e. the use of borrow pits) is regarded as mining and accordingly is subject to the requirements of the Act. In terms of the proposed project, Section 106 (3) provides exemption from the Act. "Only where the organ of state has obtained formal exemption from the Minister, the organ of state has to:

- make formal application for exemption;
- notice of the exemption has to be gazetted by the Minister; and
- the organ of state has to compile an EMP per borrow pit and submit these to DMR for approval" (DME, 2002).

6.2.8 Development Facilitation Act (No. 67 of 1995)

The Development Facilitation Act (DFA) is the flagship statute, which sets the overall framework and administrative structures for planning throughout the country. It is a framework Act with broadly worded provisions to allow individual provinces to enact more detailed planning laws and regulations to meet their own specific needs and circumstances. The DFA and its provincial equivalent may be relevant should Eskom require a rezoning of the land from agricultural to industrial zoning (South Africa, 1995).

6.2.9 Expropriation Act (No. 63 of 1975)

The Expropriation Act is used to acquire land from unwilling sellers (South Africa, 1975). If necessary, Eskom may need to acquire additional land for this development. This would have to take place during the pre-construction phase of the development should the need to expropriate any section of land become necessary.

6.2.10 National Environmental Management: Biodiversity Act (No. 10 of 2004)

Provisions of this Act which are relevant to this study are the guiding principles relating to threatened and protected ecosystems and species, species and organisms posing a threat to biodiversity, permits relating to listed threatened and protected species, alien species or invasive species. Cognisance is also taken of the list of critically endangered, vulnerable and protected species as listed in the Government Notice No. R151 of 23 February 2007.

6.2.11 National Environmental Management: Waste Act (Act No. 59 of 2008) (NEMWA)

NEMWA came into effect on 1 July 2009 and Government Notice Regulation GNR 718, the list of waste management activities that have, or are likely to have a detrimental effect on the environment was published in Government Gazette 32368 on 3 July 2009.

Section 2 of the Act states the objectives of NEMWA are to protect the health and well-being of the environment, ensure awareness of the impacts of waste on health and provide for compliance with measures to protect health in order to secure an environment that is not harmful to health and well-being.

In terms of section 16 (1) of the Act, duty of care is applicable to (DEAT, 2008b):

- Avoid the generation of waste and where such generation cannot be avoided, to minimize the toxicity and amounts of waste that are generated;
- Reduce, re-use, recycle and recover waste;
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
- Prevent any employee or any person under the proponent's supervision from contravening this Act; and
- Prevent the waste from being used for an unauthorised purpose.

6.2.12 Conservation of Agricultural Resources Act (Act 43 of 1983)

In Terms of GN 1048 of 1984 and GN 2485 of 1999, the Act provides management principles relating to weeds and invaders and also categories of weeds and invaders (DOA, 1983).

6.2.13 National Water Act (No 36 of 1998)

The proposed development will traverse through an area where water provision is a key issue. The Constitution of South Africa, 1996 (Act No. 108 of 1996), compels all to ensure the fundamental rights of the citizens of South Africa. Section 24 of the Constitution has caused a paradigm shift towards a new environmental policy for South Africa. The NEMA, was promulgated to give legal effect to the principles of sustainability and harmonise decision-making mechanisms aimed at managing the

environment. With regard to the water resource component of the environment, the National Water Act, 1998 (Act No. 36 of 1998), was promulgated to give effect to Section 24 of the Constitution. A person who wishes to use, or who uses water in a manner that is not a Schedule 1 use, not covered under a General Authorisation, or in a manner that is not regarded or declared as, an existing lawful use, may only use that water under the authority of a licence (Section 4).

The National Water Act makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The Act also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the Environmental Impact Assessment regulations promulgated under the National Environmental Management Act. This proposal is based on an individual application and includes a component on the determination of the lawfulness of the use.

The process of applying for an Integrated Water Use Licence under the National Water Act, Act 36 of 1998, is based on the following principles:

• The process follows a strong procedural approach;

• Application can be made for multiple water uses through the execution of a single process, resulting in the issuing of a single licence for these water uses;

• Existing water pollution or impact on surface or groundwater will not be legalised and a user will be expected to mitigate the situation. Such mitigatory actions will form part of a water use license application.

• Decision-making by the regulatory authority is based on a set of rules or criteria and makes provision for the integrated assessment of all potential impacts posed by proposed, existing and historical actions;

• An open and participatory approach, where the public are involved in decision-

making. Information obtained during the assessment must be made available to the public in an understandable manner. It is assumed that this will form part of the EIA process;

• A staged procedure that increases in complexity as the process progresses, in order to ensure cost effectiveness, with each stage involving some type of assessment by the applicant, and a decision by the DWA; and

• Harmonisation of the Integrated Water Use License Application (IWULA) process with any Environmental Impact Assessment processes.

The following water uses generally have to be licensed, in accordance with Section 21 of the Water Act.

- S21(a) Taking water from a water resource;
- S21(b) Storing water;
- S21(c) Impeding or diverting the flow of water in a watercourse;
- S21(d) Engaging in a stream flow reduction activity;
- S21(e) Engaging in a controlled activity;
- S21(f) Discharging waste or water containing waste into a water resource
- through a pipe, canal, sewer or other conduit
- S21(g) Disposing of waste in a manner which may detrimentally impact
- on a water resource;
- S21(h) Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process;
- S21(i) Altering the bed, banks, course or characteristics of a watercourse;
- S21(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; and
- S21 (k) Using water for recreational purposes.

Section 4(4) of the NWA replaces the water rights under old legislation, with entitlements under the new legislation. However, existing water uses were allowed to continue as "existing lawful water use". The following provisions of the NWA define and limit the extent of this entitlement:

- Section 32 defines existing lawful use as a water use that was lawfully undertaken during a two-year period immediately before the date of commencement of the Act.
- Section 33 allows for the declaration of any water use not considered under Section 32, as an existing lawful use.
- Section 34 provides the authority to continue with an existing lawful use until its replacement by a licence.
- Section 35 outlines provisions for persons claiming an existing lawful use entitlement, to apply for the verification of the extent of existing lawful use. Water users may not continue to use the water if they do not apply for verification when requested to do so, or if the verification application has been refused.
- The responsible authority can also conduct its own investigation into the veracity of the claims made.

Briefly, it is clear that the National Water Act placed the burden and duty of care to remedy the effects of pollution to water resources needs to be taken into consideration in all circumstances while stipulating procedures to be followed in the event of an emergency incident that may impact on a water resources, governing water use licences (Section 21) if required for construction purposes (DWAF, 1998).

6.2.14 Promotion of Administrative Justice Act (PAJA) (Act no 3 of 2000)

The Promotion of Administrative Justice Act aims to give effect to the right to administrative action that is lawful, reasonable and procedurally fair, and to the right to written reasons for administrative action as contemplated in Section 33 of the constitution of the Republic of South Africa 1996 and provides for matters

incidental thereto (PAJA, 2000). In particular, the proposed development was considered in accordance with this Act in terms of the following (PAJA, 2000:4):

An administrator undertaking procedurally fair administrative action must give adequate notice of the nature and purpose of the proposed administrative action:

- a reasonable opportunity to make representations;
- a clear statement of the administrative action;
- adequate notice of any right of review or internal appeal, where applicable; and
- adequate notice of the right to request reasons if they were not provided In cases where an administrative action affects the rights of the public, an administrator, must decide whether to hold a public inquiry and therefore conduct the public inquiry or appoint a suitably qualified person to do so and determine the procedure for the public inquiry, which must:
- include a public hearing and comply with the procedures to be followed in connection with public inquiries;
- conduct the inquiry in accordance with that procedure; and
- compile a written report on the inquiry and give reasons for any administrative action taken or recommended If an administrator decides to follow a notice and comment procedure, the administrator must:
- take appropriate steps to communicate the administrative action to those likely to be materially and adversely affected by it and call for comments from them;
- consider any comments received; and
- comply with the procedures to be followed in connection with notice; and
- comment procedures.

Any person whose rights have been materially and adversely affected by

administrative action and who has not been given reasons for the action may, within 90 days after the date on which that person became aware of the action, request that the administrator concerned furnish written reasons for the action. The administrator to whom the request is made must, within 90 days after receiving the request, give that person adequate reason in writing for the administrative action.

6.2.15 National Environmental Management: Protected Areas Act (Act 57 of 2003).(NEMPAA)

NEMPAA provides for protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. The Act also supports the establishment of a national register of all national; provincial and local protected areas, for the management of those areas in accordance with national norms and standards, for intergovernmental cooperation and public consultation in matters concerning protected areas, for continued existence, governance and functions of South African National Parks and for matters in relation to protected areas.

The proposed development would traverse environmental sensitive areas (to be identified by biodiversity specialists during field work). Nonetheless, mitigation measures will be adhered to with regards to avoid and / or minimise detrimental impacts on the environmental sensitive areas

EIA Regulations 2010 promulgated in terms of NEMA under Government Notice (GN) No. 543 outline the activities for which Basic Assessments or EIAs should apply.

Table 3:Activities listed within Government Notice No. R544, R545 and R546 applicable to this project (as per Numbering in the Government Notice)

Activity number and date of the relevant notice	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
545, 18 June 2010	Activity 8: of listing notice 2 of 2010	The proposed development involves the construction of approximately substation works.
545, 18 June 2010	Activity 3: of listing notice 2 of 2010	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. Storage of fuel may be required during the construction phase of the project.
544, 18 June 2010	Activity 22(ii) of listing notice 1 of 2010	The proposed development would involve construction of a road or multiple roads wider than 8m for access to the construction and maintenance of the proposed power line.
544, 18 June 2010	Activity 23(ii): of listing notice 1 of 2010.	Temporal transformation of land will be required by the construction team for placement of their construction camps in strategic positions along the power line.
544, 18 June 2010	Activity 24: of listing notice 1 of 2010.	A precursory assessment on the proposed areas for the proposed development indicated that some of the areas where the power line would be constructed are zoned agriculture. Therefore it will be important to change the zoning to accommodate the proposed development.
544, 18 June	Activity 38: of	The proposed development would involve

Activity number and date of the relevant notice	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
2010	listing notice 1 of 2010.	expansion of facilities for the transmission line
544, 18 June 2010	Activity 47: of listing notice 1 of 2010	The proposed development would require the construction of a road that would be used both in construction and operations of the proposed power line..
546, 18 June 2010	Activity 4(a)(d): of listing notice 3 of 2010	The proposed development would require the construction of a road that would be used both in construction and operations of the proposed power line.
546, 18 June 2010	Activity 9(a): of listing notice 3 of 2010	The proposed construction of a 765kV power line would inherently involve the use of above ground cable ways for electricity transmission between Aurora and Omega substations.
546, 18 June 2010	Activity 14(3)(a)(i): of listing notice 3 of 2010	Although most parts of the area of the proposed development is dry and limited plants are expected, it is envisaged that the proposed development would involve clearance of an area of 5 hectares for the construction of the proposed power line where 75% or more of the vegetation cover constitutes indigenous vegetation.

