

## 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. Electricity is primarily generated in coal-fired power stations across the country. The electricity is transported from these stations along high voltage transmission power lines (usually 400kV, but also 220kV, 275kV, 533kV and 765kV lines) to Transmission substations or load centres. These substations then feed local distribution substations with power lines from 132kV and smaller voltage, from where electricity is distributed to communities and other users.

Eskom Group Capital Division is in the process of undertaking major infrastructure investments, including the construction of new 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 has 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 (among other project components) 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 and apply for Environmental Authorisation from the Department of Environmental Affairs.

### 1.2 PURPOSE AND CONTENT OF THE DOCUMENT

According to the NEMA 2010 regulations that apply to this application, a Scoping & Environmental Impact Assessment process is applicable.

The objectives of the Scoping Report were

- 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 Interested & Affected Parties (I&AP's) the opportunity to comment on the preliminary findings and recommendation in terms of a viable route for the project.

The final Scoping Report submitted to the Department of Environmental Affairs (DEA) was approved on 15 April 2015. DEA advised that Landscape Dynamics could proceed with the tasks contemplated in the Plan of Study for the Environmental Impact Report as proposed in Chapter 8 of the Scoping Report.

The content of the Environmental Impact Report (EIR) is based on the above-mentioned approved Plan of Study and is summarised as follows:

- Confirmation of relevant legal requirement
- 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

Status quo reports were prepared by the specialists during the Scoping Phase. Environmental components that are more site-specific were only 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 was presented to all the I&AP’s, it was possible that the route corridors could be changed in which case the specialists had to revisit the site in order to prepare their final reports for the EIR.

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

- Palaeontology Report
- Geotechnical Engineering Investigation
- Soil & Agricultural Potential Report

The following specialist reports were finalised for the Environmental Impact Report:

- Freshwater Study
- Terrestrial Fauna & Flora Study
- Bird Impact Report
- Heritage Impact Assessment
- Visual Impact Report
- Socio-economic, Tourism and Land Use Potential Impact

- Public Participation Programme

Proceedings, findings and recommendations of the Public Participation Programme (PPP) undertaken during the EIA Phase are summarised and includes the following:

- Distribution of the Draft EIR for comment;
- No comment that could change the outcome of the project as proposed during the Draft EIR phase was received and a second Public Open Day and/or Stakeholder Meeting(s) were not conducted;
- Continuous and direct liaison with the directly affected landowners and key stakeholders took place to strive to ultimately present route corridors (preferred and viable alternative) on which reasonable consensus have been reached.
- Distribution of the Final EIR is not required because no significant changes to the Draft EIR were made.
- All comment, objections and concerns raised and submitted by the I&AP’s were addressed during the PPP and all proceedings, recommendations and correspondence is documented in the Final EIR (this document) which is submitted to DEA for their perusal and ultimately the issuing of the Environmental Authorisation.

- Impact Assessment

An impact assessment based on relevant issues and impact identified during both the Scoping and the EIR Phases is supplied in Chapter 6 of this EIR. Impact were evaluated and assessed in terms of extent; duration, probability; magnitude/intensity and significance.

- Environmental Management Plan

An Environmental Management Plan (EMP) had been compiled and is included as Appendix F of the EIR. The main objectives of the EMP are to confirm 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 are also be provided.

DEA will 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 specialist investigations
- Refuse the activity

Landscape Dynamics endeavours with this report to submit a comprehensive study containing all relevant data and information in order to enable informed, fair and responsible decision-making by DEA.

## 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:

Government Notice 544 (Listing Notice 1)	
<p><b>Listing Notice 1: Number 11</b>            The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50m<sup>2</sup> in size; (ix) slipways exceeding 50m<sup>2</sup> in size; (x) buildings exceeding 50m<sup>2</sup> in size; or (xi) infrastructure or structures covering 50m<sup>2</sup> 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>The proposed activities involve the construction of power lines of which the foundations plus associated structures would exceed 50m<sup>2</sup> – referring to concrete foundations for both the pylons plus cables. As well as a temporary access roads.</p> <p>The proposed pylon structure at this stage is either the Guyed V- Type with a total base width of 26 meters with pointed tower base in the centre; or the Cross-Rope Suspension Type with a distance between base towers of 21 meters.</p> <p>The aquatic features within the study area that would be affected consist of endorheic pans and associated wetland areas and drainage lines.</p>

	<p>The extent to which the watercourses would be affected could however only be determined once the final route design with placement of pylons had been done. A site walkover with the freshwater specialist at that stage will also further confirm the extent to which impact would occur.</p>
<p><b>Listing Notice 1: Number 18</b>  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</p> <ul style="list-style-type: none"> <li>(i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</li> <li>(ii) occurs behind the development setback line</li> </ul>	<p>It is proposed that the new substation should be placed in such a manner as to avoid impacting on pans and associated wetland areas - to be confirmed only during the design phase.</p> <p>The concrete foundations will exceed 5 cubic metres per pylon structure with cables and could affect the aquatic features occurring within the study area that consist of endorheic pans and associated wetland areas and drainage lines.</p> <p>The extent to which the watercourses would be affected could however only be determined once the final route design with placement of pylons had been done. A site walkover with the freshwater specialist at that stage will also further confirm the extent to which impact would occur.</p>

#### Government Notice 545 (Listing Notice 2)

<p><b>Listing Notice 2: Number 8</b>  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 mostly outside urban areas and/or industrial complexes on agricultural and game farm land.</p>
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#### Government Notice 546 (Listing Notice 3)

<p><b>GN 546, June 2010, Number 14</b>  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> <p>Northern Cape provinces</p> <ul style="list-style-type: none"> <li>(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</li> <li>(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.</li> <li>(3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.</li> </ul> <p>i) All areas outside urban areas</p>	<p>The study area affects rural land of which some falls on game farms with an indigenous vegetation cover of 75% or more.</p> <p>The extent of the substation site had been confirmed as 5ha each. Eskom requires a servitude width of 55m (27,5m on either side of the line) which will have to be cleared of potential obstructions to the powerline and for construction, inspection and maintenance purposes.</p> <p>The total area to be cleared would exceed 5 hectares.<sup>1</sup></p>
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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, Northern Cape Provinces (Section Environmental Quality Management).
- Department of Water and Sanitation (DWS), Northern Cape Region
- The South African Heritage Resources Agency (SAHRA). They will advise whether authorisation is also required from the Free State and or Northern Cape 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)

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. The Department of Water & Sanitation (DWS) is the administering body in this regard.

Should the proposed activities associated with the substation or power line impact on water resources e.g. cross through rivers, the applicant would be responsible to obtain a Water Use License or General Authorisation for the activity from the regional office of DWS.

### 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 000m<sup>2</sup> in extent
- (c) the re-zoning of a site exceeding 10 000m<sup>2</sup> in extent

### 1.3.4 ADDITIONAL ACTS, FRAMEWORKS AND GUIDELINES

#### **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 or power line, this Act may be applicable and the necessary measures should be taken for implementation.

Note should be taken of the **Alien and Invasive Species Regulations, 1 August 2014 (GNR 598)** which requires that all alien and/or invader plants declared as invaders/weeds, in accordance with the regulations, must be removed.

#### **National Environmental Management: Protected Areas Act (No 57 of 2003)**

The Act came into operation on 1 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.

#### **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.

#### **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.

#### **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, could 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 make it unsafe or creates a risk to health when properly used.

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

Policy and legislation governing tourism in South Africa emphasises the concepts of responsible tourism and sustainable tourism development. Tourism 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 emphasises the optimisation of benefits relating to tourism,

#### **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.

#### **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 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 1.5m 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.

#### **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.

### **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.

### **Department of Environmental Affairs Integrated Environmental Management Series**

DEA's Information Series were drafted as sources of information about concepts and approaches to Integrated Environmental Management (IEM). 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.

### **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.

### **All relevant Provincial Legislation and Municipal bylaws**

#### **National Department of Environmental Affairs: Guidelines**

The National Department of Environmental Affairs has a set of guidelines that have to be adhered to during the EIA Process. The following guidelines are applicable:

- Companion Guideline for the Implementation of the Environmental Impact Assessment Regulations (Guideline 5), as published in Government Notice 805 of 10 October 2012.
- Public Participation Guideline for the Environmental Impact Assessment Process (Guideline 7), as published in Government Notice 807 of 10 October 2012.

#### **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 has been appointed to apply for Environmental Authorisation on behalf of Eskom SOC Limited (Group Capital Division) for this 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 17 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, Mpumalanga and Kwazulu-Natal.

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

The Landscape Dynamics' Company Profile as well as relevant condensed Curriculum Vitae's are attached in Appendix H.

## 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 was therefore required for this Environmental Impact Assessment.

The EIA Project Team members are the following (condensed CV's are attached in Appendix H):

<b>Company Name</b>	<b>Contact Person(s)</b>	<b>Responsibility and/or Project Component</b>
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 Impact Assessment
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 Impact Assessment Water Use License Applications
Enviroguard Ecological Services CC	Dr Leslie Brown	Terrestrial Fauna & Flora
Chris van Rooyen Consulting	Mr Chris van Rooyen	Bird Impact
Archaetnos Cultural & Heritage Resource Consultants	Dr Anton van Vollenhoven	Heritage Impact Assessment
Newtown Landscape Architects	Mr Graham Young	Visual Impact Assessment
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:

<b>Division within Eskom Group Capital Division</b>	<b>Contact Person(s)</b>	<b>Responsibility and/or Project Component</b>
Eskom Project Development Engineer	Mr Fick Booysen	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 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, 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, which is in the Free State Province and the starting point of the Kimberley Strengthening Phase 4 Project, 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 400kV power line. 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 power line 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. The Beta and Boundary Substations are situated in the Free State Province and the 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, the application for Environmental Authorisation for this project was divided into four different applications. 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)
- 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 Environmental Impact Report has ONLY been prepared for Application 4 – the MANGANORE-FERRUM section of the project.**

The line runs in a northerly direction through areas of the Tsantsabane, Ga-Segonyana and Gamagara Local Municipalities in the Northern Cape Province. It starts close to the town of Postmasburg and ends just south of Kathu (refer to the Route & Locality Map attached in Appendix A).

Different route alternatives were considered during the course of the project. The properties that had initially been investigated by the proposed MANGANORE-FERRUM application included the following but were not necessarily limited to, various portions of the farms Kapstewel 436, Klipfontein 437, Plaas 438, Plaas 588, Plaas 439, Mount Huxley 676, Cophorne 677, Plaas 309, Grasmere 680, Malans Rust 256, Billinghurst 681, Crawley 682, Driehoeks Pan(Broughton) 435, Gloucester 674, Thaakwaneng 675, Lohaltla (Nooitgedacht) 673, Morokwa 672, Maremane Nature Reserve 678, Kadgame 558, Maccarthy 559, Mokaning 560, Helpebietjie 738, Mashwening (Rust in Vrede) 557, Gathlose Native Reserve 548, Demaneng 546, Lylyveld 545, Legoko 460, Sekgame 461, Morokwa 672, Kadgame 558, Maccarthy 559, Mokaning 560, Helpebietjie 738, Mashwening (Rust in Vrede) 557, Mashwening 557 and Lyleveld 545.

**The properties that are now affected by the Route One Corridor (Preferred) for the MANGANORE-FERRUM application - refer to Appendix A(5) - are the following:**

Kapstewel 436 Restant, Kapstewel436 Portion 4, Gloucester 674 Portion 8, Thaakwaneng 675 Portion 2, Thaakwaneng 675 Portion 1, Thaakwaneng 675 Remainder, Lohaltla (Nooitgedacht) 673 Portion 1, Morokwa 672 Portion 2, Morokwa 672 Portion 3, Morokwa 672 Portion 1, Morokwa 672 Remainder, Maremane Nature Reserve 678, Kadgame 558 Portion 1, Kadgame 558 Portion 2, Kadgame 558 Remainder, Kadgame 558 Portion 4, Maccarthy 559 Remainder, Mokaning 560 Portion 4, Helpebietjie 738, Mashwening (Rust in Vrede) 557 Portion 1, Mashwening 557 Remainder, Demaneng 546 Remainder, Demaneng 546 Portion 2, Demaneng 546 Portion 1, Lylyveld 545 Remainder, Legoko 460 Portion 1, Bruce 544 Portion 1 and Sekgame 461 Restant.

## 2.2.2 PROJECT COMPONENTS AND TECHNICAL INFORMATION

The project will consist of the construction of an approximately 67km 400kV powerline from the Manganore Substation to the Ferrum Substation, including the construction of the new Manganore TX (Transmission) Substation adjacent to the existing Manganore DX (Distribution) Substation.

A maximum area of 5 hectares is generally investigated and/or acquired for a transmission substation, although the actual footprint of the substation will be less than 5 hectares. The additional land is however necessary to allow for sufficient space for entries and exits of power lines 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 at this stage:

- Guyed Suspension Type - Top width 23m; total base width 26m with pointed tower base in the centre, height average 33m
- Cross-Rope Suspension Type – Top width 29m; distance between base towers 21, 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 55m, with 27.5m on either side of the line. Note however that for the purpose of the Environmental Impact Assessment a route corridor width of 2km is being investigated for each alternative and a 2km wide route corridor will ultimately be authorised by DEA. This enables slight adjustments within the corridor during the corridor walk-down and servitude negotiations with the relevant landowners without having to enter into an additional environmental authorisation process.

It will be strived to reach reasonable consensus during the EIA process 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 power line according to the servitude conditions referred to above.

### 2.2.4 METHOD STATEMENT

The construction of a transmission line involves the following actions:

#### **Surveying (Pegging of tower positions)**

- Resources: Surveyor, assistants, 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.
- 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, 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 to be done in consultation with the ECO.

### **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 a 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**

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 Environmental Authorisation will include 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.

#### *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 1m 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 of 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 55 metre (27.5 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 on vacant land identified adjacent to the existing Ulco DX Substation where the new Ulco TX Substation will be built.

Since the proposed power line will be approximately 94km in length, the aforementioned tasks may occur simultaneously along the power line corridor.

Draft Scoping Report to I&AP's	December 2014
Final Scoping Report submitted to DEA	April 2015
Finalisation of all specialist studies	June 2015
Submission Draft EIR and EMP's to I&AP's	September 2015
Submission of Final EIR and EMP to I&AP's, if required	November 2015
Submission of Final EIR and EMP to DEA	November 2015
Environmental Authorisation	January/February 2016
Appeal period ending	February/March 2016
Servitude rights (valuations, negotiations and registrations)	April 2016 – March 2017
Detail Design and Detail Site Overview with Specialists	April 2016 – March 2017
Construction Period	April 2017 – March 2019

## CHAPTER 3: ALTERNATIVES

### 3.1 NO GO ALTERNATIVE

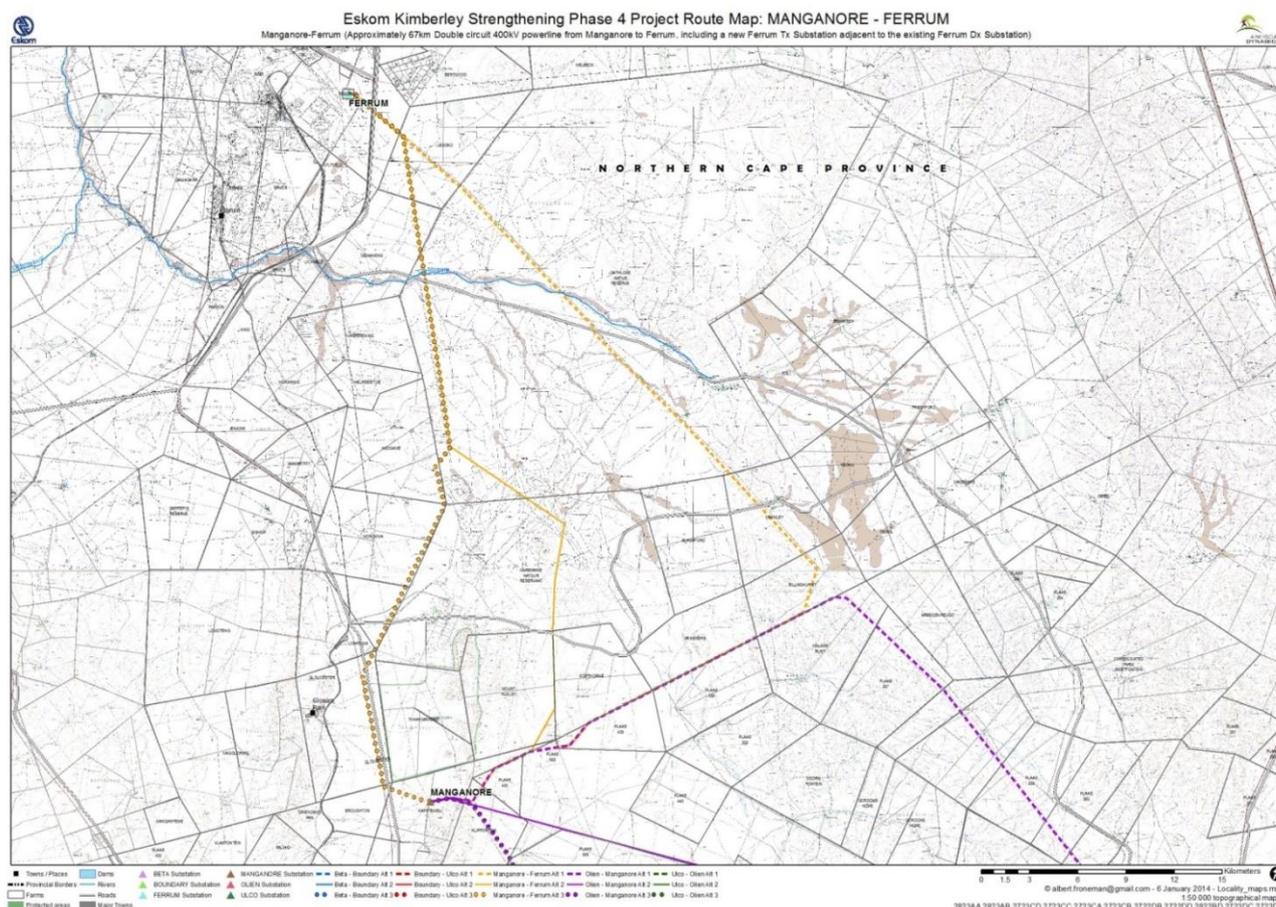
This is the “do nothing” alternative. Under these circumstances no power line will be constructed, a new substation will not be constructed and there would obviously be no changes to the environment.

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 supply 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 requirements 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 ROUTE ALTERNATIVES INITIALLY PRESENTED AND INVESTIGATED

The route alternatives as per the map below (A3 copy attached in Appendix A.2) were investigated during the site visit which was undertaken by the EAPs, Eskom personnel as well as the specialists in January 2014.

