

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Eskom is the South African utility that generates, transmits and distributes electricity. Eskom supplies about 95% of the country's electricity, and about 60% of the total electricity consumed in Africa. Eskom plays a major role in accelerating growth in the South African economy through the supply of high-quality electricity. Eskom is in the process of undertaking major infrastructure investments, including the construction of substations and new transmission power lines. The transmission network supplying electricity to the Northern Cape and Free State Provinces requires strengthening to meet the growing demand in these provinces and to improve service quality and reliability. To address this situation Eskom wants to construct a number of new transmission lines, linking its main generating facilities with the demand centres. The strengthening of the electricity network entails the phased construction of various 400kV transmission lines in the proposed Eskom Kimberley Strengthening Phase 4 Project.

The construction of a 400kV power line is a listed activity in terms of Section 24(5) of the National Environmental Management Act (NEMA), Act No 107 of 1998, as amended, and therefore requires environmental authorisation from the Department of Environmental Affairs (DEA). Eskom Transmission has therefore appointed Landscape Dynamics Environmental Consultants as an independent company, to conduct an Environmental Impact Assessment (EIA) to evaluate the potential environmental and social impacts of the proposed project.

1.2 PURPOSE AND CONTENT OF THE DOCUMENT

In terms of NEMA legislation, a Scoping & Environmental Impact Assessment process is applicable. The first part of this process, namely the Scoping Phase is documented in this report.

The objectives of the Scoping Study and therefore this Scoping Report are

- to identify the issues relevant to the activity for which authorisation is being applied for;
- to identify the potential impacts of the activity to enable authority to take into consideration the environmental effects of activities before development decisions are taken;
- to identify potential alternatives to the proposed activity to ensure the objectivity of the assessment process.
- to give all registered I&AP's the opportunity to comment on the Scoping Report.

According to the NEMA the following information must be supplied in a Scoping Report:

“A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –

- (a) details of –
 - (i) the EAP who prepared the report; and
 - (ii) the expertise of the EAP to carry out scoping procedures;
- (b) a description of the proposed activity and of any feasible and reasonable alternatives that have been identified;
- (c) a description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is –
 - (i) a linear activity, a description of the route of the activity; or
 - (ii) an ocean-based activity, the coordinates where the activity is to be undertaken;

- (d) a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- (e) an identification of all legislation and guidelines that have been considered in the preparation of the scoping report;
- (f) a description of environmental issues and potential impacts, including cumulative impacts, that have been identified;
- (g) information on the methodology that will be adopted in assessing the potential impacts that have been identified, including any specialist studies or specialised processes that will be undertaken;
- (h) details of the public participation process conducted in terms of regulation 28(a), including
 - (i) the steps that were taken to notify potentially interested and affected parties of the application;
 - (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;
 - (iii) a list of all persons or organisations that were identified and registered in terms of regulation 57 as interested and affected parties in relation to the application; and
 - (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;
- (i) a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include –
 - (i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;
 - (ii) an indication of the stages at which the competent authority will be consulted;
 - (iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and
 - (iv) particulars of the public participation process that will be conducted during the environmental impact assessment process; and
 - (j) any specific information required by the competent authority.

In addition, a scoping report must take into account any guidelines applicable to the kind of activity which is the subject of the application.”

1.3 LEGAL REQUIREMENT

1.3.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.543, June 2010. Environmental Authorisation is requested for the following listed activities :

Listed activity as described in GN R.544, 545 and 546	Description of project activity that triggers listed activity
Government Notice 544 (Listing Notice 1)	
Listing Notice 1: Number 10 The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; (ii) or inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	It could be that the proposed 400kV line runs inside of urban areas or industrial complexes.

<p>Listing Notice 1: Number 11 The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50m² in size; (ix) slipways exceeding 50m² in size; (x) buildings exceeding 50m² in size; or (xi) infrastructure or structures covering 50m² or more where such construction occurs within a watercourse or within 32m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>According to the SANBI River and Wetlands maps attached in Appendix A(4), rivers and wetlands would be crossed by the proposed powerline. It is unclear at this stage whether it will be possible to restrict construction within 32m of these watercourses and it is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that watercourses will be impacted upon. Finality in this regard will be obtained during the EIR phase when the final route has been determined.</p>
<p>Listing Notice 1: Number 18 The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater; but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line</p>	<p>According to the SANBI River and Wetlands maps attached in Appendix A(4), rivers and wetlands would be crossed by the proposed powerline. It is unclear at this stage whether it will be possible to restrict construction within 32m of these watercourses and it is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that watercourses will be impacted upon. Finality in this regard will be obtained during the EIR phase when the final route has been determined.</p>
<p>Listing Notice 1: Number 23 The transformation of undeveloped, vacant or derelict land to (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; except where such transformation takes place for linear activities</p>	<p>The proposed Beta and Boundary TX Substations will be constructed on land bigger than 1 hectare but smaller than 20 hectares outside of urban areas.</p>

Government Notice 545 (Listing Notice 2)

<p>Listing Notice 2: Number 8 The construction of facilities of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>The proposed 400kV power line will run outside of urban areas or industrial complexes.</p>
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Government Notice 546 (Listing Notice 3)

<p>Listing Notice 3: Number 4 The construction of a road wider than 4 metres with a reserve less than 13.5 metres: i. In an estuary; ii. Outside urban areas in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 km from the high-water mark of the sea if no such setback line is determined.</p>	<p>The powerline will cross a NPAES focus area (refer to the SANBI map attached in Appendix A(4) and roads wider than 4m will be constructed. Information regarding CBA's within the study area is not available on the SANBI website. During the course of the EIA, intense investigations will be required in order to obtain the necessary information, thereby determining the applicability of this NEMA activity. It is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that CBAs will be impacted upon. Due to the total length of the powerline alternatives being approximately 274km, the environmental plans of the province and the natural environment surrounding the study area will have to be studied in depth to determine the applicability of certain highlighted activities. Finality in this regard will be obtained during the EIR phase when the final route has been determined.</p>
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<p>iii. In urban areas</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for 'a conservation purpose</p> <p>(cc) Seawards of the development setback line or within urban protected areas</p>	
<p>GN 546, June 2010, Number 12</p> <p>The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</p> <ul style="list-style-type: none"> • Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; • Within critical biodiversity areas identified in bioregional plans; • Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line or even in urban areas. 	<p>Vegetation clearance is required for the substation and small areas will be cleared for the pylons. Areas bigger than 300m² will be cleared. Specialist studies will determine if 75% or more of the vegetation cover constitutes indigenous vegetation.</p> <p>Information regarding CBA's within the study area is not available on the SANBI website. During the course of the EIA, intense investigations will be required in order to obtain the necessary information, thereby determining the applicability of this NEMA activity. It is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that CBAs will be impacted upon.</p> <p>Finality in this regard will be obtained during the EIR phase when the final route has been determined.</p>
<p>GN 546, June 2010, Number 13</p> <p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;</p> <p>(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing 1 in terms of GN R.544 of 2010.</p> <p>(a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.</p> <p>(b) National Protected Area Expansion Strategy Focus areas.</p> <p>(c)(i) In an estuary</p> <p>(c)(ii) Outside urban areas the following:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Core areas in biosphere reserves;</p> <p>(ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p>iii. In urban areas, the following:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) Areas seawards of the development setback line;</p> <p>(dd) Areas on the watercourse side of the development setback line or within 100m from the edge of a watercourse where no such line has been determined.</p>	<p>Vegetation clearance is required for the substation and small areas will be cleared for the pylons. The cumulative effect may be bigger than 1 hectare. Specialist studies will determine if 75% or more of the vegetation cover constitutes indigenous vegetation. The powerline will cross a NPAES focus area (refer to the SANBI map attached in Appendix A(4)).</p> <p>Information regarding CBA's within the study area is not available on the SANBI website. During the course of the EIA, intense investigations will be required in order to obtain the necessary information, thereby determining the applicability of this NEMA activity. It is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that CBAs will be impacted upon.</p> <p>Due to the total length of the powerline alternatives being approximately 274km, the environmental plans of the province and the natural environment surrounding the study area will have to be studied in depth to determine the applicability of certain highlighted activities.</p> <p>Finality in this regard will be obtained during the EIR phase when the final route has been determined.</p>

<p>GN 546, June 2010, Number 14 The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <ol style="list-style-type: none"> (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes; (2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list. (3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010. <p>i) All areas outside urban areas</p>	<p>Vegetation clearance is required for the substation and small areas will be cleared for the pylons. The cumulative effect may be bigger than 5 hectares. Specialist studies will determine if 75% or more of the vegetation cover constitutes indigenous vegetation.</p>
<p>GN 546, June 2010, Number 16 The construction of:</p> <ol style="list-style-type: none"> (i) jetties exceeding 10m² in size; (ii) slipways exceeding 10m² in size; (iii) buildings with a footprint exceeding 10m² in size; or (iv) infrastructure covering 10m² or more where such construction occurs within a watercourse or within 32m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. <ol style="list-style-type: none"> i. In an estuary ii. Outside urban areas, in: <ol style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an International Convention; (ff) Critically biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. iii. In urban areas: <ol style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line. 	<p>The powerline will cross a NPAES focus area (refer to the SANBI map attached in Appendix 7).</p> <p>According to the SANBI River and Wetlands maps attached in Appendix A(4), rivers and wetlands would be crossed by the proposed powerline. It is unclear at this stage whether it will be possible to restrict construction within 32m of these watercourses and it is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that watercourses will be impacted upon.</p> <p>Information regarding CBA's within the study area is not available on the SANBI website. During the course of the EIA, intense investigations will be required in order to obtain the necessary information, thereby determining the applicability of this NEMA activity. It is therefore required to include this activity so that it can be addressed in its totality should it become clear at a later stage that CBAs will be impacted upon.</p> <p>Due to the total length of the powerline alternatives being approximately 274km, the environmental plans of the province and the natural environment surrounding the study area will have to be studied in depth to determine the applicability of certain highlighted activities.</p>

In terms of the NEMA legislation application for environmental authorisation is lodged with the National Department of Environmental Affairs (DEA). DEA has to evaluate this Scoping Study and based on the findings and proceedings documented in the Scoping Report supply the Environmental Assessment Practitioner (EAP) with a decision to proceed with the EIA or to amend the Scoping Report.

The following departments and government institutions are key commenting authorities :

- Department of Economic Development, Tourism and Environmental Affairs, Free State Province: (Section Environmental Quality Management)
- Department of Water and Sanitation (DWS) Free State Region
- The South African Heritage Resources Agency (SAHRA) and they will advise whether authorisation is also required from Free State Provincial Heritage Authority

The NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.

The NEMA principles serve as:

- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

NEMA principles are the following :

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

1.3.2 THE NATIONAL WATER ACT (ACT NO 36 OF 1998)

Procedures prescribed in the **National Water Act** require that an application for a water use license for the proposed sewage treatment works (if applicable) will apply. This application should be lodged with the regional office of the Department of Water Affairs (DWA).

The National Water Act guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources, where Department of Water Affairs (DWA) is the administering body in this regard. Should the proposed activities associated with the proposed substation extension or power line deviation impact on water resources e.g. cross through rivers, the applicant would be responsible to obtain a permit from DWA.

1.3.3 THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The proposed project falls within the scope of Section 38 of the **National Heritage Resources Act, (Act 25 of 1999)** and the applicable activities are:

- (a) the construction of a road, wall, power line, pipeline, canal or similar form of linear development or barrier exceeding 300m in length;
- (b) any development or other activity which will change the character of a site-
 - exceeding 5 000m² in extent
 - involving three or more existing erven or subdivisions thereof
- (c) the re-zoning of a site exceeding 10 000m² in extent

1.3.4 ADDITIONAL ACTS AND FRAMEWORKS

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

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. Should protected species and ecosystems be impacted on by the proposed substation upgrade or power line deviation, this Act may be applicable and the necessary measures should be taken for implementation.

National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

Protected species – Provincial Ordinances

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the provincial departments responsible for environmental affairs.

Expropriation Act (No. 63 of 1975)

Eskom has a policy of "willing buyer, willing seller", and therefore endeavours to purchase land where ever possible or necessary. However, the State and State-owned-enterprises can acquire the rights to use or possess the requisite land through the Expropriation Act (No 63 of 1975). The Expropriation Act requires the determination of compensation based on the principle of market value (i.e. what would the value be in the event of both a willing buyer and a willing seller trading the land). There is a suite of additional legislation, which, in conjunction with the Expropriation Act, would be used to determine the compensation value.

Occupational Health and Safety Act (Act No 85 of 1993)

This Act makes provisions that address the health and safety of persons working at the proposed substation and power line. The Act addresses amongst others the:

- Safety requirements for the operation of plant machinery;
- Protection of persons other than persons at work against hazards to health and safety, arising out of or in connection with the activities of persons at work;
- Establishment of an advisory council for occupational health and safety; and
- Provision for matters connected therewith.

The law states that any person undertaking upgrades or developments for use at work or on any premises shall ensure as far as is reasonably practicable that nothing about the manner in which it is erected or installed makes it unsafe or creates a risk to health when properly used.

Department of Environmental Affairs and Tourism Integrated Environmental Management Series

The Department of Environmental Affairs (DEA) Information Series of 2002 and 2006 comprise 23 information documents. The documents were drafted as sources of information about concepts and approaches to Integrated Environmental Management (IEM). The IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general guidance on techniques, tools and processes for environmental assessment and management.

White Paper on the Energy Policy of the Republic of South Africa – 1998

Development within the energy sector in South Africa is guided by the White Paper on the Energy Policy, published by the Department of Minerals and Energy (DME) in 1998. This White Paper sets out five objectives for the further development of the energy sector. The five objectives are as follows:

- Increased access to affordable energy services;
- Improved energy governance;
- Stimulating economic development;
- Managing energy-related environmental and health impacts; and
- Securing supply through diversity.

Furthermore, the Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between energy demand and resource availability, whilst taking into account health, safety and environmental aspects. 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.