Bearing in mind the above Regulations and listed activities, and as been discussed in proceeding sections of this report, the proposed development requires scoping and a full EIA process. Following the submission and acknowledgement of the EIA application by DEA (Reference No DEA: 14/12/16/3/3/2/353 and NEAS:

DEA/EIA/0001267/2012, this Scoping study for the project was formulated in line with the applicable regulations to achieve the following:

a) Conduct at least the public participation process set out in Regulation 54-57

b) Give notice in writing of the proposed application to any organ of state which has jurisdiction in respect of any aspect of the activity

c) Open and maintain a register of all interested and affected parties in respect of the application in accordance with Regulation 57

d) Consider all objections and representations received from interested and affected parties following the public participation process

e) Subject the application to scoping by identifying

   i. Issues that will be relevant for consideration of the application

   ii. The potential environmental impacts of the proposed; and

   iii. Alternatives to the proposed activity that are feasible and reasonable

f) Prepare a scoping report in accordance with Regulation 28; and give all registered interested and affected parties an opportunity to comment on the scoping report in accordance with Regulation 57

6.3 Eskom Guidelines

The following Eskom guidelines are also relevant to the proposed development:

- Air Quality Management Policy (ESKPBAAA3)
- The Control Of Dust Exposure Within Eskom (ESKADAAD6)
- Environmental Impact Assessment (ESKPVAAL7)
- Passive Fire Protection For Oil Filled Equipment In High Voltage Yards (FSGASAAQ8)

- Standard For Bush Clearance And The Maintenance Of Overhead Powerlines (ESKASABG3)
- Guidelines For Weed Eradication At Eskom Substations Using Herbicides (TRR/S.92/034)
- Oil Spill Clean-Up And Rehabilitation (ESKAGAAD7)
- Bird Collision Prevention Guideline (TGL41-335)

6.4 BEST PRACTICE GUIDELINES

The following Best Practice Guidelines will be taken into consideration:

- Pollution Prevention and minimisation of Waste (Department of Water Affairs)
- Water Re-use and Reclamation (Department of Water Affairs)
- Storm Water Management (Department of Water Affairs)
- Impact Prediction
- Water Management for Mine Residue Deposits
- Pollution Control Dams (Department of Water Affairs).

6.5 Existing Environmental Management System

6.5.1 Eskom ISO14001 Certified EMS

Eskom SOC Limited has developed and implements an Environmental Management System (EMS) that is certified to the ISO14001 International Environmental Management Standard. This International Standard, as per SANAS ISO14001: 2004 Edition 2, Environmental Management Systems - Requirements with guidance for use, states that the Standard "specifies requirements for an environmental management system to enable an organisation to develop and implement a policy and objectives which take into account legal requirements and other requirements

to which the organisation subscribes, and information about significant environmental aspects. It applies to those environmental aspects that the organisation identifies as those which it can control and those which it can influence. The system enables an organisation to develop an environmental policy, establish objectives and processes to achieve the policy commitments, take action as needed to improve its performance and demonstrate the conformity of the system to the requirements of the ISO14001 International Standard".

Figure 2: The ISO 14001 Approach for Eskom EMS.

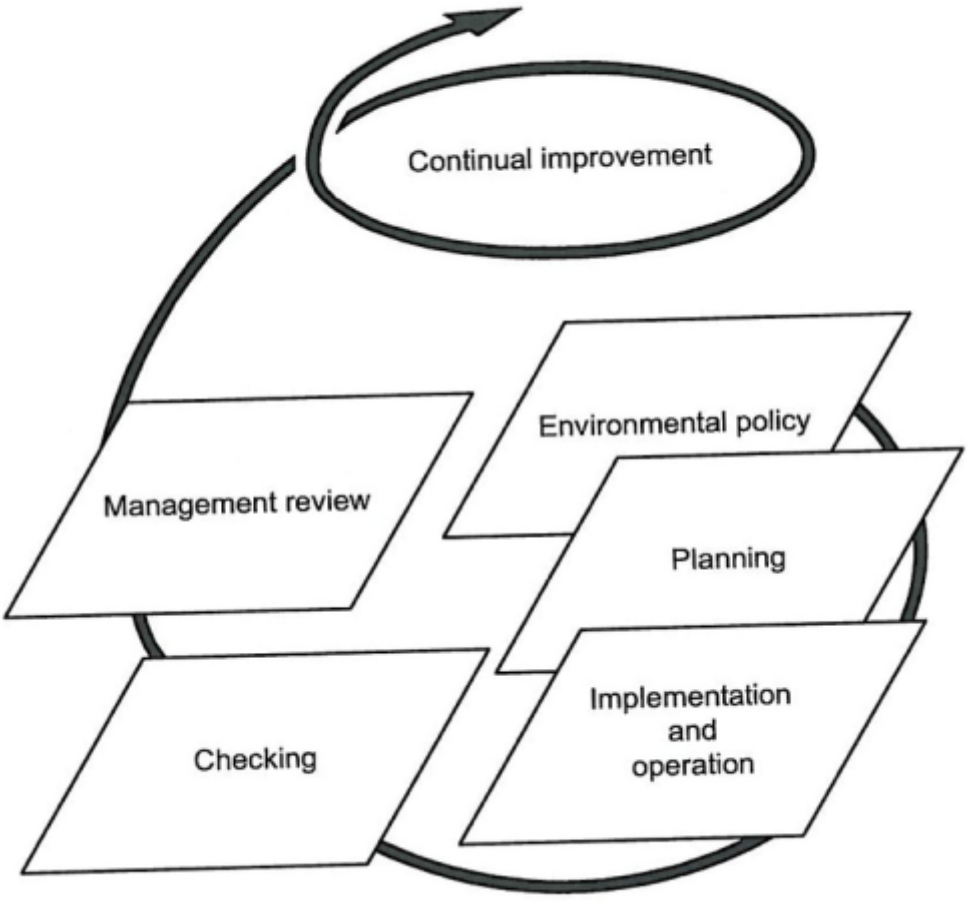
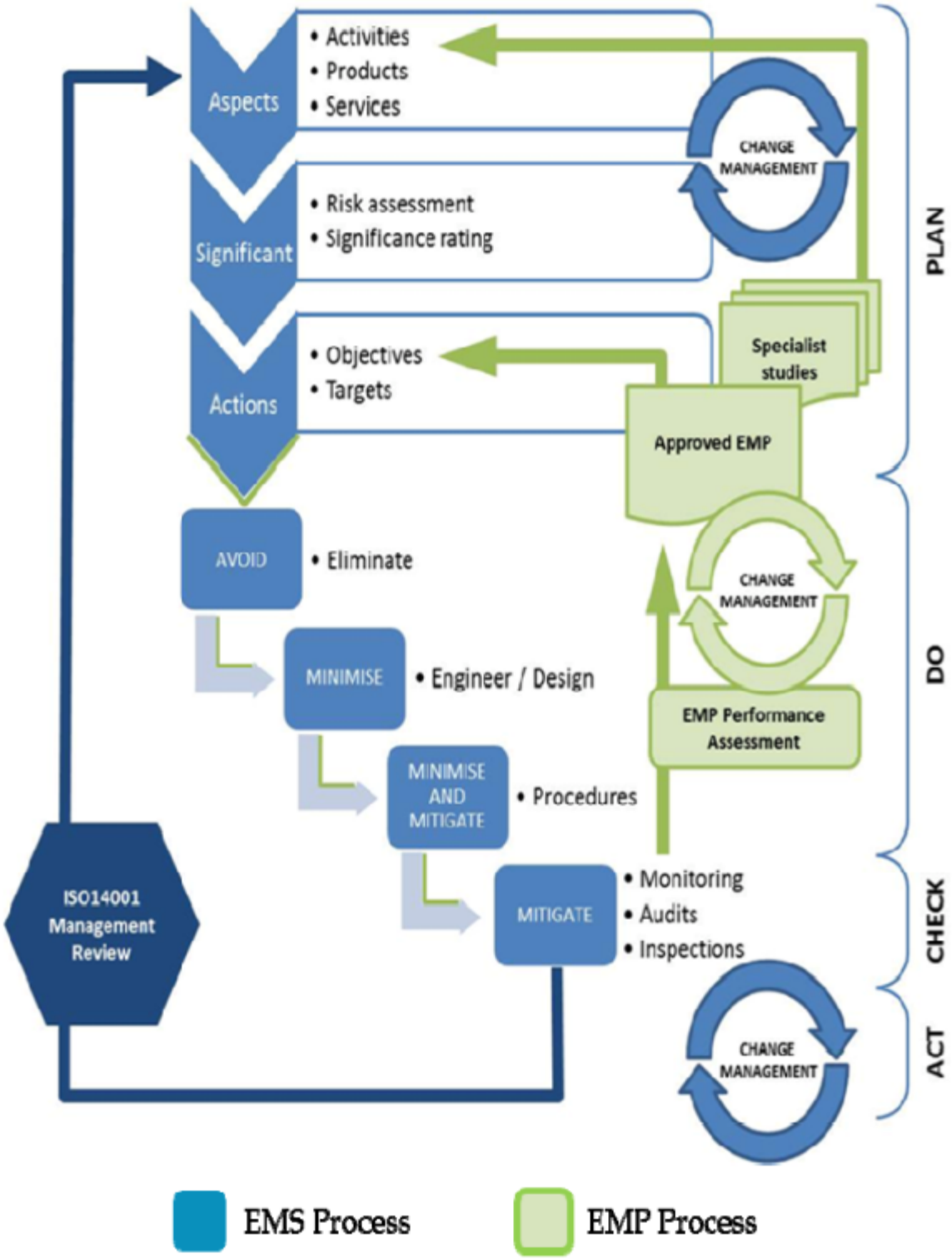


Figure 3: Proposed Implementation of EMP via the Eskom EMS.