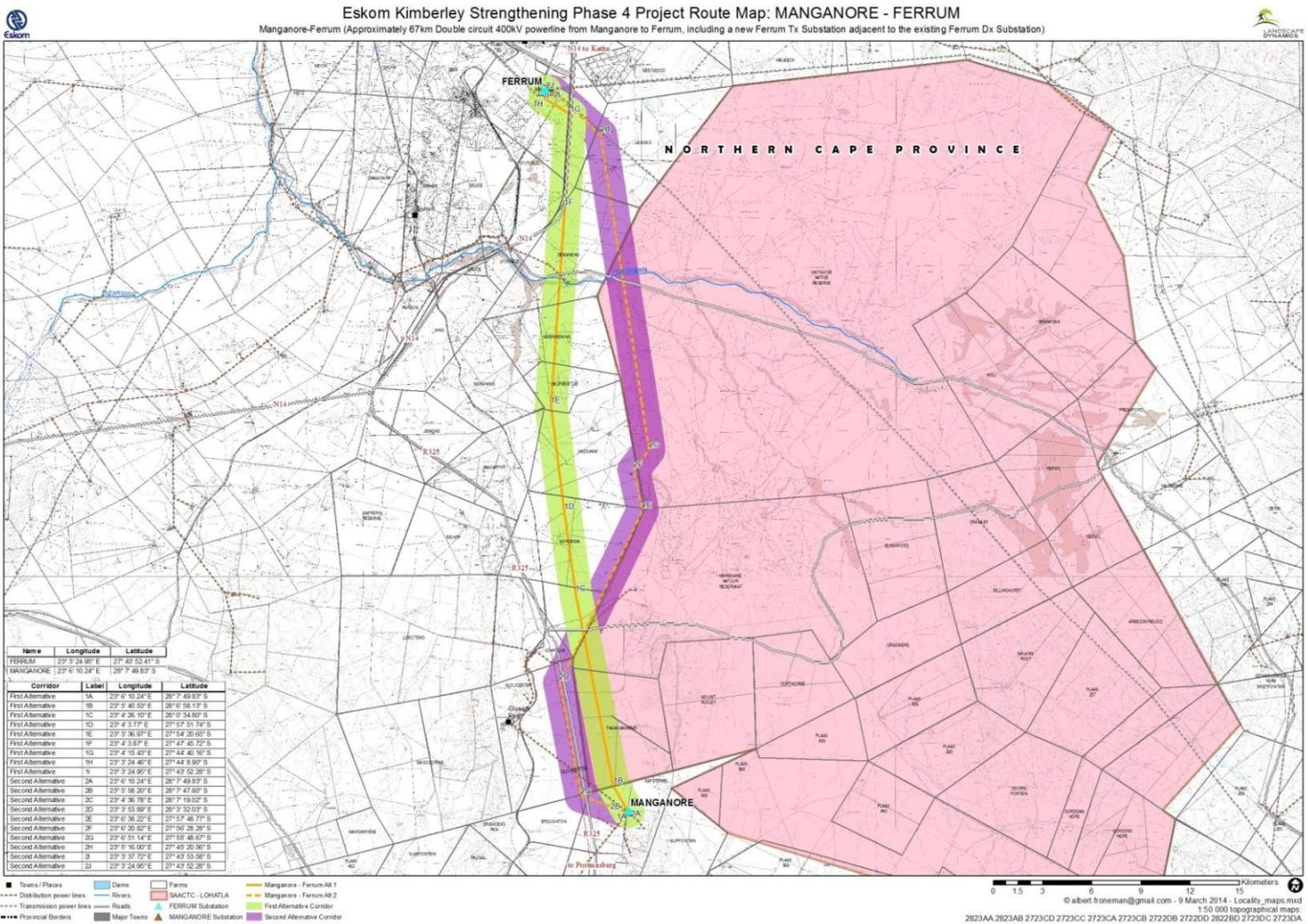


- Route Alternative 1 & 2 (the dashed and solid line)

It came to the attention of the EIA team during the site visit that a section of both Route Alternatives 1 and 2 transect through the property of the SA Lohatla Army Training Combat Centre, which is a no-fly zone (the pink shaded area in the map below clearly indicates this no-fly zone). These routes are therefore, amongst other, not feasible since helicopters are extensively used by Eskom Transmission for construction and maintenance on 400kV power lines. These routes are therefore not viable and were scrapped as an alternative. It was not presented to the public as an alternative route.

**Route & Corridor Alternatives as assessed by the specialists and presented as part of the public participation programme (an A3 size map is attached in Appendix A3)**

The three route corridor alternatives investigated by the specialists and presented to the public are as follows:



**3.3 ROUTE DESCRIPTION**

A general description of the macro area of the proposed route corridors is provided below.

The Manganore Substation at the southern extent of the study area is located approximately 21 km north-east of Postmasburg, while the Ferrum Substation at the northern extent of the study area is located approximately 3km south of Kathu. The various power line alternatives run east of Route 325 between Postmasburg and Kathu.

Land use within the study area consists largely of natural areas. Kathu and Sishen are towns in the immediate area. They are located approximately 3km north and 10km southwest of the Ferrum Substation. Other smaller urban areas occur that are associated with the mines in the area. Postmasburg is located approximately 20km south of Manganore Substation. Iron-ore mining takes place at mostly in the north of the study area at Sishen. The South African Army Combat Training Centre at Lohattha covers a large portion of the study area to the east of the proposed power lines. A number of Eskom power lines already transect the landscape.

The majority of the landscape consists of slightly undulating plains in the east of the study area within the South African Army Combat Training Centre at Lohattha and hillocks of the Klipfonteinheuwels to the west. While the landscape is relatively undisturbed at Lohattha, much of the topography of the northern portion of the study area around Kathu has been significantly altered by the mining activities, especially large scale excavations and waste rock dumps.

The study area falls within the Eastern Kalahari Bushveld Bioregion of the Savanna Biome. The natural vegetation types found in the area include Kathu Bushveld, Kuruman Thornveld and Southern Kalahari Salt Pans. Kuruman Thornveld covers most of the southern portion of the study area, Kuruman Mountain Bushveld occurring on the hillocks and Kathu Bushveld occurring in the northern extent. There are still large portions of these vegetation types remaining and as a result they are all considered to be Least Threatened vegetation types.

Other vegetation that may be affected is that of Southern Kalahari Salt Pans and the riparian vegetation along the various streams in the area. The Southern Kalahari Salt Pan vegetation type is considered least threatened and is scattered throughout South Africa where the rainfall ranges between 300 and 500 mm. Some small depressions within this landscape contain valley floor pans that are largely devoid of vegetation. The pan bottoms tend to be exposed for most of the year but carry shallow pools for short periods of time during the rainy season (March-April) which provides some habitat for biota but are usually also usually subject to cycles of degradation and regeneration as a result of grazing of livestock.

The riparian vegetation along the rivers and streams are in general in a largely natural to moderately modified condition as a result of the activities taking place along these rivers.

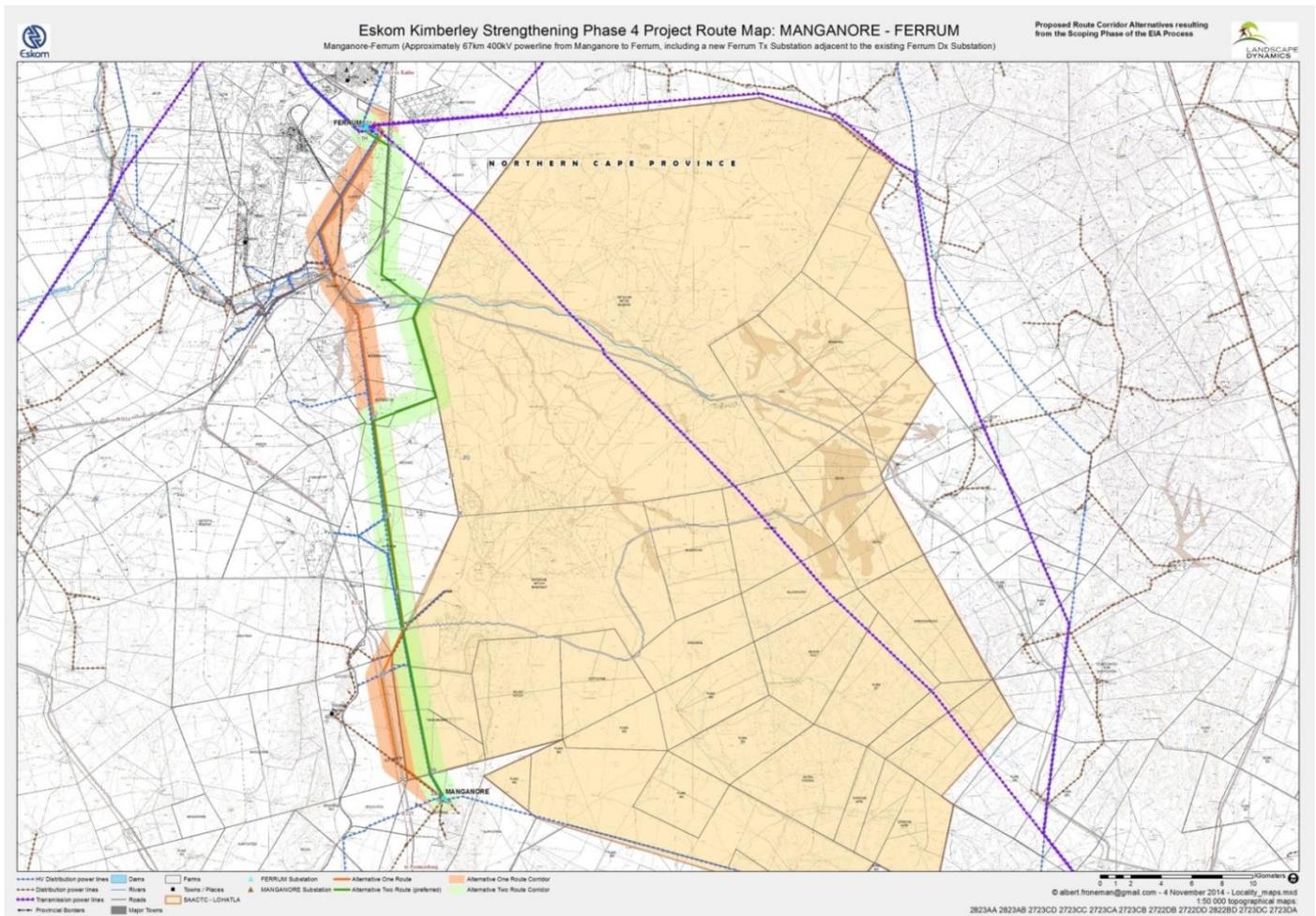
In terms of freshwater features, the study area lies primarily in the upper catchment of the north-west flowing river Ga-Mogara River which discharges into the Kuruman and Molopo Rivers before it too reaches the Orange River at Riemvasmaak. The southern portion near Manganore is located in the headwaters of the south-west flowing river, the Groenwaterspruit, which discharges into the Orange River as the Soutloop River near Boegoeberg. The watershed between these two catchments lies approximately 1.5km north of Manganore Substation. A few relatively small valley floor depressions or pans occur to the east of the Second Alternative route and are largely associated with the Ga-Mogara River System.

The geology in the area consists of a mixture of Transvaal, Ventersdorp and Karoo Supergroups which are tertiary to recent secondary deposits with carbonate rocks dominating together with surficial deposits, lavas and sub-ordinate shales and dolerites.

In general the soils within the study area are freely drained, structure-less red soils with a high base status that may have restricted soil depth, excessive drainage, high erodibility and low natural fertility. Within the southern portion of the area the soils are shallow over hard or weathering rock and are of a restricted depth with lime generally present. The area to the west represents the hillocks where little to no soil is present.

### 3.4 RECOMMENDATION IN TERMS OF ROUTE CORRIDORS RESULTING FROM THE SCOPING PHASE

The initially proposed routes (attached in Appendix A3) were presented to all the stakeholders (government departments, municipalities and other) as well as 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 size copy is attached as Appendix A4). It was made clear during the consultation process 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.



- **New Alternative 1 (orange line)**

This alternative begins similar to the original Alternative 1 and continues parallel to the existing Ferrum-PMG Mine -, the Bulkop-Ferrum - and the Sishen-Lohatla 132kV power lines. The approximate length will be 48km.

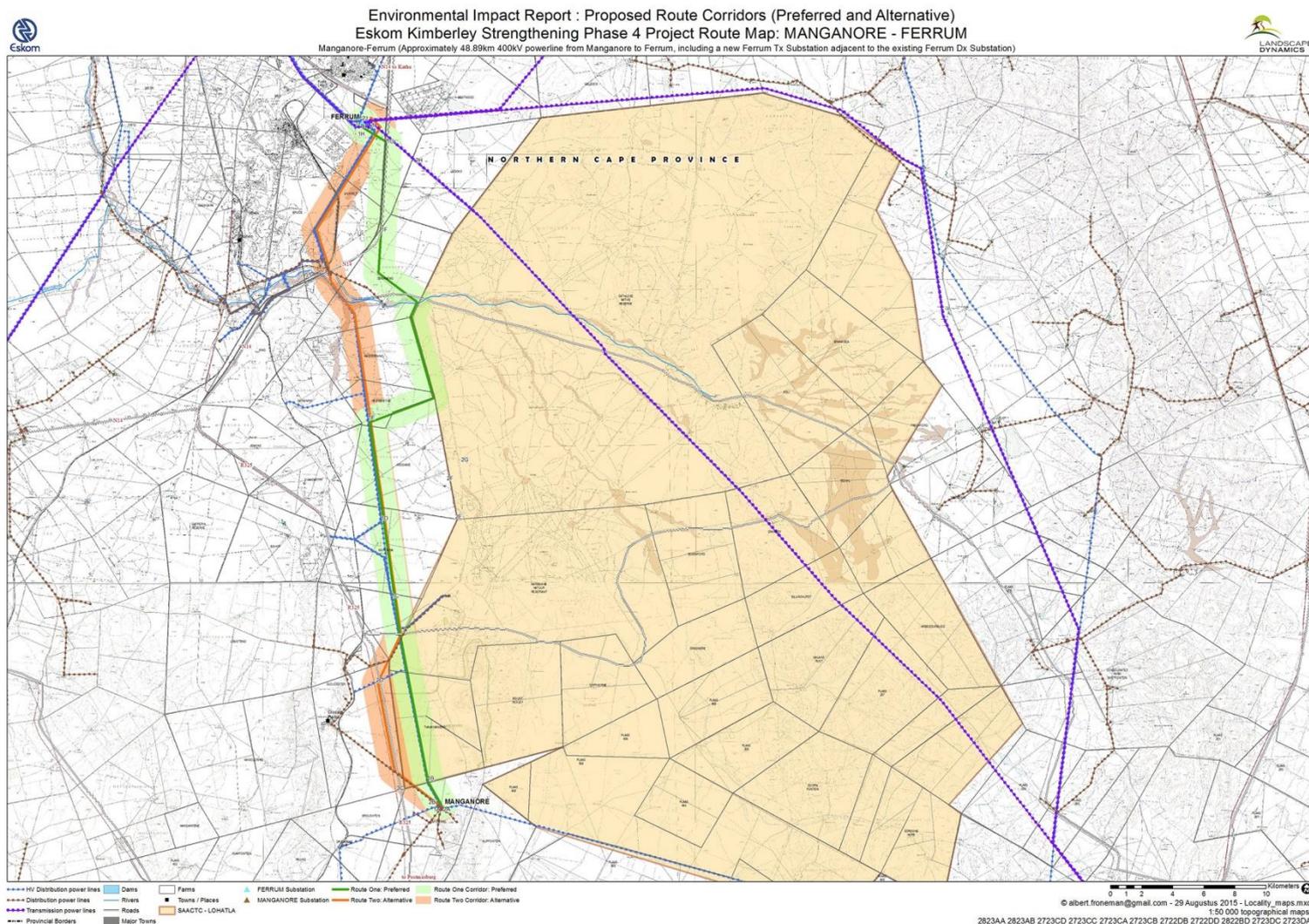
- **Alternative 2 (green line)**

This route is similar to the original Alternative 2 with the exception that it runs to the eastern side of the Lohatla Military Base, parallel to the Manganore-Bulkop -, Manganore-Lohatla - and PMG Mine-Manganore 132kV power lines. The route then bends in the area of Farm Helpebietjie 738 to run parallel to farm boundaries and then north and parallel with the N14 (this section is similar to the original Alternative 1). The approximate length will be 48km.

Through feedback from some of the IAPs it became apparent that the new Alternative 2 will be their preferred route with the least impact on current and future mining operations.

### 3.5 DESCRIPTION OF THE ROUTE CORRIDORS PROPOSED FOR ENVIRONMENTAL AUTHORISATION

Attached in Appendix A(5) is an A3 copy of the “**Route Map with Preferred Route Corridor and Alternative Route Corridor**” that is proposed for Environmental Authorisation. Also attached as Appendix A(5) is the co-ordinates of the Preferred Route Corridor.



#### Route description

The proposed 400kV power line will not directly affect residential areas. The power line may cross inhabited farm land and mining areas. Denser residences are, however, found near the Ferrum substation and the town of Kathu. Both alternative routes cross over combinations of agricultural land and mining properties.

#### ROUTE ONE CORRIDOR (PREFERRED) – *Green route*

The proposed corridor route heads north from the Manganore Substation on the eastern side of the Alternative 2 corridor. It continues on the eastern side of Lohatla Military Base, parallel to the Manganore – Bulkop, Manganore – Lohatla and PMG Mine – Manganore 132kV power lines. On Lohatla 673/1 the corridor joins the same route as alternative 1 until Helpebietjie 738, where it bends east towards Kadagame 558/4. The corridor follows the eastern boundary of Mashwening 557, Demaneng 546/1. On Demaneng 546/RE the route bends to follow the railway tracks towards the Ferrum Substation.

## Recommendation

The socially preferred route will have the minimum impact on individual properties. The area around Kathu and Manganore that will be affected by the proposed power line are mostly mining and grazing properties. In the mining areas, special consideration is required regarding pylon placement especially when future mining activities are being considered.

The eastern side of the study area mostly consists of the Lohatla military base which is a “no fly zone”. Construction and maintenance of transmission power lines utilises helicopters to a large extent, therefore it will be insensible to consider a corridor through this area.

The public participation meetings held in August 2014 provided an opportunity to discuss specific landowner reservations. Concerned property stakeholders were consulted to develop a corridor that will be acceptable.

Currently there are various mining companies that applied for or have prospecting rights, with no guarantees that mining will commence. Considering that the area is rich in manganese and iron ore the probability however exists. Eskom has a policy that they cannot compensate for the loss of mineral rights within the servitude area, however during the servitude acquisition process there is an additional addendum that can be negotiated to relocate the power line once should the servitude be mined. The power line can be relocated to a different position on the same owner’s property, which will be for the cost of Eskom.

Considering the information available from research conducted through desktop studies, site visits and consultation with Eskom, land owners, mining companies and other relevant individuals it became apparent that the Preferred Route as proposed will have the least impact on current and future mining operations. It will also be the shortest and the more economic route.

The specialist studies undertaken for this project concluded as follows:

### *Freshwater Impact Assessment*

There is little difference between the alternative routes in terms of the freshwater features that would potentially be impacted by them as both corridor routes will need to cross the Go-Mogara River as well as its tributary near Mashwening. It is rather the alignment of the route within the alternative corridors that could be determined to minimise the number of freshwater features and their buffers crossed and have the least potential impact on the freshwater features within the study area.

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.

### *Fauna & Flora*

Route Two Corridor has most probably the largest sections of land affected by mining that has totally transformed the natural ecosystems and would therefore from a plant ecological point of view have the least impact on the ecosystem, especially in the western parts of the corridor near the town of Kathu. However, the Flora Impact Assessment concluded that any of the two proposed alternative corridors could be considered for the construction of the proposed powerlines with no long or medium-term negative effects envisaged.

### *Avifauna*

Both the route alternative corridors emerged with very similar risk ratings, with only a 2% difference in ratings between the highest risk (Route Two Corridor) and the lowest risk (Route One Corridor). This indicates that both route alternative corridors are very similar as far as envisaged impacts on avifauna are concerned. Both corridors are therefore regarded as potentially suitable from an avifaunal impact perspective, with appropriate mitigation.

*Visual*

The significance of impact is predicted to be low for Route Two Corridor and the sub-stations and moderate for Route One Corridor. A moderate significance of impact is considered to be an impact that is real but not substantial and low when the impact is negligible or is of a low order and is likely to have little real effect. Although the impact would be higher for the Route One Corridor, it can be supported because the impact is not substantial.

*Heritage / Cultural / Archaeology / Palaeontology*

There is no specific preference for any of the two route alternatives. Areas on these two alternative routes to be avoided would be high-lying areas such as hills or mountains, but very few of these were encountered during the survey. None of the alternative routes are within a 10 km radius of a world heritage site.