The Tourism Act, 1993 (Act No. 72 of 1993)

Policy and legislation governing tourism in South Africa emphasizes the concepts of responsible tourism and sustainable tourism development. Tourism in South Africa is legislated in terms of the Tourism Act (Act No. 72 of 1993), which was amended as the Tourism Amendment Act (Act No. 105 of 1996 and the Tourism Second Amendment Act no. 70 of 2000. The 1996 White Paper on Development and Promotion of Tourism in South Africa introduces the concept of “responsible tourism”; i.e. tourism with a responsibility towards the environment, through sustainable use of resources, involvement of local communities, and commitment to safety and security of all concerned. Taking this further, the drive towards “sustainable tourism” development emphasizes the optimisation of benefits relating to tourism,

The Constitution Act (No 108 of 1996)

Chapter 2 Bill of Rights; Section 24 Environmental rights; Section 25 Rights in property; Section 32 Administrative justice; Section 33 Access to information.

NEM: Protected Areas Act (No 57 of 2003)

The Act came into operation on 01 November 2004. The aim of the Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes. In 2004, the National Environmental Management: Protected Areas Amendment Act 31 of 2004 was promulgated to amend Act 57 of 2003 with regard to the application of that Act to national parks and marine protected areas. The NEM: Protected Areas Amendment Act was published for public information on 11 February 2005 and came into operation on 01 November 2005. The NEM: Protected Areas Act, as amended by the NEM: Protected Areas Act 31 of 2004 repeals sections 16, 17 & 18 of the ECA as well as the National Parks Act with the exception of section 2(1) and Schedule 1.

The Conservation of Agricultural Resources Act (No 43 of 1983)

Section 6 Implementation of control measures for alien and invasive plant species.

Atmospheric Pollution Prevention Act (No 45 of 1964) and regulations

Sections 27 – 35 Dust control; Section 36 -40 Air pollution by fumes emitted by vehicles.

National Environmental Management: Air Quality Act, 2004 (No 39 of 2004)

Section 32 Control of dust; Section 34 Control of Noise; Section 35 Control of offensive odours.

Occupational Health and Safety Act (No 85 of 1993) and regulations

Section 8 General duties of employers to their employees. Section 9 General duties of employers and self-employed persons to persons other than their employees.

National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)

Strategy for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory (NEMBA), Sections 65-69. These sections deal with restricted activities involving alien species; restricted activities; involving certain alien species totally prohibited; and duty of care relating to alien species Sections 71 and 73 These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.

National Forests Act (No 84 of 1998) and regulations

Section 7 No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under section 7(4) or section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette.

Sections 12-16: These sections deal with protected trees, with the Minister having the power to declare a particular tree, a particular group of trees, a particular woodland; or trees belonging to a particular species, to be a protected tree, group of trees, woodland or species. In terms of section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.

Fencing Act (No 31 of 1963)

Section 17 Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora. National Water Act (No 36 of 1998) and regulations Section 19 Prevention and remedying the effects of pollution. Section 20 Control of emergency incidents Chapter 4 Use of Water and licensing Hazardous Substances Act (No 15 of 1973) and regulations Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances

Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations

Sections 3 to 10 Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard.

All relevant Provincial Legislation and Municipal bylaws**Eskom Environmental Procedures**

Eskom Environmental Procedures in terms of :

- Acquiring of servitudes
- Bush Clearing
- Access to properties

1.3.5 ESKOM PLANNING PROCESSES

The following section, although not legislative, provide supplementary information on some of Eskom's planning processes.

Integrated Resource Plan for Electricity (IRP) – 2010

The Integrated Resource Plan (IRP) is a long-term electricity capacity plan, which defines the need for new generation and transmission capacity for the country. The IRP outlines the concepts and development behind the IRP for the electricity industry in South Africa as well as the strategic objectives of the IRP including the policy and technical parameters that drive the planning process.

The National Energy Act of 2008 (Act 34 of 2008) obligates the Minister of Energy to develop and publish an IRP for energy. As electricity forms a sub-component of the energy sector the electricity IRP needs to be integrated into the outlook for energy. The system Operations and Planning Division in Eskom has been mandated by the Department of Energy (DoE), under the New Generation Capacity regulations, to produce the IRP for electricity in consultation with the DoE and the National Energy Regulator of South Africa (NERSA). 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. The investment strategy includes implications arising from demand-side management (DSM) and pricing, and including capacity provided by generators (Eskom and independent power producers).

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 on 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.

1.4 PROJECT TEAM

1.4.1 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Landscape Dynamics Environmental Consultants is the Environmental Consultants for the project. Landscape Dynamics cc is an environmental consultancy firm, established in May 1997. The main line of business since that time up to the present date is the compilation of environmental impact assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 15 years of professional services supplied. The operating base for Landscape Dynamics is the entire South Africa; with local representation in Gauteng; the Western Cape; Limpopo Province as well as the Mpumalanga Province.

The Environmental Assessment Practitioners (EAP's) for this project are Ms Annelize Grobler and Ms Susanna Nel.

Please find attached hereto in Appendix F the Company Profile as well as the relevant Curriculum Vitae's.

1.4.2 PROFESSIONAL TEAM

The impact that this project might have on the environment could only effectively be assessed if all the environmental project components had satisfactorily been identified and considered. A multi-disciplinary approach is therefore required for this Environmental Impact Assessment.

The EIA Project Team members are the following :-

Company Name	Contact Person(s)	Responsibility and/or Project Component
Landscape Dynamics CC	Ms Annelize Grobler & Ms Susanna Nel	EIA Project Management Environmental Assessment Practitioners Public Participation Programme
AMP Property Management & Land Acquisition	Ms Anna-Marie Botha & Ms Maritha Duvenage	Route verification Liaison with landowners Socio-Economic, Tourism and Land Use Potential Impact
Evolutionary Studies Institute, University of the Witwatersrand	Prof Marion Bamford	Palaeontology
Geoset Geotechnical Engineers	Mr David van der Merwe	Geotechnical Engineering Investigation
Terra Africa Consult CC	Ms Marine Pienaar	Soils & Agricultural Potential Report
Blue Science (Pty) Ltd	Dr Toni Belcher & Mr Dana Grobler	Freshwater Assessment Water Use License Specialists
Enviroguard Ecological Services CC	Dr Leslie Brown	Terrestrial Fauna & Flora
Chris van Rooyen Consulting	Mr Chris van Rooyen	Bird Impact
Archaeos Cultural & Heritage Resource Consultants	Dr Anton van Vollenhoven	Heritage Impact Assessment
Newtown Landscape Architects	Mr Graham Young	Visual Impact
Ivan Pauw & Partners Attorneys	Mr Travis Baikie	Legal Review

The EIA Project Team is supported by the following team members from within Eskom Group Capital Division:-

Division within Eskom Group Capital Division	Contact Person(s)	Responsibility and/or Project Component
Eskom Project Development Engineer	Mr Fick Booyesen	Overall Project Management
Eskom Land Development : Manager	Mr Itumeleng Moeng	Project Management
Eskom Land Development : Environment	Ms Lindiwe Motaung	Applicant Representative & Environmental Manager
Eskom Land Development : Acquisition	Mr Koos van der Merwe	Compensation and Servitude Acquisition
Eskom Land Development : Survey	Ms Tinny Makaringe	Mapping
Eskom Land Development : Spatial	Mr Christo Bandehorst	Route Planning
Eskom Land Development : Project Planning	Ms Jamila Kombe	Project Planning
Eskom Land Development : Line Engineering Services	Mr Mdu Mthethwa	Line Designer
Eskom Land Development : Acquisition	Mr Koos van der Merwe	Acquisition

CHAPTER 2: PROJECT INFORMATION

2.1 NEED AND DESIRABILITY

In the past 15 years load has increased in the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor by 32.5%. The forecast in this corridor anticipates a huge load growth due as a result of high mining activities (diamond, manganese and iron ore mining), electrification and the establishment of small businesses in underdeveloped areas as well as increased housing densities and commercial development in developed areas. Growth is anticipated to quadruple in the next 25-30 years.

The network will not be able to support the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor load past 2021, therefore strengthening will be required to support the forecasted load and potential renewable generation. In addition, changes in the generation pattern have resulted in Beta Transmission Substation becoming a stronger injection source to this corridor.

The role of grid planning flows from the Eskom Transmission License issued by NERSA of which the main scope of activities is to plan and augment the transmission system in accordance with the South African Grid Code. The Transmission Grid Code (GCD) stipulates that the transmission network shall be N-1 compliant. This implies that the transmission network must be able to supply the load under loss of any of the power lines or equipment. The existing network is currently not compliant and the problem will worsen as the load in the region increases. The solution proposed is to construct a 400kV ring feed supply.

2.2 PROJECT DESCRIPTION

2.2.1 LOCALITY & REGIONAL CONTEXT

The total Eskom Strengthening Phase 4 Project entails the construction of an approximate 390km double circuit 400kV powerline. The line starts west of the town of Dealesville in the Free State and ends south of Kathu in the Northern Cape. The approximately 390km powerline runs east to west, starting at the **Beta** Substation, connects to the **Boundary** Substation, then on to the **Ulco** Substation, connects at the **Olien** Substation, then **Manganore** Substation and ends at the **Ferrum** Substation. Ulco, Olien, Manganore and Ferrum Substations are all situated in the Northern Cape Province.

Due to the significant length and extensive study area across two provinces, it was decided to divide the application for Environmental Authorisation for this project in four different applications to DEA. These applications are as follows :

Application 1 (DEA Reference No 14/12/16/3/3/2/647): Eskom Kimberley Strengthening Phase 4 Project: **Beta to Boundary** (Free State Province)

Application 2 (DEA Reference No 14/12/16/3/3/2/646): Eskom Kimberley Strengthening Phase 4 Project: **Boundary to Ulco** (Free State and Northern Cape Provinces)

Application 3 (DEA Reference No 14/1/16/3/3/2/645) : Eskom Kimberley Strengthening Phase 4 Project: **Ulco to Olien to Manganore** (Northern Cape Province)

Application 4 (DEA Reference No 14/12/16/3/3/2/644) : Eskom Kimberley Strengthening Phase 4 Project: **Manganore to Ferrum** (Northern Cape Province)

Note that this Scoping Report has ONLY been prepared for Application 1 – the BETA-BOUNDARY section of the project.

The BETA-BOUNDARY project area is situated entirely within the jurisdiction of the Tokologo Local Municipality in the Free State Province. The powerline commences west of Dealesville, runs south of Boshoff and ends to the east of Kimberley. Different route alternatives are being considered. The properties that could directly be affected by the proposed BETA-BOUNDARY application include the following but are not necessarily limited to, various portions of the Farms Braklaagte, Eensgevonden, Wolvenpan, Walvischuil, Constantia, Kalkfontein, Palmietfontein, Doornhoek, Brakfontein, Mierdam, Gruisheuwel Tuinpan, Nooitgedacht, Kromloop, Graspan, Blouville, Waterpas, Erfdeel, Eerste Aanleg, Kaalfontein, Kopje Alleen, Koos, Klein, Vlaklaagte, Vredehoek, Uitkyk, Zyferfontein, Wellington, Middelbult, De Rust, Virginia, Vlakpan, Langlaagte, Erfdeel, Content, Nieuwe Aanleg, Valschpan, Kaalfontein, Fouriesrust, Vrede, Vrede, De Villiers Rust, Kameelfontein, Nelliesrust, Verwisseling Enkelboom, Merriesfontein, Driehoek, Les Marais, Olyvenfontein, Boshof Dorps Gronden, Goede Uitsig, Kareeloop, Leeuwfontein, Doornlaagte, Katdoorn Pan, Garvoch, Rowden, Serfonteinshoop, Napier, Set, Melita, Skietpan, Saltmarshe, Geduld, Zwartkop, Morelands, Methven, Karreepan, Spitskop, Vergesig, Middelkuil, De Vlake, Jaagpan, Erfdeel, Hermanus vei, Excelsior, Doornkop, Bernhardus Rust, Achterdam, Marienthal, Honingberg, Cyferpan, Loshok, Kromrand, Wag'nbiokiespan, Wag'nbiokiespan, Kolveria, De Put, Frankfort, Leeuwkop, New Bonnievale, Roseberryplain, Bakenkop, Tarentaalrand, Tafelkop, Tablefarm, Vaalboschrand, Kameelhoek, Brinksvlei, Glen, Waterpaslaagten, Remhoogte, Populier, Populier, Smouspan, Holland, Brakdam, Brakdam, Schuinshoek, Bedrog, Vijgedam, Leboheme, Rudolphspuit, Montague, Montague, Montague, Solheim, Botha's Put, Bothashoek, Jaagpoort, Alethem, Mosterd's Hoek, Vooruitzicht, Olifantsrug, New Klippiespan, Tolppan, Rietpan and Kareeboom.

2.2.2 PROJECT COMPONENTS AND TECHNICAL INFORMATION

This project will consist of the construction of an approximately 90km double circuit 400kV powerline from the existing Beta TX (Transmission) Substation which will be upgraded, to the Boundary Substation, including a new Boundary TX (Transmission) Substation adjacent to the existing Boundary DX (Distribution) Substation.

A maximum area of 5 hectares is generally investigated and/or acquired for a transmission substation. This allows for a footprint of approximately 400m X 400m which is actually required. The additional land is however necessary to allow for sufficient space for entries and exists of powerlines from all directions.

Different pylon structures are being considered for this project. Find attached diagrams with their dimensions attached in Appendix B.

They include the following, with the Guyed and Cross-Rope Suspension Type towers being the preferred option from Eskom's point of view :

- Guyed Suspension Type- Top width 23m; total base width 26 meters with pointed tower base in the centre, height average 33m
- Cross-Rope Suspension Type – Top width 29m; distance between base towers 21 meters, height up to 38m.
- Strain Tower Type – Top width 22,8m; base width 22,8; total base 55 meters; height average 33m
- Double Circuit (where more than one power line is carried via the same pylons) – Top width 12,6m; base width 8,05m; height average ranging between 30m and 61,22m

The proposed "double circuit" line is a worst case scenario. It will only be used where no other viable alternative is possible due to huge financial implications and construction constraints.

The final pylon structure will however only be determined during the design phase. The choice of pylon structure will be guided by the site-specific characteristics, i.e. geology, soils, topography, landowners' preference, etc. At this stage it does however appear as if the 'Cross-Rope Suspension Type' pylon is favoured by the engineers for this project specifically.