"The ISO14001 Standard is based on the methodology known as Plan-Do-Check-Act, which is described as follows:

Plan: establish the objectives and processes necessary to deliver results in accordance with the organisation's environmental policy;

Do: implement the processes;

Check: monitor and measure processes against environmental policy, objectives, targets, legal and other requirements, and report the results; and

Act: take actions to continually improve performance of the environmental management system."

(SANAS ISO14001: 2004 Edition 2, Environmental Management Systems - Requirements with guidance for use).

7 BIO-PHYSICAL RECIEVING ENVIRONMENT

7.1 Introduction

This section discusses the key characteristics of the biophysical and human environmental aspects of the project-receiving environment. The primary impact study area is defined as the development footprint servitude corridor of 2000m and its immediate surroundings as well as to a larger scale, the local municipal areas, the broader district and regions. The information pertaining to the receiving environment has been complemented by information from desktop studies. During the EIA stage, the biophysical and human environmental aspects would be supplemented with results from the various specialist impact assessments comprising of Vegetation, Fauna; Avifauna; Wetland; Agricultural Land Capability; Visual; Heritage; Tourism, Paleontology, and Socio-economic impact assessments studies.

7.2 Biodiversity

7.2.1 Flora

The development lies predominantly within the Karoo biome which is the largest biome in region. The arid interior is dominated by Karoo drought-resistant shrubbery. The West Coast and Little Karoo are semi-arid regions and are typified by many species of succulents and drought-resistant shrubs and acacia trees. Two vegetation types characterize the Karoo: the majority of the area is Robertson Karoo and a small area consists of Breede Shale Renosterveld. This natural area provides a haven for many species. It is characterized by a succulent Karoo which occupies the arid zone between the winter rainfall fynobes Biome and the summer rainfall Nama Karoo Biome. The Karoo exhibits grassy ground layer and a distinct upper layer of bushy plants (trees and shrubs, [Also see Plate 2]). The environmental factors delimiting the Karoo biome are complex and include altitude, rainfall, geology and

soil types, with limited rainfall being the major delimiting factor. Fire and grazing also keep the grassy and shrub layer dominant. The undulating topography of the area resulted in a mosaic of habitats differing in soil types. In spite of these differences, however, the Karoo vegetation is quite homogenous as far as species composition is concerned, although the density of the vegetation and frequency of a species may subtly differ in different localities. More details on the vegetation of the project area will be explored in the EIA phase and specialists studies.

Plate 2: Karoo Biome dominate the proposed powerline servitude

7.2.2 Fauna

The Karoo region has a wide variety of endemic wildlife. Many species such as the Small grey mongoose (Galerellapulverulenta); Scrub hare (Lepussaxatilis); Cape grysbok (Raphicerusmelanotis); Caracal (Felis caracal); The nocturnal Cape porcupine (Hystrixafricaeaustralis) and small reptiles are found across the area through which the proposed powerline will traverse. Details on the fauna of the region will be presented in the EIA specialist study reports.

7.2.3. Birds

Eskom Holdings SOC Limited has a commitment to avifaunal conservation and has established an Environmental Division to investigate problems related to the possible interactions between wildlife and electrical equipment (Ledger, 1988). Therefore, one of Eskom's responsibilities is to cause as little destruction to bird life as possible, whether by electrocution, collision or any other cause. A particular concern is the mortality of endangered and vulnerable birds that may be the result of interactions with transmission lines. The death of such birds due to collisions with an Eskom Line is a serious loss to these small populations. A number of bird species are to be found along the banks of the river course and the wooded ravines on either side of the river. Black Storks will undoubtedly use the banks of the river or wetlands as foraging areas (Beater, 2007). Some of the prominent bird species in the general project area include the Gymnogene (Polyboroidestypus); Klaas Cuckoo (Chrysococcyxklaas) and the Cape Francolin (Pternistescapensis). An assessment on avifauna will be conducted during the EIA phase to identify potential impacts and mitigation measures on any identified species that may occur in the study area.

7.2.4. Pollinators

The most important animals in the Karoo region are the little ones like the bees, beetles, butterflies and the small sunbirds. These pollinators make it possible to give the region a spectacular display of flowers year after year.

7.3 Climate

The Atlantic Ocean borders the Western Cape Province to the West, and the cold ocean current and varying elevation levels on land, due to the various mountains and valley, are the cause of the large variations in temperature and rainfall that the province is experiencing. The Western Cape has warm temperature with hot dry summers and cold winters, late summer and constant rainfall regimes, the Karoo

which is situated in the interior of the Western Cape experiences the severest conditions, and ranges in rainfall from as low as 100mm on the west coast to 300mm in the East. The interior Karoo has a semi-arid climate with cold, frosty winters and hot summers with occasional thunderstorms. The number of rain days in the Karoo is less than the rest of the province. The provinces rainfall pattern, high temperatures and high severe drought period is described as a period in which the annual rainfall is less than 60% of the average annual total. During severe drought periods, soil moisture becomes insufficient for continued plant growth over large parts of the province.

The Western Cape and Northern Cape are the two regions in South Africa, which experience the highest moisture losses in terms of potential evaporation rates.

Due to high temperatures, low rainfall patterns and the high mean annual evaporation rates experienced, some areas in the Western Cape Province experience a non moisture-growing season which means that the agricultural production in these affected areas are dependent on irrigation, and due to low rainfall experienced in Western Cape and Northern Cape, erosion is more prone. Ripped, exposed areas will be susceptible to severe erosion in the event of flash flooding due to unseasonal high rainfall.

7.4 Land Use

There are multiple land characteristics and existing land uses in the project area through which the proposed powerline would traverse from the Northern Cape to Western Cape. The features include natural landscapes such as mountains, cultural landscape such as built up contemporary and historic settlements, farms, isolated homesteads, scenic routes, agricultural lands, declared nature areas and conservancies. Most of the significant portion of the receiving environment is situated within the Karoo region. Most of this landscape is used for grazing and

agriculture. Livestock farming, including dairy cattle, sheep, ostriches and karakul make up 43% of land use in the Western Cape. Most agricultural activities in the region depended on irrigation supported by infrastructures such as dams and transformed rive valleys. A further 36% of land use is made up of crops, which consist of wheat, citrus, deciduous fruit, and indigenous crops. The cultivation of grapes, citrus, tobacco, alfalfa and vegetables is practiced along the project area. Several small historical towns such as Tulbagh, Wolsely, Ceres and Prince Albert Hamlet are situated on the valley floor through which section of the proposed powerline would traverse. Detailed agricultural land use capability study will be conducted during the EIA phase.

Plate 3: View of typical farm landscape. This is the portion of Winelands vineyard farms where part of the proposed alternate powerline servitude will traverse

7.5 Geology and Soils

The Karoo Supergroup is the largest stratigraphic unit in Southern Africa, covering almost two thirds of the present land surface, including central Cape Province,

almost all of Orange Free State. The Lower most geological Unit of the Karoo Supergroup is the Dwyka formation, a glacial deposit laid down around 300 million years ago. The Karoo Supergroup in the Great Karoo Basin (South Africa) is divided into the following strata (from oldest to youngest):

- Dwyka Group (glacial marine)
- Ecca Group
- Beaufort Group (terrestrial)
- Stormberg Group (including basalts).

The project area lies in an area with the bedrock, which consists of dark olive to darkish brown tillite of the Dwyka Groupout crops or occurs at shallow depts. The bedrock is covered by alluvial gravel and wind blown sand. The project area's geology will be explored further during specialist studies including palaeontology. The latter will explore fossils presence, which may include plants (both macro-fossils and pollen), rare insects and fish, common and diverse *tetrapods* (mostly the rapid reptiles, *temnospondyl amphibians*, and in the upper strata dinosaurs), and *ichnofossils*. Their biostratigraphy has been used as the international standard for global correlation of Permian to Jurassic non-marine strata in other studies (Beater 2007).

7.6 Existing Infrastructure

The proposed development seeks to install a 765kV powerline along an area that has sections that are either sparsely developed (Karroo dessert) and heavy developed built up areas such as urban Centre's. The study area has existing infrastructure that include the existing Eskom 400 kV and 765 kV which are currently under construction from existing Gamma and Kappa Substation. In addition to these powerline networks, there are several lines of distribution powerlines traversing the entire project area and affected servitude. All three alternate servitude sites are

located adjacent to the R46 Road linking the towns of Ceres and Touws River. Sections runs parallel to existing 400kV transmission line. Several Farmhouses were observed in the close vicinity of the proposed alternative sites on the farms such as BrakPoort, Klein KoeDoes Kop, Stand Vastigheid, TygerHoek, DeHoek Estates, VredeHoek. Reconnaissance survey also recorded a number of guest house sand tourism facilities in the vicinity of the powerline servitude section. These include facilities such as Lalaphansi, KarooGastehuis, Lemoenfontein Guest Lodge recorded on Alternative 1 servitude that runs parallel on existing N1 National Road and the R63 Road.

Plate 4: View of existing powerlines in the project area.

Plate 5: View of proposed powerline and the existing powerline crossing the main road.

7.7 Noise

The main source of high noise level associated with the proposed project area derives from traffic from the local farmers, and also from agricultural machinery and activities. The environment in which the proposed development is located has the topography of an undulating landscape interspersed with some hills in the closer vicinity of the powerline servitude. Furthermore, there are numerous human designed landscape which together with the natural topography of the area provide significant screening against the propagation of noise. More specific data on noise pollution in the region will be derived during the EIA stage.