**The proposed Route One Corridor will have very little impact on mining activities within the area whereas powerlines within the Route Two Corridor will have major negative economic impacts on mining operations. This, coupled with the conclusion of the specialist studies that development with mitigation within the Route One Corridor can be supported, makes it the Preferred Option.**

**The Route One Corridor (the green route) as indicated on the above map is therefore proposed for Environmental Authorisation.**

ROUTE TWO CORRIDOR (ALTERNATIVE) – *Orange route*

This corridor heads north, north-west, on the eastern side of the R325 from Manganore substation then continues parallel to the existing Ferrum – PMG Mine, Bulkop – Ferrum and Sishen – Lohatla 132kV power lines. It continues parallel to Ferrum – Lyllyveld 66kV, Bullkop – Ferrum 132kV, Sischen – Ferrum 132kV and Ferrum – PMG Mine 132kV power lines towards the Ferrum Substation.

This route is not preferred due to the direct impact it would have on current mining operations. The negative economic impact a power line on this route will have is making this route a non-viable option.

## CHAPTER 4: RECEIVING ENVIRONMENT

### 4.1 BIOPHYSICAL ENVIRONMENT

#### 4.1.1 CLIMATE

Kathu normally receives about 250mm to 350mm of rain per year, mostly during summer. On average, the lowest rainfall (0mm) occurs in July and the highest (76mm) in January to February. The average annual evaporation rate in the region is more than 5 times greater than the annual rainfall. The prevailing wind direction is from the northeast and southwest.

#### 4.1.2 GEOLOGY, SOILS & GROUNDWATER

An *Engineering Geological Investigation* was undertaken by Geoset CC and is attached in Appendix C(1). A summary thereof is provided below.

The proposed alternative corridors between the Manganore and Ferrum Substations were investigated to determine the expected engineering geological properties that will influence the placement of pylons:

##### Site Geology

- The southeastern area is underlain by recent Aeolian dune sand on the farms Morokwa 672 and Kadgame 558. It is underlain by calcrete or dolomite, dolomitic limestone, chert and lenses of limestone and shale and chert, of the Ghaap Plateau and Schmidtsdrift and Vryheid Formations of the Campbell Group of the Griqualand West Supergroup. The Ulco (Vgh/Vgu) Member of the Ghaap Plateau was found north of Manganore and consist of fine grained dolomite and stromatolitic limestone interbedded with chert, with a banded iron formation at the top, underlain by the Vryburg Formation (Va/Vv) comprising siltstone, shale, quartzite, gritstone and conglomerate.
- The Asbestos Hills Ironstone Formation of the Griquatown Group, Griqualand West Supergroup is located east of the road to Sishen and it consists of banded ironstone, with amphibolites and crocidolite.
- The upper soil may only consist of Aeolian dune sand and should be removed for construction on underlying competent bedrock or calcrete.
- Some economic deposits of calcrete or limestone, as well as diamonds and iron ore may occur along the corridors, and it should be addressed during the final geotechnical ground survey, should it be required. The locality of diamondiferous gravel mines or kimberlite were noted on the farm Thaakwameng 675 east of the corridors, with no known economic deposit within the proposed corridors.
- Asbestos and crocidolite were mined at the old asbestos mines, and iron ore at Sishen, but no mining activities were noted along the proposed corridors.
- The bedrock is in many portions covered by transported material which may consist mainly of dune sand.

##### 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 an easterly direction to the GaMagara River, a tributary to the Kuruman River and the Molopo River, noted far northwest of the investigated area. The river crossing at the GaMagara River on the farm Demaneng 546 may require extra attention and the 1:100 year flood lines should be determined and used in spacing the pylons.
- 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.

### Soil Profiles

- All terrain land forms or mapping units should be sampled and more than adequate characterization of each represented soil horizon should be determined through evaluation of the gathered information.
- The typical natural soil profiles of the test pits with substantial soil cover must be represented as an overall impression by the profiler and the complete logs should be considered for specific details, and some photos should be taken of rock outcrop and shallow rock for a visual characterization.
- 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 in depth. To ensure the stability of excavations, it will need standard sidewall protection in excavations exceeding 1,5m.

### 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. All open excavations exceeding 1,5m in depth must be supported.

### 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.
- 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 where 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, some foundations will need special precautionary measures to minimize soil movement associated with a variation in moisture content of the soil.
- Problems regarding excavatability can be expected on calcrete and within the ironstone and dolomite and special equipment such as large excavators and blasting will be required for the placement of services.
- A dolomite stability evaluation may be required as large areas within the investigated area contains dolomite and limestone of the Griqualand West Supergroup, as some sinkholes and dolines can be expected and can possibly form, especially within the mined areas where the water table is drawn down to enable the mining and as such combined with blasting act as a trigger mechanism for the activation of a sinkhole.
- 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.
- Mining activities on site and a long history of mining and some contaminated land in the area were found, and iron ore, limestone and gypsum mining as well as alluvial and Kimberlite diamond mining occur in the area.
- The likelihood for the development of borrow pits along the routes should be investigated to provide construction material, or this can be sourced from overburden material from the existing mines.
- All road building and construction materials will in the interim be sourced from established commercial activities in and around the existing mines.
- 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 ironstone koppies, usually unaffected by the placement of the pylons next to them.
- Drainage takes place through sheet wash, and a prominent drainage channel intersects the corridors, with some large erosion noted near the GaMagara River.
- Drainage generally occurs in a northern direction towards the GaMagara River, and then north towards the Kuruman and Molopo Rivers. A vector drainage map is represented in figure 2 where some drainage features can be observed.
- 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, lava, lime stone, dolomite, ironstone or where calcrete nodules or hard pan calcrete is expected.
- Ground water in the form of seepage may be intersected in some test pits during the final field investigation, and some problems are foreseen and normal water tightening techniques such as damp course on foundation levels may be required.
- The aeolian sand is expected to exhibit a moderate to high permeability, which possibly accounts for the absence of a connected network of proper drainage features between the drainage features.
- Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments should be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

### Development Zones

Zoning of the site may reveal zones with constraints regarding the expansive potential or heave and compressibility or collapse potential of the soil, as well as areas with restricted excavation.

Provisional development zones were determined, indicating the expected geotechnical conditions of each site class: Potentially low to medium expansive and compressible and highly collapsible soil with thickness up to 750mm which classified as site class C2H1 (with up to 10mm differential movement measured at surface) requiring special foundations varying through to site class HCR (with less than 7,5mm soil movement measured at surface) requiring normal or modified normal construction or a soil raft, with associated site drainage provisions. Substantial financial implications are expected in Geotechnical Zone PR where scattered rock, shallow rock and rock outcrop are expected, but will possibly prove as excellent and stable foundation material for the pylons. A dolomite stability evaluation in Zone PD may be required to ensure the safe placement of the pylons.

#### 4.1.3 SURFACE WATER

A Freshwater Assessment was undertaken by BlueScience CC and is attached in Appendix D(3) based on the route map provided in Appendix A(3) “*Route Map of Corridor Alternatives resulting from the Scoping Phase*” and a Freshwater Constraints Map is provided in Appendix A5. A short summary thereof is provided below.

This freshwater assessment is intended to inform the authorisation process for the proposed Eskom Kimberley Strengthening Phase 4 Project between the Manganore and Ferrum Substations. Two alternative routes were considered in the Scoping Phase (and described in detail in the Scoping Report) and two amended final routes considered for the Environmental Impact Phase, where a 2km wide corridor was investigated for all the route alternatives. A 5km radius was also considered around the substation sites.

Aquatic features which occur within the study area include the following:

- The Groenwaterspruit, a south-west flowing tributary of the Skeifontein River which discharges into the Orange River as the Soutloop River near Boegoeberg.
- The Ga-Mogara River which flows to the north-west before discharging into the Kuruman River and then the Molopo River. The Molopo River has its confluence with the Orange River at Riemvasmaak.
- A few relatively small valley floor depressions or pans that occur largely to the east of the alternative routes and are largely associated with the Ga-Mogara River System.

All of these freshwater features tend to be ephemeral, mostly only carrying water for short periods of time during the rainy season (March-April). The streams in general have little to no riparian associated vegetation except for occasional trees and shrubs.

The Groenwaterspruit is in a largely natural to moderately modified state. The Ga-Mogara River in its upper reaches is located within the South African Army Combat Training Centre and is still in a largely natural to moderately modified ecological state. The riparian habitat of these rivers tends to be more impacted by the surrounding activities. The ecological importance and sensitivity of the rivers assessed is deemed to be moderate.

The depression wetland areas/pans in the study area are in general in a largely natural to moderately modified state as a result of limited physical habitat modification with some flow and water quality modification largely as a result of the surrounding farming activities, as well as some mining activities. The condition of these systems is often closely related with the stream condition of the tributaries of the Ga-Mogara River that they are associated with. The pans provide limited goods and services largely due to their relatively small size but are, in general, closely associated with the Ga-Mogara River tributaries and form an integral part of these aquatic ecosystems. Particular goods and services provided include some flood attenuation and sediment trapping functionality, as well as the provision of some habitat for aquatic life primarily during the rainy season.

All of the proposed activities for the proposed route alternatives will have a *very low to no significance impact with mitigation* (including final route selection), both within the construction and operation phases of the

project. Alternative Two is likely to have the least impact on the freshwater features in the study area. There is however little difference between the alternative routes in terms of the freshwater features that would potentially be impacted by them as both corridor routes, as was the case for the Scoping Phase routes, will need to cross the Go-Mogara River as well as its tributary near Mashwening. It is rather the alignment of the route within the alternative corridors that could be determined to minimise the number of freshwater features and their buffers crossed and have the least potential impact on the freshwater features within the study area.

As the Route Two Corridor lies further west of the Route One Corridor, the potential impact of this route impacting on the freshwater features is less due to the fact that the surrounding land use activities and their impact on the freshwater features is more evident to the west. A dam and a small drainage line are close to the Ferrum Substation and there are some small pans within the 5km radius of the substation approximately 3km to the south of the substation. All of these features are of a low ecological significance but could also easily be avoided by the proposed transmission lines while no expansion to the existing Ferrum Substation is planned. There appears to be no freshwater constraints associated with the proposed expansion of the Manganore Substation.

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

A Vegetation and Faunal Report based on the route map provided in Appendix A(3) "Route Map of Corridor Alternatives resulting from the Scoping Phase" and an Ecological Sensitivity Map is provided in Appendix A5. The main findings are summarised as follows:

##### ***Threatened ecosystems & Protected areas***

According to the SANBI data and locality maps no protected or threatened areas are present within the proposed corridors.

##### ***Vegetation types***

On a small scale the proposed routes fall within the savanna biome and within a larger regional scale the proposed routes are according to Mucina & Rutherford (2006) located within the Eastern Kalahari Bushveld Bioregion (Svk).

Four different vegetation types were identified:

##### ***Kuruman Thornveld (SVk9)***

The vegetation is characterised by an open to closed woody layer. The topography ranges from flat sandy (aeolian) plains (sometimes with rocky pavements) to rocky rolling hills with a dense woody layer. The vegetation is dominated by the woody species *Tarchonanthus camphoratus*, *Grewia flava*, *Lycium hirsutum*, *Vachellia erioloba*, the grasses *Eragrostis lehmanniana*, *Aristida stipitata* and *Aristida meridionalis*.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation system with little erosion.

### *Kuruman Mountain Bushveld (SVk10)*

The Kuruman Mountain Bushveld (SVk10) (Mucina & Rutherford 2006) comprises of rolling hills. These hills have ridges with moderate slope midslopes and relatively steep midslopes with different aspects (east / west). The vegetation is mostly open shrubveld with shallow (< 0.3 m), rocky soil of the Mispah soil form with rocky outcrops also dominant in the vegetation type. The vegetation is characterised by the dominance of the shrub *Searsia ciliata* with the grasses *Andropogon chinensis*, *Andropogon schirensis*, *Antheophora pubescens*, *Themeda triandra*, and *Triraphus andropogonoides* co-dominant. The protected geophyte *Boophone disticha* is also present within this vegetation type.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation system with little erosion. This vegetation type is mostly used for grazing purposes with grazing evident in some areas.

The scattered low-lying rocky outcrops and hills form important habitat for rupicolous faunal species such as Elephant Shrews, Rock Hyrax, Southern Pygmy Toad as well as several reptile species and are considered as sensitive. The proposed towers should be positioned away from any major rocky outcrop.

### *Kathu Bushveld (SVk12)*

The vegetation and landscape is characterised by red, deep (> 1.2 m), sandy texture, windblown soil, with medium to tall height (> 3 m) trees dominant on relatively flat Kalahari savanna plains. The vegetation is dominated by the trees *Acacia erioloba*, *Acacia mellifera* and small tree *Boscia albitrunca*. The grass layer is dominated by the grasses *Schmidtia pappophoroides*, *Eragrostis lehmanniana*, *Stipagrostis ciliata* and *Brachiaria nigropedata*. Other prominent species include *Terminalia sericea*, *Diospyros lycioides*, *Grewia flava*, *Aristida congesta*, *Schmidtia kalahariensis*, *Gisekia africana*, *Limeum fenestratum*, *Heliotropium ciliatum* and *Hermbstaedia fleckii*.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation system with little erosion. Some sections are already transformed due to iron ore mining activities..

### *Postmasburg Thornveld (SVk14)*

The area comprises flats surrounded by rocky ridges with open shrubby thornveld. The vegetation structure is mostly a dense shrub layer with sparse individual trees and a poorly developed herbaceous layer. The dominant species are *Acacia erioloba*, *Acacia karroo*, *Acacia tortilis*, *Diospyros lycioides*, *Ziziphus mucronata*, *Felicia muricata*, *Digitaria eriantha*, *Enneapogon scoparius*, *Eragrostis lehmanniana* and the geophyte *Boophane disticha*.

None of this vegetation type is statutorily conserved, but little is transformed and it is regarded as a least threatened vegetation system with little erosion.

### **Vegetation units**

The study area comprises natural vegetation with mining, agricultural (cattle & other domestic stock) and game farming activities conducted on the land. The area comprises three different vegetation units, all mostly natural in species composition.

The ***Tarchonanthus camphoratus* shrubland (Vegetation Unit 1)** occurs within the western section of the proposed powerline corridors. The vegetation is natural although some degradation due to grazing is evident in some areas. The soil is deep red sandy with the vegetation covering up to 80% of the area. Due to the flat topography no soil erosion was observed. It seems as many of the taller trees such as *Senegalia mellifera* and some *Vachellia erioloba* trees were previously sprayed with herbicides to open up the woody layer for grazing purposes. This has most probably assisted in the shrub *Tarchonanthus camphoratus* becoming dominant. This shrub is known for its invasive nature in degraded or disturbed areas. This vegetation unit occurs over a large area in this region and is regarded as a common vegetation type not threatened.

From a plant ecological end ecosystem functioning point of view this area has a **low-medium conservation value**.

The vegetation of the ***Vachellia karroo riverine woodland (Vegetation Unit 2)*** is typical of riverine areas. The vegetation is dense and dominated by the woody layer, while the grass layer is well-developed. Large individuals of the declining red data/protected tree *Vachellia erioloba* and other trees are unfortunately negatively affected by the red dust from the iron ore mining in the area. This has resulted in the red dust settling on the leaves thereby negatively affecting the photosynthesis of the plants. Due to the low rainfall the dust is never washed off resulting in large numbers of the tree species dying within this stream/riverine area. That is most probably the reason for the shrub layer being dominant since it seems that the larger trees protect them against a large amount of dust. However as soon as these species become tall they are covered with the red dust and then slowly die.

The area has a moderate species composition with a good vegetation cover protecting the soil. Some erosion that naturally occurs during high rainfall events is evident. This area due to its water channelling function has a **medium-high conservation value**.

The ***Senegalia mellifera open shrubland (Vegetation Unit 3)*** comprises the largest section of the proposed corridors. The vegetation has a moderate to low species richness but is degraded and dominated by the shrub *Senegalia mellifera*. The area is mostly used for grazing by animals.

From a plant ecological and ecosystem functioning point of view this vegetation unit is regarded as having a **low-medium conservation value**.

### **Sensitivity analysis**

A sensitivity analysis was done for the three vegetation units as described above. This was achieved by evaluating the different vegetation units against a set of habitat criteria. The results indicate that Units 1 & 3 have **medium-low sensitivity** while Unit 2 have a **medium sensitivity** (the upper medium score) to disturbance.

### **Ecological sensitivity of the different vegetation units**



### Red data species

Only one red data species which is also a protected species namely *Vachellia erioloba* was found to be present in the study area. This species has a conservation status of “declining” due to its removal for fire wood and other agricultural activities.

### Protected species

The Department of Forestry and Fisheries (DAFF) developed a list of protected tree species. In terms of Section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilisation. The most recent list of protected tree species was published in GN 908 of 21 November 2014.

The DAFF / Eskom developed a document in 2012 titled: “Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests”. According to this document and in relation to new planned Eskom linear infrastructure, “protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species such as Shepherd’s trees) and trees in the way of towers to be erected”. The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.

DAFF will have to be approached to obtain the required permits for the removal of any protected tree species.

One protected species, *Vachellia erioloba* (Camel thorn), was recorded during the survey in Vegetation Units 1 & 2.

### Medicinal species

Four medicinal plant species, have been identified within the study area. These plants occur throughout the southern African region on various soil types and areas and none are threatened species. Two species (*V. karroo* & *S. frutescens*) only occur in Vegetation Unit 2 which is regarded as having a high conservation value.

Plant name	Plant part used	Medicinal use	Vegetation unit
<i>Vachellia karroo</i>	Leaves, bark and gum	Diarrhoea & dysentery Gum: colds, oral thrush & haemorrhage.	2
<i>Sutherlandia frutescens</i>	Leaves	Stomach problems, internal cancers, eye ailments, wounds, colds & chicken pox	2
<i>Tarchonanthus camphoratus</i>	Leaves & twigs	Stomach trouble, headache, toothache, inflammation	1, 2, 3
<i>Ziziphus mucronata</i>	Roots, bark or leaves	Cough & chest problems; diarrhea; pain relief	1, 2, 3

### Alien plant species

A total of five different declared alien invasive species, the tree *Prosopis glandulosa* (Unit 2) and the succulents *Opuntia ficus-indica* (Unit 3), *Cylindropuntia imbricata* (formerly *Opuntia imbricata*) (Unit 1), the grass *Pennisetum setaceum* (Unit 2) and the forb *Argemone mexicana* (Unit 2) were found to be present in the study area.

*Opuntia ficus-indica*, *Cylindropuntia imbricata*, *Pennisetum setaceum* and *Argemone mexicana* are declared category 1 weeds (CARA) and category 1b plants (NEMBA), while *Prosopis glandulosa* a declared category 2 (CARA) and 1b (NEMBA) invader tree. All category 1 plants must be removed and eradicated by the land

owner by law, while *Prosopis glandulosa* may not be grown or present on one's property unless a permit is obtained from nature conservation. It is therefore important that these plants are removed from the different vegetation units and that a programme is implemented on a long-term basis to control the spread of these plants.

### **Indigenous invader plant species**

One indigenous invader species namely *Acacia mellifera* was found to be present in the study area. This species is however, in these areas part of the natural ecosystem and do not pose a threat to the environment under natural conditions. Where vegetation is disturbed due to overgrazing, agricultural activities, general mismanagement etc., this species can quickly spread, forming dense stands that replace other indigenous species.

### **Selecting an alternative**

Route Corridor Two has most probably the largest sections of land affected by mining that has totally transformed the natural ecosystems and would therefore from a plant ecological point of view have the least impact on the ecosystem, especially in the western parts of the corridor near the town of Kathu. However, the Flora Impact Assessment concluded that any of the two proposed alternative corridors could be considered for the construction of the proposed powerlines with no long or medium-term negative effects envisaged.