2.2.3 SERVITUDE DETAILS

The servitude width is 54meters, with 27m on either side of the line. Where two lines are placed adjacent to each other the total servitude width that is applicable is 110meters. Note however that for the purpose of the Environmental Impact Assessment a route corridor width of 2km is being investigated for each alternative to enable slight adjustments within the corridor during the corridor walk-down and servitude negotiations with the relevant landowners without having to enter into an additional authorisation process.

During the EIA process, it will be strived to reach reasonable consensus with the directly affected landowners with regards to the route and the 2km wide corridor across their properties. As soon as environmental authorisation has been obtained, Eskom will appoint independent evaluators and the process of negotiation in terms of compensation with the relevant landowners will take place. It is also during this process that site-specific issues will be addressed that include the following :

- Specific placement of pylons so as not to interfere with farming activities; infrastructure and sensitive environmental features
- Access and control requirements (i.e. gates, fencing; access roads; etc.)
- Communication channels during ongoing maintenance and inspection of the power line (relevant personnel with contact details; etc.)
- Communication channels emergency situations (i.e. power failures; veld fires; etc.)
- Clearing of vegetation (i.e. selective clearing; what to do with the cuttings (removal or place in heaps for the landowner for firewood; etc.?)

After all agreements had been finalised; the servitudes will be registered against the properties at the deeds office. The property remains that of the landowner, but Eskom will have the right to build and maintain a powerline according to the servitude conditions referred to above.

2.2.4 METHOD STATEMENT

The construction of a transmission line project involves the following actions:

Surveying (Pegging of tower positions)

- Resources: Surveyor, survey assistants (3), survey instruments, 4x4 vehicle, hammers, steel tapes and steel pins.
- The tower positions are pegged using a single steel pin knocked into the ground. The position is reached by utilising GPS co-ordinates taken from the tower staking table. Cross sections of the site will be taken to facilitate the calculation of the tower leg extensions.
- Whilst driving in the field, special care is taken not to drive through visible wet areas and drive through streams. Existing tracks are preferred and will be utilised as far as possible.
- In the event that access is not available or impossible, walking will be an option.
- The surveyor will note all available access routes and problem areas. Access routes will be investigated and agreed upon in writing by the Environmental Control Officer (ECO), where after they will be marked.

Geotechnical Soil Investigations

- Resources: Geotechnical engineer, assistant, operator, ladder, geological pick, 4x4 vehicle and excavator (TLB).
- Access routes are followed as agreed upon and marked to reach the tower positions. No multiple tracks will be allowed.

- The excavator will dig a trial pit to the approximate depth of 3m deep x 2m square.
- The topsoil will be removed and placed apart from the rest.
- Geotechnical engineer will climb down the hole by means of the ladder and classify the soil type and propose the tower foundation type to be installed.
- The hole will be backfilled with the excavated soil and then covered with the topsoil.
- In the event of probable oil spillage from the excavator (all vehicles and machinery will be equipped with drip-trays), spillage will be removed using a spill kit as required by environmental specification and disposed of at a registered dumping site.

Setting out of towers

- Resources: Surveyor, survey assistants, survey equipment, steel measuring tapes, hammers and 4x4 vehicle.
- Once the foundations have been designed and the drawings approved, the surveyor will peg the foundation as per the approved drawings, driving to the tower position via the approved access routes.
- Notes and photographs are to be taken of the position for record purposes both before and after construction.

Foundation Excavations

A site plan or a tower foundation excavation layout plan shall be drawn up as a basis for discussion between the Contractor and the Employer (Site Representative and Environmental Control Officer) resulting in a formal signed document of how the foundation will be excavated at a given site. There are three basic part of this layout plan:

Tower site information

The tower site information includes all the limitations and restrictions as per the Environmental Authorisation for access, operation and demobilisation of the equipment required to install the spread foundation (conventional foundation) such as:

- Restrictions on points of access to the tower position
- Equipment limitations on site
- Underground and overhead services
- Existing structures
- Clearing restrictions
- Presence of surface water
- Environmental restrictions

Foundation Construction Survey

The construction survey establishes the foundation centre hub, reference points, elevations and required depth of the excavations. Before the excavation of the foundation can start, the outline of the tower foundation is set out as per the approved foundation drawing and the depth of the excavation calculated. The centre of the leg excavation is established and the depth calculated in relation to the foundation hub. The foundation hub is used to control the depth of the excavation. (The four corners of the foundation excavation should match the dimensions of the concrete foundation slab if the concrete is cast against in-situ material).

Foundation Site Information

Foundation site information in compliance of the Environmental Authorisation includes the following:

- Access to the tower position.
- Foundation assembly site.

- Spoil pile management.
- Erosion control measurements.

Access to the foundation sites and the sequence of excavating each foundation must be planned to avoid the undercutting of other foundations. Access limitations may require that only one leg foundation may be done at a time; excavated, assembled, set and backfilled. Large spread foundations are often required, which require a spoil pile management plan. The excavated material is normally used for backfilling. The topsoil and fines need to be separated so that they can be replaced as topsoil and used adjacent to the foundation. All surplus material will be removed from site. Erosion control measures shall be carried out in consultation with the Environmental Control Officer.

Excavation

The equipment and methods that are used for the excavation of the foundation depends on the type of soil that is encountered at the excavation site. The following types of soil can be encountered on site (TRMSCAAC1 rev 3):

- “Type 1”: competent soil with equal or better consistency than would be encountered in stiff cohesive soil.
- “Type 2”: less competent soil than “type 1” with weaker or equal consistency in firm to stiff cohesive soils.
- “Type 3”: dry loose non cohesive soil or very soft to soft cohesive soils.
- “Type 4”: submerged cohesion less and cohesive soils. This includes soils below the permanent water table, including soils below a re-occurring perched water table or permeable soils in low lying areas subjected to confirmed seasonal flooding.

Often the high water table will require dewatering of the excavation. Depending on the specific site conditions, open pumping, cut-off drains (trenches), or drainage pits may be necessary to remove the water. Should the water continue to run into or seep from the walls or the bottom of the excavation a sump hole may be dug at one of the corners of the foundation bottom and a small pump used in these pumping holes to keep the foundation dry during the construction of the foundation. Whenever personnel are in the excavations, the safety hazards shall be assessed. There must be good means of ingress and egress from the excavation. Excavated material shall be stock piled away from the edges of the excavation and round rocks and boulders will be preferably placed in a location and manner that will prevent them from rolling back into the excavation. The stability of the side walls shall be inspected to establish the soundness thereof in mitigating against the collapsing of the sides.

Foundation Preparation

After the excavation the stability of the foundation bottom shall be checked to ensure that the bearing capacity is adequate. In the case of foundations in soil type “3” and “4”, a blinding layer of not less than 50mm shall be cast as to have a firm and clean surface to work on. The excavation shall be kept free of water and mud.

Foundation Installation

All the reinforcing shall be placed using the specified bar sizes and spacing top and bottom before the stubs are placed in the centre of the foundation and the rake of the stub set at the required angles.

Foundation Setting

Once the reinforcing and the stubs have been placed the final setting are done. Measurement and levels are set to within the allowable tolerances and checked. Cover blocks are placed and checked that the specified cover is obtained from the bottom and sides of the excavation before first layer of concrete is cast. Successive

layers are checked and cast after the cover to the shuttering is checked and released for concrete casting.

Concrete Placing

During the casting of concrete into the foundation slabs, plinths and columns care shall be taken to prevent any spillage of concrete from the concrete mixer trucks. Any spillage shall be cleaned and wasted concrete placed in special containers for this purpose and then disposed of at registered dumping sites. No washing or rinsing of the mixer drums will be undertaken on site. Rinsing will be disposed of in special constructed areas to contain the cement water in consultation with, and approval of the ECO.

Backfilling

Backfilling will be done in layers of 300mm utilising suitable excavated material. Should the excavated material not be suitable, imported material shall be used from approved borrow pits. The final layers shall be done with the topsoil separated from the rest of the excavated material.

Site Restoration

After the backfilling has been completed the excess soil shall be removed from site and dumped at an approved site as agreed with the ECO. The area around the excavation site shall be cleared of all debris and rubbish. The oversight of possible oil, cement and concrete spillage shall be cleared in the specified manner and properly disposed of. All site vehicles and equipment shall be equipped with the necessary oil drip trays.

Tower Assembly and Erection

Tower Site Information

The Environmental Authorisation (EA) will include the following:

- Access to the tower position.
- Tower assembly site (material lay down area).
- Tower assembly and erection management.
- Proposed crane positions for the safe lifting of the tower. The use of a crane for the erection of lattice type towers is in general the most efficient method of erection.

Access to the Tower sites and the sequence of assembly and erection of each tower will be planned to avoid unsafe working conditions. All site vehicles and equipment shall be equipped with oil drip trays.

Stringing of Phase and Earth Conductors

Puller and Tensioner Site Information

Tower site information in compliance with the EA includes the following:

- Access to the proposed Puller, tensioner and drum station positions as per the agreement and approval of the ECO.
- Access to tower positions to offload and dress towers with Insulators and Hardware.
- Access to Tower positions along the servitude to install the pilot ropes/ cables as per agreement with, and approval of the ECO.
- Possible clearing/ cutting of bush and trees that may foul the stringing of the conductors. See the **EMPr**.

Installation of Pilot Cables

Once the stringing section (approximately 2000m to 3000m depending on the terrain) has been established and agreed upon, the pilot cables/ ropes are run out along the servitude and installed onto the stringing pulley blocks. Should access along the servitude be inadequate for the pulling vehicle due to the presence of wetlands or deep valleys, a light rope or fish line can either be walked through or pulled through by other approved means and the pilot cable then pulled along the servitude. Both ends of the pilot cable are attached to the Puller and the Tensioner, ready for pulling the phase and earth wire conductors.

Stringing Operation

The conductors (one phase at a time) are pulled through the tensioner from the drums and then attached to the Pilot cable. The puller then starts applying tension to the pilot cable to lift the cable off the ground, to a height of 1 to 3m to prevent any damage to the conductors by dragging them on the surface and the clearing of obstacles along the servitude.

Regulating and Sagging

Once stringing has been completed, the conductors are pulled to the required tension as per the sag and tension charts using a dynamometer or sag boards attached to the towers in a predetermined span. The conductors are made of dead-ends applied and attached to the strain towers. Suspension towers and the conductors are placed in the suspension clamps and the pulley blocks lowered to the ground for collection and installation on the following stringing section.

Site Rehabilitation

After the completion of the binding in of the conductors, all pulley blocks and ropes shall be removed from site using the access routes agreed upon. All rubbish will be collected and placed in the required bins for collection and disposal at registered dumping sites. Once the site has been cleared the ECO shall undertake an inspection to see that all the conditions as stated in the EA have been complied with and then sign off the release. Special care shall always be taken when crossing wetlands and river streams in compliance with the requirements of the Water Use License. All site vehicles and equipment shall be equipped with oil drip trays.

2.2.4 DESIGN, CONSTRUCTION AND OPERATIONAL TARGETS

The construction phase for the proposed project will take approximately 24 months to complete and will entail the following process post authorisation:

- **Corridor walk-down:** This will be undertaken by both the Eskom Engineers and the relevant specialists (Fauna & Flora Specialist; Bird Impact Specialist; as well as the Heritage Impact Specialist). The purpose of this walk-down is to ensure that all site specific sensitivities are avoided. During this process the exact design and co-ordinates of the proposed pylons will be established.
- **Construction Camps:** The specific areas will be confirmed during the design phase of the project, also to be visited during the corridor walk-down. These construction sites will be secured by temporary fencing and 24-hour guarding personnel.
- **Vegetation clearance:** A 54 metre (27 metres on either side of the power line) servitude is required for the proposed 400kV power line, tall trees will be cleared along the entire length of the servitude. Maintenance of the vegetation will be done by Eskom during the operational phase of the project.
- **Pylon footings:** Foundations will be laid for the footings of the pylons.
- **Steelwork structures:** The pylons will be erected in segments.
- **Stringing:** Once the pylons have been erected, cables will be strung between the pylons.

- Feeder bays and Transformers: Feeder bays and transformers will be erected in the existing footprint of the new existing Beta TX Substation and on vacant land identified adjacent to the existing Boundary Substation where the TX Substation will be built.

Since the proposed power line will be approximately 90km in length, the aforementioned tasks may occur simultaneously along the power line corridor.