7.8 Visual Features

The project-receiving environment is susceptible to visual impact emanating from intrusive powerline towers. However, the project area already hosts existing 400kV powerlines and 765kV, which is under construction (see plate 6). Nonetheless, the

visual impacts that the proposed powerline will trigger will further be investigated during the EIA stage.

Plate 6: View of existing powerlines from a distance.

7.9 Air Quality

The existing powerlines are not known to be or are currently a source of any potential air pollution, similarly the proposed powerline installation is not expected to be a source of air pollution either. The nature of the proposed development entails that it is unlikely that there will be any activities during the operational phase of the development, which would generate any emissions. As such, apart from temporary construction vehicular tailpipe emissions pollution, the operation of the proposed powerline is highly unlikely to cause air pollution in the surrounding area.

The only potential source of air pollution for sensitive receptors in the project area (such as surrounding farmlands and Eskom employee temporary dwellings) from the proposed development would be dust that may be generated during the

construction phase. Dust levels depend on the type and level of construction activity being undertaken as well as the prevailing meteorological conditions. Dust emissions are typical caused by land clearing, drilling, blasting and cut and fill operations. The excavation for new development is likely to generate dust, which may travel into surrounding farmlands areas.

Vehicle tailpipe emissions are always present, and depending on whether the vehicle is maintained efficiently the tailpipe emissions can contribute heavily or minimally to air pollution. Vehicle emissions can be classified into two groups, primary and secondary pollutants. Pollutants such as carbonmonoxide (CO), carbon dioxide (CO2), sulphur dioxide (SO2), oxides of nitrogen (NOx), particulates and lead are generally released into the atmosphere depending on the type of fuel that is used; these pollutants are termed primary pollutants. Secondary pollutants exist only because of the chemical reactions that take place in the atmosphere; pollutants formed during this process include nitrogen dioxide (NO2), photochemical oxidants (e.g. ozone), sulphates and nitrates to name a few. Within the project area there are small vehicle populations, such as cars, vans and on a smaller scale trucks or minibus taxis, there are also heavy vehicles used for hauling along the existing national, regional and local roads traversing through he project area.

However mitigation measures, which will be put in place during the construction phase, are likely to prevent dust from affecting areas beyond the boundaries of the site. The Environmental Management Plan will specify measures such as the dust suppression agents to be as they reduce the need for high water use.

7.10 Human Environment

The project area falls predominantly within the Western Cape Province, which shares the immediate boarder with Northern Cape Province. The Western Cape is the second largest economic active province in contribution to the national GDP. The individual local municipalities (affected by the proposed project) have demographic features that resemble the districts in which they are located. The following socio-economic characteristics have been gathered from the following local Municipalities Pixley-kaSeme District Municipality and Ubuntu Local Municipality in Victoria West, and Central Karoo District Municipality with Beaufort West, Prince Albert and Liangsburg Local Municipality and Cape Winelands District Municipality with Breede Valley and Witzenberg Local Municipality Integrated Development Plans (IDPs).

The main economic activities are commercial agriculture, manufacturing, wholesale and retail and tourism. The levels of income in the municipalities are also low based on the fact that unemployment is high. Access to water, lighting and refuse removal in the rural areas are other challenges. Furthermore, the construction and maintenance of the transmission powerlines and substations could lead to a change in the number and composition of people within any given community, which in turn could lead to economic, land use, and socio-cultural change processes.

A question that is regularly raised by interested and affected parties is whether the installation of powerlines will have a detrimental medical effect on those living in close proximity of the powerlines. In 2006, Eskom commissioned an independent study conducted by Empetus Close Corporation to assess the effect of electric and magnetic fields (EMF) on the surrounding environment. The report, and several others from international researchers and experts, highlights that all household appliances and other electrical equipment generate electrical and magnetic fields

(EMF). Therefore people are generally exposed to varying levels of EMF in their daily lives at work and at home. EMF is always created, in varying levels, with the generation of electricity and the frequency of the electrical power system. Overhead powerlines generate electric and magnetic fields but not any different from what people are already exposed to from other sources in their daily lives. (Refer to Electrical and magnetic Fields from Overhead Powerlines in Appendix 5).

Table 5: Summary of typical electric field levels measured in the vicinity of the Eskom Powerlines (Empetus Close Corporation).

VOLTAGE (kV)	MAX ELECTRIC Field (V/m)	ELECTRIC FIELD AT SERVITUDE (V/m)	SERVITUDE WIDTH (m)
132	1,300	500	15,5
275	3, 000	500	23,5
400	4,700	1,500	23,5
765	7,00	2,500	40,0

Table 6:Summary of magnetic field in the vicinity of the Eskom Powerlines (Empetus Close Corporation).

Voltage (kV)	Current	Max Magnetic field	Magnetic field at Servitude Boundary	Servitude Width
132	150	4,0	1,0	15,5
275	350	6,0	1,0	23,5
400	650	10,5	2,5	23,5

765	560	6,0	1,5	40,0

The above tables (Table 5 and Table 6) illustrate that the electric and magnetic fields fall to lower levels with an increase in distance from the line. The main concern that is raised with regard to powerlines is that they are thought to increase chances of cancer. No evidence of a causal relationship between magnetic field exposure and childhood leukaemia or breast cancer has been found and no dose-response relationship has been shown to exist between EMF exposure and biological effects (Ibid).

The (Empetus Report,2006).concluded that according to findings of studies on the effects of electric and magnetic fields on plants with levels typical of a powerline environment, complying with the requirements for proper servitude management as prescribed by the electric utility, are unlikely to affect plants in terms of growth, germination and crop production.

The guidelines for electric and magnetic field exposure set by the International Commission for Non- ionising Radiation Protection (ICNIRP 2000) receives world wide support and are endorsed by the Department of Health in South Africa (2006). Calculations of electric and magnetic field levels created by overhead powerlines have shown that areas where members of the public may be exposed at the servitude boundary and further away from the line are well within the ICNIRP guidelines. Where field levels exceed the ICNIRP guidelines within the servitude, Eskom is experienced and has advanced techniques that exist to reduce the field levels.

The proposed development may traverses through section where it is near residential areas such as Beurfort West side, however it is not anticipated to result in

prohibitive and high significant or unmitigatable impacts. Any issues relating to the human environment will be explored further during the EIA phase.

Nonetheless, one class of impact that has been identified relates to heritage resources, such as historical buildings and settlements in areas such as Beaufort West, Prince Albert and Scenic routes associated within the proposed servitudes. These are usually fixed and Eskom will have to consider applicable mitigation or apply avoidance measure where applicable should the line be cleared to proceed as planned. Detailed study of the built environment and cultural landscape will form part of the Heritage Impact Assessment Specialist Studies during the EIA stage.

7.11 Heritage

The proposed project may impact on a range of heritage resources as defined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) including places, homesteads and buildings of cultural and historical significance, archaeological sites, graves and burial grounds. Stone artefacts found scattered on the surface of the earth mark archaeological sites such as Stone Age sites or that form part of the deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA) (from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (from 22 000 years ago to about 2 000 years ago). The same categories of Iron Age archaeological sites are available in the project area. A detailed Heritage Impact Assessment will however be undertaken during the EIA phase.

7.12 Construction Camp

The proposed powerline will require the erection of a temporary construction camp. Due to the time limits nature of this project the construction camp will also be

required and their final positions will be identified and finalised prior to construction. The EMP will include strict mitigation measures, which will manage the construction camp during construction. Eskom and the independent contractors both appoint Environmental Control Officer (ECO), who will be responsible for the implementation of these measures. Due to these mitigation measures, the presence of a construction camp is not expected to impact negatively on the Socio economic environment of the site.

7.13 Visual Landscape

The visual impact of powerlines depends on the complex relationship between the visual environment (landscape), the development (object), and the observer (e.g. local residents or farmers). To further elaborate; the visual environment (landscape) is a combination of landform and land cover. It determines whether the object will be visible to observers and whether the landscape provides any significant visual absorption capacity. It also determines the extent of visual compatibility of the object with its immediate surroundings and the background to the object (Eyethu Engineers, 2000).

In general, the visual character of the study area is largely natural. Man-made interventions include the existing main roads and road servitudes, existing power lines, as well as the infrastructure and buildings associated with the farmsteads, rural and urban settlements and also nature reserves such as the Karoo Mountains (Beater, 2007).

A visual impact study will be conducted, as the proposed transmission line would traverse in natural scenic landscapes, agricultural areas, rural regions potentially impacting on their sense of place, as well as impacts on tourists and motorists.

8 DISCUSSION OF THE PROJECT ALTERNATIVES

8.1 Introduction

This section considers the three alternative routes for the proposed power line. The preferred route for the power line is Option 1 subject to change after thorough considerations and detailed studies by the scientists and specialists in the EIR process. Explanations and discussions on each alternative option are presented below. This section includes strategic, technical, site, route and no go option alternatives.

8.2 Strategic Alternatives

As part of the planning exercise, the division of Eskom Holdings SOC Limited responsible for Transmission investigated different alternatives to the preferred powerline. They identified the preferred technical, design and cost effective options for the proposed development. The power line will be approximately 370 km long traversing through terrain of ranging from the uniform Karoo landscape to the mountains and hills across the region but representing relatively uniform environment sensitivity. Hence, preference is given to developing a power line running directly from and to the proposed substations at Gamma and Kappa Sites. The shortest possible route will also ensure minimum impact on the receiving environment.

8.3 Technical And Process Alternatives

8.3.1 Overhead Powerlines

From engineering, planning and financial perspectives, overhead lines are less

costly to construct than underground lines. They are also less destructive on the ground compared to underground cabling. Therefore, the preference with overhead lines is mainly on the grounds of costs and intrusive nature.

Overhead lines allow high voltage operations and the surrounding air provides the necessary electrical insulation to earth.

Further, the surrounding air-cools the conductors that produce heat due to lost energy (Swingleret al, 2006). The overall weather conditions in the Western Cape and Northern Cape are less likely to cause damage and faults on the proposed overhead transmission powerline. Nonetheless, if a fault occurs, it can be found either quickly by visual means using a manual line patrol or, in urgent cases, by helicopter patrol. Repair to overhead lines is relatively simple in most cases and the line can usually be put back into service within a few days.