### **Conclusion of Flora Assessment**

The purpose of any ecological assessment is to determine areas of high sensitivity and to provide guidelines to ensure that the proposed development is ecologically sensitive and to prevent unnecessary destruction of natural ecosystems. It is mostly unavoidable to prevent all development especially power lines to cross and affect sensitive areas. It is therefore important that all possibilities for such power lines are investigated in order to provide ecologically sound recommendations on routes to be followed.

The proposed corridors are located within three different vegetation types that are not regarded as being threatened. The landscape is mostly low flat to undulating areas with sandy plains, while rocky hills and outcrops are present in some areas.

Large parts of the land are used for mining and the rest for grazing by domestic stock and free roaming game. Although representative of the natural vegetation, none of the units are regarded as very sensitive with large patches of these vegetation types available in other parts of the region.

None of the impacts assessed for the different vegetation units will have a high negative effect on the environment and no unit was found to be highly sensitive to development.

From a flora point of view, the development can be supported, with mitigation measures in place, on both route alternatives.

## **4.1.5 FAUNA**

A *Vegetation and Faunal Scoping Report* was undertaken by EnviroGuard Ecological Services CC and is attached in Appendix D(1). A summary of the relevant sections is provided below.

### **Amphibians**

The bio-geographical 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 Gariiep 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 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.

### **Habitat Available for Sensitive or Endangered Species**

No threatened amphibian species have been recorded from the area during the South African Frog Atlas Project (SAFAP). This was however poorly surveyed and amphibian surveys are severely restricted due to the unpredictable rainfall patterns. The seasonal pans within the open thornveld offer suitable breeding habitats for the Red listed 'near-threatened' Giant Bullfrog (*Pyxicephalus adspersus*).

### **Reptiles**

The majority reptile species are sensitive to severe habitat alteration and fragmentation. Due to human presence in the area coupled with increased habitat destruction and disturbances around the alternative sites are all causal factors in the alteration of reptile species occurring on the site and surrounding areas. Large low-lying rock outcrops occurs throughout the site and provide favourable refuges for certain snake and lizard species (rupicolous species). Several large termite mounds *Trinervitermes haberlandii* were observed along and around the proposed alignments. Termite mounds offer important refuges for numerous frog, lizard and snake species. Large number of species of mammal, birds, reptiles and amphibians feed on the emerging alates (winged termites). These mass emergences coincide with the first heavy summer rains and the emergence of the majority of herpetofauna. Termite mounds also provide nesting site for numerous snakes (Southern African Python), lizards (varanids) and frogs. Trees including stumps, bark and holes are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors).

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

#### *Threatened Reptile Species*

No threatened reptile species have been recorded from the area. 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. 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 (R370 and R385) 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 Mongoose and Suricates were observed on the site and prey on the smaller rodents, birds, reptiles and amphibians on the site. Animal burrows (Yellow Mongooses, Suricate, 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.

#### *Threatened Mammal Species*

No sensitive or endangered mammals were recorded during the survey but suitable habitat occurs on the site and surrounding conservancy areas for certain rare or threatened mammal species.

#### **Selecting an alternative**

Route Corridor Two has most probably the largest sections of land affected by mining that has totally transformed the natural ecosystems and would therefore from a plant ecological point of view have the least impact on the ecosystem, especially in the western parts of the corridor near the town of Kathu. However, the Fauna Impact Assessment concluded that any of the two proposed alternative corridors could be considered for the construction of the proposed powerlines with no long or medium-term negative effects envisaged.

#### **Conclusion**

From a faunal point of view the development can be supported, with mitigation measures in place, on both route alternatives.

#### 4.1.6 AVI-FAUNA

A *Bird Impact Report* was undertaken by Mr Chris van Rooyen and Mr Albert Froneman and is attached in Appendix D(2). A summary thereof is provided below.

#### **Important Bird Areas**

There are no Important Bird Areas (IBAs) located close to the study area, the closest IBA, (SA028 Spitskop Dam), is located approximately 140km east of the proposed line.

#### **Description of bird habitat classes**

Whilst much of the distribution and abundance of the bird species in the study area can be explained by the composition of the natural vegetation, it is as important to also examine the modifications which have changed the natural landscape, and which may have an effect on the distribution of power line sensitive species. These are sometimes evident at a much smaller spatial scale than the biome types, and are determined by a host of factors such as vegetation type, topography, land use and man-made infrastructure. For purposes of the analysis in this report, the following bird habitat classes were defined from an avifaunal Red Data power line sensitive perspective:

- *Savanna*

The study area is situated in savanna, consisting primarily of a mixture of Kuruman Mountain Bushveld, Kuruman Thornveld and Kathu Bushveld (mainly around Ferrum Substation). Kuruman Mountain Bushveld occurs on ridges and inselbergs and consists of open shrubveld with *Lebeckia macrantha* prominent in places, and a well-developed grass layer. Kuruman Thornveld occurs on flat, rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting of *Acacia eriobola*. Kathu Bushveld consists of a medium tall tree layer with *Acacia eriobola* in places but mostly open and including *Boscia albitrunca* as the prominent trees. Shrub layer is very well developed and grass layer is variable. The power line sensitive Red Data avifauna occurring in this habitat is typically arid woodland species i.e. White-backed Vulture, Tawny Eagle, Martial Eagle, Lanner Falcon, Verreaux's Eagle (ridges and koppies), Secretarybird and Kori Bustard.

- *Pans*

A feature of the arid landscape where the proposed power line is located is the presence of pans, a few of which occur in the central part of the study area. Pans are endorheic wetlands having closed drainage

systems. They are characteristic of poorly drained, relatively flat and dry regions. Water loss is mainly through evaporation, sometimes resulting in saline conditions, especially in the most arid regions. When flooded, the water depth is shallow (<3m), and flooding characteristically ephemeral. When flooded, pans are important for a variety of power line sensitive Red Data species which potentially occur in the study area e.g. Black Stork, Greater Flamingo, Lesser Flamingo, Abdim's Stork and Maccoa Duck. Flooded pans are also used by raptors and vultures for drinking and bathing. When dry, the pans are usually covered in short grass often dominated by *Sporobolus* species, with a mixture of dwarf shrubs. Species that may seek out dry pans are Double-banded Courser, Burchell's Courser, Ludwig's Bustard, Kori Bustard and Secretarybird. There are no large pans in the study area, but a few medium-sized pans are present in the central part of the study area.

- *Rivers*

The study area contains no perennial rivers, but it does contain several ephemeral drainage lines, the largest being the Ga-Mogara River with several tributaries, which crosses the study area from east to west. After rains, when large pools form in the ephemeral river channels, they are important for a variety of waterbirds, including Red Data Black Stork, while Abdim's Stork are attracted to the grass-covered river channels and adjacent floodplain areas. The grassy river channels are also attractive to Ludwig's Bustards and Secretarybirds.

- *Agricultural lands*

The study area contains a few agricultural lands in the extreme north of the study area near Ferrum Substation. Although agricultural lands completely destroy the structure of the original vegetation, some birds do benefit from this transformation. Abdim's Stork and Ludwig's Bustard (to a lesser extent) are the Red Data species most likely to utilise agricultural lands in the study area.

- *Cliffs and ridges*

In places the proposed alignments run between rocky ridges and inselbergs which offer potentially suitable roosting and breeding habitat for a number of Red Data power line sensitive species, e.g. Black Stork, Lanner Falcon, and Verreaux's Eagle. In the south of the study area, near Manganore Substation, the Klipfontein Hills and a couple of isolated inselbergs provide suitable habitat for the aforementioned species.

- *Transmission lines*

Transmission lines are an important roosting and breeding substrate for large raptors in the study area. Existing transmission lines are used extensively by large raptors e.g. a total of 19 Martial Eagle and 7 Tawny Eagle nests' were recorded in 2005 on the Ferrum-Garona 275kV power line. Lanner Falcon also breeds regularly in crow nests on transmission lines, and White-backed Vultures may use them as perches and roosts in the study area. Transmission lines therefore hold a special importance for raptors in the study area.

### **Power line sensitive Red Data species potentially occurring in the study area**

A total of 15 Red Data species could potentially occur in the study area. For each species, the potential for occurring in a specific habitat class was indicated, as well as the potential impact most likely associated with this specific species – refer to the table on page 12 of the Bird Impact Report as attached in Appendix D2.

### **Potential impact on birds associated with power lines**

- *Electrocutions*

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components. The electrocution risk is largely determined by the pole/tower design. 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. The risk of electrocution posed to Red Data species by the new power line infrastructure is likely to be negligible.

- *Collisions*

Collisions are probably the biggest single threat posed by transmission lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines.

A significant impact that is foreseen for the proposed Manganore-Ferrum transmission line is collisions with the earth wire of the proposed line. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because such a huge number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth.

The most likely potential candidates for collision mortality on the proposed power line are Kori Bustard, Greater Flamingo, Lesser Flamingo, Secretarybird, Abdim's Stork, White-backed Vulture, Black Stork, Verreaux's Eagle, Martial Eagle and Blue Crane. Ludwig's Bustard will also be at risk, based on the species flight characteristics and tendency to fly long distances between foraging and roosting areas and when migrating. The highest risk for Ludwig's Bustard is likely to be at dry riverbeds and dry pans. Flamingos and Maccua Ducks might be at risk near water bodies, particularly large pans when flooded. Kori Bustards might be at risk anywhere in the savanna habitat, particularly when flying to roost sites in the late afternoon and early evening. Secretarybirds will be most at risk in areas of open woodland with a prominent grass layer, and when descending to pans to drink, and in dry riverbeds and dry pans. Abdim's Stork will be at risk at flooded pans, where they often roost in large numbers, in irrigated areas, where they forage in large numbers, and in river floodplains and dry pans. White-backed Vultures are at risk when descending to waterbodies to drink and bath or to carcasses. Black Stork will be at risk in river beds and pans. Black Stork, Lanner Falcon and Verreaux's Eagle will be most at risk where the proposed lines cross the low cliffs at the edge of the Ghaap Plateau. Tawny Eagle and Martial Eagle might be at risk anywhere in savanna habitat, but particularly when coming down and leaving from pans when visiting to drink and bath. Burchell's Courser, Lanner Falcon and Double-banded Courser are also potentially at risk of collisions, but less so than the larger species as they are more agile and therefore less likely to collide with the earthwires of the proposed lines. The coursers are also not likely to regularly fly at power line heights.

- *Displacement due to habitat destruction and disturbance*

During the construction phase and maintenance of power lines and substations, some habitat destruction and transformation inevitably takes place. This happens with the construction of access roads, the clearing of servitudes and the levelling of substation yards. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line, which can result in electrical flashovers. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through transformation of habitat, which could result in temporary or permanent displacement. In the present instance, the risk of displacement of Red Data species due to habitat destruction is likely to be fairly limited, given the nature of the habitat.

Apart from direct habitat destruction, the above mentioned construction and maintenance activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. This is a particular concern where the proposed line is situated next to an existing transmission line which contains active raptor nests, e.g. Martial Eagle, Verreaux's Eagle or Tawny Eagle.

### **Selecting an alternative**

Both the route alternative corridors emerged with very similar risk ratings, with only a 2% difference in ratings between the highest risk (Route Two Corridor) and the lowest risk (Route One Corridor). This indicates that

both route alternative corridors are very similar as far as envisaged impacts on avifauna are concerned. Both corridors are therefore regarded as potentially suitable from an avifaunal impact perspective, with appropriate mitigation.

### **Conclusion**

From an avifauna perspective the proposed project can be supported, should mitigation measures as proposed being followed.

#### **4.2.2 ARCHAEOLOGY & CULTURAL HERITAGE**

A *Heritage Impact Report* was undertaken by Archaetnos Culture & Cultural Resource Consultants and is attached in Appendix D(4). A summary thereof is provided below.

The fieldwork undertaken revealed three sites that could have cultural heritage significance. All three are within the Route One Corridor. However, it would be easy to avoid these sites. They also are of low cultural significance and may therefore be demolished if necessary. No further action is needed with regards to any of the sites identified during the survey.

There is no specific preference for any of the two route alternatives. Areas on these two alternative routes to be avoided would be high-lying areas such as hills or mountains, but very few of these were encountered during the survey. None of the alternative routes are within a 10 km radius of a world heritage site.

It should be noted that due to the nature of the subterranean presence of archaeological and/or historical sites, features or artifacts, the possibility to find these during the course of construction work are always real. Care should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA and the recommended mitigation measures should be included in the Environmental Management Plan.

By not placing the pylon positions on any such sites, no further action will be necessary as these sites may be over-spanned. The only exception is graves which may not be over-spanned and for which a 20m buffer zone is recommended. A final walk-down, to inspect pylon positions, is therefore recommended.

The proposed development may therefore continue as long as the above mentioned recommendations are adhered to.

### **4.3 SOCIO-ECONOMIC, TOURISM AND LAND USE**

A *Socio-Economic, Tourism and Land Use Potential Impact Report* was undertaken by AMP Property Management and Land Acquisition and is attached in Appendix D(6). A summary of the relevant sections is provided below.

#### **4.3.1 LANDUSE**

Land use in the region of the proposed project mostly consists out of mining and the Lohatla Military base. There are a few private owners who use properties for grazing of cattle, sheep, goats and in rare occasions game. The proposed power line corridors may also cross property owned by the Maremane Communal Property Association.

The proposed 400kV power line will not directly affect the residential areas. The power line may cross inhabited farm land and mining areas. Denser residences are, however, found near the Ferrum Substation and the town of Kathu. The alternative routes cross over combinations of agricultural and mining properties.

Currently the most of the farms in the area of study is used for mining and grazing of livestock and/or game.

### **Game Farms and Nature Reserves**

There are a few private land owners whom have game on their farms. However during the study no nature reserves were found to be encroached by the proposed corridors.

### **Mining**

The area is known for manganese and iron ore mines, there are a few existing mines as well as environmental impact assessments underway for up and coming mines. During the study it was not found that any current mining operations will be encroached. However it is necessary for more involvement from the mining entities and mineral right holders in order to establish what their future mining development plans will be. Some of the mines in the area include:

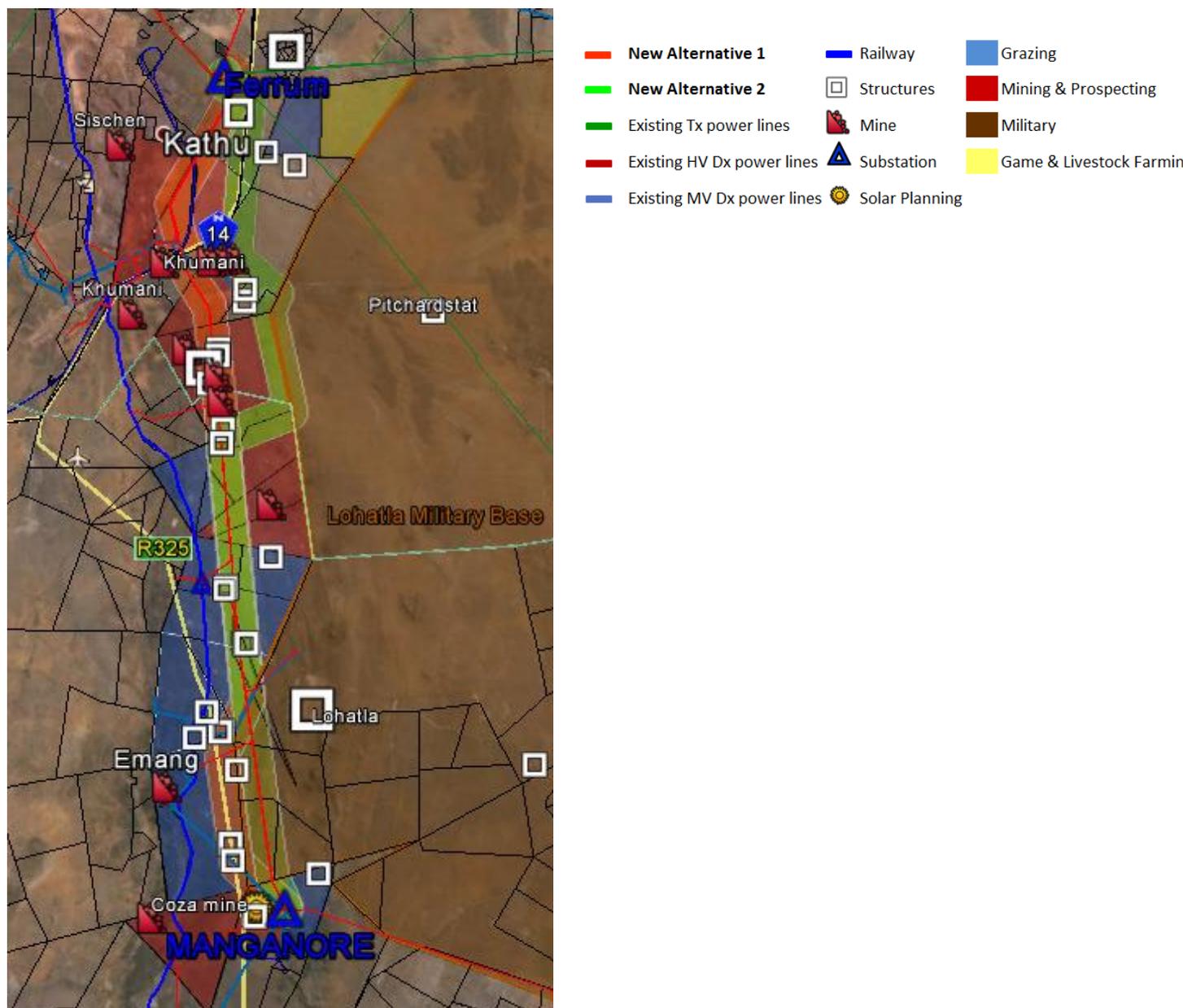
- *E & R China Elite International Investments Ltd (Incorporated in British Virgin Islands)*  
A few of the Kadgame farm portions was bought by this company and there will the prospecting for mining reserves on this properties with the possibility of future mining. Two mining right permits were already approved by the Department of Minerals & Energy.
- *Coza*  
A new mine being planned on the farm Driehoekspan 435. The property is owned by the Maremane Communal property Association.
- *Khumani Mine*  
This mine is approximately 30km south of Kathu. It is an iron ore mine that started in 2006 and is being operated by Assmang.
- *Sishen*  
This is one of the largest iron ore mines in South Africa and has been producing Iron ore since 1953. The mine is being operated by Kumba Iron Ore which forms a part of the Anglo American Group. It is located on the southern side of the town of Kathu.
- *Soliter Myn Ondernemings*  
Helpebietjie 738. The consultant for this company is Milnex 189 BK. There is currently a mine on this property.
- *Diro Iron Ore (Pty) Ltd*  
Portion 2 of Demaneng 546. The consultant for this company is Milnex 189 BK. Prospecting right applications are currently in process.
- *Diro Manganese (Pty) Ltd (Previously Bulk Mining)*  
The proposed Rust and Vrede Iron Ore mine is currently in EIA phase on Mashwening 557, Portion 1 and located approximately 15 km toward the south-east of the Sishen Iron Ore Mine. The consultant for this company is Milnex 189 BK.
- *Wide Investments 100 Pty Ltd*  
Prospecting right applications are currently in process on the Remainder of Mashwening 557 and various portions of Legoko 460.
- *Floxiflo Pty Ltd*  
Prospecting right applications are currently in process on Gatlose Native Reserve 548 which falls inside the Military area and will most probably not be affected.

### **Agriculture**

Agricultural activities consist out of cattle, and sheep farming.

## Land Use Summary

The majority of the properties affected have mining and prospecting or mining rights present, with some grazing areas.



### 4.3.2 SOCIO-ECONOMY AND TOURISM

A *Socio-Economic, Tourism and Land Use Potential Impact Report* was undertaken by AMP Property Management and Land Acquisition and is attached in Appendix C(1). A summary of the relevant sections is provided below.