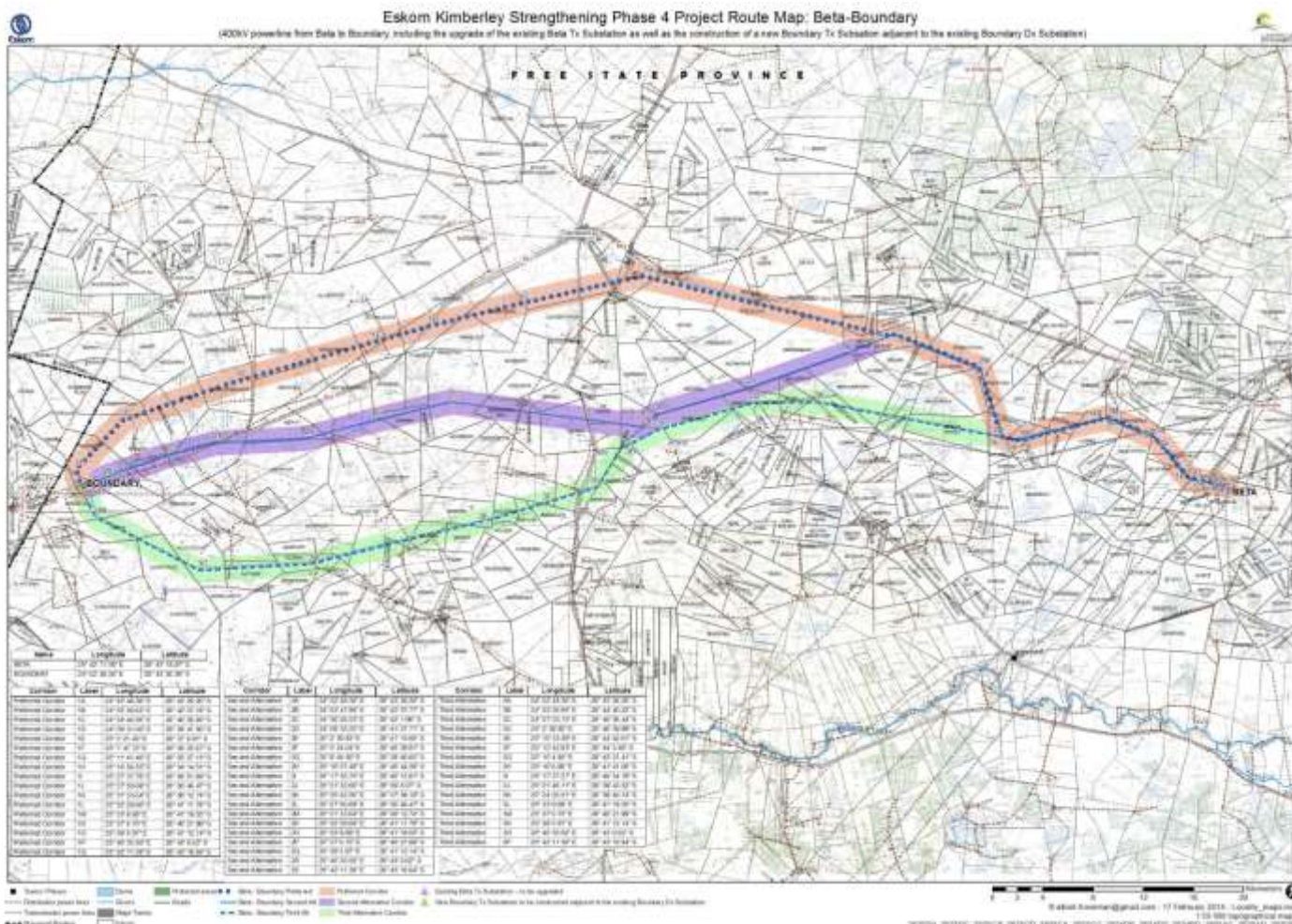
The primary milestones for the Kimberley Phase 4 Project : BETA –BOUNDARY are the following :-

Draft Scoping Report to I&AP's	November 2014
Final Scoping Report submitted to DEA	January 2014
Finalisation of all specialist studies	End January 2015
Submission Draft EIR and EMP's to I&AP's	February 2015
Submission of Final EIA and EMP to I&AP's	March 2015
Submission of Final EIR and EMP to DEA	May 2015
Environmental Authorisation	July 2015
Appeal period ending	August 2015
Servitude rights (valuations, negotiations and registrations)	August 2015- August 2016
Detail Design and Detail Site Overwalk with Specialists	August 2015 – August 2016
Construction Period	August 2016 to August 2018

CHAPTER 3 : ALTERNATIVES

3.1 ROUTE ALTERNATIVES INITIALLY PRESENTED AND INVESTIGATED

The three route corridor alternatives **initially** investigated are the following (note that an A3 copy is attached as Appendix A(2) :



NO GO ALTERNATIVE

This is the “do nothing” alternative. Under these circumstances there would obviously be no changes to the environment along the proposed route.

With this alternative, current and future network constraints under N-1 contingency in the Northern Cape and Free State Provinces will not be alleviated. The reliability of electricity supplies to the Northern Cape and Free State Provinces remain a significant concern unless other sources of power generation and transmission are identified and implemented within the very near future. It is important to realise that alternative sources of energy provision are also associated with significant project components and are also subject to relevant legal requirement for which the authorisation process can reasonable take between 12 and 24 months. With increasing economic activity and demand for electricity in these provinces, the regional impact of electricity failures would be significantly increasing.

The “No Go” option cannot be considered a responsible and viable alternative.

3.2 DESIGN ALTERNATIVES

Placing electricity cables underground vs overhead power lines

With 400kV transmission lines, there is always a visual impact, some areas being more sensitive than others and generally always is the alternative of placement of underground cables raised.

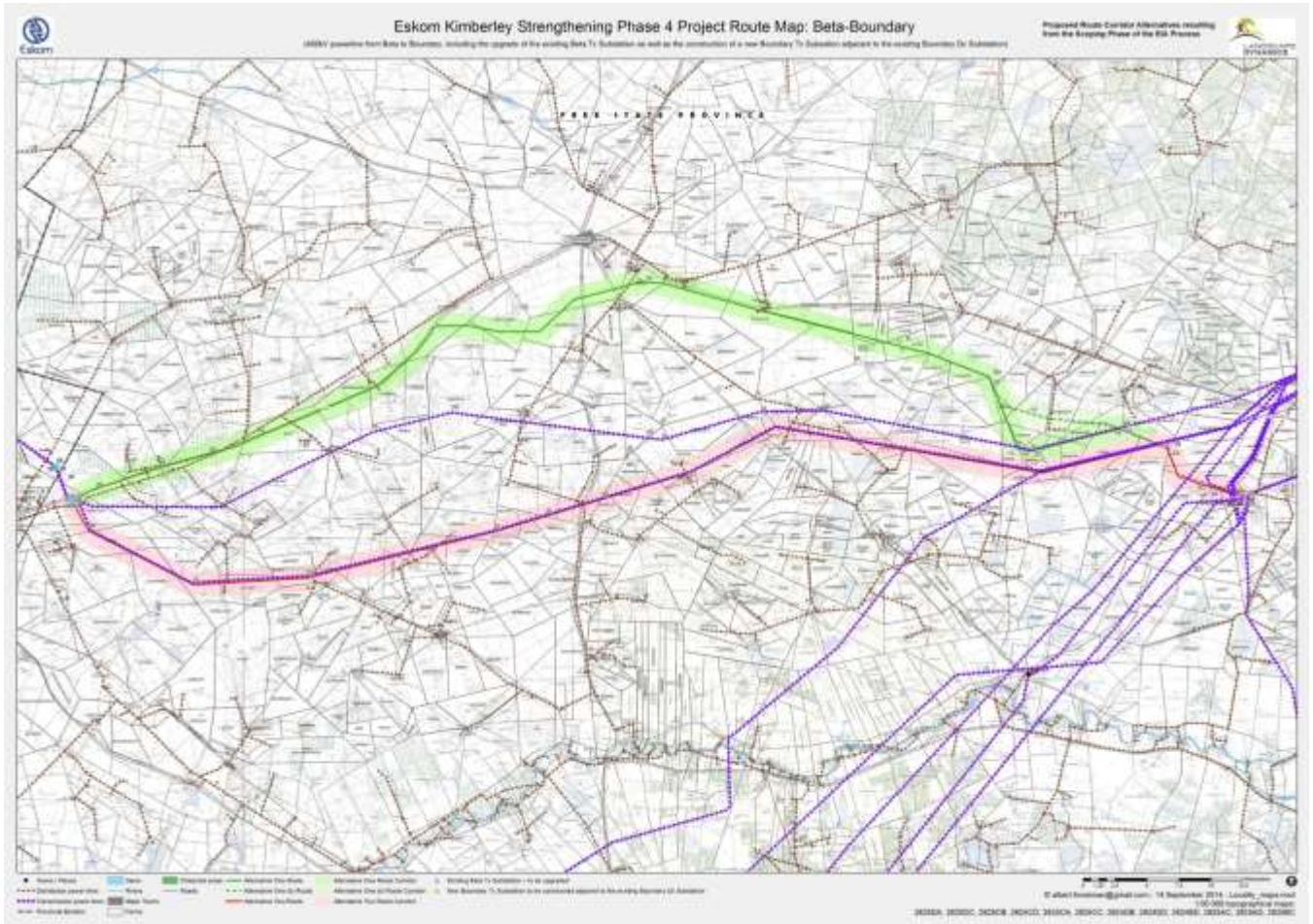
The following factors require consideration :-

- The cost of underground cables can be estimated at 20 times more than that of overhead power lines due to cable cost, the required sand bedding and significant trenching requirements.
- Tremendous additional impact will occur on the environment as a result of trenching for underground cables.
- The lifespan of an underground cable is approximately 12 years compared to the 30 years of an overhead power line, resulting in a repeat of the direct impact on the natural habitat on a regular basis in order to upgrade the project at that stage.
- During power failures large sections of the route would have to be excavated to identify the specific problem area for rectification. Impact on the ecology will therefore not be limited to the construction phase as is the case with overhead power lines.
- The servitude would effectively be sterilised for many land uses, including most agricultural applications because of risk of electrocution. Servitude requirements for underground cables are far more onerous.
- With overhead power lines there is very limited risk for electrocution if all parties comply with legal requirement in terms of the servitude.

The option of placing the proposed transmission line underground is not considered technically and financially viable by Eskom for the reasons stated above.

3.3 RECOMMENDATION IN TERMS OF ROUTE CORRIDORS RESULTING FROM THE SCOPING PHASE

The three initially proposed routes had been presented to all the stakeholders and directly affected landowners. The extent and detail of the community consultation is described in detail in Chapter 5. Extensive negotiations and constructive meetings took place with the affected parties and it was proposed to amend the proposed route corridors as supplied in the map below (an A3 copy is attached as Appendix A(3)). Note that only two route corridors are now proposed to be investigated in more detail during the Environmental Impact Phase. Note that these proposed routes could still be amended or could even result in a combination of both routes, depending on the outcome of specialist investigations and further community consultation.



CHAPTER 4: STATUS QUO OF RECEIVING ENVIRONMENT

4.1 BIOPHYSICAL ENVIRONMENT

4.1.1 CLIMATE

The area is known for its warm dry summers (November-February) and mild to cold winters (June-August). The average midday temperatures for Kimberley range from 18°C in June to 32°C in January and can be below 0°C in winter. The erratic rainfall occurs mainly during summer in the form of thunderstorms. The rainfall varies between 250 and 700mm per year with the average annual rainfall for the area being 400mm (Bezuidenhout 2009).

4.1.2 GEOLOGY, SOILS & GROUNDWATER

The site is located from flat areas to a gentle to low gradient slopes with small dolerite koppies or hills, with average elevations of 1250 MASL at the Beta Substation and again 1250 metres above mean sea level at the Boundary Substation near Kimberley, confirming the flatness of the area.

The area is underlain by recent Aeolian dune sand, underlain by calcrete or Karoo Supergroup sediment comprising Ecca Group consisting of shale, siltstone and sandstone of the Tierberg Formation. The shale is represented as micaceous mudrocks interbedded with infrequent carbonaceous mudrocks. Dolerite dykes and sills appear commonly along the investigated area.

The general thickness of the soil cover will thus in general marginally decrease moving from east to west, and will increasingly be covered by recent Aeolian dune sand, underlain by calcrete or Karoo sediment. The geology map however indicates the presence of dune sand as Qs: Aeolian dune sand of red and grey colour and calcrete as Qc: Calcrete, calcified pandune and surface limestone, and it is evident that the calcrete is mainly present in the first half to the centre portion of these corridors, whereas the dune sand is located at the Beta site itself on the farm Braklaagte 149, and then only again at the last half of the area towards Boundary, westwards from the farms Frederiksdal 881 on the third alternative route, and Katdoorn pan 398 of the first alternative route.

The geology map indicates many intrusive dolerite sills and dykes (Jd: dolerite) in general into the Ecca Group (Pt: shale, siltstone and sandstone) of the Karoo Supergroup sediment along the entire areas surrounding the three corridors. These dolerite sills usually occur as small hills or koppies with slightly weathered to unweathered or fresh dolerite on top with some loose material or talus at the sloping sides of the koppies. These dolerite dykes and sills are usually targeted as construction materials and should be adequate in providing efficient foundations for power pylons and also to be used as construction or founding materials. The specific contact zone between the dolerite and Karoo sediment usually has baked shale as indicator, and these zones should preferably not be used for the pylons as differential movement may contribute to unstable foundation conditions.

The upper soil may only consist of Aeolian dune sand and should be removed for construction on underlying competent bedrock or calcrete. An old gypsum mine occurs on the farm Vrede 1065, between the proposed corridor and near the Kaalfontein pan, and some economic deposits may occur along the corridors, and should be addressed during the final geotechnical ground survey, should it be required. The bedrock is in many portions covered by transported material which may consist mainly of dune sand. No dolomite occurs in the area and no dolomite stability investigation is required.

Groundwater Conditions

Drainage mainly takes place through sheet wash and a few drainage channels and pans are present adjacent to the corridors. Drainage occurs in a southwesterly direction towards the Modder River, a tributary to the Orange River.

The permanent water table on site is expected to be deeper than 1,5m below natural ground surface. A perched water table within the Aeolian sand may exist on shallow bedrock with low permeability characteristics of the rock mass, during long periods of consistent rain.

Slope Stability and erosion

The potential for lateral soil movement or erosion is medium, and the Aeolian sand can easily be washed away during thunderstorms. Except for local slope instability within opened trenches specifically within shale or layered mudstone, and the possible collapse of unstable open pit side walls encountered, no other slope instability is expected within these relative flat areas. In many areas difficult excavation can be expected along the corridors, and a competent TLB, pneumatic tools and even blasting may be required to reach installation depths for services, or for the placement of the pylons. Refusal of a normal TLB is expected in almost all test pits, typically at depths less than 1,5m. To ensure the stability of excavations, it will need standard sidewall protection in excavations exceeding 1,5m.

The potential for lateral soil movement or erosion is medium, and the Aeolian sand can easily be washed away during thunderstorms. Except for local slope instability within opened trenches specifically within shale or layered mudstone, and the possible collapse of unstable open pit side walls encountered, no other slope instability is expected within these relative flat areas.

Excavation classification with respect to services

Problems regarding excavatability can be expected along the routes, with some outcrop and sub outcrop areas possibly classified as medium hard rock excavation in restricted and non-restricted excavation (SANS 1200 D). The area may be classified regarding excavation properties and it can range from easily excavated by hand to intermediate excavation where a competent TLB, pneumatic tools and even blasting is required. Unstable pit side walls may be encountered and to ensure the stability of excavations, it will need standard sidewall protection in excavations exceeding 1,5m.