In terms of impacts caused by the proposed development, factors such as visual intrusion and threats to sensitive habitat are not generally the same along the whole route.

8.3.2 Upgrade the 400kv to 765kv

Upgrading the current existing 400kv is another technical alternative, which will be investigated by specialist's studies after which Eskom SOC Holdings will assess and consider in detail. The value of this Upgrade alternative lies in the fact that Eskom Holdings SOC Limited already has infrastructure in situ and controls the servitude. This same servitude would be used for a 765kV line replacing the low capacity 400kV. Impacts of this alternative will be considered during the EIA phase. From a receiving environmental perspective, this option may have reduced impacts however; Eskom

Holdings will have to look at the cost and operational impacts of this alternative in the context of an ideal solution being:

- To meet the project demand
- Optimise the existing infrastructure
- Minimise cost
- Minimise any adverse environmental impact

Design Alternatives

8.3.2 Tower design

There are various types of tower design that has different implication in terms of cost for implementation. The need for selection of a tower type will be determined by Eskom engineering team that will consider the tower type that is most feasible and can still be less risk in terms of collision with birds. Self supporting suspension tower is the one that will be suitable in most places of the Gamma to Kappa 370 km powerline and also depending on the terrain and also suggestions from different specialists.

8.3.3 Self supporting suspension

Self-supporting suspension single circuit structures currently in use were being developed to support Eskom's introduction of 765kv lines to the national grid. It typically carries twin Dinosaur conductor a relatively light configuration. The use of a V-string assembly allows for compaction of phase spacing which in turn results in both structural and electrical efficiency. In terms of the economical feasibility of this tower, it was found that self-supporting suspension towers are more costly compared to others towers. The impetus to opt this tower design it is expensive but does not require more land as compared to other ones, as shown on Appendix 4.

Plate 7:Self Supporting suspense tower (H. Mlotshwa, 2012)

8.3.4 Cross rope suspension tower

This tower is more suitable for long distance powerline whereby most part goes straight and doesn't have a lot lost of bends and turning. This is a more preferred design that is suitable for birds in relation to powerline impact on Birds. It requires a lot of land as compared to other towers.

8.3.5 Compact cross rope suspension tower.

The cross rope tower concept was modified in a unique design, which introduces an inverted delta configuration, in which all phases are approximately equally spaced. This configuration results in greater electrically efficiency over long distances links, and also enables the reduction of related substation equipment costs.

Plate 8: Compact cross rope suspension tower (Pallett, 2009)

8.3.6 Guyed-V Suspension Tower Voltage

Eskom developed this structure for optimal use with the quad Zebra configuration. The guyed-v towers has one large foundation and four guys therefore four smaller foundations. Guyed-v towers provide the best protection from lightning impulses

due to the ground wire and cross arm configuration. Tower cross bar helps with the live line maintenance. They are known to be visually intrusive over a distance.

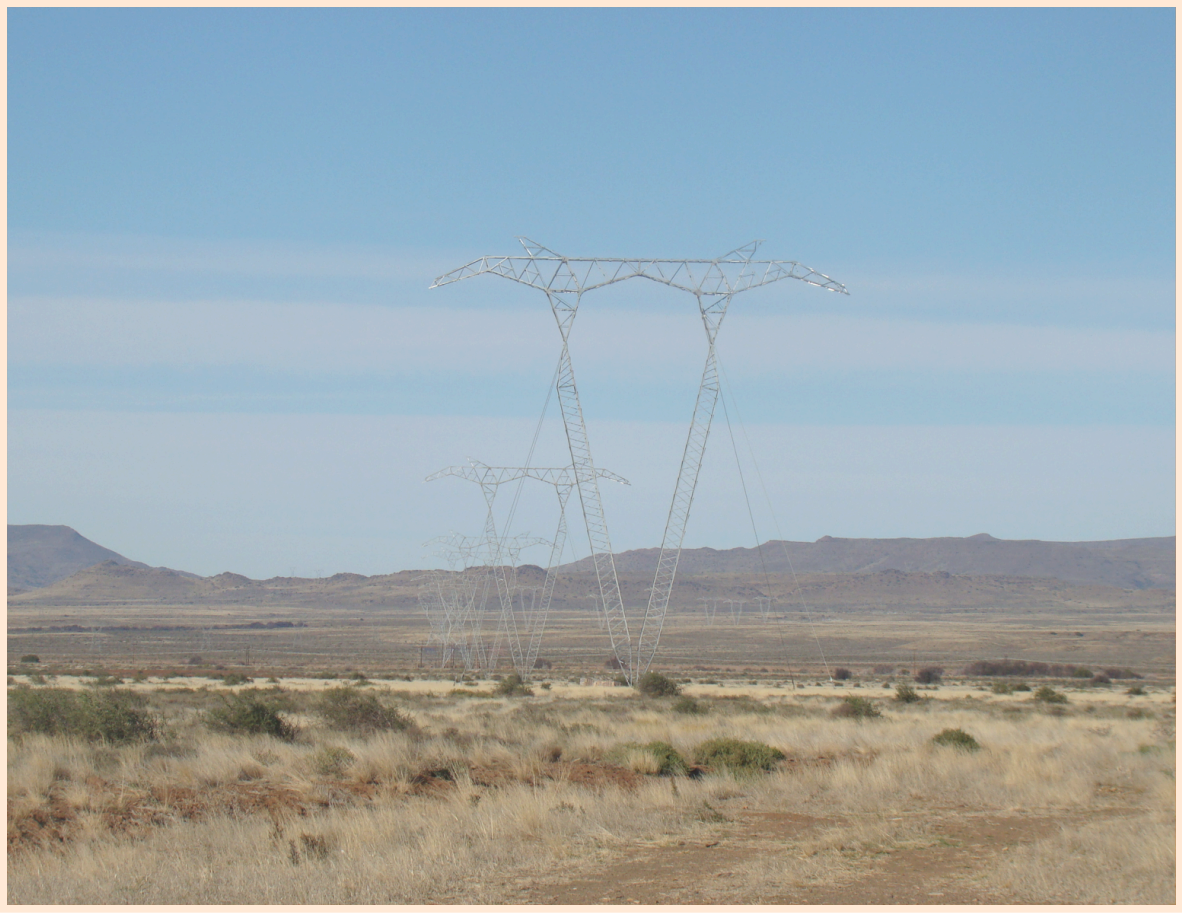


Plate 9:Guyed vee suspension tower (Photography: H. Mlotshwa, 2012)

8.4 Route Alternatives

For this study, three alternative routes are being considered each estimated to be 370km long with a 2000m (2km) wide corridor being considered. However, the final approved servitude corridor would be reduced to the appropriate width according to the final engineering designs and approvals by the DEA.

8.4.1 Preferred Power Line (Option 1)

The preferred powerline route starts from Gamma substation in Victoria West. The route runs in a slightly straight alignment towards the southwest and pass R63 Road. The line runs in the vicinity of the road reserve and eventually traversing parallel to the N1 road. The route will pass in vicinity of the Vale 4WD Trail and traverses past a number of guesthouses in the area such as Lemoenfontein Guest house. The route passes along but outside the boundaries of the Karoo National Park. This powerline route traverses through at least 69 farm propoerties including large estates such as the Quagas Fontein, De Rante, WeltVden, Cannon Fontein, and DrieKoppen.

This servitude line is the most preferred because it has limited bends and it is relatively straight making it the most direct and shortest possible route between Gamma and Kappa Substations. The route has another added advantage, reduced construction costs of constructing the powerline along the shortest possible alignment.

8.4.2 Alternative Powerlines Option 2

The Alternative Route 2, (which is red in colour as shown by the attached map, starts from the Gamma substation in Victoria West, as it starts bends and crosses R353 and also cross R61, passing the sheep land and also the Karoo nature reserve park will be passed by this route, there is a Beacon 257042 Katjieshoogte which was noticed during the site visit, as a nature resources area there are a number of guest houses such as Elandrus guest house, Gamamadi guest farm which also cuts on alternative one, also on alternative 2 there are +- 58 farms for example Yuk river, Weltevreden, Platfontein, Klipfontein extension, RietFontein, De drift, Montana, please note that some farms both alternatives pass on the same farms for example Weltevrden, and the powerline stops at Kappa substation known as Koruson .

8.4.3 Alternative Powerlines (Option 3)

Alternative Option 3 starts from Gamma Substation, in Victoria West, this alternative has got a lot of bends and as it starts about 60km it bends towards the alternative 2 and runs straight for about 90km then it bends, it also pass a number of guest houses such as Karoo Gastehuis, and it also takes a bend and runs the vast lands of Karoo in Beufort west, it passes the Goliaths Head Karoo next to the servitude, it crosses the main road N1, adjacent to the route there are farm houses, it later crosses the R53 and runs parallel to prince Albert Road, following the Swarberg near Dwayka river, and finally crosses the R354 to (Kappa)Koruson, on the servitude there are also farms +- 55, namely Good Hope, StolsHoek, Die bad, Plaas 4008, Klipwaletc.and on one of them is an ostrich farm.

8.5 Demand Alternatives

Demand can generally be defined as the activities performed by the electricity supply utility, which are designed to produce the desired changes in the load shape through influencing customer usage of electricity and to reduce overall demand by more efficient use. These efforts are intended to produce a flat load duration curve to ensure the most efficient use of installed network capacity.

By reducing peak demand and shifting load from high load to low load periods, reductions in capital expenditure (for network capacity expansion) and operating costs can be achieved. Some of the basic tools are the price signals (such as time of use tariffs) given by the utility and direct load management. This option is practised to a certain extent. Regardless of alternative sources of electricity, the power would still require transmission from source to consumer. As such, no other alternative means of transmitting electricity have been identified at this stage. At this stage and with today's technology, Eskom will still have to construct transmission powerline to move electricity from generation source to distribution regions, the function for

which the proposed powerline would fulfil.

8.6 No-Go Option

The "Do nothing" Alternative is the option of not undertaking the proposed development, which implies that the proposed 765kV powerline line should not be considered and would not be constructed. Retention of the status quo would mean that it would not be possible to meet the growing electricity demands in the Western Cape Province.