#### Social Change Processes

The purpose of this section is to describe the social processes that this proposed Eskom project will entail. It is important to understand that social and economic change processes can evolve to relevant impacts. The following processes are predicted in the different phases of the project:

- *Demographic Processes*

In small communities the movement of people looking for new opportunities is more visible. This may happen during the construction phase, where people of other areas will be looking for jobs. However job opportunities during the construction phase will be very limited since most contractors do not use many unskilled labourers. In the operational phase the greater electricity capacity may indirectly attract development of industries which may offer new work opportunities.

- *Economic Processes*

Macroeconomic factors as well as the way that people make a living in the area will have an effect on the economic processes. There may be a possibility for a small amount of temporary jobs for unskilled workers during the construction phase, but the operational phase will be performed by Eskom employees.

- *Geographic Processes*

These processes affect the land-use patterns of the community. Most of the land is used for mining purposes and grazing for livestock. There will be a time period during construction when the farms will be encroached upon, should there be structures on the properties. During the design phase, pylon placing will be done in a matter that has minimum encroachment on the property and is most economically sustainable.

- *Institutional and Legal Processes*

These processes affect the efficiency of organisations, which include government and non-government agencies, as well as the commercial sector that is responsible for the supply of the services that the people depend on. The power line will cross over railway lines.

- *Emancipatory And Empowerment Processes*

Emancipatory and empowerment processes lead to the ability of the local community to participate in the decisions that will have an effect on their lives. The proposed power line will not have a direct benefit for the local people, since it will be between two substations, the influence is therefore of an indirect nature since the substations will feed the local electricity network with a better quality supply. Therefore it will be applicable in the operational phase. As discussed above it will provide the possibility for economic growth in the area.

- *Socio-Cultural Processes*

The aspects in the culture and the way people live together are applicable in this section. During construction there may be an influx of people from other areas mainly for labour purposes.

## **Social Impact Assessment Categories**

- *Health and Social Wellbeing*

Future aspirations – Economic growth regarding farming, tourism and mining activities. Feeling in relation to project – great sense of fear and resistance was experienced initially, but with consultation and explanation it changed positive regarding many private land owners. It was established to rather work together in planning an environmentally acceptable route than to force a route on the 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.
- Adequacy of physical infrastructure. The route next to the existing roads as well as sections next to existing power lines will be preferred to minimise additional impacts. Gates should be closed at all times.
- Personal safety and risk exposure. This is a high risk to property owners. No unauthorised 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.
  - Fire risk prevention. Eskom Transmission implemented the AFIS system where three satellites monitor (two of which are MODIS by NASA) which together track fires. The system updates every 15 minutes and fires as small as 0.25ha can be picked up. If these fires come within 2.5km from transmission power lines, warnings are sent via text messages to relevant Eskom employees mobile phones. Where possible national control can temporarily isolate the circuit under threat. Fire suppression teams are sent out where available.
  - Eskom registers servitudes for power lines. This means that the property still belongs to the relevant land owner, and Eskom owns the right to have a power line over the property. Since the property still belongs to the land owner, it is still the responsibility of the land owner. Eskom does however do maintenance of the vegetation under the power lines to decrease the fire risk under the lines.
- *Economic impacts and material wellbeing*
    - Property values. There may be a negative effect on the property values pending on the utilisation 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.
- *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.
    - Other institutions that will also possibly be affected are state owned organisations like SANRAL, Transnet as well as the relevant municipalities and provinces.
- *Gender relations*
    - Gender division of labour. According to Statistics South Africa Tokoloko Local Municipality has a greater than 50,3% female population. There are normally not woman employed as unskilled labour for the construction of power lines.

## Conclusion

The socially preferred route will have the minimum impact on individual properties. The entire area around Kathu and Manganore that will be affected are mostly mining and grazing properties. In the mining areas, special consideration is required regarding pylon placement especially considering future mining activities.

Currently there are various Mining Companies that applied or have prospecting rights. There are no guarantees that mining will commence however considering that the area is rich in manganese and iron ore

the probability exists. Eskom has a policy that they cannot compensate for the loss of mineral rights within the servitude area, however during the servitude acquisition process; there is an additional addendum that can be negotiated to relocate the power line once, should the servitude be mined, on the cost of Eskom to a different position on the same owner's property.

The route corridors as presented in Paragraph 3.4 and the map as attached in Appendix A(3) is a result of, amongst other, these studies.

#### 4.3.3 SOILS & AGRICULTURAL POTENTIAL

An *Soil and Agricultural Potential Baseline Study* was undertaken by TerraAfrica Consults and is attached in Appendix C(3). A summary thereof is provided below.

##### **Land Types**

Twelve different land types were identified within the larger Manganore-Ferrum study area. These land types are Ae1, Ae7, Ae8, Ae12, Ae215, Ag109, Ag110, Ag111, Ah9, Ib1, Ib237 and Ib238. Refer to page 10 – 16 of the *Soil and Agricultural Potential Baseline Study* (attached in Appendix C3) for a description of each type.

##### **Soil classification**

Four different main soil groups are present in the entire Manganore-Ferrum baseline area as well as in the areas currently indicated as the proposed alternative corridors for the project.

- *Lithic soils (Group 2)*

This group include shallow, rocky soils that are considered rather young in pedogenesis (soil formation processes). 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). These soils have sandy texture, while topsoil structure is apedal and the profiles are very shallow (as shallow as 0.10 m of soil on a rocky layer). The orthic A-horizon of the lithic soil group is unsuitable for annual cropping or forage plants (poor rooting medium since the low total available moisture causes the soil to be drought prone). 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.

- *Oxidic soils (Group 1)*

The soil group consists of an orthic A horizon on a red or yellow-brown apedal B horizon overlying unspecified material. The B1-horizon has more or less uniform "red" or "yellow" soil colours in both the moist and dry states and has weak structure or is structureless in the moist state. 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%.

- *Oxidic soils (Group 2)*

The soil group consists of an orthic A horizon on a red or yellow-brown apedal B horizon overlying unspecified material. The B1-horizon has more or less uniform "red" or "yellow" soil colours in both the moist and dry states and has weak structure or is structureless in the moist state. 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%.

- *Oxidic soils (Group 3)*

The soil group consists of an orthic A horizon on a red or yellow-brown apedal B horizon overlying unspecified material. The B1-horizon has more or less uniform "red" or "yellow" soil colours in both the moist and dry states and has weak structure or is structureless in the moist state. 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%.

### **Soil Depth**

The Environmental Potential Atlas indicated that soil depths in the study area are divided into three groups i.e. soils shallower than 450mm; soils between 450 and 750mm and soils deeper than 750 mm. Deeper soils dominate the entire baseline area. The shallower soils are present on the western part of the side and are found in the areas associated with the oxidic 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 gather for this study, it is the opinion of the soil scientist, from a soil conservation and land capability point of view, that the first alternative for the proposed development be considered favourably. Although the first alternative has a longer footprint than all other alternatives considered, it will avoid cutting through areas with endorheic pans that may have ecological value. However, it is not anticipated that the first alternative will have any detrimental impact on the crop production ability of the region or result in soil degradation. It is 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

A *Visual Impact Assessment Scoping Report* was undertaken by Newtown Landscape Architects and is attached in Appendix D(5). A summary thereof is provided below.

### **Study area**

For the purposes of the visual specialist report the study area is defined as 3km beyond the proposed corridors. Beyond 3km the power line would tend to become part of background and will not have a major impact on views.

## Visual Resource

- *Value of the Visual Resource / Scenic Quality*

The sensitivity of a landscape or visual resource is the degree to which a particular landscape type or area can accommodate change arising from a particular development, without detrimental effects on its character. Its determination is based upon an evaluation of each key element or characteristic of the landscape likely to be affected. The evaluation will reflect such factors such as its quality, value, contribution to landscape character, and the degree to which the particular element or characteristic can be replaced or substituted.

<p style="text-align: center;"><b>High</b></p> <p style="text-align: center;">Undisturbed hills in the south-eastern section of the study area.</p>	<p style="text-align: center;"><b>Moderate</b></p> <p style="text-align: center;">Rolling plains with savannah and grassland and the Ga-Mogara valley– mostly game and cattle grazing.</p>	<p style="text-align: center;"><b>Low</b></p> <p style="text-align: center;">Power infrastructure and mining areas</p>
<p>This landscape type is considered to have a <i>high</i> value because it is:</p> <p>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.</p> <p>Sensitivity: It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt with.</p>	<p>This landscape type is considered to have a <i>moderate</i> value because it is:</p> <p>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.</p> <p>Sensitivity: It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with.</p>	<p>This landscape type is considered to have a <i>low</i> value because it is:</p> <p>A minimal landscape generally negative in character with few, if any, valued features.</p> <p>Sensitivity: Generally not sensitive to change</p>

- *Sense of Place*

Central to the concept of sense of place is that the landscape requires uniqueness and distinctiveness. The primary informant of these qualities is the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area.

The study area's sense of place derives from the combination of all landscape types and cultural interventions and their impact on the senses. The open, gently rolling bushveld, with the low hills that protrude above the plain and form a backdrop to many of the views, give the area a relatively strong, expansive and positive sense of place. However, much of the study area is compromised / being compromised with power line infrastructure and mining activities. Therefore, when driving around the study area, the visitor is constantly being reminded about the ever expanding mining activities. This is most evident in the northern section of the study area around Sishen.

## Visual Receptors

- *Views*

Public views of the study area originate along the main public roads and district farm roads. The R325 runs north south from Postmansburg to Kathu and parallels the study area. The N14 national road cuts diagonally across the northern section of the study area. The other main tarred road, R385 runs from south of Olien, meets with the R31 just south of Danielskuil and then moves west to Postmansburg. A number of gravel farm and mining roads cross the various corridors in northern sector of the study area.

Private views, from residences, originate mostly from the farmsteads and residential areas of the southern-

most extension of Kathu and some small-holdings immediately east of the Ferrum sub-station. Due to the flat nature of the landscape and the lack of many tall trees in the north eastern sector of the study area, many views from these private vantage points would be open and expansive and the proposed power lines (either corridor) would be visible from these vantage points.

- *Sensitive Viewers and Sensitive Viewer Locations*

<p style="text-align: center;"><b>High</b></p> <p>Residential – South Kathu and small holdings and farmsteads</p>	<p style="text-align: center;"><b>Moderate</b></p> <p>Public roads N14, R325, and local district roads</p>	<p style="text-align: center;"><b>Low</b></p> <p>Mining areas in the northern sections of the study area between and at the Ferrum substations</p>
<p>Communities where the development results in changes in the landscape setting or valued views enjoyed by the community;</p> <p>Occupiers of residential properties with views affected by the development.</p>	<p>People travelling through or past the affected landscape.</p>	<p>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 been severely compromised.</p>

### **Public perception of power infrastructure**

The public and landowners usually exhibit animosity towards proposed power line and substation developments. Aesthetic concerns vary with the particulars of terrain and land use, and research suggests that there is no single or best aesthetic solution to address these concerns and that avoidance is the most effective form of management i.e. The final routing of the line is to avoid as many conflict zones as is possible. It is however clear that the public should be involved in the decision making process for any given routing.

### **Selecting an alternative**

The significance of impact is predicted to be low for Route Two Corridor and the sub-stations and moderate for Route One Corridor. A moderate significance of impact is considered to be an impact that is real but not substantial and low when the impact is negligible or is of a low order and is likely to have little real effect. Although the impact would be higher for the Route One Corridor, it can be supported because the impact is not substantial.

### **Conclusion**

The scenic quality of the study area is regarded to have a sensitivity rating from low (around the mines) to moderate sensitive (undisturbed plains and Ga-Mogora valley) and highly sensitive (the hills along the south eastern portion of the study area) to change to the landscape characteristics of the study area.

The existing visual condition of the landscape would be affected negatively by the proposed power line and substation upgrades and visual resource impacts would result from the construction and operation phases. Specifically, impacts and cumulative impacts would result from the power line being seen from sensitive viewpoints such as farmsteads and tourist areas as well as conflict with sensitive visual landscapes. Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from their homes, travel routes, and in foreground views. The visual impacts that would result from the construction and operation of a power line are direct, adverse, and long-term.

The original corridor alignments have been changed after the scoping phase, in response to comment received during the scoping phase public participation process.

The upgrade to the substations is predicated to be low negative for both sub-stations as their predicted impact is of the low order and would have not real effect on the visual environment.

During the operational phase, the significance of impact will remain as predicted for the construction phase as, mitigation measures once the route has been chosen, are not feasible.

Development as proposed in Route One Corridor is supported from a visual perspective.

#### **4.4 SUMMARY OF ENVIRONMENTAL SENSITIVITY**

Refer to the Environmental Sensitivity Maps included as Appendix A(6). The maps summarises the significant site sensitivities that guided the route selection. Specific mitigatory measures are proposed in the Environmental Management Plan to ensure that no unnecessary negative impact will occur on these environmental features as a result of the project.

## 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 were 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:

#### INITIAL / 1<sup>ST</sup> PHASE NOTIFICATION and ADVERTISING

- The PPP for this project kicked-off during January 2014.
- All potential directly and indirectly affected landowners, stakeholders and government departments were identified. The following I&AP lists were compiled (and is included in Appendix E(11) 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).

- Eighteen 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
- Two Public Open Days were held on Wednesday 13 August 2014 and on Thursday 14 August 2014:
  - Formal presentation at 17h00 at the Papkuil Safari Lodge (closes town Lime Acres), followed by a discussion period.
  - Formal presentation at 12h00 at the NG Church, Kudu Street, Kathu, followed by a discussion period.

The objectives of this Public Open Day were the following:

- To communicate the purpose and details of the proposed project;
- To present the alternative routes which are being considered and investigated;
- 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.

Comment received during the initial advertising phase as well as the public open day was addressed in the Draft Scoping Report.

### ***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 power line 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 however 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 by accepting the Application Form, dated 13 March 2014.

### DISTRIBUTION OF SCOPING REPORT

Proof of distribution is attached as Appendix E6.

- The distribution of the Draft Scoping Report was done as follows:
  - Notification to all the listed stakeholders of the availability of the Draft Scoping Report at a public venue (Postmasburg and Kathu public libraries) 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 applied: 4 December 2015 to 5 February 2014 (excluding the period 15 December to 2 January).
  - The Draft Scoping Report was linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA).
  - Hard copies of the Draft Scoping Report were hand-delivered to the following authorities;
    - **Department of Environment and Conservation, Northern Cape**  
The Environmental Officer: Ms Dorien Werth  
90 Lang Street, Vasco Building, Kimberley; Tel 053 807 7468
    - **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
    - **Tsantsabane Local Municipality**  
The Municipal Manager: Mr Mathobela  
13 Springbok Street, Postmasburg; Tel: 053 313 7300 / 02 / 11
    - **Ga-Segonyana Local Municipality**  
The Municipal Manager: Mr Edward Ntefang  
Cnr Voortrekker & School Streets, Kuruman; Tel: 053 712 9300
    - **Gamagara Local Municipality**  
Municipal Manager: Mr Clement Itumiling  
Civic Centre; Cnr of Hendrick van Eck and Frikkie Meyer Road, Kathu; Tel: 053 723 6000

Comment received on the Draft Scoping Report was responded to in the Final Scoping Report as well as the Draft Environmental Impact Report, which was distributed for further public comment (see paragraphs below).

### DISTRIBUTION OF DRAFT ENVIRONMENTAL IMPACT REPORT

Proof of distribution is attached as Appendix E9.

- The Distribution of the Draft EIR was done as follows:
  - Notification to all the listed stakeholders of the availability of the Draft EIR at a public venue (Postmasburg and Kathu public libraries) was done via email, fax and/or postal service. Where an e-mail address was available an internet link to the Draft EIR was provided. A 40-day response period applied.
  - The Final Heritage Impact Assessment Report and Final Route Map were linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA). An email was also sent to the applicable case officers informing them of the submission on SAHRIS.

- Hard copies of the Draft EIR were hand-delivered to the following authorities;
  - **Department of Environment and Conservation, Northern Cape**  
The Environmental Officer: Ms Dorien Werth  
90 Lang Street, Vasco Building, Kimberley; Tel 053 807 7468
  - **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
  - **Tsantsabane Local Municipality**  
The Municipal Manager: Mr Mathobela  
13 Springbok Street, Postmasburg; Tel: 053 313 7300 / 02 / 11
  - **Ga-Segonyana Local Municipality**  
The Municipal Manager: Mr Edward Ntefang  
Cnr Voortrekker & School Streets, Kuruman; Tel: 053 712 9300
  - **Gamagara Local Municipality**  
Municipal Manager: Mr Clement Itumiling  
Civic Centre; Cnr of Hendrick van Eck and Frikkie Meyer Road, Kathu; Tel: 053 723 6000

Comment received on the Draft EIR is addressed in the Final EIR (this document). No comment that could change the outcome of the project was received and no substantial changes were made to the Draft EIR. No changes were made to the Preferred or Alternative Route as presented in the Draft EIR. The Final EIR is now submitted to the Department of Environmental Affairs for their perusal and ultimately, the issuing of the Environmental Authorisation.

### 5.3 ISSUES RAISED DURING THE SCOPING PHASE

#### 5.3.1 WRITTEN COMMUNICATION WITH I&AP'S UP TO DISTRIBUTION OF DRAFT SCOPING REPORT Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(4)

*Please note*

- *AMP Property Management & Land Acquisition (the route identification specialists on the project team) contacted the affected landowners directly to discuss issues as mentioned below. The proposed power line route corridors were adjusted in some cases to accommodate the landowners' concerns.*
- *Comment summarised below was either addressed by AMP via direct consultation with the applicable landowner or are responded to in Paragraph 5.2.2, "Main Issues Raised at the Public Open Day".*
- *The routes as proposed in the amended route map (attached in Appendix A4) could still be amended or could even result in a combination of routes, depending on the outcome of specialist investigations, further community consultation and input from the directly affected landowners.*
- *It is important to note that Eskom cannot construct any power lines without the written consent of the landowner, since a servitude has to be registered for the power line and substation.*

#### **Mr Nicolas Loubser, Director: Golden Falls Properties (Pty) Ltd**

It is the attention of Golden Falls Properties (Pty) Ltd, RE Capita (Pty) Ltd and Atlantic Energy Partners to develop a CSP solar plant on Portion 4 of the Farm Kapstewel 436. An EIA is currently underway for this solar plant. The power line route Alternative 2 may impact thus on the planned development on Portion 4 of the Farm Kapstewel 436. Alternative 1 would not pose any problems.

#### **Mr Frans Briedehann – owner of Magobi Farm**

He is concerned about the safety of the animals on the farm (damage to fences, water pipe lines, tanks, gates being left open, littering, illegal trapping, damaging of grazing, collection of firewood, etc.); veld fires as well as theft of cattle, sheep and farm equipment.

### **Mainstream Renewable Power SA: Solar Development Project Manager: Mr Jonathan Frick**

- The servitude corridor between Boundary and Ulco impacts on 3 of Mainstream's projects:
  1. Most notably is the servitude route to the north designated to run through our constructed round 1 solar PV plant indicated by the red square in the image (Boundary – Ulco proposed route obstacles).
  2. Additionally the same northern route runs across the Droogfontein PV 2 (Bid in in round 2 of the REIPPP) and Droogfontein PV 3 both developed solar PV projects.
  3. Finally both routes potentially cross the 132kV grid connection planned for Droogfontein PV3 project connecting into Homestead SS.
- To the south of ULCO the servitude routes cross 3 land parcels which they have under option as well as the area where they are developing a number of solar projects. If the southern route into Ulco is taken there would overlap of the projects.