Impact of the geotechnical character of the corridors on the placement of pylons

During the final engineering geological investigation it is essential to determine and quantify the extent of potential problems associated with the area. The ideal conditions may be listed as follows:

- A smooth surface gradient with slopes less than 12E. Accessibility should not
- be restricted by topography (plateau areas).
- No potential for slope instability features - landslides, mud flows.
- Easy excavation for foundations and installation of pylons.
- Foundations above the ground water level or perched water table, with not too
- low permeability.
- Development above or outside the 1:100 year flood line.
- Adequate surface and subsurface drainage conditions, with minimal erosion
- potential.
- No presence of problematic soils, for example heaving clays, compressible
- clays, sand with some collapse potential, or dispersive soils, that will require
- expensive remedial measures.

- No potential for surface subsidence due to the presence of dolomite (sinkholes) or undermining.
- No damaging differential subsidence or movement (less than 5mm total movement at the surface allowed).
- The site should be placed away from potential pollutants such as waste disposal or sewer sites.

Evaluation for the placement of pylons

No seepage or the presence of perennial fluctuations of ground water was encountered on site, but a seasonal perched water table may exist on top of the bedrock or within the pedogenetic layer comprising nodular or hard pan calcrete. Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. The area may contain low and low to medium expansive soil, and together with a medium compressible and a highly collapse potential, foundations will need special precautionary measures to minimize soil movement associated with a variation in moisture content of the soil. Some problems regarding excavatability can be expected usually on the dolerite near or at the hills. Retaining walls as well as slope stabilization measures are recommended on all constructed embankments exceeding 1,5m, as unstable pit walls may be encountered. Storm water control measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments must be adequately compacted and vegetated with grass to limit any excessive erosion and scouring of the landscape. No mining activities on site or history of mining or contaminated land in the area were found, except the old gypsum quarry. The site is located far from any mining activities and in an inactive area regarding seismic activity. The likelihood for the development of borrow pits along the routes should be investigated to provide construction material. All road building and construction materials will in the interim be sourced from established commercial activities in and around Kimberley and Boshof. The placement of the ESKOM pylons is possible along the routes if the recommended precautionary measures and possibly difficult excavation of service and foundation construction is anticipated.

Drainage

The corridors are located on shallow slopes less than 4%, with some steeper slopes next to the dolerite koppies, usually not affected by the placement of the pylons. Drainage takes place through sheet wash, and no prominent drainage channel intersects the corridors, with some pans adjacent to the placement of the pylons. Drainage generally occurs in a southwesterly direction towards the Modder River, and then south to the Orange River. No seepage or the presence of perennial fluctuations of ground water was encountered on site, but a seasonal perched water table may exist on top of the shallow bedrock sandstone, mudstone, dolerite or where calcrete nodules or hard pan calcrete is expected.

4.1.3 SURFACE WATER

The freshwater assessment is intended to inform the authorisation process for the proposed Eskom Kimberley Strengthening Phase 4 Project between the Beta to Boundary Substations.

The aquatic features occurring within the study area consist of endorheic pans and associated wetland areas and drainage lines. Drainage tends to take place within a wider floodplain area and is largely towards the Modder River. Most of the aquatic features are located in the eastern extent of the study area. The pans and wetland areas vary slightly in condition but are mostly be in a largely natural to moderately modified state, with agricultural activities and existing infrastructure development being the main impacts.

In terms of rivers, the area is located approximately 110 km east of the confluence of the Vaal and Orange Rivers and approximately 30 km south of the Leeu River and 30km north of the Modder-Riet River, both tributaries of the Vaal River. Thus no larger river systems occur within the study area. During the mid-Tertiary geological period, the Palaeo-Kimberley and the Palaeo-Modder systems which once formed part of the Vaal River system were cut off due to headward erosion. The remnants of these palaeo-fluvial systems are today visible as an ancient floodplain with numerous pans. A wide variety of pan types occur namely salt pans, calcareous pans, gypsum pans, clay basin pans and other soils as well as fresh water pans, occur in the region. One of Kimberley's famous features is Kanfers Dam, a large pan north of the city, which is an important wetland supporting a breeding colony of Lesser Flamingos. Conservation initiatives in the area aim to bring people from the city in touch with its wildlife.

Based on the consideration of the route alternatives undertaken as part of this study, the First Alternative is considered to have the least potential negative impact on the freshwater features within the study area. The new Boundary and Beta Substation should preferably be placed north or south of the existing substations to avoid impacted on pans and associated wetland areas to the east and west of the structures. Where the proposed power lines are located close to freshwater features it is proposed that a buffer of 50 from the centre of the drainage lines and approximately 500m (varies depending on wetland cluster) from the edge of the pans be implemented. This can largely be achieved for the proposed First Alternative.

Providing that the recommended mitigation measures are implemented (adherence to the proposed buffers adjacent to freshwater features, minimisation of impacts and rehabilitation of disturbed areas and the utilisation of the existing access roads where possible) the significance of the impact is expected very low. A water use authorization may need to be obtained from the Department of Water Affairs Northern Cape Regional Office for approval of the water use aspects of the proposed activities.

4.1.4 VEGETATION

On a small scale the proposed routes fall within the interface between the savannah and grassland biomes. Within a larger regional scale the proposed routes are according to Mucina & Rutherford (2006) located within two bioregions namely the Eastern Kalahari Bushveld Bioregion (Svk) and the Dry Highveld Grassland Bioregion (Gh) (Figure 2). The largest section of the proposed routes traverses the Eastern Kalahari Bushveld Bioregion (Svk).

The following vegetation units occur in the study area :

- Western Free State Clay Grassland- considered 'least threatened' vegetation type
- Kimberley Thornveld - considered 'least threatened' vegetation type
- Vaalbos Rocky Shrubland – considered 'least threatened' vegetation type
- Highveld Salt Pans – the pans are poorly conserved and under threat from agricultural activities; grazing potential is high.

A sensitivity analyses concluded the following :-

1st Alternative Route

This route passes through an estimated 5% of the pans with very little passing through rocky outcrops but rather through the Vaalbos rocky shrubland on slight slopes covered with rocks.

Sensitivity: Low

2nd Alternative Route

This route also passes through a number of pans and drainage areas together with various rocky outcrops. Although some parts will not pass through the rocky outcrops, the 2km buffer area will directly influence the rocky outcrops.

Sensitivity: Medium

3rd Alternative Corridor

This route passes through a high number of pans and through various rocky outcrops within a 2km wide buffer. This route is considered to be a sensitive route due to the number of sensitive areas as well as the potential negative impact on the environment.

Sensitivity: High-medium

4.1.5 FAUNA

A detailed literature search was undertaken to assess the current status of faunal species that have been historically known to occur in the Kimberly to Nooitgedacht (Beta)

Amphibians

The biogeographical distribution of amphibians in the greater Kimberly area falls under the Central District. The Central District covers most of Lesotho, Free State and North West Province, together with northern parts of Northern Cape Province. In the west, the southern boundary follows the course of the Gariep River. In the east, the southern boundary lies in the ecotonal Grassy Karoo. In the northwest, the district ends where subtropical woodlands begin, and in the east the boundary follows the interface between sweet grasslands in the west and sour grasslands in the east. Amphibian species richness is generally low in the Central District and tends to decrease toward the west. Species counts just exceed 10 species per grid cell in the eastern extremes and are mostly <6 in the west. Species richness of endemics is <4 species per grid cell over the entire district, and no range-restricted species are present. This district is subdivided into two assemblages namely the Sweet Grasslands and Kalahari assemblages (Alexander *et al.* 2004).

The Giant Bullfrog is currently assigned as a near-threatened species (IUCN Red List category). Giant Bullfrogs have been recorded from the Kimberly area and adjacent grid squares during previous surveys as well as during the South African Frog Atlas Project (SAFAP). Specimens recorded were of road fatalities, migrating adult males as well as potential breeding localities in the Kimberly area. Bullfrog density commonly varies within certain habitats (open grassland and woodland habitat). High densities are often associated with specific microhabitats or patches (hygrophytic or aquatic ephemerophytic grass and sedge dominated temporary pans) that can be identified and randomly sampled. Emphasis must be placed on remaining natural open grassland and woodland habitats (important migratory and foraging areas) as well as seasonal wetlands (pans, drainage and marshland vegetation) surrounding the alternative alignments. The seasonal wetland habitats offer the most suitable breeding habitat for Giant Bullfrogs in the area.

Reptiles

Reptile species recorded from the rocky areas along the alignments included Yellow-Throated Plated Lizard (*Gerrhosaurus flavigularis*), Montane Speckled Skink (*Trachylepis (Mabuya) punctatissima*), Cape Skink (*Trachylepis (Mabuya) capensis*) Ground Agama (*Agama aculeata*), Cape Thick-toed Gecko (*Pachydactylus capensis*) and Southern Rock Agama (*Agama atra*).

Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors). Reptile species recorded in the woodland areas of the sites included Kalahari Tree Skink Flap-neck Chameleon (*Chamaeleo dilepis*).

No threatened reptile species have been recorded from the area although four endemic reptile species namely Distant's Ground Agama (*Agama aculeate distanti*), the Marico Gecko (*Pachydactylus mariquensis*), Thin-tailed Legless Skink (*Acontias gracilicauda*) and Greater Padloper (*Homopus femoralis*) have been recorded. Both the Nile (*Varanus niloticus*) and Rock or White-throated Monitors (*Varanus albigularis*) are protected species.

Mammals

The majority of larger mammal species are likely to have been eradicated or have moved away from the area, as a result of previous agricultural activities, hunting and poaching as well as severe habitat alteration and degradation. The settlements surrounding the site as well as several informal settlements and associated hunting and poaching limits the suitability of the site for larger mammal species. High levels of hunting were noted on and surrounding the site with the use of dogs and wire snares as well as several empty shotgun cartridges. Several dog tracks were observed along the existing Eskom servitudes as well as hunting with dogs was observed during the site visit. The collection or harvesting of wood (stumps) and rock material as well as the frequent burning of the vegetation reduces available refuge habitat and exposes remaining smaller terrestrial mammals to increased predation levels. The use of wire snares for high intensity poaching activities will significantly affect remaining smaller mammal species such as rabbits and mongooses. Secondary access roads and vehicles (motor cars, motor cycles, quad bikes) which transverse the area and bisect the valley bottom wetlands increase access to the site as well as potential road fatalities. Major road networks (R59) with high vehicular traffic increase the risk of road fatalities (hedgehogs, hares) of mammals. Smaller mammal species are extremely vulnerable to feral cats and dogs.

The Yellow and Slender mongooses were observed on the site and prey on the smaller rodents, birds, reptiles and amphibians on the site. Animal burrows (Yellow Mongooses, Highveld Gerbil, Multimammate Mouse and African Molerat) were observed around the sandy sections of the grasslands. Several active Antbear burrow systems were observed within the foothills. Rocky outcrops were observed and offer suitable habitat for rupicolous mammal species such as Rock Hyrax, Smith's Elephant Shrew, Bushveld Elephant Shrew, Dassie Rat, Smith's Rock Rabbit and Rock Dormouse

According to the "*The Red Data Book of the Mammals of South Africa: A Conservation Assessment*" (Friedmann Y. and Daly B, (editors) 2004) and Skinner and Smithers (1990) as well as *The Mammals of the Southern African Subregion* (Skinner and Chimiba 2005) the study area falls within the distribution ranges of 15 species which are placed into one of known threatened species (0) Critically Endangered; (1) Endangered, (6) Vulnerable and (7) Near-threatened) as well as (1) species which is presently listed as Data Deficient. No sensitive or endangered mammals were recorded during the brief survey but suitable habitat occurs on the site and surrounding conservancy areas for certain rare or threatened mammal species.

4.1.6 AVI-FAUNA

Bird habitat classes that occur include the following :-

Savanna

The western part of the study area (between Kimberley and Boshoff) is situated in savanna, and consists of Kimberley Thornveld with a few isolated areas of Vaalbos Rocky Shrubland, which only occurs on solitary hills and scattered ridges. The powerline sensitive Red Data avifauna is typically arid woodland species i.e. Lappet-faced Vulture, White-backed Vulture, Cape Vulture, Tawny Eagle, Martial Eagle, Lanner Falcon, Verreaux's Eagle (ridges and koppies), European Roller and Kori Bustard.

Grassland

The eastern part of the study area (between Boshoff and Dealesville) is situated in grassland, and consists mostly of Western Free State Clay Grassland and a few areas of Vaal Vet Sandy Grassland. The powerline sensitive Red Data avifauna that occur in grassland habitat are Blue Crane, Secretarybird, Ludwig's Bustard, Abdim's Stork, Burchell's Courser, Double-banded Courser and Lanner Falcon. White-backed Vultures and Cape Vultures occur sporadically when food is available in the form of carcasses, and roost on high voltage lines as there are few trees.

Pans

An important feature of the arid landscape where the proposed power lines are located is the presence of pans. When flooded, pans are important for a variety of powerline sensitive Red Data species which occur in the study area e.g. Greater Flamingo, Lesser Flamingo, Blue Crane, Abdim's Stork, Chestnut-banded Plover, Black-winged Pratincole, Maccao Duck and Yellow-billed Stork. Pans are also used by raptors and vultures for drinking and bathing. Double-banded Coursers occur along the pan fringes and on dry pans.

Vulture breeding areas

A notable feature of the study area is the large number of breeding White-backed Vultures which are in loose colonies over several areas within a 50km radius around Kimberley. The most important breeding colonies known at this stage are Dronfield, Riet River, Paardeberg, Secretarius, Rivermead and Susanna. The total number of breeding pairs is estimated at around 240 pairs with a total of 650 individual birds across all the colonies.

Agricultural lands

The study area contains very few agricultural lands, because the land-use is mostly grazing. Blue Crane and Black-winged Pratincole are the Red Data species most likely to utilise agricultural lands in the study area.

Potential impact on bird associated with powerlines:-

Electrocutions

Due to the large size of the clearances on overhead lines of 400kV, electrocutions are ruled out as even the largest birds cannot physically bridge the gap between energised and/or energised and earthed components.

Collisions

The most likely potential candidates for collision mortality on the proposed power lines are Ludwig's Bustard, Kori Bustard, Greater Flamingo, Lesser Flamingo, Blue Crane, Secretarybird, Abdim's Stork, White-backed Vulture and Cape Vulture.

Displacement due to habitat destruction and disturbance

The risk of displacement of Red Data species due to **habitat destruction** is likely to be fairly limited, given the nature of the habitat. The one exception to the last statement is the White-backed Vulture breeding colonies, where the removal of large Camel Thorn trees could result in the destruction of nests, and the resultant displacement of breeding birds.