This option is not socio-economically feasible because electricity users including industry, settlements, farmers and domestic users across the Western Cape Province would be unable to avoid interruptions and possible incrementally declining supply stability. Based on Eskom's demand and supply calculations, Western Cape would face critical power supply shortage by 2020 if the proposed transmission solution is not implemented. Consequently, reading from these Eskom calculated probabilities, without the proposed new 765kV transmission power line it is reasonable to anticipate that there would be increasing possibility that outages and ultimate grid collapse could occur. This could result in economic collapse wide spread across the Western Cape Province.

Based on the identified need for the proposed development to proceed and the fact that although there could be potential negative impacts associated with the proposed development, there are several possible and effective mitigating measures that could be implemented to minimise or eliminate negative impacts, where possible, associated with the construction and operational /maintenance phases for power line developments. It is reasonable to postulate and go as far as to indicate that the "No Go" alternative is not a viable or sustainable option to be considered for this activity.

With reference to the above discussion, it should be noted that it is important to identify potential impacts in the early development process in order for timely influence on power alignment, the position of power line, technical designs criteria and budget allocations for effective implementation of necessary mitigation measures.

The most prominent envisaged outcome of the proposed activity would be the effective and efficient transmission of electricity from generation source to Western Cape Province. Electricity supply developments are directly associated with economic and social development through improvement to the social welfare of communities, industries and overall economy of the region and country at large. A steady growth in electricity demand is expected to continue in South Africa for some time because required electrification of housing projects and developments such roads, schools and railway lines and other industrial developments such as mining and mining beneficiation industries are planned by provincial and national governments. It is in this context that the proposed 765kV transmission powerline should be assessed.

9 POTENTIAL ENVIRONMENTAL IMPACTS

9.1 Introduction

The environmental impacts of a project are those consequential changes in environmental parameters, in space and time, compared with what would have happened had the project not been undertaken. The subsections below gives a simplistic summary of the anticipated negative environmental impacts of the proposed development and mitigation measures. It must be acknowledged that the intended overview of issues does not highlight a wide range of details such as: the differences in impacts between the different phases (for example, construction, operation and decommission); spatial extent and predicted lifetime of the impact.

9.2 Biodiversity

Biodiversity is an important environmental component. It is essential for the regulation of natural processes that support human life such as soil formation. Vegetation will be cleared for the construction camp as well as for the servitude; this will result in loss of species that depend on the grassland. There will be habitat loss and degradation as a result of the vegetation clearance and natural environmental processes such as soil erosion will be affected. The proposed site and alternatives do not have much vegetation cover; hence vegetation clearance will be minimal.

As a result of the noise during construction activities, animal species may migrate in search of other habitat; this may disturb the ecosystem in the area. In addition, birds may be electrocuted by power line in three possible ways. The possible ways are: simultaneously touching two live wires or simultaneously touching an energised wire

and any other piece of equipment on a pole or tower that is bonded to the earth through a ground wire.

9.3 Land Use

Current or future land uses may be affected on sections of the receiving environment due to the proposed construction of the power line. But again, should the powerline be approved and installed, any future development would be planned around or taking into consideration this line. Nonetheless, Powerlines usually run across various property boundaries and livestock pasture lands, agricultural lands, and settlements. Portions of agricultural land may need to be changed from current land use should a powerline be developed on such lands. For example, power line towers may limit a specific area from irrigation activities. Boundary fences may be damaged during construction or gates may be left open resulting in the unplanned integration of livestock. The portions of land earmarked for the proposed development are currently grazing and agricultural land and other areas are wine lands dotted with vineyards and fruit plantations. Construction of the power line will result in changes of the land use in some of these sections.

9.4 Visual Impact

All construction activities would involve the use of variety construction equipment, stockpiling of soils, materials and other visual signs. While evidence of such will be visual to the farm owners and others in the nearby vicinity, such visual disruptions will be short term and limited to the construction phase only. The entire powerline installation will permanently alter the landscape further contributing to permanent visual impact on the receiving environment.

9.5 Archaeological/Heritage Resources

Cultural heritage resources can be broadly defined as physical features, both natural and man-made, which are associated with human activity. Heritage resources would include both tangible and intangible resources such as archaeological resources, Palaeontological remains, meteorites, historical sites and beliefs systems, religious practices, ideas and oral traditions respectively. The National heritage Resources Act (Act No.25 of 1999) regards the following as heritage resources:

- Places, homesteads, building structures and equipment,
- Places to which oral traditions are attached
- Places which are associated with living heritage
- Historical settlements and townscapes
- Landscapes and natural features
- Geological sites of scientific or cultural importance
- Graves and burial grounds.

Any development that alters the status quo has the potential to impact upon any of the listed heritage resources particularly during construction phase.

Plate 7: View of an old historic farmhouse and a graveyard.

9.6 Water Resources

Construction grading and utility excavations for the pylon installations would increase the sediment load in storm water during rainfall events. Sediment sources created during construction include soil stockpiles and soil tracked across construction areas, debris resulting from the installation of electric pylons foundation. These sediment loads could be deposited into the water bodies close to the site. Due to the vast spatial extent of power line developments, it is often impossible for the power line corridor not to cross over water bodies such as rivers and wetlands. Construction activities within the vicinity of these water bodies create problems if not taken care of to prevent them. These range from erosion into rivers, which

creates water pollution to draining of wetlands in order to give way for the construction equipment. Some of the construction equipment could be located within floodplains and/or within 1:50 000 year flood lines. The combination of all these presents direct threat to water resources. Concrete resides from tower foundations or runoff has the potentially t alter aquatic environments. Management of them must be very strict for example no pours when rain is imminent, allocating controlled concrete truck washdays or areas along the route

9.7 Soil

Soil has an important role in the environment as it supports biodiversity and provides for a physical base for plants, buildings and other infrastructure. Soil structure will be disrupted during the digging of foundation for the new, pylons for the power line and during excavation works. Continuous movement of heavy machinery to and from the construction site will result in soil compaction thereby reducing its capacity to hold water which will in turn result in increased runoff during the rainy season. Fuel leakages and accidental oil spills from construction vehicles and machinery have the capability of contaminating soil once they infiltrate into the soil, this indirectly also affects plant growth in the near future.

Mixing of cement on unpaved surfaces during construction will result in change of soil chemistry, such as changes in the alkalinity/ acidity of the soil, which will reduce soil fertility hence indirectly affecting flora. Such an effect will be limited to the construction phase and it will be of short duration and it will be limited to the construction site. The significance of the impact can be avoided if mitigation measures are implemented.

9.8 Noise

Noise levels are expected to increase as a result of various construction activities. The noise will be limited to the construction phase.

9.9 Air Quality

The quality of the air will be impacted on and the sources are likely to emanate from: excessive emission of exhaust gases from construction vehicles, dust during excavation works, digging of foundations, stock piled soils and gravel surface access roads. However, this form of pollution is limited to construction period.

9.10 Health And Safety

If construction workers are exposed to excessive and continuous levels of construction-related dust and noise their health could be affected. Such exposure to dust may aggravate conditions such as asthma. Exposure to excessive levels of noise may result in temporary deafness, shock and discomfort.

9.11 Infrastructure And Services

Powerlines often intersect or are aligned in close proximity to existing infrastructure and services such as roads, telecommunication lines, boundary lines and existing powerlines. There could be temporary disruption of services during the construction of the power line.

9.12 Socio Economic

Employment opportunities may arise during the construction phase especially for activities that do not require the use of machinery. This will have a temporary positive impact on the local communities especially if provision of appropriate training and skills development is implemented. Other potential social impacts associated with the proposed development will emanate from safety and security concerns of the affected communities from the uncontrolled influx of migrant workers during the construction phase of the project. This is especially so given the fact that the project area is sparsely populated and contractors may have to bring in labour from outside the immediate project area.

Due to the specialised and technical complexity of the proposed development, it is unlikely that local service providers qualified to undertake the job will be found within the project area. As such, contractors may have to be retained from other areas either nationally or even internationally.

9.13 Topography

The topography of the area will determine the level of visual exposure of the power line. The power line will be visible from a distance if it is located on an elevated landscape. There are other linear developments already in the vicinity of the project area and as such, the proposed development will conform to some of these developments, such as 400kv and the 765kv powerlines from Gamma to Kappa and from Kappa to Omega in the Western Cape region.

9.14 Avifauna

The construction of the 765kv powerline from Gamma to Kappa in the Western and Northern Cape Provinces could potential have a very negative effect on different

vulnerable birds species in the receiving area. According to Roberts Book of Birds a total of 510 bird species occurs in the Western Cape Province. The birds are likely to utilise the powerline for perching and roosting, which will place them at risk of collision with the earth wires. Eskom has got different bird nesting guidelines, which will be used on the construction of the powerline as well with the Management plan, which will be used. The purpose of the bird nesting guideline seek to minimise and prevent incidences of bird collisions through a bird physically striking either the overhead conductor or overhead ground wire of a powerline. In case of transmission lines, the overhead ground wire of a powerline. In case of transmission, the overhead ground wire is usually involved. It is generally accepted that birds usually avoid the highly visible bundled conductors but often fail to see the thin ground wire (refer to in Appendix 6).

10 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGIES

10.1 Criteria For Assessing Impacts

The environmental impact assessment will be according to selected standard criteria for impact assessment, which are detailed below. The same criteria will be used by each of the specialists contracted to do the studies.

The first stage of impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change.

The above terms, used in relation to significance, are defined in Table below. The cut-off points have been defined in relation to characteristics of exploration, but those for Probability, Severity/Intensity and Significance are subjective, based on rule-of-thumb and experience.

The significance of the impact will be assessed by rating each variable numerically according to defined criteria as outlined in the impact assessment table. The purpose of the rating will be to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of quantified impacts. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact will be then read off a significance-rating matrix to be presented in the EIAR.

The assessment of significance will be undertaken twice. Initial significance would be based on only natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment would take into account the recommended management measures required to mitigate the impacts.