### **Milnex 189 BK (Mr Riaan du Plessis) on behalf of:**

- **Diro Iron Ore (Pty) Ltd – previously known as SA Manganese (Pty) Ltd**
- **Diro Manganese (Pty) Ltd- previously known as Burk Mining (Pry) Ltd**
- **Soliter Myn Ondernemings CC Trading as Helpebietjie Mine**

Milnex's clients are amenable to Alternative 2 (green route); the boundaries being the middle point of the corridor save for where they border the Military area in which case the corridor will encroach the properties by 55m. Milnex's clients would have to do drilling to determine the quantum of the reserves sterilised which will guide the negotiation process to determine the applicable compensation payable. All cost incurred for the drilling will have to be paid by Eskom.

*After the public open day and conversations with AMP (the route identification specialists), Milnex commented as follows:*

- Milnex's clients will venomously object the power line in the event of the First Alternative Corridor (*the green route as presented at the public meeting*) being chosen. Further investigations will be required.
- Milnex's clients will be amenable to the proposed Alternative 2 (*green route as per the map attached in Appendix A4*) on condition that an amicable agreement can be reached as far as compensation or their damages and the temporary relocation of power line for mining of the sterilised area are concerned. Alternative 1 is in no way acceptable and will be venomously opposed.

### **Sishen Iron Ore Company (Pty) Ltd – Mr Harry Dul, Manager Mineral Rights**

The following companies should be registered as IAPs and all communication should be with Mr Dul:

- Sishen Iron Ore Company (Pty) Ltd is the registered owner of the following affected properties:
  1. The Remaining Extent of the farm Mashwening 557;
  2. The Remaining Extent of the farm Sekgama 461.
- Main Street 576 (Pty) Ltd, a wholly owned company of Sishen Iron Ore Company (Pty) Ltd, is the registered owner of the following affected properties:
  1. The Remaining Extent of the farm Demaneng 546;
  2. Portion 1 of the farm Demaneng 546\*;
  3. Portion 4 Mokoneng 560\*

### **Mr Simon Gear, Birdlife SA**

Although the lines are in the vicinity of some important bird populations, they do not specifically traverse areas of particular concern. The best anti-bird collision practice must however be implemented and appropriate technology be deployed on the lines.

### **Wide Investments 100 (Pty) Ltd – Mr Mzamani Mdaka, Director**

- Wide Investments 100 (Pty) Ltd ("Wide Investments") is a holder of a prospecting right for iron ore and manganese on the farm, the Remaining Extent of Mashwening 557 ("Mashwening") and Lekgoko 46 ("Lekgoko"), located in the Kuruman magistrate district, Northern Cape Province.
- Following successful results from the initial exploration conducted on Mashwening, the company has applied for a mining right on the same property, with finalisation of the application by the Department of Mineral Resources expected before the end of 2014. The company plans to commence with mining operations on Mashwening in early 2015.
- The company has been made aware by Sishen Iron Ore Mining company, the registered landowner of Mashwening, of the process planned for the implementation of the Eskom Kimberley Strengthening Project Phase 4, currently underway.
- Wide Investments wishes to raise an objection regarding the proposed route for the Manganore to Ferrum power-line as depicted on the map for the following reasons:
  - i. The proposed route for the power-line will sterilize mineral ore bodies that may be located along the servitude area, as no mining is allowed to take place to within 100 metres of any power-line;
  - ii. There is already an existing power-line passing through Mashwening property, which will in any event result in the provision of a 100 metres buffer from both sides of the servitude area;
  - iii. Having a second power-line passing through Mashwening will result in over 200 hectares of the total mineral right area being sterilized, resulting in a significant loss of potential economic benefits for the company.

### **Floxiflo (Pty) Ltd – Mr ME Mdaka, Director**

- This is to inform you that Floxiflo (Pty) Ltd ("Floxiflo") is a holder of a prospecting right for iron ore and manganese on the farm Gathlose Native Reserve 548 ("Gathlose"), located in the Kuruman magistrate district, Northern Cape Province.
- Floxiflo wishes to raise an objection regarding the proposed route for the Manganore to Ferrum power-line as depicted on the map for the following reasons:
  - i. The proposed route for the power-line will sterilize mineral ore bodies that may be located along the servitude area, as no mining is allowed to take place to within 100 metres of any power-line;
  - ii. Sterilisation of any of the mineral right area may result in a loss of potential economic benefits for the company.

Mr Mdaka attended the public meeting on behalf of Floxiflo (Pty) Ltd as well as Wide Investments 100 (Pty) Ltd and commented as follows:

- The powerline route will have a negative impact on the prospecting rights granted for mining of iron ore and manganese. The propose line could reduce the area granted for the mining activities / prospecting by as much as 200 hectares. This will negatively impact on the area required for mining operations and subsequent loss of a portion of economic benefits that could be derived from the project.

### **Shepstone & Wylie Attorneys – Ms Casey Scheepers on behalf E&R China Elite International Investments Limited, Ms Barbara Joy Swart and Kadgame Mining (Pty) Ltd; collectively referred to as the Kadgame IAPs**

- The Farm is used for prospecting and mining operations, bulk sampling, residential purposes, office and storage areas, grazing land and as a thoroughfare to landlocked farms in the area. The project may impact negatively on these operations.
- The Eskom project may interfere with carrying out the work on the farm.
- Cattle and buck roam freely on the Farm and the project may interfere with their water supply and limit access to grazing.
- The project may cause damage to existing infrastructure on the Farm.
- Should either of the proposed power line routes obstruct / disturb current and/or future prospecting and mining activities there may be grave implications.

- Detail of the Eskom project is required in order to make in order to isolate and comment on specific concerns.

Shepstone & Wylie Attorneys commented after the public meeting as follows:

- *Route Alternative 2 (purple route) – as per the map presented at the public meeting*
  - Since this route crosses the SA Army Combat Training Centre at Lohatla, permission for the project will not be granted.
  - Should the route be shifted to be outside of the military area, it will have a direct impact on the mining operations of Farm Kadgame 558.
  - It is proposed that a new route to the west of Alternative 1 (the green route) be established, thereby sidestepping Farm Kadgame 558 entirely.
- *Route Alternative 1 (green route) – as per the map presented at the public meeting*
  - This route would cause minimal disruption to the operations at the Farm Kadgame 558 and is accordingly preferred to the current purple route. However, since the prospecting and mining operations are not yet complete, the likelihood of discovering additional deposits of minerals on the Farm is very likely.
  - It is therefore propose that the green route be moved slightly west to avoid al potential disturbances to mineral that may be found.
  - Nevertheless, in the event that the green route corridor, in its current location, is chosen as the route on which the power line will be erected, the Kadgame IAPs will not object to the construction of the power line, subject to being adequately compensated.

### 5.3.2 MAIN CONCERNS RAISED AT THE PUBLIC OPEN DAY

The PowerPoint presentation as presented at the Open Day is attached in Appendix E(5)

The project components, EIA process as well as the key findings of the specialist studies up to date were communicated at the Open Day. A Draft Environmental Sensitivity Map was presented on which additional comment was added to during discussions.

It was explained during the introduction to the meeting that the route alternatives as presented are in draft form and that the routes may change considerably – the routes as presented were identified to kick-off route negotiations, specialist studies and investigations. Concerns raised during the EIA process will determine the final route which will be presented to DEA for Environmental Authorisation.

Once the Environmental Authorisation is in place, Eskom will appoint evaluators to evaluate the land and establish the compensation price according to the current market value of the land. This would be negotiated with the landowners. Servitudes with a 55m width will be registered for the purpose of the power line. Eskom will have the right to access the servitude for construction, maintenance and inspection purposes.

Discussions took place after the presentations were given at the two respective meetings.

It was stated by Landscape Dynamics that concerns raised at the meeting must also be put in writing so that formal responses thereto can be provided in the Draft Scoping Report. Very little written concerns were however received after the meeting. The main issues and comments raised can be summarised as follows:

- The Eskom maintenance teams which maintain existing power lines very often cause damage to property and farm roads, cutting trees without permission, leaving farm gates open, etc.  
*Response: Eskom has official complaint procedures which should be followed in this regard. The EMP that will be compiled during the EIA phase will include the relevant contact details and complaints structure to address these enquiries and claims.*

Regarding the new transmission power lines, it is important to note that the construction and maintenance teams will be bound by the stipulations as per the EMP. Each landowner will receive a copy of the EMP and they can ensure that the various contractors abide by the EMP. It was emphasised that the landowners could forward specific conditions to Landscape Dynamics for inclusion in the EMP.

- 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 houses and 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.*
- The power line should run as close as possible to railway lines, so that existing infrastructure can be utilised for the new power line. This could also assist in reducing habitat fragmentation and edge effects.  
*Response: It was explained by the Eskom engineers that the Eskom power lines may cross railway lines, but it may not run adjacent to railway lines. It should be at least 1km away from existing railway lines.*
- 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 were 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 will be impacted on 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.*
- 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 question was raised why the new power lines could not be strung on the existing pylon structures.  
*Response: It was responded by Eskom that bigger conductors are required, resulting in a requirement for bigger structures and the existing pylons 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 existing 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, property boundaries and existing power lines.*

The outcome of the meetings can be summarised as follows:

- Numerous objections regarding the proposed route alternatives were received.
- The fact that the power line project is a necessity was realised; therefore the general feeling of the affected landowners is that of support for the project. Further communication with regards to a practical and viable route corridor is required.

It was concluded that further stakeholder meetings and significant communication will take place between Landscape Dynamics, AMP (the route identification specialists on the project team) and the key stakeholders, specifically the directly affected landowners. The main aim of the discussions would be to establish a recommended route corridor with viable alternatives. Viable route alternative corridors which result from the Scoping Phase will be provided in the Draft Scoping Report on which all the Interested & Affected Parties would have the opportunity to comment.

Furthermore, the relevant specialist studies would be updated to accommodate new information supplied at the Public Open Day.

### 5.3.3 WRITTEN COMMENT RECEIVED ON THE DRAFT SCOPING REPORT

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(7).

#### **Northern Cape Province: Department of Agriculture, Forestry & Fisheries: Chief Forester: NFA Regulation: Ms Jacoline Mans**

1. The Directory: Forestry Management (Other Regions) in DAFF is mainly concerned about the potential impact on protected tree species. See the National Forest Act, Act 84 of 1998 (NFA) as amended, section 12(1(d) read with section 15(1) and section 62(2)(c). The most recent list of protected tree species was published in GN 908 of 21 November 2014. *No protected tree may be damaged, disturbed, cut or destroyed without a valid Forest Act license, irrespective of other authorisations and approvals.* The DAFF is also responsible for the administration of the National Veld and Forest Fires Act, Act 101 of 1998 (NVFFA). Please take note of responsibilities in terms of the NVFFA.
2. Page 19 of the Draft Report refers to vegetation clearance required for the construction of the power line over a distance of approximate 133km and stated that tall trees will be cleared along the entire length of the servitude. The DAFF would like to point out that the total width of (55m or 27.5m on either side of the line) may not be cleared of protected trees. The DAFF / Eskom developed a document in 2012 titled: *"Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests"*. According to this document and in relation to new planned Eskom linear infrastructure, "protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species such as Shepherd's trees) and trees in the way of towers to be erected". The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.
3. The Ferrum Substation located south of Kathu seems as if the Kathu Forest will not be affected, but it is requested to confirm that the proposed development will not have any impact on the Kathu Forest. The Kathu Forest is a nationally declared Protected Woodland. A map of the Kathu Forest can be obtained from the DAFF.
4. Page 29 refers to protected tree species observed in the proposed corridors, but only mentioned NFA listed protected tree species. Kindly note that some plants are provincially protected or specially protected under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA) and may not be disturbed without a valid Flora Permit, to be obtained from the provincial Department of Environment and Nature Conservation (DENC) in Kimberley.

5. Areas with higher density protected trees (national and provincial) should be avoided as far as possible.
6. A copy of the EIA Report should be submitted to the Department once available.

*Response from Landscape Dynamics*

- *This information was forwarded to the botanist for inclusion in the Vegetation and Faunal Report (to be submitted with the EIA Report).*
- *These stipulations will also be included in the EMP (to be submitted with the EIA Report).*

**The Northern Cape Province: Department of Environment & Nature Conservation: Environmental Officer, Environmental Quality Management: Ms Dorien Werth**

- The Department awaits the Final Scoping Report for review.

*Response from Landscape Dynamics*

- *Landscape Dynamics responded to the Department as follows:*
  - *The Draft Scoping Reports were distributed for comment and the Final Scoping Reports will be submitted to DEA for approval.*
  - *Should the Department wish to make any further comment on the Draft Reports, it should be done within the next 2 weeks. If no comment from the DENC is received, it will be assumed that the DENC awaits the Draft EIR to submit further comment.*
- *No further comment from the Department was received.*

**Shepstone & Wylie Attorneys – Ms Casey Scheepers on behalf E&R China Elite International Investments Limited, Ms Barbara Joy Swart and Kadgame Mining (Pty) Ltd; collectively referred to as the Kadgame IAPs**

- Having considered the Draft Scoping Report, they confirmed that their comments, made on behalf of the Kadgame Interested and Affected Parties, have been satisfactorily documented and addressed.
- They do, however, reserved their client's respective rights in respect of any valuation to be conducted and they look forward to receiving all future correspondence concerning the Eskom Kimberley Phase 4 Project: Manganore - Ferrum.

*Response from Landscape Dynamics*

- *Comment noted*

**Wide Investments 100 (Pty) Ltd – Mr Mzamani Mdaka, Director**

Wide Investments has now been granted the Mining Right on the remaining extent of Mashwening 557. The company will commence mining operations on the farm from the beginning of 2015. Once again, the planned route through Mashwening will sterilize minerals that would be exploited to the benefit of the company and thus the objection still stands.

*Response from Landscape Dynamics*

- *Comment duly noted*
- *Anne-Marie Botha and Maritha Duvenhage, the route negotiators for this project and whom Mr Mdaka met at the public meeting, were made aware of this objection. The objections will be incorporated when the final routes are being finalised during the EIA phase.*

**Milnex 189 BK (Mr Riaan du Plessis) on behalf of:**

- **Diro Iron Ore (Pty) Ltd – previously known as SA Manganese (Pty) Ltd**
- **Diro Manganese (Pty) Ltd- previously known as Burk Mining (Pry) Ltd**
- **Soliter Myn Ondernemings CC Trading as Helpebietjie Mine**

Their mandate to act on behalf of Helpebietjie Mine was terminated and new contact details for the mine were given.

*Response from Landscape Dynamics*

- *The IAP lists were updated accordingly*

**Atlantic Renewable Energy Partners (Pty) Ltd: Director: Mr David Peinke**

- **Kapstewel 436, Remainder (Schalk Willem Victor & Marieta Victor: Tiaan Victor)**
- **Kapstewel 436, Portion 4 (Golden Falls Prop (Pty) Ltd: Nicolas Loubser)**

First comment

- They have a PV interest on the Remainder of Kapstewel 436 and a CSP development on Portion 4 of the Farm Kapstewel.
- They requested the KMZ or SHP files for the proposed power line routes.
- They wanted to know in which direction the Manganore Substation will expand in order to accommodate the new Manganore TX (Transmission) Substation.
- The servitude width is only 55m, but DEA will authorise 2km width. This has a material impact on their layouts and they would need to work much closer to the Eskom servitude than this 2km buffer.

*Response from Landscape Dynamics*

- The KMZ file of the proposed route was forwarded via email.
- It is unclear at this stage in which direction the substation site will expand. Should there be specific objections regarding the site, Landscape Dynamics should be informed. Even though 5 hectares are being investigated, the substation will not be as big (the exact size is not known at this stage).
- Approval from DEA is obtained for a 2km route corridor to allow for the final route to be pegged according to landowner preferences (i.e. along the fence / next to a road, etc.). If any layout plans are available for the solar plants within this 2km corridor, it can be forwarded to Landscape Dynamics to take into consideration, or alternatively, specifications can be put in writing to be included in the Environmental Management Plan which will be forwarded to the route engineers.

Second comment - solar PV development on Rem of Kapstewel 436

1. Based on final sensitivity mapping they are fairly limited as to movements on the property. The preferred site is shown in green in the map as provided in their email (attached in Appendix E(6)). They could shift the site access and security checkpoints (and southern boundary fence) upwards slightly.
2. The need to scope for a larger line corridor and substation footprint is understood. It is preferred at this stage that the substation expands in a southerly direction away from their developments. At the end of the day the substation will not increase substantially in size so they can work with Eskom based on their needs. They should be kept involved in future discussions.
3. The 2km line corridor is the real issue, it cannot be accepted as it eliminates the site. It is proposed that route engineers follow as close as possible the existing Eskom servitude/s so as to minimise as far as possible the geographical spread of servitude crossing both Portion 4 Kapstewel 436 and Rem Kapstewel 436. The landowner will feel exactly the same. The following should be included in the EMP: a) follow the light blue servitude for new lines crossing on Portion 4 Kapstewel 436, and follow the existing 132kV line coming in from the east as close as possible.
4. It is in their best interest to work with Eskom as they understand the significance of this Phase 4 Expansion Project in the Northern Cape.

*Response from Landscape Dynamics*

1. *This information was forwarded to AMP Property Management & Land Acquisition (the route identification specialists on the project team) as well as to Eskom.*

2. *This information was forwarded to AMP Property Management & Land Acquisition (the route identification specialists on the project team) as well as to Eskom.*
3. *Eskom always try to run the lines parallel to encroach less on the properties. The parallel distance for a 400kV line to any other voltage power line will be 55m. The indicated blue line in their map as received via email is in fact the recommended route. However it will only be finalised pending the decision made by the Environmental Department granting the Environmental Authorisation.  
The information as requested will be included in the EMP (to be submitted with the EIA Report).*
4. *Comment noted.*

## 5.4 ISSUES RAISED DURING THE EIR PHASE

### 5.4.1 COMMUNICATION WITH STAKEHOLDERS DURING THE EIR PHASE

Continuous liaison is required for a project of this magnitude and the following comment was received after submission of the Final Scoping Report to DEA (Appendix E8) and before distribution of the Draft EIR.

#### **Atlantic Renewable Energy Partners (Pty) Ltd: The Director – Mr David Peinke**

AEP has been developing the Postmasburg Solar PV Energy Facility 2 project around the Manganore Substation just north of Postmasburg.

One of the stipulations in the comment ("*Eskom requirements for works at or near Eskom infrastructure*") made by Eskom to AEP reads as follows:

- Eskom must be informed of any concentrated solar & photovoltaic activity within a 5km radius of a substation. Where concentrated solar & photovoltaic plants fall within a 2km radius of the closest point of a substation, Eskom should be informed in writing during the planning phase of such plant or structure.

AEP also need to be informed of any lines entering the Manganore Substation from both the Ferrum and Olien Substation.

#### *Response from Landscape Dynamics*

- *Ms Lindiwe Motaung, Snr Advisor Environmental Management, Eskom Group Capital Division received the original email from Mr David Peinke and Eskom was therefore informed of the activities of AEP.*
- *AEP is added to the IAP list of both the Ulco-Olien-Manganore Project as well as the Manganore-Ferrum Project.*

#### **Tsantsabane Local Municipality: The Municipal Manager: Mr Heinrich Mathobela**

They took note of the Draft Scoping Report and its contents. Mr Mathobela was not aware of the public participation process referred to in the report.

#### *Response from Landscape Dynamics*

- *Mr Mathobela was informed of the process via email and a hard copy of the Scoping Report was delivered to his offices. A hard copy of the Draft EIR will also be delivered to his offices, marked for his attention.*

### 5.4.2 WRITTEN COMMENT RECEIVED ON THE DRAFT EIR

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(10).

The Draft Environmental Impact Report was distributed to all the registered Interested and Affected Parties as well as key stakeholders, including all directly and potentially affected landowners, and the following comment was received:

**South African Heritage Resource Agency: Case Officers: Mr Phillip Hine, Ms Jenna Lavin and Mr Andrew Salomon**

An email was sent on 8 September 2015 to above-mentioned case officers, informing them that the final HIA's and Route Maps were uploaded on SAHRA for their perusal and comment.