4.2 CULTURAL/HISTORICAL ENVIRONMENT

4.2.1 PALAEOLOGY

The proposed substation and powerline route alternatives fall within a number of geological formations, including ancient rocks of the Ventersdorp Supergroup, Permian aged Prince Albert and Tierberg Formations and young (Tertiary to Quaternary) Kalahari sands, alluvium and limestones. The Vryburg, Schmidtsdrif and Ghaap Plateau formations of the Campbell Group, Ventersdorp Supergroup, range in age from 2650 – 2588 Ma (Eriksson et al., 2006) which is much too old for vertebrates and plants. Algae, fungi and bacteria had evolved but were seldom preserved. These rocks are sedimentary (dolomites) and igneous (andesite) do not appear to have any microfossils.

Only the permian rocks could potentially have fossils but they are too old for land vertebrates and too deep for land plants. No vertebrates, invertebrates or plants have been recorded from this region (Plumstead 1969; Anderson and Anderson 1985; Johnson et al 2006). The unpublished records at the Evolutionary Studies Institute, University of the Witwatersrand, do no record any fossils from this area. The overlying Quaternary Kalahari sands are Aeolian and there is no record of fossils. Since none of the rock formations or sediments in the region is potentially fossiliferous, being too old or too young, the project to erect powerlines and substations between Beta and Boundary, as one of the four phases of the Eskom strengthening project, may continue as far as the palaeontology is concerned. If however, any fossils are discovered during the excavations then it is strongly recommended that the fossils are rescued and a palaeontologists is called to assess their importance and make further recommendations.

No phase 2 palaeontological impact assessment is required.

4.2.2 ARCHAEOLOGY & CULTURAL HERITAGE

From the desktop data the following potential impacts can be indicated:

- It can be concluded that the chances of finding Stone Age sites is reasonably high. Due to the lack of research in the area it will then most likely have a high cultural significance.
- Chances to find Iron Age sites and occurrences are very slim. However, should such sites be found it would most likely have a medium to high cultural significance due to the scarcity thereof. Also, finding some evidence such as pottery lying around is always possible, but such occurrence would not be regarded as important.
- One will more than likely find historical structures dating to the first white farmers in the area, the missionaries and early mining activities. These will include ruins and foundations of houses and other outbuildings on a farm as well as possible cattle kraals. Significance can only be determined on identification of such features.
- Graves always is a distinct possibility and two sites are already known. Graves always are of a high cultural significance due to the religious and social context thereof. If such sites are identified it will undoubtedly have to be dealt with in accordance with ethical guidelines and legislation in this regard.

4.3 SOCIO-ECONOMIC, TOURISM AND LAND USE

4.3.1 LANDUSE

The proposed 400kV power line will not directly affect the residential areas but will influence rural farms in the area. The power line may cross inhabited farm land and tourist areas. The alternative routes cross over combinations of agricultural, tourist and game farm properties.

The region has a variety of land uses mostly but not exclusively tourist game farms which include international hunting facilities and agricultural farms which greatly consist out of cattle and sheep husbandry. There are several EIA's in process for Solar Energy Facilities.

Land use along the route corridors can be broadly described as follows :-

Alternative 1: The proposed corridor follows existing power lines after which it follows the R64 on the southern side. It joins an existing line and then passes through undeveloped Boshof townlands then crosses to the northern side of the R64, through game farms, after which it heads south towards BoSS crossing the R64 again. The length is approximately 94km.

Alternative 2: The proposed corridor route goes parallel to existing 275kV lines, then deviates to the southern side of the R64 from Boshof to Kimberley, for about 10km. The length is approximately 90km.

Alternative 3: This is the most southern alternative and passes through multiple game farms. The route is along various existing 275kV power lines. The length of this alternative is approximately 89km.

4.3.2 SOCIO-ECONOMY AND TOURISM

The proposed project is planned in the Free State and will involve the Lejweleputswa District Municipality including Tokologo Local Municipality.

BeSS is located +/- 8km south west from the town Dealesville (28°43'19"S, 25°42'14"E). The proposed power line is planned from BeSS to BoSS (28°43'25"S, 24°52'49") which is located adjacent to the R64 on the eastern side of Kimberley.

Health and Social Wellbeing

- Future aspirations – Economic growth regarding farming and tourism.
- Feeling in relation to project – great sense of fear was experienced, but with consultation and explanation it changed positive regarding private land owners. Rather work together in planning than enforce a route on land owners.

Quality of living environment

- Quality of physical environment - There will be exposure to minimum dust and noise of vehicles in the construction phase. Construction workers will be fitted with PPE and be in the possession of identification when in the construction area.
- Aesthetic Quality- The visual impact of the structures was addressed. See the relevant report for more information.
- Adequacy of physical infrastructure. The route next to the existing R64 main road as well as sections next to existing power lines will be preferred to minimize additional impacts. Gates should be closed at all times.
- Personal safety and risk exposure. This is a high risk to property owners. No unauthorized entrance will be acceptable. Staying on next to existing roads where possible will be more acceptable – not accessing the total farm. No fires on construction sites.

- Crime and violence. Eskom and the contractors are not welcome due to the perception that livestock thefts can increase.

Economic impacts and material wellbeing

- Property values. There may be a negative effect on the property values pending on the utilization of the land. The influence will be taken into consideration during the valuation process where a valuation is to be done and land owners is to receive market value compensation.
- Employment. Only limited unskilled work opportunities may be available to local communities.
- Replacement costs of environmental functions. Land owners will be able to continue farming activities.
- Structure planning must be liaised with land owners in cultivated fields.

Cultural impacts

- Loss of natural and cultural heritage. Refer to relevant report.

Family and Community impacts

- Social networks. The proposed route is mostly over game and agricultural farm land and a good neighbouring relationship exists.
- Community connections. Social network exist in the community where a group will support each other. This is essential in the form of farmers associations. The relevant associations in the area have been informed about the proposed project and is considered part of the I & AP's.

Institutional, legal, political and equity impacts

- Impact equity. There should be a fair distribution of the impacts across the community. This project will ensure a better supply of electricity and fewer interruptions to all.

Gender relations

- Gender division of labour. According to Statistics South Africa TLM have a greater than 50,3% female population. There are normally not woman employed as unskilled labour for the construction of power lines.

4.3.3 SOILS & AGRICULTURAL POTENTIAL

Soil classification

Three different main soil groups are present in the entire baseline area as well as in the areas currently indicated as the proposed alternative sites for the project. Below follows a description of each of the groups:

Lithic soil

The lithic group is dominated by soils of the Mispah and Glenrosa forms and also include rocky outcrops (in this area more specifically dolerite outcrops). This soil group covers the smallest area of the three groups within the study area and is limited to the south-western part of the study site. The pans identified on site are endorheic pans that formed as a result of low infiltration rate of the soils present on site. These pans are underlain by rock and hardpan carbonate horizons where water accumulates during thunderstorms during the summer months. The water in the pans remains present until the high evaporation rate resulted in all the water evaporating. This leaves the soil surface barren and the lack vegetation on the soil surface cause sand to erode away as a result of wind erosion. The rock and/or carbonate horizon does not function as a conventional wetland and therefore the soils present in the pans are not considered sensitive. Sensitivity of these pans is more related to the ecosystems that are supported by the temporary water supply in the summer months.

Red-yellow apedal freely drained soil

The red and yellow apedal horizons are per definition non-calcareous within 1500mm of the soil surface, but may contain small lime nodules as was the case on site. Textures are coarse to medium sand to sandy-loam in the topsoil and medium to fine sandy-loam in the subsoil. Structure is weak blocky (dominant) or apedal in all horizons. These red-yellow apedal soils dominate the western half of the entire study area. The clay content for this soil group is less than 15%.

Duplex soils (prismacutanic and pedocutanic soils)

Duplex soils have strong B horizon structure and a marked increase in clay content down the soil profile, compared to the overlying horizon, from which it is separated by a clear or abrupt boundary. This clear change between adjacent horizons has resulted in the term “duplex soils” being given to this group. The soils have high erosion susceptibility and the B horizon is often sufficiently hard to be an impediment to both root growth and water movement. The marked enrichment with clay in the subsoil results in strong blocky structure and cutanic character (clay skins). The cutans give the peds shiny surfaces that reflect the light and are often a different colour to the interior of the peds. The orthic A horizon often has a weak structure and when it contains sufficient clay it may become hard or very hard when dry (a feature known as ‘hard-setting’).

Amounts of organic matter are low giving their (orthic) top soils a grey or brown colour. Base status varies from low to high, a range directly correlated to the amount of clay in either the overlying horizon or the B horizon itself. The soils have a low phosphate (P) fixing ability and often have moderate reserves of plant nutrients. Duplex soils dominate the eastern half of the site and the clay content ranges between 15 and 35%.

Soil depth

The Environmental Potential Atlas indicated that soil depths in the study area are divided into two groups i.e. soils shallower than 450mm and soils between 450 and 750mm (Figure 13). Deeper soils are present on the eastern portion of the study area and are associated with the pedocutanic and prismacutanic soil forms. The shallower soils are present on the western part of the site and are found in the areas associated with the red and yellow apedal soils as well as the lithic soil group.

Agricultural potential

The dominant land-use in the larger study area prior is cattle and small livestock farming. This included the commercial farming of cattle, goats and sheep. The average carrying capacity of the veldt is 14 ha per unit of large stock. Game farming is also present in the study area. This region is not suited to the production of dryland arable agricultural owing to the low rainfall. Irrigated crop production is practiced in very small areas that are limited by the availability of irrigation water and proximity to the water resource.

According to the ENPAT data, the western portion of the study area is dominated by land with no or very low arable agricultural potential due to the shallow nature of the topsoil present. The eastern portion is considered to have intermediate suitability as a result of the deeper soil profiles however the climate only permits successful production in the presence of irrigation systems as a result of the erratic rainfall and high evaporation rate that results in soil water losses.

Conclusion

Based on the baseline soil and agricultural potential data gathered for this study, it is the opinion of the soil scientist, from a soil conservation and land capability point of view, that the First Route Alternative be considered favourably. Although this alternative has a longer footprint than all other alternatives considered, it will avoid cutting through areas with endorheic pans that may have ecological value. It is not anticipated that

the proposed project will have any detrimental impact on the crop production ability of the region or result in soil degradation. It is however still important that due care is taken to minimise impacts on soils and land capability through good soil management principles.

4.3.4 VISUAL COMPONENT

The following is a summary of the main findings of the visual impact specialist in terms of the study area :-

Visual resource

High	Moderate	Low
Hills with Kimberly Thorn Bushveld and Game Farms West and south central to study area	Rolling plains – mostly game and cattle grazing Northern and central eastern sections of study area	Power infrastructure Eastern section of study area
This landscape type is considered to have a <i>high</i> value because it is: A distinct landscape that exhibits a very positive character with valued features that combine to give the experience of unity, richness and harmony. It is a landscape that may be considered to be of particular importance to conserve and which has a strong sense of place.	This landscape type is considered to have a <i>moderate</i> value because it is: A common landscape that exhibits some positive character but which has evidence of alteration /degradation/erosion of features resulting in areas of more mixed character.	This landscape type is considered to have a <i>low</i> value because it is: A minimal landscape generally negative in character with few, if any, valued features
Sensitivity: It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt with.	Sensitivity: It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with	Sensitivity: Generally not sensitive to change

Sense of Place

The study area's sense of place derives from the combination of all landscape types described above and their impact on the senses. The wide open, gently undulating landscape and the natural hills, give the area a relatively strong positive sense of place in the western sections other than the areas immediately around the Boundary sub-station. The north central and eastern areas are generally experienced as wide open spaces with panoramic views across the landscape. However, the intrusion of transmission lines in the central and eastern sections compromises this effect and the dominant experience is one of busyness brought on by the myriad of power lines that criss-cross the landscape.

Views

Public views to the proposed alternative transmission line corridors area originate along the main public road R64 and the gravel farm roads that cross the study area (refer to Figure 6). Private views, from residences,

originate mostly from the farmsteads scattered about the site. The western section of the study area is where most of these occur, many of which area associated with game farms (refer to Figure 6). Due to the flat and open nature of the landscape most views from these areas would be exposed to one or other of the alternative alignments of the transmission line.

Sensitive Viewers and Sensitive Viewer Locations :-

The most sensitive viewing locations are considered to be views to the project from residential properties, tourist destinations and natural conservation areas. Tourism is an industry based primarily on the subjective perspectives of visitors to an area. In destinations where tourism is focused on outdoors or based on natural elements, the tourism value rests largely on the experience which can be provided. This concludes that tourist facilities will constitute the highest viewer sensitivity.

Views from residences and lodges to the transmission lines are typically more sensitive, since views from these areas are considered to be frequent and of long duration. The number of game farms in the western section of the study area represents a large constituency of sensitive viewer locations, together with the farmsteads, settlements and other private dwellings scattered throughout the entire study area. The visual impact from these views is however subject to the distance of the viewer location from the proposed transmission line. A viewshed of approximately 3km from the viewer location is usually considered the maximum distance from where any object would be visible from that specific point.

Potential Sensitivity of Visual Receptor areas High Residential, Farmsteads and Game Farms	Moderate Public roads R64 and local roads	Low Far eastern section of the study area
Visitors of tourist attractions and travelling along local routes, whose intention or interest may be focused on the landscape; Communities where the development results in changes in the landscape setting or valued views enjoyed by the community; Occupiers of residential properties with views affected by the development.	People travelling through or past the affected landscape.	Visitors and people working within the study area and travelling along local roads whose attention may be focused on their work or activity and who therefore may be potentially less susceptible to changes in the view. Or the character of the landscape in this area has

4.4 SUMMARY OF ENVIRONMENTAL SENSITIVITY

It is clear that from a natural environmental point of view that the First Route Corridor Alternative is the most acceptable with the Third Route Alternative being the least acceptable. However, during the public participation process and community consultation it became clear that the First Route Corridor could not be accepted as proposed. Numerous exclusive game farms and developments would be affected and it was required that the routes be re-assessed with significant assistance of the directly affected landowners. The result being the amended route alternative map as included in Appendix A(3). The proposed routes on this map will be investigated in more detail during the environmental Impact phase of the project; however, it does appear that reasonable consensus among the directly affected landowners regarding a proposed route could be reached.