10.2 Measuring Environmental Impacts

There are guidelines and universal formulas developed for assessing or measuring identified or anticipated impacts on a given development's receiving environment. This study would apply such standards specifically those applicable to linear developments such as the proposed 765kV powerline installation. There are at least seven generic rating scales that are used into this EIA study. These are:

- Duration
- Extent
- Intensity
- Significance
- Status of impact
- Probability and
- Degree of confidence.

10.2.1 Duration

Table 8: Period of Impact Rating.

RATING	DESCRIPTION
Short term	0-5 years

RATING	DESCRIPTION
Medium term	5-15 years
Long term	Where the impact will cease after the operational life of the activity
Permanent	The impact will occur even after the operational and decommissioning of the project has occurred.

10.2.2 Extent

Extent defines the physical or spatial scale of particular impact on the receiving environment.

Table 9: Extent of Impact Rating.

RATING	DESCRIPTION
Local	Limited to the site and its immediate surroundings
Regional	Impact extends beyond site boundary.
National	Impact is widespread, it can be Countrywide

CONSEQUENCIES	
SEVERITY OF IMPACT	RATING
Insignificant/Non-harmful	1
Small/potentially Harmful	2
Significant/ Slightly harmful	3
Great/ harmful	4
Disastrous /extremely harmful	5
SPATIAL SCOPE OF IMPACT	RATING
Activity specific	1
Powerline specific (within servitude)	2
Local Area (within 5km of the activity boundary)	3
Regional	4
National	5
DURATION OF IMPACT	RATING
One day to one month	1
One month to one year	2
One year to ten years	3
Life of operation	4
Post decommission/permanent	5
LIKELIHOOD	
FREQUENCY OF ACTIVITY/DURATION	RATING
Annual or less/low	1
6 monthly/ temporary	2

Monthly / infrequent	3
Weekly/life of operation/regularly/likely	4
Daily/ permanent/ high	5
FREQUENCY OF IMPACT	RATING
Almost never/almost impossible	1
Very seldom/highly unlikely	2
Infrequent/unlikely/seldom	3
Often/ regularly/ likely/possible	4
Daily/ highly likely/definitely	5

10.2.3 Intensity

Evaluation of intensity is used to measure or establish whether the impact would be destructive or the level of destruction particular impacts will have, on a given environment.

Table 10: Impact Intensity Rating.

RATING	DESCRIPTION
Low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
Medium	Where the affected environment is altered but natural, cultural and social functions and processes continue, although in a modified way.

High	Where natural, cultural and social functions or processes are altered to the extent that they will temporarily or permanently cease.

10.2.4 Significance

Significance scale refers to threshold of the importance of a particular impact on the receiving environment.

Table 11: Significance Rating.

RATING	DESCRIPTION
Very high	Impacts could either of high intensity at a regional or national level and last for a long time
High	These impacts could of high intensity at a regional level and last for a medium term or they could be of high intensity at a national level and go on for a short duration.
Medium	Impacts could be either of high intensity at a local level and endure in the medium term or of medium intensity at a regional level in the medium term.
Low	Impacts could both be of low intensity at a regional level and endure in the medium term or of low intensity at a national level in the short term.

Comprehensive Criteria for assessing significance of impacts.

Table 12: Significance Rating Matrix

LIKELIHOOD (Frequency of activity + Frequency of impact) \ CONSEQUENCE (Severity + Spatial Scope + Duration)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

Table 13:Positive/Negative Mitigation Ratings.

Colour Code	Significance Rating	Value	Negative Impact Management Recommendation	Positive Impact Management Recommendation
	Very high	126-150	Improve current management	Maintain current management
	High	101-125	Improve current management	Maintain current management
	Medium-high	76-100	Improve current management	Maintain current management
	Low-medium	51-75	Maintain current management	Improve current management
	Low	26-50	Maintain current management	Improve current management
	Very low	1-25	Maintain current management	Improve current management

10.2.5 Status of Impact

The status of an impact is used to describe whether the impact would have a negative, positive or no effect on the receiving environment.

10.2.6 Probability

Probability describes the likelihood of the impact occurring during the proposed development, after the development or during the operational phase of the development.

Table 14: Impact Probability Rating.

RATING	DESCRIPTION
Improbable	The possibility of the impact occurring is very low or unlikely
Probable	There is a possibility that the impact will occur.
Definite	The impact will definitely occur

Table 15: Risks identified.

RISK IDENTIFIED	PROBABILITY	IMPACT	PROPOSED MITIGATION
A number of old buildings, and church buildings exist on site and also there are graves.	High	High	A heritage specialist will have to form part of the team and all the necessary applications to relevant government departments will have to be processed accordingly.

The Western Cape and Northern cape have an upper hand in terms of Agricultural Practices	High	High	A socio-economic assessment study should be conducted to mitigate the risk on economic loses as a result of the proposed development.
Negotiations with the landowners for construction of the proposed powerline.	High	High	Challenges may be faced in terms of negotiations with the landowners regarding the project. Acquisition of properties may be a challenge
Farming activities around the study area might pose a risk on positioning of towers.	High	High	Careful planning should be involved.
Visual Impact of powerline	High	High	A visual impact study will have to be conducted as part of the proposed powerline may affect "sense of place" of the nearby towns.

10.2.7 Degree of confidence

Degree of confidence measures the level of reliability of the impact predictions subject the availability of relevant information.

Table 16: Degree of Confidence.

RATING	DESCRIPTION
High	Greater than 70% sure of impact prediction.
Medium	Between 35% and 70% sure of impact prediction.
Low	Less than 35% sure of impact prediction.

11 SPECIALIST STUDIES

11.1 Introduction

To compile the Scoping Report, issues identified from preliminary consultations with key stakeholders and I&APs, Local municipalities, field visits and consultations with Eskom were considered. This information has made it possible to identify specialist studies required. The studies would be used in the assessment of potential impacts from the proposed development. Furthermore, the studies would identify sensitive areas. The following specialist studies would be conducted during the EIA phase:

The following specialists were sub-contracted by Nzumbululo Heritage Solutions to investigate key potential impacts further (Table 17)

Table 17: Specialists Studies.

Specialist studies	Requirements
Flora and fauna	• Provide status of habitat and identification of all ecologically sensitive areas. • Identification of endangered species and their locations. • Identify conservation worthy areas and how the proposed development can avoid them. • Identify potential impacts of the fauna and flora, if any, on the proposed infrastructure per alternative route to be assessed • Identify potential impacts and mitigation measures of the proposed infrastructure on the fauna and flora per alternative route to be assessed. • Provide recommendations for clearing of plants and acceptable heights. • Recommendation of the best alternative route and technology to be used.

	• Provide status of bird habitats in the area and any endangered species including their migration patterns.
Avifauna	• Provide status of bird habitats in the area and any endangered species including their migration patterns. • Identification of areas where bird interactions may play a major role. • Classification of potential bird impact, if any, on the proposed infrastructure and infrastructures impact on the bird species in the area. • Recommendations regarding how to mitigate any potential impacts on both birds and the proposed infrastructure. • Recommendation of the best alternative route and technology to be used
Wetland assessment	• Identification of wetlands and river crossings. • Mapping of information digitally on all alternatives being assessed. • Analyses of both negative and positive impacts on the proposed infrastructure, if any, and on the natural environment by the proposed development. • Recommendations for mitigation measures for each potential impact identified. • Recommendation of the best alternative route and technology.
Agricultural assessment	• Identification of agricultural activities taking place in the area and the significance to the local economy and livelihoods. • Identification of stakeholders in this sector to be engaged on the proposed development, • Analyses of both negative and positive impacts on the agriculture by the proposed development. • Recommendations for mitigation measures for each potential impact identified. • Identification of potential impacts of the proposed powerline on the agricultural sector in the area. • Recommendation of the best alternative route and technology.
Heritage Impact	• Identification & location of archaeologically, historically important areas, heritage declared sites, paleontology sites.

Assessment	• Mapping of all areas to be affected and the identification of mitigation measures. • Recommendation of the best alternate route.
Visual Impact Assessment	• Identification and location of visual impact that may affect no-go areas. • Development of mitigation measures. • Recommendation of the best alternative routes and technology.
Social Impact Assessment	• Social and economic impact assessment of the proposed development. • Identify service crossings, railways, roads, airfields, and local settlements with people who will be affected by the proposed development. • Provide a brief background of the area (i.e. language, population composition • Identify socio-economic factors of locally affected communities and how they will be impacted by the proposed development. • Identification of various land uses e.g. agricultural areas, nature reserves, zonings and future land use to be considered during corridor selection. • Identification of proposed townships lodged with local municipalities within the study area, • Identify potential impacts of the proposed development on those settlements and land-uses or economy. • Identify areas of tourism potential in the study area that may be affected by the proposed development. • Recommendation of the best alternative route and technology.
Geographical Information Systems	• All maps to be produced in a format, which will enable the process of corridor and route selection and assessment of issues for inclusion in the Scoping report and EIR. The maps will include information like land use, access routes, conservation areas and locality. The locality maps must be printed on A3 size to ensure clear illustrations.

12 AUTHORITY CONSULTATION AND PUBLIC PARTICIPATION

12.1 Introduction

As part of this on going EIA Study process, Nzumbululo Heritage Solutions will continue to gather information on the potential impacts of the project from various stakeholders, registered I&APs, and local authorities. Stakeholder engagement will be carried out throughout the EIA process. In addition, secondary and primary information will systematically and continuously be gathered from existing literature, secondary and primary sources as well as specialist studies on the study area. At this stage, information gathered and preliminary reconnaissance field surveys conducted to date were used to compile the present Draft Scoping Report (DSR), which will be circulated to the stakeholders and I&APs for review before being finalised to a Final Scoping Report (FSR) which will be submitted to DEA for further processing and final review from which the authority decision and comments will be carried into the next phase of EIAR.

Constitutionally and legislatively as well as from a public good perspective. The Public Participation Process (PPP) is a cornerstone of any EIA exercise. It is an integral requirement of the National Environmental Management Act (Act 107 of 1998) and other auxiliary legislations. Chapter 6 of the Environmental Impact Assessment Regulations (GN No R.543 of 02 August 2010) governs the nature and manner in which the public participation process (PPP) should take place. This chapter outlines the PPP should be advertised on site and in the media, the requirement of maintaining a register of Interested and affected parties (IAPs) and the entitlement of Registered IAPs to comment on written submissions to the Decision- Making

Authority. The process followed during the public participations has taken into account all aspects of public participation as stipulated in legislation.