A further email was sent on 28 October, reminding them that comment was required. The deadline for comment was extended from 19 October to 30 October and the email specifically stated the following: "If no comment is forthcoming, it will be seen that SAHRA has no further comment on these development proposals."

No further comment / reply to the email was received and it is therefore concluded that SAHRA has no further comment on this Eskom power line project.

**South African Civil Aviation Authority: Obstacle Specialist: Procedure Design and Cartography: Mr Harry Roberts**

SACAA has no objection to the routing as depicted on the KMZ file accompanying their email. Should the route differ from that which is depicted, this comment will become null and void, subject to a new review of the route proposed. They requested information regarding the intended height of the pylons.

*Response*

*Technical information regarding the pylons that could be used for the Eskom Kimberley Strengthening Phase 4 project was included as Appendix B in the Environmental Impact Report and the following information was also provided in the EIR:*

*Different pylon structures are being considered for this project. Find attached diagrams with their dimensions attached in Appendix B. They include the following:*

- *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.*

**Department of Agriculture, Forestry and Fisheries: Zilungile**

There are protected trees within the development area and the Department therefore requested that a site visit should be undertaken before comment can be supplied.

*Response*

*The extent of the project is as follows:*

- *The total Eskom Strengthening Phase 4 Project entails the construction of an approximate 390km 400kV power line. Environmental authorisation is requested for a 2km wide corridor within which a 55m servitude will be registered.*

- *During the EIA process the ecological specialist did confirm that protected species occur within the route corridor alternatives. Note that only once environmental authorisation is obtained for a specific corridor for each of the four sections can Eskom start with the detail design of the powerline. As soon as the proposed positions of the pylons are identified within the approved corridor will a Site Walk-down with the relevant Eskom engineers; the ecologist; the bird impact specialist; the freshwater specialist and the archaeologist take place. During this Site Walk-Down the protected trees that require permits from the Department will be marked and coordinates will be identified and permits will be prepared for submission to your office.*
- *Due to the reasons supplied above, a detailed site investigation at this stage will not be time and cost effective since the approved route corridor had not been confirmed yet and the locality of protected species had also not been identified.*
- *It is therefore strongly recommended that the Site Walk-Down be attended by the Department at the time that it takes place; or else that the Department attends a site investigation to the relevant areas of concern where the permits are required once more specific detail in that regard becomes available, when the permit applications are submitted to the Department. We could include your requirement to attend the Site Walk-Down in the Environmental Management Plan as a condition, should the Department wish to do so.*
- *Written comment in terms of the way forward and the Department's requirement in terms of compliance with the Department's legislation should be submitted.*
- *Landscape Dynamics further requested that complete contact details should be submitted since it is not sure from which office Zulingile is since comment from the Northern Cape Forestry Branch was already received.*

*No further comment from the Department was received.*

**The Northern Cape Department of Environment & Nature Conservation: EIA Administration: Ms L Tools-Bernardo**

The Department acknowledged receipt of the hard and electronic copy of the Draft EI Report on 9 September 2015. The application has been assigned the reference number NC/MAT/FB/SOL/KIM/2014 and the responsible officer is Mr T Mthombeni.

*Response from Landscape Dynamics*

- *Comment noted*
- *No further comment from the Department was received.*

**SA National Roads Agency: Statutory Control: Ms Rene de Kock**

If services need to be constructed over or under a national road or within 60m measured from the road reserve fence, the service owner must apply for a written permission from SANRAL, before any work may be carried out.

*Response*

- *A Way Leave Application will be made to SANRAL should it be required. There are standard agreements between SANRAL and Eskom that will be followed in this regard.*

**Northern Cape Department of Water & Sanitation: Office of the Provincial Head: Lindiwe Franks**

Mr Franks requested that all correspondence should be directed to Mr Mahunonyane, Director Institutional Establishment, whom was also copied on the email.

*Response*

- *The IAP register was updated as requested.*
- *Mr Franks was informed that hard and electronic copies of the Environmental Impact Reports of all four applications were sent via courier and addressed to Ms Nosie Mazwi as well as Mr Abe Abrahams. A*

*request was made that Mr Franks should please ensure that these reports are being delivered to Mr Mahunonyane. Mr Mahunonyane was copied on the email.*

- *On request of Mr Franks, the contact detail of Ms Mei and Ms Lefluer were also added to the IAP register. Both Ms Mei and Ms Lefluer were copied on the email.*
- *No further comment from DWS was received.*

**Atlantic Renewable Energy Partners (Pty) Ltd: Analyst: Ms Sonia Miszczak**

On behalf of AEP, Ms Miszczak confirmed that their comment raised during the public participation process was satisfactorily documented. A letter was attached and the following comments were made:

- Postmasburg Solar PV Energy Facility 2 (Pty) Ltd is proposing the establishment of a commercial solar photovoltaic energy facility (SEF) in the Postmasburg area.
- The SEF is located on the farm Kapstewel 436 Restan t/ Remaining Extent. It is proposed to connect the SEF directly to the planned Manganore 132/11kV SUBSTATION adjacent to the site. The on-site SEF substation will be approximately 120m x 70m in size and feature a power transformer/s to allow the generated power to be connected to Eskom's electricity grid via the Manganore Substation. The overhead 132kV transmission power line, to distribute the generated electricity from the on-site substation to the existing Eskom Manganore Distribution Substation, will be a single circuit line,  $\pm$  500m to 1km in length, with a maximum height of  $\pm$  32m, within a servitude width of between 31m – 40m. This proposed project received Environmental Authorisation on 25 May 2015. A layout and locality map were attached to the letter
- The 2km width for which approval is being sought for the corridors will cross into land that AEP has secured for the proposed SEF and which has already received EA. If the actual servitude width will be only 55m in the 2km corridor, with 27.5m on either side of the line then it is requested that the final line routing is placed a minimum of 27.5m from the south eastern border of Kapstewel 436 Restant / Remaining Extent so that the final servitude corridor does not impact the proposed SEF.

*Response*

- *The route negotiators appointed for this Eskom project confirmed that Atlantic Renewable Energy Partners could be accommodated and no problems are foreseen. The plan is to run the new 400kV power line parallel to the existing 132kV line, over Portion 4 of the farm Kapstewel.*

**Kumba Iron Ore: Sishen Iron Ore Company (Pty) Ltd: Corporate Office: Manager Mineral Rights: Mr Harry Dul**

1. The proposed power line routes as communicated will impact on the following SIOC properties: Mokaning 560 Ptn 4; Mashwening 557 RE; Demaneng 546 RE; Demaneng 546 Ptn 1; Lylyveld 545 RE; Bruce 544 Ptn 1 and Sekgami 461 RE.
2. SIOC put on record that the proposed alternative route 2, will *inter alia*:
  - result in the sterilization of its mineral resources at its Sishen Mine;
  - seriously impact on its mining activities at its Sishen Mine;
  - result in significant financial losses for SIOC;
  - result in job losses.
3. SIOC put on record that it will not consent to the alternative route and will take all necessary steps to protect its interest and the interest of its employees and/or shareholders, including legal action if so required
4. The preferred route 1 highlighted in green on the route map appears to be more acceptable although the direct impact of this route still needs to be studied in more detail by SIOC. This includes from an environmental and Mine Health and Safety Aspect. SIOC will revert back in this regard.

5. The contact person for Bruce 544 and Sekgami 461 was incorrect on the IAP register. SIOC (Mr Dul) should be the contact person for both these properties.

*Response*

1. *The IAP register was amended to reflect the SIOC ownership of the said properties.*
2. *It is clearly stated in the Final EIA and correspondence to DEA that the Preferred Route as indicated in the Final Route Map should be authorised. There are no obvious reasons why DEA should authorise the Alternative Route 2.*
3. *The comment regarding actions to be taken should Route Alternative 2 be authorised are duly noted.*
4. *No further comment regarding the possible impact of the Preferred Route Corridor was received. It is therefore accepted that any potential environmental impact could be mitigated within the 2km wide Preferred Route Corridor. Significant opportunity exists for discussion and accommodation of any site-specific requirements and impact during the servitude negotiation phase, which will take place after Environmental Authorisation has been obtained.*
5. The IAP register was amended accordingly.

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There are protected trees within the development area and the Department therefore requested that a site visit should be undertaken before comment can be supplied.

#### *Response*

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*Response*

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Mr Franks requested that all correspondence should be directed to Mr Mahunonyane, Director Institutional Establishment, whom was also copied on the email.

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**Atlantic Renewable Energy Partners (Pty) Ltd: Analyst: Ms Sonia Miszczak**

On behalf of AEP, Ms Miszczak confirmed that their comment raised during the public participation process was satisfactorily documented. A letter was attached and the following comments were made:

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- The SEF is located on the farm Kapstewel 436 Restan t/ Remaining Extent. It is proposed to connect the SEF directly to the planned Manganore 132/11kV SUBSTATION adjacent to the site. The on-site SEF substation will be approximately 120m x 70m in size and feature a power transformer/s to allow the generated power to be connected to Eskom's electricity grid via the Manganore Substation. The overhead 132kV transmission power line, to distribute the generated electricity from the on-site substation to the existing Eskom Manganore Distribution Substation, will be a single circuit line, ± 500m to 1km in length, with a maximum height of ± 32m, within a servitude width of between 31m – 40m. This proposed project received Environmental Authorisation on 25 May 2015. A layout and locality map were attached to the letter.
- The 2km width for which approval is being sought for the corridors will cross into land that AEP has secured for the proposed SEF and which has already received EA. If the actual servitude width will be only 55m in the 2km corridor, with 27.5m on either side of the line then it is requested that the final line

routing is placed a minimum of 27.5m from the south eastern border of Kapstewel 436 Restant / Remaining Extent so that the final servitude corridor does not impact the proposed SEF.

*Response*

- *The route negotiators appointed for this Eskom project confirmed that Atlantic Renewable Energy Partners could be accommodated and no problems are foreseen. The plan is to run the new 400kV power line parallel to the existing 132kV line, over Portion 4 of the farm Kapstewel.*

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3. SIOC put on record that it will not consent to the alternative route and will take all necessary steps to protect its interest and the interest of its employees and/or shareholders, including legal action if so required
4. The preferred route 1 highlighted in green on the route map appears to be more acceptable although the direct impact of this route still needs to be studied in more detail by SIOC. This includes from an environmental and Mine Health and Safety Aspect. SIOC will revert back in this regard.
5. The contact person for Bruce 544 and Sekgami 461 was incorrect on the IAP register. SIOC (Mr Dul) should be the contact person for both these properties.

*Response*

1. *The IAP register was amended to reflect the SIOC ownership of the said properties.*
2. *It is clearly stated in the Final EIA and correspondence to DEA that the Preferred Route as indicated in the Final Route Map should be authorised. There are no obvious reasons why DEA should authorise the Alternative Route 2.*
3. *The comment regarding actions to be taken should Route Alternative 2 be authorised are duly noted.*
4. *No further comment regarding the possible impact of the Preferred Route Corridor was received. It is therefore accepted that any potential environmental impact could be mitigated within the 2km wide Preferred Route Corridor. Significant opportunity exists for discussion and accommodation of any site-specific requirements and impact during the servitude negotiation phase, which will take place after Environmental Authorisation has been obtained.*
5. The IAP register was amended accordingly.

*Please note*

The above-mentioned reply was sent via email to Mr Harry Dul. It was requested in this email that Mr Dul should please provide Landscape Dynamics with comment before Friday, 20 November. If no reply to this email is forthcoming, it will be seen that SOIC is in agreement with the response.

*The email was received by Mr Dul and no further comment was received.*

## 5.5 CONCLUSION OF PUBLIC PARTICIPATION

The main issues raised during the 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
- Eskom access during the operational phase is problematic in terms of security, poaching and veld fires

These issues are addressed in this chapter in what is believed to be a fair and satisfactory manner. Relevant mitigatory measures and specifications are prescribed in the Environmental Management Plan in Appendix F.

The main objective of the Public Participation Programme undertaken for this project was to identify viable route corridors that are not only acceptable from an ecological point of view, but also from a landowner perspective. It should be noted that it is very difficult to meet this goal with a project of this magnitude; however the EAP is confident that reasonable consensus was reached regarding the preferred and alternative route corridors presented in this document.

## CHAPTER 6: IMPACT ASSESSMENT 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 ASSESSMENT OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT

The impacts below are assessed according to the following criteria:

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

## 6.2.1 EXPECTED NEGATIVE IMPACTS

Please note that mitigation measures as supplied below are also included in the Environmental Management Plan.

### IMPACT EVALUATION: ROUTE ONE CORRIDOR (PREFERRED)

#### VEGETATION

##### *Loss of flora, fauna and habitat*

The construction of pylons will lead to the destruction and loss of vegetation, which can result in degradation of the environment, loss of vegetation cover and resultant erosion and loss of topsoil, increase in water runoff and less water infiltration, loss of habitat for sensitive or secondary species, reduction of species richness and system diversity and eventual loss of ecosystem functioning and species composition.

##### *Habitat fragmentation (loss of landscape connectivity)*

Habitat fragmentation refers to destruction of the habitat leading to a discontinuity in a species/populations' the environment. The remaining habitat therefore becomes smaller.

##### *Loss of vulnerable species*

Not only will the loss of vulnerable species cause further degradation of the environment and the conservation status of the ecosystem, but it will alter also the functioning of adjacent ecosystems and their species compositions.

##### *Invasion of invader plants and declared weeds*

Weeds, alien invasive and indigenous invasive plants are normally aggressive growers that can out-compete other natural species growing in the environment.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Loss of flora, fauna and habitat	Low	Site	Short / Medium	Probable	Low / Moderate	Low
Habitat fragmentation (loss of landscape connectivity)	Moderate / Low	Site	Short	Possible	Low	Low
Loss of vulnerable species	Low	Site / Local	Medium	Possible	Low / Moderate	Low
Invasion of invader plants and declared weeds	Moderate	Site	Medium	Possible	Moderate	Low

The results of the above impact evaluations show that the proposed power lines should have no severe (high) impacts on the different units with low-medium impacts over the short-medium term that will be experienced in the different vegetation units (fauna & flora).

The impacts on the loss of flora and habitat will be low to medium due to the areas having few sensitive species (except for the declining *Vachellia erioloba* in Units 1 and 2). The expected influence could however be further mitigated by restricting the clearing of natural vegetation to as small an area as needed for the construction of the pylons.

The fragmentation of the habitat is not expected to be of any significance with normal connectivity between ecosystems still intact due to the relatively small footprint of the pylons. Any fragmentation will also be mitigated by clearing as small an area as possible when constructing the pylons.

## Mitigation

### *Protected trees*

- It is important to take into consideration during the planning phase of the project the fact that the total width of the servitude may not be cleared of protected trees. The Department of Agriculture, Forestry & Fisheries, together with Eskom developed a document in 2012 titled: “*Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests*”. According to this document and in relation to new planned Eskom linear infrastructure, “protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species such as Shepherd’s trees) and trees in the way of towers to be erected”. The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.
- Areas with higher density protected trees should be avoided as far as possible.
- *Vachellia erioloba* (Camel thorn) have been recorded within Vegetation Units 1, 2 and 5 (more species may be found during the walk-down exercise).
- The Directory: Forestry Management in the Department of Agriculture, Forestry and Fisheries (DAFF) is mainly concerned about the potential impact on protected tree species. The most recent list of protected tree species was published in GN 908 of 21 November 2014. *No protected tree may be damaged, disturbed, cut or destroyed without a valid Forest Act license, irrespective of other authorisations and approvals.*

### *Preparation of servitude / vegetation clearance*

- The procedures for vegetation clearance and maintenance within overhead power line servitudes and on Eskom owned land, updated September 2009 or latest approved revision thereafter, must be implemented (EPC 32-247).
- Vegetation clearance is often one of the very first activities of construction. The Project Coordinator shall inform the ECO before the vegetation clearance contract is issued. Vegetation clearance is considered commencement of construction. Eskom needs to notify the DEA of its intention to commence with construction before vegetation clearance can commence.
- Indigenous vegetation which does not interfere with the safe operation of the power line should be left undisturbed.
- Clearing for pylon positions must be done to the minimum required for that specific pylon.
- Vegetation clearing during construction must be restricted to the footprint of the substation infrastructure only and the power line servitude.
- Existing access roads must be used as far as possible and the creation of new access tracks for power line construction should be minimised.
- Unnecessary impacts (such as driving off road) on surrounding natural vegetation must be avoided.

### *Control of alien vegetation*

- Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall “control” i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.
- The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).
- All alien vegetation should be eradicated along the servitude. Invasive species (*Prosopis glandulosa*; *Nicotiana* spp.) should be given the highest priority.
- A total of five different declared alien invasive species, the tree *Prosopis glandulosa* (Unit 2) and the succulents *Opuntia ficus-indica* (Unit 3), *Cylindropuntia imbricata* (formerly *Opuntia imbricata*) (Unit 1), the grass *Pennisetum setaceum* (Unit 2) and the forb *Argemone mexicana* (Unit 2) were found to be present.

*Opuntia ficus-indica*, *Cylindropuntia imbricata*, *Pennisetum setaceum* and *Argemone mexicana* are declared category 1 weeds (CARA) and category 1b plants (NEMBA), while *Prosopis glandulosa* a declared category 2 (CARA) and 1b (NEMBA) invader tree. All category 1 plants must be removed and eradicated by the land owner by law, while *Prosopis glandulosa* may not be grown or present on one's property unless a permit is obtained from nature conservation. It is therefore important that these plants are removed from the different vegetation units and that a programme is implemented on a long-term basis to control the spread of these plants.

- No dumping of any materials in undeveloped open areas and neighbouring properties.
- Activities in the surrounding open undeveloped areas (especially the rocky hills and koppies must be strictly regulated and managed.
- It is imperative that the construction activities as well as vegetation clearance are restricted to the powerline servitude. The limitation of the disturbance of vegetation cover within the servitude will ameliorate this impact.

#### *Protection of flora*

- No animals or birds may be fed, disturbed, hunted or trapped. Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harm remaining faunal species.
- No plant material may be removed if not part of identified vegetation clearance.
- Workers must be limited to areas under construction within the corridor and access to the undeveloped areas, especially the surrounding open areas must be strictly regulated ("no-go" areas during construction activities).
- Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area.
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant should be removed from the site to prevent further invasion.
- Contract employees must be educated about the value of wild animals and the importance of their conservation.
- All vegetation not interfering with the operation of the line shall be left undisturbed. This is especially pertinent to the protected Camel Thorn (*Acacia erioloba*). This species may not be removed without permission from the DAFF & Nature Conservation.
- Collection of firewood and traditional medicinal plants is strictly prohibited.
- All alien vegetation should be eradicated along the corridor.
- Remaining indigenous bulbous geophytes should be retained or replanted wherever possible. Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited.

#### *Rehabilitation*

A suitably qualified rehabilitation specialist should be appointed for the commencement of rehabilitation activities. The specialist should identify areas requiring rehabilitation as well as appropriate seed mixes which are required. Photographic records of the servitude and access roads prior to construction activities and after the construction phase will be taken to assess the level of rehabilitation and re-vegetation.

### **FAUNA (MAMMALS, REPTILES AND AMPHIBIANS)**

Disturbance to and/or destruction of habitat and illegal placement of snares could have an impact on fauna breeding, foraging and roosting in or in close proximity of the servitude. Thus it is important that no unnecessary destruction of the habitat takes place during any development/construction phase.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Disturbance / destruction of habitat	Moderate / Low	Local	Short	Possible	Moderate	Low

## Mitigation

### *Mammal management recommendations*

- All large indigenous tree species should be conserved wherever possible as they form important habitat for arboreal mammal species.
- Activities should be restricted away from any rocky hills and outcrops as well as riparian habitats along the non-perennial drainage lines.
- The conservation and correct management of the Vaal and Harts Rivers riparian habitats along the proposed servitudes should ensure the conservation of all remaining suitable habitat for wetland/riverine associated mammals on the site (Cape Clawless Otter).
- No hunting or poaching activities must be allowed along the servitudes during all phase of the project.