CHAPTER 5: PUBLIC PARTICIPATION

5.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROGRAMME

The main aim of public participation is to ensure transparency throughout the EIA process. The objectives of public participation in this EIA are the following :-

During the Scoping Phase

- To identify all potentially directly and indirectly affected stakeholders, government departments, municipalities; landowners;
- To communicate the proposed project in an objective manner with the aim to obtain informed input;
- To assist the Interested & Affected Parties (I&AP's) with the identification of issues of concern, and providing suggestions for enhanced benefits and alternatives;
- To obtain the local knowledge and experience of I&AP's;
- To verify that the concerns and issues raised by I&AP's define and guide the scope of further studies to be undertaken during the Impact Assessment.
- To ensure that all reasonable alternatives are identified for assessment in the EIA Phase.

During the Environmental Impact Assessment Phase

- To communicate the progress of the EIA study as well as the proceedings and findings of the specialist studies;
- To ensure that informed comment is possible;
- To ensure that all concerns, comment and objections raised are appropriately and satisfactorily documented and addressed;
- To obtain reasonable consensus with regards to the final route corridor proposed for the Eskom project.

5.2 PROCESS FOLLOWED

Significant measures were taken to ensure that all stakeholders and interested and affected parties had been informed of the project and were allowed the opportunity to place their concerns and comment on record.

The Public Participation Process (PPP) followed is summarised as follows :

- The PPP for this project kicked-off during January 2014.
- All potential directly and indirectly affected landowners, stakeholders and government departments had been identified. The following I&AP lists were compiled (and is included in Appendix E(8) of this report):-
 - List of Government Departments
 - List of Municipalities
 - List of General Stakeholders
 - List of Directly Affected Landowners
- A Background Information Document (BID) was compiled and distributed to all the stakeholders listed. The method of distribution included e-mail; fax and/or postal service. Both the BID and the proof of distribution of the BID are included in Appendix E(1).

- Twenty onsite advertisements (in both English and Afrikaans) were placed along the three initially route corridor alternatives initially proposed. Proof of placement of these onsite advertisements are included in Appendix E(2).
- Seven newspaper advertisements were placed in the following publications :-
 - Regional Publications:-
 - Kalahari Bulletin, 13 February 2014
 - Free State Times, 14 February 2014
 - Kathu Gazette, 15 February 2014
 - Volksblad, 15 February 2014
 - Diamond Fields Advertiser, 17 February 2014
 - National Publications:-
 - Sunday Times, 16 February 2014
 - Rapport, 16 February 2014
- A Public Open Day was arranged for Wednesday 25 June 2014 at two different venues as follows :
 - Formal presentation at 12:00 at the Agri Boshof Auction Kraal (just outside Boshof on the Petrusburg Road), followed by a discussion session until 15:00
 - Formal presentation at the Protea Hotel Big Hole, followed by a discussion period up to 20:00.

The objectives of this Public Open Day are the following:

- To communicate the purpose and details of the proposed project;
 - To present the alternative routes which are being considered and investigated (map attached);
 - To present the findings of the specialist studies;
 - To further enable informed comment from the public and key stakeholders;
 - To provide an opportunity to address questions to a panel of specialists and/or Eskom personnel.
- The Distribution of the Draft Scoping Report is done as follows :
 - Notification to all the listed stakeholders of the availability of the Draft Scoping Report at a public venue was done via email, fax and/or postal service. Where an e-mail address was available an internet link to the Draft Scoping Report was provided. A 40-day response period is applicable.
 - The Draft Scoping Report would be linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA).
 - Hard copies of the Draft Scoping Report would be hand-delivered to the following authorities :-
 - **Dept of Economic Development, Tourism & Environmental Affairs, Free State Province**
The Acting Director - Environmental Quality Management, Ms Grace Mkhosana
Bojanala Building; 34 Markgraaf Street; Bloemfontein; 9301
Tel 051 400 4812 / 051 400 4817
 - **Department of Water and Sanitation, Free State Region**
Care of the Deputy Director: Mr Willem Grobler,
Bloemplaza 2nd Floor; Corner of Burger & Charlotte Maxeke Streets, Bloemfontein, 9301;
Tel. 053 836 7600 / 082 802 7128
 - **Department of Water and Sanitation, Northern Cape Region**
Acting Director: Water Sector Regulation and Use: Ms Nosie Mazwi
28 Central Road; Room B 24; Beaconfield; Kimberley, 8301
053 836 7600 / 082 802 7128
 - **Tokologo Local Municipality**
The Municipal Manager: Mr Kelihle Motlhale
Market Square, Voortrekker Street, Boshof; 8340
Tel 053 541 0014

Deviation requested

The following deviations from the public participation process were applied for with the Department of Environmental Affairs in terms of Regulation 54(5) of GN R. 543:

Deviation from GN R. 543 Item 54(2)(b)(ii):

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by

- (b) giving written notice to—
- (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken

Deviation from GN R. 543 Item 54(2)(b)(iii)

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by

- (b) giving written notice to—
- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

Reason for deviation request

Three different route alternatives were identified for this powerline proposal and a total of 274km with a 2km wide corridor will be investigated.

It is not possible, nor feasible to inform all the occupiers of the land or the adjacent land of this development proposal.

Numerous steps were taken to ensure that nobody is negatively affected by the allowance of the deviation request (refer to the public participation followed as described above).

The deviation request was granted by the Department of Environmental Affairs.

5.2 ISSUES RAISED DURING THE SCOPING PHASE

5.2.1 WRITTEN COMMUNICATION WITH I&AP'S: INITIAL ADVERTISING PERIOD UP TO THE PUBLIC OPEN DAY

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E4.

Savannah Environmental

Specific consideration in the identification of a viable route corridor is required in terms of an application for a solar energy facility, the proposed Boundary Solar Energy Facility, on the farm Karreeboom No 1716 that has been lodged with DEA with reference number 14/12/16/3/3/2/555. The proposed project is located approximately 15km south-east of Kimberley and 40km south-west of Boshof in the Tokologo Local Municipality on the same farm as the existing Eskom Boundary Substation. The proposed project includes the following infrastructure :

- Photovoltaic (PV) solar panels with a generation capacity of 75 MW

- Appropriate mounting structures
- Cabling between the project components, to be laid underground where practical
- A new on-site substation and overhead power line to evacuate the power from the facility to the Eskom Grid at the adjacent Boundary Substation
- Internal access roads and fencing
- Workshop area for maintenance, storage and offices.

Mr HPJ (Henk) Pieterse, Landowner of the Farm Walvischkuil

He confirmed his land is situated adjacent to the existing Boundary Substation. He requires that the servitude planned through his game camp may not affect his windmill, dam and water cribs. He is concerned of the fact that there are already 4 to 5 Eskom power lines across his property and this affected land can only be used and rented out for grazing. He stated that the power lines had a definite negative impact on his property values; therefore he requires that the line be planned along the farm boundary between him and Wolvenpan, or alternatively reasonable compensation is required.

Ms Karina Nel of the Farms Leliehoek, Constantia, Walvischkuil and 9 other in the region

She confirmed she has signed a 5 year option for solar power development on her properties which implies that it would be close to impossible for any Eskom power lines to cross her farms. All her farms are either directly adjacent or relatively close to the existing Eskom Beta Substation.

She is concerned that requirements in Environmental Management Plan previously compiled are not implemented; therefore Eskom could expect a lot of negativity from the landowners.

Mr Mark Brenner of the Tolpan Game Farm

He strongly, on behalf of the owners of Tolpan Game Farm, raised his objection against any additional power lines across their property. He stated that the existing power lines cause inconvenience to the operational requirements of their business as Eskom personnel frequently arrives unannounced, endangering not only themselves but also interrupting hunting parties which is unacceptable.

Mr Wiets Botha of the Farm Rowden 703

He confirmed that their farm has been registered as a private nature reserve with the Department of Environmental Affairs in Bloemfontein. Their objections will be forwarded as soon as more information becomes available.

Mr Henk van der Post (Tembador 101 (Pty) Ltd), owner of the Farms Marienthal, Portion 1 of the Farm Kareeloop 1516 and the Remainder of Kareeloop 1516

He would provide additional input when more information becomes available; however, consideration must be given of the following :-

- Most of the farms between Boshof and Kimberley are being used for game farms and/or conservation purposes.
- The habitat in this area is ideal for that purpose and cannot be found elsewhere in the Free State. The area is unique and restricted and can be referred to as the Free State's Serengeti.
- Additional power lines with the associated wide corridors will irreparably harm nature and the industry that protects it.

Claudette Jansen van Vuuren of the Farm Skietpan 1456

She confirmed they already have two power lines crossing their property. They only have grasslands which are at present mowed down annually by Eskom. They are concerned that an additional line will result in even less grass for their animals. They are however open for discussions should it be possible that maintenance could be done differently.

Mr Francois and Ms Cornelia Squirra of the Montagu Nature Reserve (Farms 1665 and 795)

They strongly object against the proposed Eskom project since additional lines on their property will further interrupt their hunting and eco-tourism operations and impact on the aesthetic quality of the area. They are also concerned that it would become impossible to effectively guard their rhino and lion during the construction phase.

Mr FD Hugo (of the Farms Populier and Smouspan)

He stated that he owns a relatively small portion of land which is already affected by a power line. He said it would be difficult to convince him to agree to an additional line.

Mr Jaco Pretorius, on behalf of the owners of the Farm Zyferfontein (Messr Pieter Pretorius and Etiaan Saaiman)

He required more information in terms of the technical details, i.e. exact placement of pylons. They have no specific objection against the project; however; they require negotiations with Eskom to ensure that their future expansion plans are accommodated. He pointed out the following in terms of detail design requirements :

- They want the line to run along the farm boundary as far as possible for minimal interference of the farming activities.
- The corner of the proposed Second Alternative Corridor affects the main water points of the farm. They request that the line be planes to miss this infrastructure.
- Following the line about halfway from the corner to the western boundary it crosses a windmill and borehole. Moving the line slightly south will solve that problem.

Mr Roelf Jacobs (on behalf of Roecon Trust, the owner of the farm Vooruitzicht)

They strongly object to the proposed power lin, based on the following :

- They are currently busy converting their cattle farm to a game farm and any additional power lines will affect the aesthetic value.
- Power lines can start veld fires which is a serious challenge in the area. An additional line will aggravate the risk.
- Eskom enters property for inspection and maintenance purposes without prior arrangement. This will cause serious safety risk while hunting is taking place.

Mr Liam Urry (on behalf of the register owner Mr Trevor George Urry, of the Farms Ferridale, Frankfurt and Montagu)

He confirmed the following :

- They run a successful game farming business.
- They have an established vulture restaurant on their property and the existing powerlines result in numerous deaths of the birds.
- It was requested that this information be forwarded to the Bird Impact Specialist to take into consideration in his Bird Impact Report.
- He requested to be invite you to the proposed Public Open Day.

Mr EM Vrey (of the Farms Wellington 569, Middelbult 1083, Virginia 1200, Vlakpan 26 and Langlaagte 1313)

He stated that the above properties involve approximately 1200 agricultural land that is intensively being farmed. He is concerned that any activity that might restrict the production value of the property might result in two owners, his labourers and their dependants not be able to make a living anymore.

They request that Route Corridor Alternative Three be implemented since they would object against Route Corridor Alternatives 1 and 2.

Mr Christo Fourie (of the Remainder of the Farm Goede Uitsig 1480 on behalf of Centuria 0194 (Pty) Ltd)

He stated his concern that proper route investigation has not yet taken place. He required more detail in terms of servitude widths and access roads. He wants to be invited to the Public Open Day.

Dr Charl De Witt (of the Welloch Boerdery (Pty) Ltd, the landowner of Garvoch 367, Serfonteinshoop 43 and Napier 662)

He stated that the proposed routes of which the First Route Alternative runs straight through the middle of his properties would be totally incompatible with the current land use that is a private game and nature reserve, named O Sole Mio. Environmental Authorisation had been obtained for the development of a private recreational and accommodation resort. Thirty 1-hectare stands had already been pegged fronting north, in the direction of the proposed routes. The negative visual impact would result in the cancellation of the sale of numerous stands. Dr De Witt is furthermore concerned about the significant negative impact that the powerline would have on tourism, hunters and the ecology. His objection was strongly emphasised.

Dr Malan van Zyl (of Portion 1 of the Farm Goede Uitsig 1480)

He emphasised his serious concerns on the expected negative impact that a large powerline (the First Route Corridor Alternative) would have on his relatively small property of approximately 370ha. The farm is used for game farming and eco-tourism which is the sole income of the property. His concerns include negative visual impact (specifically from his homestead), health risk associated with the line close to his homestead; the risk involved with darting and catching of game with helicopters; etc.

5.2.2 MAIN ISSUES RAISED AT THE PUBLIC OPEN DAY

The main issues and comments raised during the course of the meetings can be summarised as follows :-

- Reasonable compensation would be required. Numerous game farms focus on eco-tourism, exotic farming and hunting and compensation negotiations should accommodate these land uses.
Response : This should be communicated with the evaluators. The landowners will have the opportunity to meet with them on site.
- A concern was raised that land is not usable for grazing for a period up to a year during the construction period. Compensation should take this loss of income into account.
Response : This should be communicated with the evaluators. The landowners will have the opportunity to meet with them on site.
- Eskom power lines are not suitable at all in areas where game farming is dependent on management via helicopters.
Response : Noted
- A question was raised on the safe distance between from power line servitudes.
Response : Houses can be built immediately adjacent to the 55m servitude.
- The concern was noted that from the Visual Impact Report it is taken that power lines are generally considered a visual intrusion within 3km from the line.
Response : It will be strived to accommodate this issue as far as reasonably possible with the final route corridor alignment.
- A concern was raised that some of the specialist reports were lacking important information, because not all game farms had been listed.
Response : The reports was still in draft format and would be finalised in appropriate detail for the Scoping Report.
- The need for the project was questioned. The concern was raised that eco-tourism and game farms must be impacted to accommodate future mining that would ruin the current businesses.