12.2 Public Participation Process

The principles of the National Environmental Management Act (NEMA) govern many aspects of EIA process, including public participation, including the provision of sufficient and transparent information on an on-going basis to the interested and affected parties to allow to comment.

The PPPs primarily based on two factors, firstly the on-going interaction with the environmental specialist and the technical teams in order to achieve integration of environmental assessment, technical assessment and public participation throughout. Secondly to obtain the bulk issues to be addressed early on in the process, with the latter half of the process designed to provide environmental and technical evaluation of these issues. These findings are presented to interested and affected parties for verification that their issues have been captured and for further comment.

Providing Interested and Affected Parties (I&APs) with opportunity to express their concerns and/or views on issues relating to a proposed development is one of the aims of scoping, as mandated by best practice and the regulations, as it means of focusing on the relevant issues to ensure that the concerns of the IAPs are addressed, as well as ensuring that the environmental report deals with those identified issues and is thus useful to the decision maker whose obligation is to review the report and either authorise or reject the application.

12.2.1 Objectives of Public Participation

The public participation process is designed to provide and accessible information to interested and affected parties (IAPs) in an objective manner to assist them:

- During the Scoping Phase
    - To raise issues of concern and suggestions for enhanced benefits and alternatives
    - Verify that their issues have been captured

- During the Impact Assessment Phase:
    - Verify that their issues have been considered by the specialist and technical investigations
    - Comment on the findings of the EIA

12.2.2 On-Site and Press Advertising

In accordance with the requirements pertaining to advertising as detailed in the Regulations, on site notices, press advertisements, sending emails and registered letters were utilised to bring the proposed activity to the attention of IAPs. The response or registration / comment period linked to the on-site notices and advertisements was 30 days.

- The newspaper adverts were placed November 2012 and February 2013 (Appendix 3).

12.3 Public Participation – Scoping Phase

During the scoping process the following public participation activities were carried out. The detailed Stakeholder Engagement Plan will be captured in the document to be presented at EIA phase. Generally the activities included:

- Pre-consultation and Application submissions with DEA
- Development of and Updating of the existing stakeholder database;
- Distribution of the Background Information Document (BID) to Authorities, communities and other I&AP's;
- Placement of media notices;
- Placement of Posters/ On-Site notices
- Information sharing meetings, one-on-one discussions and focus group meetings; and
- Placement of the Draft Scoping Report in the public domain on 22 March 2013 for public comment.

12.4 Background Information Document (BID)

A BID document was circulated to all identified I&APs. The documents remain available and will be accessible to any member of the public who may express interest in the project. The BID document encourages all individuals to contact Nzumbululo Heritage Solutions should they wish to be registered on the I&AP database and make a comment regarding the proposed project. The BID and Response Sheet are attached to this report Appendix 3.

12.5 Public Review of Draft Scoping Report

The draft Scoping Report will be sent to different departments and posted on different public areas for review and commenting by the key stakeholders and to the Interested and affected parties The reports will be sent to :the following municipalities

- Pixley- kaSemeDistrict Municipality
- Ubuntu Local Municipality,
- Central Karoo District Municipality

- Prince Alberty Local Municipality
- Liangsburg local Municipality
- Cape Winelands District Municipality
- Breede Valley and Witzenberg Local municipality,
- Western Cape Heritage Resource Agency (Commenting Authority)
- South African Heritage Resources Agency (Commenting Authority)
- Department of Agriculture, Forestry and Fisheries (Commenting Authority)
- Western Cape Department of Environment Agriculture and rural Development (Commenting Authority)
- Department of Water Affairs (Commenting Authority)

12.6 Public Meetings

I&APs will be invited with registered letters, direct invitations through the local Councillors and community leaders and emails for Public meetings. The public meetings for the project will be held from the week of and they will continue until EIA as it is difficult to get hold of them all. All samples have been attached as appendices as follows:

- Appendix 3: List of IAPs so far.

12.7 Issues And Response Report

Government Regulation 543, Section 56, dictate that comments received from IAPs should be kept and response thereof recorded. Appendix 3 presents a comments sheet, which will be attached with comments. So far comments, which have been received, are attached on appendix 7 which are from SAHRA and Heritage Western Cape.

13 RECOMMENDATIONS

13.1 Introduction

The proposed power line, and associated auxiliary developments are located in an area, which is a mixture of currently densely developed urban scapes, agricultural landscape, cultural landscapes. The arid interior is dominated Karoo drought resistant shrubbery and the mainly visibly animals in the area of the Karoo is the Ostrich, farmed for meat eggs and feathers. The climate with winter rainfall gives rise to various microclimates that allow winemakers to produce a wide variety of quality wines from vines. In terms of infrastructure in the Western cape it has excellent network of highways, which are N1 from Cape town to Three Sisters, other routes are the "R" roads which connect the smaller towns and all major roads are tarred with major rural roads are gravel roads and well maintained. No major or radical or prohibitive natural or human environmental impacts are anticipated during the construction and operational phases of the project, furthermore, where adverse impacts are anticipated, there are existing tried and tested mitigation measures that will be implemented to ameliorate the negative impacts and augment the positive impacts.

However, a number of recommendations are set out in this report, and these are considered relevant to the future implementation of the project. Detailed specialist studies are recommended for this development to allow for detailed investigation of some anticipated impacts that will emanate during the construction and operational phases. A detailed Environmental Management Plan should be compiled to outline the mitigation measures for the anticipated impacts.

13.2 General Recommendations

Further general recommendations are:

- It is recommended that Eskom clarify issues relating to servitude access, maintenance and fire management in the servitude and associated responsibilities. It is suggested these responsibilities are clearly set out in the servitude agreements. A greater level of integration with local fire fighting associations is also recommended.
- Construction camps for the project should also be located on sites recommended in the EMP to be compiled as part of the final EIAR.

- The construction program should set out anticipated rehabilitation activities and timing. These should be included in the final EIAR. Emergency rehabilitation measures should also be identified (e.g. for spillage containment, erosion, plant damage, etc.).
- It is important that the PPP proceeds as the EIA process moves through different phases.

- The EIA exercise should develop a detailed biodiversity and monitoring plan as part of the proposed project EMP. The general objective for terrestrial and biological and physical monitoring during the construction and subsequent operation of the powerline and associated substations would be to evaluate the success of sustaining biodiversity by measuring specific indicators or biological / physical elements, and to contribute to on-going and future adaptive management of the sensitive regions such as the Karoo natural and secondary environments of the project area.
- Given potential biophysical concerns relating to sections of the project area specifically the Karoo landscape and biome, the final project EMP would include the following recommended monitoring programme:

  Indicators of biodiversity

For the purposes of the powerline development and operation monitoring plan indicators should be chosen at the species level and landscape scale. The choice of indicators would be based on recognised threats to biodiversity where applicable. Nzumbululo recommends that the following indicators be used for future monitoring biodiversity in the study area (along the entire powerline servitude) should the development be approved to proceed:

- Extent and condition of arid land
- Extent and condition of wetlands where they exist;
- Habitat transformation;
- Distribution and abundance of selected alien plant species;
- Extent of roads;
- Viability of populations of endangered endemic species;
- Extinct, threatened and endemic species per taxonomic group;
- Occurrence of natural disturbances (e.g. fire);
- Woody species encroachment; and
- Soil erosion.

- Details on the monitoring of each indicator will be presented in the final EIAR in the Biodiversity Action Plan.

14 CONCLUDING REMARKS

14.1 Introduction

This section concludes the Draft Scoping Report for the proposed construction of 765kV power line traversing a length of approximately 370km from Gamma Substation in Northern Cape Province to Kappa Substation in the Western Cape Province. The proposed location of the power line is in an area, which consists of varying landscape typology including commercial farming with a mixture of game, sheep, ostrich, cattle and crop cultivation, and the vast semi-arid Karoo land. The preliminary study data identified potential adverse impacts on sections and segments of the receiving terrestrial and cultural environments. However, this scoping did not identify nor anticipate permanent barriers or unmitigatable impacts that may emanate from the proposed development. Most of the receiving environment is not pristine landscape by any measure. Although localities along the powerline route and project area may directly be affected by the proposed development, the proposed new power line is a necessity for the Western Cape Province's energy supply in the near future. It is of critical importance that the EIA study for the proposed powerline be completed and be submitted to the compliance agency, DEA for further consideration.

14.2 Final Remarks

The power line route is located in an area of medium to high visual quality, and every effort should be made to minimize any further disturbances on the cultural and rural as well as the sensitivity of the Karoo landscape. Where they exist, heritage resources such as cultural landscape, built historic and colonial homesteads, including potential archaeological and paleontological sites such multiple Stone Age Phase (Early, Middle and Late), rock art, Khoe and Xhosa herders prehistoric

sites would be protected or avoided during the proposed development. Nonetheless, given that there are other significant linear developments already existing in the area (distribution power lines, railway line, telecommunication and dirt small access roads in some areas in the farming areas etc.), and other substation sites, the proposed development will result in similar impacts to the existing infrastructure or landscape in the area. Therefore, studies, which will further be done during the EIA stage and reported in the EIAR, would take into consideration these factors in making detailed research along the entire route and associated alternatives.

Furthermore, it is recommended that more public input and consultations should be conducted through out the EIA phase of this study. All detailed specialists inputs would form part of the EIAR to be submitted for final evaluation to DEA. The results will allow relevant authorities adequate information to assess and decide on the most suitable powerline route and conditions under which the development may be considered for approval. Given the observation that the proposed development will traverse through parts of one of South Africa's most discussed environ-regions, the Karoo, Nzumbululo lastly recommends that the final EIAR and EMP should include an Environmental Awareness Plan for the entire project which would address:

- outline how employees working on the project will be informed of environmental risks; and
- state how employees will be able to prevent, reduce or remediate risks during the development and operation of the powerline.

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