### *Reptile management recommendations*

- No rock removal should occur adjacent to the proposed towers. No termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position it should be carefully excavated by hand and pick.
- Any animals rescued or recovered will be relocated in suitable habitat away from the transmission tower and line.
- Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors).
- The removal of indigenous tree species (*Vachelia erioloba*) as well as clearance of the riparian vegetation along the Vaal and Harts Rivers must be kept to the minimum wherever possible.
- Exotic cleared vegetation should form wood piles and logs and stumps. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species. Dead trees and stumps will also be used for nesting purposes by barbets, hoopoes, owls, hornbills as well as perching or hunting platforms for birds like the kingfisher.
- Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project.
- Several venomous snake species occur along the proposed lines including Cape Cobra (*Naja nivea*) and Puff Adder (*Bitis arietans*).
- General avoidance of snakes if the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.
- Appropriate foot wear (sturdy leather boots) should be worn in the field.

### *Amphibian management recommendations*

- Construction activities should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species.
- Ideally the installation of the new towers should be undertaken during the dry winter months (May-September) when the majority of amphibian species are dormant.
- The towers should ideally not be placed in any seasonal wetland habitats and should be positioned outside the temporary wet areas.
- No Giant Bullfrogs must be collected for food or illegal pet trade.
- As a precautionary mitigation measure it is recommended that the developer and construction contractor

as well as an independent environmental control officer (ECO) should be made aware of the possible presence of certain threatened amphibian species (Giant Bullfrog) prior to the commencement of construction.

## AVIFAUNA

### *Displacement due to habitat destruction*

During the construction phase and maintenance of power lines and substations, some habitat destruction and transformation inevitably takes place. This happens with the construction of access roads, the clearing of servitudes and the levelling of substation yards. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line, which can result in electrical flashovers.

These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through transformation of habitat, which could result in temporary or permanent displacement. In the present instance, the risk of displacement of Red Data species due to habitat destruction is likely to be fairly limited, given the nature of the habitat.

### *Displacement due to habitat disturbance*

Apart from direct habitat destruction, the above mentioned construction and maintenance activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. This is a particular concern where the proposed line is situated next to an existing transmission line which contains active raptor nests, e.g. Martial Eagle, Verreaux's Eagle or Tawny Eagle.

### *Collisions*

A significant impact that is foreseen for the proposed Manganore-Ferrum transmission line is collisions with the earth wire of the proposed line. Collisions are probably the biggest single threat posed by transmission lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of water birds. The technical aspects of power line design and siting also play a big part in collision risk. Grouping similar power lines on a common servitude, or locating them along other features such as tree lines, are both approaches thought to reduce risk.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Displacement through disturbance	Moderate	Site	Short	Possible	Moderate	Low
Displacement through habitat destruction	Moderate	Site	Short	Probable	Low	Low
Collisions	Moderate	Regional	Long	Possible	Moderate	Low

## Mitigation

### *Disturbance to and destruction of habitat*

- Disturbance to and killing of birds must be prevented.
- Unnecessary habitat destruction must be avoided.
- The removal of large trees should be avoided if at all possible.
- All dismantling, construction and maintenance activities must be carried out according to best environmental practice principles so as to minimise habitat destruction (see in this respect the Eskom

Environmental Procedure, EPC 32-96). The unnecessary removal of large trees IS not allowed (see also in this respect the Procedure for Vegetation Clearance and Maintenance within Eskom owned land, EPC 32-247).

### *Collisions*

Once the final alignments and tower positions have been selected, the sections of the line that would need the application of Bird Flight Diverters to mitigate for potential collisions should be indicated by the avifaunal specialist by means of a “walk-through” exercise. This exercise should be informed by an analysis of satellite imagery supplemented by on site ground-truthing (physical inspection). The type of Bird Flight Diverter to be used and the marking scheme will be determined during that phase of the project.

### *Existing raptor nests*

The existing lattice structure HV line must be inspected on foot by a suitably experienced ornithologist prior to construction to ascertain if any raptor nests are present. All relevant detail must be recorded i.e. species, structure number, coordinates and nest status. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate cooperation between the ornithologist and the Environmental Control Officer. An effective communication strategy should be implemented whereby the ornithologist is provided with a construction schedule which will enable him/her to ascertain when and where such breeding Red Data species could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.

## **FRESHWATER FEATURES**

### **Impact of the powerline**

- Disturbance / loss of aquatic habitat

#### *Construction Phase*

The installation of new foundation and pole structures could be expected to result in some disturbance of freshwater ecosystem habitat and loss of associated vegetation. Flow & water quality modification as a result of increased erosion and invasive plant growth within disturbed areas could also impact on the effective functioning of the *freshwater aquatic systems*.

#### *Operation Phase*

Some disturbance of the freshwater features in the area of the constructed power line could be expected that would be associated with the maintenance activities for the project.

### **Impact of the access roads**

- Disturbance / loss of aquatic habit
- Flow and water quality modification

#### *Construction Phase*

The major impacts associated with any access roads, should they need to be established, relate to the potential loss of habitat within wetland areas and the streams and drainage channels, invasive alien plant growth, flow and water quality impacts and erosion of river/stream banks and drainage channels.

#### *Operation Phase*

The major impacts associated with the access roads during the operation phase relate to disturbance to the instream and riparian habitat of the freshwater ecosystems along the designated routes.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
<i>Impact of the <u>powerline</u></i> Disturbance / loss of aquatic habitat Construction Phase Operational Phase	Low Low	Site / Local Site	Short Long	Probable Possible	Low Low	Very Low Very Low / None
<i>Impact of the <u>access roads</u></i> Disturbance / loss of aquatic habit Flow and water quality modification Construction Phase Operational Phase	Low Low	Site / Local Site	Short Long	Probable Possible	Moderate / Low Moderate	Very Low Very Low / None
Impact of substation on water features	Moderate	Local	Short	Possible	Moderate	Low

## Mitigation

Where the proposed power lines are located close to freshwater features it is proposed that a buffer of 50m from the centre of the drainage lines and approximately 500m (varies depending on wetland cluster) from the edge of the pans be implemented.

### *Power lines and its structures*

- Construction activities should as far as possible be limited to the sites outside the proposed buffer zones.
- Clearing of debris, sediment and hard rubble associated with the construction activities should be undertaken post construction to ensure that flow within the drainage channels are not impeded or diverted.
- Rehabilitate disturbed stream bed and banks and re-vegetate with suitable indigenous vegetation.
- It is important that any of the cleared areas that are not hardened surfaces are rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants. Invasive alien plants that currently exist within the immediate area of the construction activities should also be removed and any regrowth prevented and managed.
- Erosion should be controlled at all times.
- Conditions as specified in the Water Use License or else the General Authorisation issued by the Department of Water and Sanitation must be met.

### *Access roads*

- The existing road infrastructure should be utilised as far as possible rather than creating new ones in order to minimise the overall disturbance created by the proposed project.
- Where access routes need to be constructed through ephemeral streams, disturbance of the channel should be limited and multiple crossings should not be created.
- Riparian areas should be avoided and any road adjacent to the riparian zone should also remain outside of the applicable buffer zones.
- All crossings over drainage channels or stream beds should be such that the flow within the drainage channel is not impeded.
- Road infrastructure and cable alignments should coincide as much as possible to minimise the impact.
- Any disturbed areas should be rehabilitated to ensure that these areas do not become subject to erosion or invasive alien plant growth. To reduce the risk of erosion, run-off over the exposed areas should be mitigated to reduce the rate and volume of run-off and prevent erosion occurring within the freshwater features and drainage lines.

Contaminated runoff from the construction sites should be prevented from entering the rivers/streams. All materials on the construction sites should be properly stored and contained and disposal of waste from the

sites should also be properly managed. Construction workers should be given ablution facilities at the construction sites that are located at least 50m away from the river/stream systems and regularly serviced.

The establishment of alien vegetation in the riparian zones should specifically be prevented, and controlled if it does occur.

#### *Substation*

No expansion to the existing Ferrum Substation is planned and there appears to be no freshwater constraints associated with the proposed expansion of the Manganore Substation.

### **VISUAL IMPACT**

Visual resource impacts would result from the construction, operation, and maintenance of the proposed 400kV transmission power lines. Impacts would result from the power lines being seen from sensitive viewpoints and from effects to the scenic values of the landscape

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Visual impact	Moderate	Local	Permanent	Definite	Moderate	Moderate

#### **Mitigation**

Mitigation measures to reduce the visual impact of transmission lines are generally difficult and costly after the alignment has been determined. To this end, mitigation measures, including alternative route alignment and specific measures for the mitigation of potential conflict areas are usually proposed for corridor options. Screening measures from sensitive viewing areas are difficult to achieve. Resultantly, there is a severe limitation to the mitigation and the management of power lines other than to avoid conflict situations wherever possible during the planning and public participation process.

To this end and in response to these issues the final alternative route corridor alignments were adjusted to avoid, where possible, conflicts with sensitive landscape and use types (game farms and nature reserves) and residences. The preferred route alignment as proposed in this report is the preferred option from a visual impact perspective.

The significance of impact is predicted to be moderate. A moderate significance of impact is considered to be an impact that is real but not substantial and development in the Route One Corridor can be supported.

### **CULTURAL / HERITAGE**

The fieldwork undertaken revealed three sites that could have cultural heritage significance. All three are within the Route One Corridor. However, it would be easy to avoid these sites. They also are of low cultural significance and may therefore be demolished if necessary. No further action is needed with regards to any of the sites identified during the survey.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Placement of pylons on grave sites	Very high	Local	Permanent	Unlikely	Severe	None
Over-spanning grave sites	High	Local	Long term	Unlikely	Moderate	None

#### **Mitigation**

It should be noted that due to the nature of the subterranean presence of archaeological and/or historical sites, features or artifacts, the possibility to find these during the course of construction work are always real. Care

should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA and the recommended mitigation measures should be included in the Environmental Management Plan.

By not placing the pylon positions on any sites of significance, no further action will be necessary as these sites may be over-spanned. The only exception is graves which may not be over-spanned and for which a 20m buffer zone is recommended. A final walk-down, to inspect pylon positions, is therefore recommended.

## PALAEONTOLOGY

Since none of the rock formations or sediments in the region is potentially fossiliferous, being too old or too young, the proposed project may continue as far as the palaeontology is concerned.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Palaeontology	Low	Local	Medium	Unlikely	Low	None / Low

### Mitigation

If any fossils are discovered during the excavations then it is strongly recommended that the fossils are rescued and a palaeontologist is called to assess their importance and make further recommendations.

## AGRICULTURAL POTENTIAL / AGRICULTURAL ACTIVITIES

Insensitive placement of power lines will have a severe negative impact on current agricultural activities, such as game farming where helicopters are used extensively and agricultural land which is under irrigation.

Incorrect placement could cut through agricultural fields where centre pivot irrigation is being used and will have a severe negative impact since it is not possible to continue with this practise directly underneath power lines.

During the construction period, interference with livestock could also have a negative impact on farming activities.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on agricultural activities	Very High	Local	Permanent	Probable	Moderate / Severe	Low

### Mitigation

Extensive communication with affected landowners took place and the proposed route alignment takes due cognisance of areas where pivot irrigation is being used as well as helicopter flying patterns in the area.

During consultation with land owners it also became apparent that it will be preferred if the proposed power line can be as close as possible to farm boundaries, existing power lines and existing infrastructure such as roads.

Considering the issue of security, access will be easier to control during construction and maintenance phases next to the existing infrastructure, rather than having the line over the middle of properties.

#### *Planning and development with regards to agricultural activities:*

The time of construction activities planned on agricultural land must be negotiated with the farmer to ensure that construction activities do not unnecessarily interfere with agricultural activities such as harvest time.

### Domestic Livestock

- Construction activities must be planned carefully so as not to interfere with the calving and lambing season for most animal species.
- The Contractor's workforce will have to be very careful not to disturb the animals as this may lead to fatalities which will give rise to claims from the Landowners.
- Interference with any wildlife without the applicable permits shall not be allowed.
- The Contractor shall under no circumstances interfere with livestock without the Landowner being present. This includes the moving of livestock where they interfere with construction activities.
- Should the Contractor's workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.
- Speed limits must be restricted especially on dirt roads preventing unnecessary road fatalities of surrounding livestock.

### SOILS / EROSION

Concrete foundations will be made for each pylon and substation and new access roads will be constructed. Vegetation will therefore be cleared and there may be an increase in surface water runoff which could lead to soil erosion.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Erosion	Moderate	Local	Medium	Possible	Moderate	Low

### Mitigation

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969. Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.
- All vehicle movement must be along existing roads or tracks as far as possible.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- The viability of undertaking construction during the dry months of the year should be investigated in order to overcome possible problems caused by excessive moisture.
- Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:
  - Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.
  - It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.
  - Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.
  - Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas.
- If any erosion occurs, rehabilitation must immediately be done.

- All embankments (if any) must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.
- After construction, all temporary access roads should be rehabilitated.
- The site must be rehabilitated and replanted with suitable, indigenous grass to prevent erosion.
- Should any signs of erosion be evident along the access and maintenance roads during the operational phase of the project, remedial action should take place as soon as possible.

## GROUNDWATER

Potential for *groundwater* pollution exists as a result of oil spills, etc. during the construction period

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Groundwater pollution	Moderate	Local	Long / Permanent	Possible	Moderate	Low

### Mitigation

- In all cases, abstraction of water from watercourses for construction purposes will not be allowed. Arrangements must be made prior to construction with the landowners or municipal water must be carted in.
- Under no circumstances must surface or groundwater be polluted.
- Adequate oil containment precautions must be taken.
- If a spill from a construction vehicle occurs it must be reported to ECO with immediate effect. A bio-remediation contractor must be appointed to rehabilitate large oil spills. Small oil spills must be cleaned immediately with an oil spill kit.
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures are in place for vehicles and equipment.
- Servicing of vehicles to be done in designated areas with appropriate spill management procedures in place.
- Ensure that measures to contain spills are readily available on site (spill kits).
- All hazardous substance spills must be reported, recorded and investigated.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into any watercourse.
- Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Drinking water and water for ablution facilities must be provided to all construction workers on the construction site.
- Waste Management
  - General Waste
    - Expected constructed waste (unused steel, conductor cables, cement or concrete) and general waste around the construction site (plastic, tins and paper) may degrade the environment if not disposed in the correct manner.
    - Littering or illegal dumping of any waste material is prohibited.
    - No waste disposal holes may be made on site.
    - Under no circumstances should waste be burnt on site.

- Waste separation should be encouraged for recycling purposes.
- Provision must be made for the collection of all general waste materials. Rubbish bags and bins with lids must be provided at various points within the construction corridor and must be emptied on a regular basis.
- Deposit solid domestic waste in containers and dispose at registered municipal waste disposal sites regularly.
- For all waste that is disposed of, Eskom shall obtain waste manifests and disposal certificates, which shall be recorded and reported to the ECO on a monthly basis.
- Liquid waste (grey water) must be disposed with sewerage.

#### *Construction Waste*

- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.
- Construction waste must be collected and sold for recycling purposes as far as possible.

#### *Sewage*

- Portable ablution facilities must be placed within the construction servitude and must be serviced by registered companies only and on a regular basis. There should be one toilet for every fifteen workers.
- No effluent to be dumped in the veld or any watercourse.
- The use of the open veld for ablution is prohibited.

#### *Hazardous Waste*

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. All these hazardous substances should be disposed of at a H:H registered waste disposal facility.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorised.

## **AIR QUALITY**

Dust created by construction vehicles could impact on air quality during the construction period.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Air quality	Low	Local	Short	Possible	Low	Very Low

### **Mitigation**

- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.

## **NOISE**

Labourers and machinery could result in noise pollution during the construction period.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Noise	Low	Local	Short	Possible	Low	Very Low

### Mitigation

- Should an onsite construction camp be necessary noise made by the workers (i.e. radios) must be limited to early evenings.
- Plan campsites an appropriate distance from any facility where it can cause a nuisance.
- Construction vehicles must be serviced on a regular basis to ensure unnecessary noise is not emitted due to poor vehicle performance.
- Eskom shall provide all necessary equipment with standard silencers and maintain silencer units on vehicles where required. Equipment must always be in good working order to minimise unnecessary noise levels.

### COMMUNITY

An influx of workers could result in an increased risk for crime and safety.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Community	Low	Local	Short	Possible	Low	Very Low

### Mitigation

- Construction workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to the ECO and repaired and to a state prior to the damage to the written satisfaction of the landowner and ECO.
- Removal of agricultural products is prohibited.
- No firewood may be collected.
- No open fires are to be made on private property.
- In order to prevent and/or minimise crime, it is required that all construction workers be supplied with controlled serviced accommodation or be supplied with daily transport to and from the site.
- No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners.
- All adjacent landowners have to be informed of the blasting programme (if applicable) prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented. Blasting may only be undertaken by specialists in the field and should be limited to small localised areas. All relevant legislation must be adhered to.
- All contractors and construction workers will be issued with temporary permits to enter the property.
- All construction workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours.
- Secure accommodation facilities must be provided for guarding personnel.
- Supervision of labourers must at all times take place.
- Construction hours will be restricted to specific periods that exclude Sundays and public holidays.
- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.
- All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them.

## IMPACT EVALUATION: ROUTE TWO CORRIDOR (ALTERNATIVE)

Impacts as described above also apply to Route Two Corridor (Alternative), with additional impacts as described below. Please note that the specialist studies all concluded that there will be very little impact difference between the alternative routes and that, from their respective fields and proposed mitigation measures in place, both alternatives could be supported.

## IMPACT ON MINING ACTIVITIES

The pylon structures will have a severe negative impact on current and planned mining activities within this route corridor.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on agricultural activities	Very High	Regional / National	Permanent	Probable	Moderate / Severe	Low

### Mitigation

Route One Corridor, the preferred route alignment, will have a far less impact on mining activities than the other alternatives assessed.

## 6.2.2 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.

## 6.3 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) was compiled and is included as Appendix F in this EIR. The implementation of the EMP will form part of the conditions of the Environmental Authorisation should the project be approved. It is therefore important that the mitigatory measures and site-specific requirements as identified during the entire Environmental Impact Assessment process are correctly reflected in the document.

The main objectives of the EMP are to ensure that

- mitigation measures are identified and implemented to avoid and/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 are supplied for the following phases of project development:

- Design & Pre-construction Phase
- Construction Phase
- Operational Phase

## CHAPTER 7: CONCLUSION

### 7.1 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 is included in Appendix G of the EIR.

The Draft EIR was also presented for legal review and the assessment letter is included in Appendix G. The review concluded as follows: "...we are respectfully of the view that the draft EIA adheres to the requirements of Section 31 of the Regulations".

### 7.2 RECOMMENDATIONS BY THE EAP

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

- All reasonable actions were taken to identify any relevant environmental components in the study area.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area and potentially sensitive areas and issues of concern and impact 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. Extensive, continuous and significant communication with the I&AP's took place.
- The Environmental Impact Report includes all proceedings, findings and recommendations from both the Scoping Phase and EIR Phase.
- All relevant legal requirement in terms of the EIR 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 were complied with.

The EAP can without reservation recommend this Environmental Impact Report for Environmental Authorisation by the Department of Environmental Affairs (DEA).

It is recommended that the following are included in the Environmental Authorisation:

- The implementation of the Environmental Management Plan is a condition of authorisation.
- A route corridor width of 2km is approved for the Route One Corridor (Preferred Route). The 55m servitude required by Eskom should be determined in cooperation with the directly affected landowners to accommodate site-specific requirement.
- A Route Walk-down with the Eskom Engineers, the Bird Impact Specialist, the Ecologist, the Freshwater Specialist and the Archaeologist must be undertaken once the draft positions of the pylons had been identified.

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