Response : Eskom has to plan and augment the Transmission System in Accordance with the South African Grid Code. In the past 15 years load, has increased in the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor by 32.5%. The forecast in this corridor anticipates a huge load growth due as a result of high mining activities (diamond, manganese and iron ore mining), electrification and the establishment of small businesses in underdeveloped areas as well as increased housing densities and commercial development in developed areas. Growth is anticipated to quadruple in the next 25-30 years. The existing network will not be able to support the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor load past 2021, strengthening will therefore be required to support the forecasted load and potential renewable generation. In addition, changes in the generation pattern have resulted in Beta Transmission Substation becoming a stronger injection source to this corridor.

- Numerous solar developments had been confirmed and indicated on the Draft Environmental Sensitivity Map.

Response : This will be considered in the final proposed route corridors.

- The issue of a Freshwater Priority Area situated along the western portion of the top route is not reflected in the planned route corridors.

Response : This will be considered in the identification of the final proposed route corridors.

- The question was raised why new power lines could not be placed on top of the existing ones.
Response : It was responded by Eskom that bigger conductors are required, resulting in a requirement for bigger structures. The existing lines had not been built with that in mind. It would be required to decommission the existing lines, resulting in a break-down of power supply. Bigger servitudes would also have to be registered. It is not technically viable.

- It was requested that the routes focus on road alignments to limit impact.

Response : Eskom generally strives to restrict route alignments as far as technically and environmentally viable along existing infrastructure such as roads, railway lines, property boundaries and existing power lines.

5.2.3 CORRESPONDENCE AFTER THE PUBLIC OPEN DAY

Mr Des Brasington, Windsun Energy

They supplied a google map indicating the property that would be used for a solar farm- the "Boundary Solar Energy Facility". This is the same site on which the Boundary Substation is situated. An application for Environmental Authorisation has been lodged with the Free State Province Department of Environmental Affairs with reference number 14/12/16/3/3/2/555. He requested that reasonable consideration be given to the route in that area so that it does not affect the layout and activities planned for their facility.

Dr Charl De Witt (of the Welloch Boerdery (Pty) Ltd, the landowner of Garvoch 367, Serfonteinshoop 43 and Napier 662

He requires that the final route be communicated with him as soon as possible, since he cannot wait until 2015 to commence with construction of the development referred to in paragraph 5.2.1.

Mr Willem van Niekerk (of Portion 1 of the Farm Leeuwfontein 10, also known as Langkop Boerdery)

He expressed his gratitude for the public meeting held. He invited Eskom and Landscape Dynamics to attend a meeting amongst some of the landowners in the area to discuss the expected negative impact associated with the line. Significant impact would occur on the 7 species of exotic game that occur on small camps of 80 hectares on his land. These species can be considered sensitive and/or endangered. The total value of game on their property amounts to approximately R15 million. The Buffelcor Langkop Wildshotel is situated on the portion of their land north of the R64. Furthermore should it be documented that significant risk is associated with counting and catching of game with helicopters where powerlines occur.

Dr Malan van Zyl (of Portion 1 of the Farm Goede Uitsig 1480)

He appreciates the public participation meeting held. He also resubmitted his comment that is summarised under paragraph 5.2.1.

Mr Fred Euvrard of the Euvrard Boerdery Trust (Landowner Kalkfontein 199; Portions 2 and 3 of the Farm Brakfontein 636)

He requested that a representative be sent to his property so that potentially problematic areas could be indicated on site.

The Department of Agriculture, Forestry and Fisheries (Land Use and Soil Management)

They confirmed that the transfer of a portion of land to a statutory body, in this case Eskom, is not subject to the provisions of the subdivision of Agricultural Land Act, Act 70 of 1970.

5.2.4 WRITTEN COMMENT ON THE DRAFT SCOPING REPORT

This comment will be included in the Final Scoping Report that will be forwarded to the Department of Environmental Authorisation for consideration.

5.3 CONCLUSION OF PUBLIC PARTICIPATION DURING THE SCOPING PHASE

The main issues raised during the initial advertising period are related to the following:-

- Impact on future planning , i.e. solar energy farms
- Impact on existing land use – eco-tourism, hunting, agriculture
- Impact on natural environment – vegetation, wildlife and avi-fauna
- Visual Impact
- Cumulative impact of additional power lines on properties with impact on property values
- More technical detail relating to the proposed project is required
- Eskom access during the operational phase is problematic

All these issues will be addressed in appropriate detail during the EIA Phase of the project.

CHAPTER 6: IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

6.1 METHODS USED TO IDENTIFY IMPACT

Environmental issues and impacts have been identified through the following means:

- Correspondence with Interested and Affected Parties, including directly affected landowners, general stakeholders and relevant authorities;
- Consultation with the EIA Project Team, supported by the Eskom Project Team;
- Evaluation and consideration of relevant existing environmental data and information;
- The general knowledge and extensive experience of the Environmental Consultants in the field of Environmental Impact Assessments for linear development planning.

6.2 LIST OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT

6.2.1 EXPECTED NEGATIVE IMPACTS

Direct (Primary) Impacts

Planning Phase :-

Route selection :

- Impact on future planning, i.e. solar energy farms, eco-tourism and game farming
- Impact on existing land use
- Impact on cultural heritage resources
- Impact on natural habitat
- Visual impact (Change of character and atmosphere of the area, change in land use)

Construction Phase :-

- Impact on natural habitat
- Increased risk for surface and groundwater pollution
- Increased risk of erosion
- Influx of labourers to the area with associated crime, access control, fire risk and habitat destruction
- Impacts associated with construction activities such as noise and dust

Indirect (Secondary) Impacts

During Construction & Operational Phase :-

- Influx of labourers to the area – associated increase in crime

During Operational Phase :-

- Impact on property values
- Impact as a result of Eskom inspections and maintenance , i.e. on hunting activities, crime& safety and habitat destruction (pollution, cutting of trees, placement of snares, etc.)

Cumulative Impacts

- Impact on tourism potential in the macro area
- Impact on agricultural potential in the area

6.3 EXPECTED POSITIVE IMPACTS

The positive impacts of the proposed project on the environment are as follows:

- The project will result in a reliable supply of electricity to the Eskom grid – less power outages and failures are likely to occur
- With the implementation of the project it is possible to accommodate new development and associated applications for electricity supply in the macro area.
- The proposed Eskom Strengthening Phase 4 Project is being planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account.
- The project will provide employment and training opportunities, mostly during the construction phase of the project development.

6.4 PROPOSED MANAGEMENT OF IMPACTS AND MITIGATION

Identified impacts and mitigation will be monitored through the application of the Environmental Management Plan (EMP) to be included in the Environmental Impact Report.

The main objectives of the EMP are to ensure that

- mitigation measures are identified and implemented to avoid or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;
- the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- communication channels to report on environment related issues are in place.

Specifications will be supplied for the following project development phases :-

Design & Pre-construction Phase

Construction Phase

Operational Phase

CHAPTER 8: PLAN OF STUDY FOR EIA

The Department has to consider the Final Scoping Report and make a decision to

- Request amendments to the report;
- Request further alternatives to be considered;
- Reject the scoping report or plan of study for EIA because it does not substantively comply with the requirements of the Regulations;
- Or accept the scoping report

The decision to grant or refuse the application cannot be made directly after the scoping process.

There are certain actions that should be undertaken and issues that would be addressed in the final Environmental Impact Report (EIR).

DEA has to review the EIR and EMP and one of the following decisions may apply:

- Grant authorisation of the activity
- Refer the report for specialist review
- Request further information or investigations
- Refuse the activity

The following is recommended as a Plan of Study for the EIA to be documented in the EIR in order to finalise the environmental impact assessment procedure:-

A. BACKGROUND

The EIR will focus on detail compared to the Scoping Report (which is the basic overview). It will include the following :

- *Confirmation of relevant legal requirement :*
Cognizance would be given to all the relevant legal requirement, documents and guidelines as identified during the Scoping Phase and documented in the Scoping Report.
The most obvious relevant legislation that will be addressed in the Final EIR with proof of relevant submissions includes:
 - *The National Environmental Management Act (Act 107 of 1998)*
 - *The National Water Act No 36 of 1998*
 - *The National Heritage Resources Act*
- *Project Description :*
 - *a clear description of all the project components*
 - *relevant technical details;*
 - *a clear description of the final recommended route corridor with viable alternatives;*
- *Final specialist investigations,*
- *Proceedings; findings and recommendations a the Public Participation Process during the EIA Phase;*
- *An impact assessment based on issues and alternatives as identified during the Scoping Process.*
- *Mitigatory measures to address the identified impacts*
- *An Environmental Management Plan to formalise legal requirement; communication channels as well as the mitigatory measures*

B. SPECIALIST INPUT DURING THE EIA PHASE

Status quo reports had already been prepared by the specialists during the Scoping Phase. Environmental components that are more site-specific had only been done in draft format. The purpose of these reports during the Scoping Phase was to identify obvious areas and/or “No Go” zones before the process has developed too far. Since the Draft Scoping Report is presented to all the I&AP’s, it is possible that the route corridors could be changed in which case the specialists have to revisit the site in order to prepared their final reports for the EIA Phase of the project.

The specialist reports already finalised during the Scoping Phase due to the macro area investigated (not being site-specific) include the following :-

- Socio-economic, Tourism and Land Use Potential Impact
- Palaeontology Report
- Geotechnical Engineering Investigation
- Soil & Agricultural Potential Report

The following draft specialists reports will be finalised for the Environmental Impact Report :

- Freshwater Study – Proof of submission of the Water Use License (WULA) will be provided
- Terrestrial Fauna & Flora Study
- Bird Impact Report
- Heritage Impact Assessment – Proof of support for and/or final recommendations in terms of the project by SAHRA will be provided
- Visual Impact Report

Environmental Sensitivity Maps will be provided for each relevant component.

C. IMPACT ASSESSMENT

Impacts will be evaluated and assessed in terms of

Extent of impact	Explanation of extent
Site	Impacts limited to construction site and direct surrounding area
Local	Impacts affecting environmental elements within the local area / district
Regional	Impacts affecting environmental elements within the province
National	Impacts affecting environmental elements on a national level
Global	Impacts affecting environmental elements on a global level
Duration of impact	Explanation of duration
Short term	0 - 5 years. The impact is reversible in less than 5 years.
Medium term	5 - 15 years. The impact is reversible in less than 15 years.
Long term	>15 years, but where the impacts will cease if the project is decommissioned
Permanent	The impact will continue indefinitely and is irreversible.

Probability of impact	Explanation of Probability
Unlikely	The chance of the impact occurring is extremely low
Possible	The impact may occur
Probable	The impact will very likely occur
Definite	Impact will certainly occur
Magnitude/Intensity of impact	Explanation of Magnitude/Intensity
Low	Where the impact affects the environment in such a way that natural, social and cultural functions and processes are not affected
Moderate	Where the affected environment is altered, but natural, social and cultural functions and processes continue albeit in a modified way
Severe	Where natural, social and cultural functions or processes are altered to the extent that it will temporarily or permanently cease
Significance of impact	Explanation of Significance
None	There is no impact at all
Low	Impact is negligible or is of a low order and is likely to have little real effect
Moderate	Impact is real but not substantial
High	Impact is substantial
Very high	Impact is very high and can therefore influence the viability of the project

D. PUBLIC PARTICIPATION PROGRAMME: EIA PHASE

- A second Public Participation Programme (PPP) will be undertaken as per the prescribed guidelines of DEA and according to the stipulations of the EIA Regulations. (It is noted that a PPP is compulsory for both the Scoping and EIA phases.)
- The PPP for the EIA Phase include the following :
 - Distribution of the Draft EIR for comment
 - Possible a Public Open Day and/or Stakeholder Meeting(s)
 - Continuous and direct liaison with the directly affected landowners will take place to strive to ultimately present route corridors (preferred and viable alternatives) on which reasonable consensus have been reached.
 - Distribution of the Final EIR – to confirm that all comment has appropriately been documented and satisfactorily addressed in the document that will be submitted to DEA for final consideration of Environmental Authorisation
- All comment, objections and concerns raised and submitted by the I&AP's will be addressed during the PPP and all proceedings, recommendations and correspondence will be documented in the final EIA Report to be submitted to DEA.

E. ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) has to be compiled to complete the EIR. The main objectives of the EMP are to identify actions and mitigation measures to minimise expected negative impact and enhance positive impact during all development phases (design/pre-construction, construction, and post-construction/operation) in terms of community issues, construction site preparation, construction workers, habitat protection, security, etc. Communication channels and contact details must also be provided.

CHAPTER 9: CONCLUSION

9.1 LEGAL REVIEW

The objectives of the Legal Review for an Environmental Impact Assessment are the following :-

- To review the processes followed with relevant to applicable legislation including the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA); the National Environmental Management : Protected Areas Act, 2003 (Act No 57 of 2003) and the National Environmental Management : Biodiversity, 2004 (Act No 10 of 2004)
- To consider any legal issues and/or technicalities raised by the Interested & Affected Parties and provide legal opinion in respect thereof.
- To provide a legal opinion on the process followed and any legal issues emanating from that.

All the associated actions, proceedings, specialist input and relevant information as well as the Draft Scoping Report have been supplied to the Legal Review Specialist for the project. The assessment letter for the Scoping Report will be included as Appendix D(6) in the Final Scoping Report to DEA.

The final recommendations on the Scoping Report from the Legal Advisor will be summarised below in the Final Scoping Report.

9.2 RECOMMENDATIONS BY EAP

It is the professional and objective opinion of the independent EAP that the following is relevant :-

- All reasonable actions had been taken to identify any relevant environmental components in the study area
- The specialist input obtained up to date is comprehensive and effective in providing an assessment of the status quo of the study area and potentially sensitive areas and issues of concern that require re-consideration of route alternatives.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. Significant communication with the I&AP's has taken place up to date
- The Scoping Report includes all proceedings, findings and recommendations from the Scoping Phase.
- All relevant legal requirement in terms of the Scoping Phase as per the Environmental Impact Assessment Regulations published on 18 June 2010 as per the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended had been complied with.

The EAP can, with no reservation, recommend this Scoping Report with the Plan of Study for the EIA Phase to the Department of Environmental Affairs (DEA) for approval.
