ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PROPOSED MOKOPANE INTEGRATION PROJECT

LIMPOPO PROVINCE

(DEA Ref No: 12/12/20/1187)

FINAL REPORT

June 2010

Prepared for:

Eskom Holdings Ltd
Eskom Transmission
PO Box 1091
Johannesburg
2000

Prepared by:

Savannah Environmental Pty Ltd

UNIT 606, 1410 EGLIN OFFICE PARK
14 EGLIN ROAD, SUNNINGHILL, GAUTENG
PO BOX 148, SUNNINGHILL, 2157
TEL: +27 (0)11 234 6621
FAX: +27 (0)86 684 0547
E-MAIL: INFO@SAVANNAHSA.COM
WWW.SAVANNAHSA.COM

PROJECT DETAILS

DEA Reference No.	:	12/12/20/1187
Title	:	Environmental Impact Assessment Process Final Environmental Impact Assessment (EIA) Report for the Proposed Mokopane Integration Project Limpopo Province
Authors	:	Savannah Environmental (Pty) Ltd Jo-Anne Thomas John von Mayer
Sub-consultants	:	Bathusi Environmental Consultants ARC: Institute for Soil, Climate and Water Endangered Wildlife Trust (EWT) Julius Pistorius MetroGIS MasterQ ILISO Consulting
Client	:	Eskom Holdings Limited (Eskom Transmission)
Report Status	:	Final EIA Report for Authority Review
Date	:	June 2010

When used as a reference this report should be cited as: Savannah Environmental (2008) Final EIA Report for the Proposed Mokopane Integration Project, Limpopo Province

PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Savannah Environmental (Pty) Ltd has been appointed by Eskom Transmission (a division of Eskom Holdings Limited), as independent environmental consultants to undertake the required Environmental Impact Assessment (EIA) process for the proposed **Mokopane Integration Project**. This project is proposed to include the construction of the following components:

» A **new transmission substation** on a site near Mokopane.
» **Two 400kV transmission power lines** running in parallel, looping in and out of one of the existing Matimba-Witkop 400kV transmission lines (i.e. two lines in parallel for a maximum distance of 1 km) in order to integrate the new substation into the transmission system or grid.
» **Two new 400kV transmission power lines in parallel** between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  * A new 400kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km); and
  * a new 400kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km).
  * A new 400kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).
» **Associated infrastructure** to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing Witkop substation site).

This project is required in order to evacuate the power from the new Medupi Power Station (near Lephalale), to support the upsurge in demand for the Platinum group metals in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area.

The EIA process is being undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998). This EIA Report represents the outcome of the EIA Phase of the EIA process and contains the following sections:

» **Chapter 1** provides background to the proposed Mokopane Integration project and the environmental impact assessment process
» **Chapter 2** provides an overview of the proposed project
» **Chapter 3** outlines the process which was followed during the EIA Phase of the EIA process

» **Chapter 4** provides a description of the environment which may be potentially affected by the proposed transmission power lines
» **Chapter 5** provides a description of the environment which may be potentially affected by the proposed substation and turn-in lines
» **Chapter 6** provides an assessment of the potential issues associated with the proposed substation and comparatively assesses the identified alternative substation sites
» **Chapter 7** provides an assessment of the potential issues associated with the proposed power lines and comparatively assesses the identified alternative corridors
» **Chapter 8** presents the conclusions and recommendations of the EIA and an Impact Statement

References and data sources used in the compilation of this report are contained within Chapter 9 as well as within the specialist reports included in Appendices F - K.

The Scoping Phase of the EIA process identified and described potential issues associated with the proposed project, and defined the extent of the studies required within the EIA Phase. The EIA Phase addresses those identified potential environmental impacts and benefits associated with all phases of the project including design, construction and operation, and comparatively assesses the identified feasible alternative substation sites and transmission power line corridors. A preferred substation site and transmission power line corridor is nominated for consideration by the decision-making authorities, an appropriate mitigation measures are recommended for potentially significant environmental impacts. The EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The public consultation process has been on-going throughout the EIA process. A draft EIA Report was made available for public comment in November 2009. During the review period of this draft report, it was requested by the stakeholders and interested and affected parties that a deviation to Corridor 8 in the central portion of the study area where technical constraints were identified be investigated as part of the EIA process. A proposed deviation corridor has been assessed within this revised EIA Report. The conclusions and recommendations of the assessment of all alternatives identified and investigated as part of the EIA process were presented in a Revised Draft EIA Report. This report was made available for public comment from 19 May to 17 June 2010 at the following public venues:

Lephalale Library – corner of Joe Slovo and Douwater Street	Agri Lephalale Offices – 6A Jacobus Street

Marken Farmers Hall	Vaalwater Agric Association – NTK Building, Meule Street
Waterberg District Municipality Offices, Modimolle	Potgietersrus DLU, Mokopane
Polokwane Municipality – Environmental Management Office	Polokwane Library – Hans van Rensburg Street
www.eskom.co.za/eia	www.savannahSA.com

The release of this revised draft EIA Report provided stakeholders with an opportunity to verify that the issues they had raised through the process had been captured and adequately considered within the study. This **Final EIA Report** incorporates all issues and responses received during the review period of the draft report prior to submission to the National Department of Environmental Affairs (DEA) for review and decision-making.

SUMMARY

Background and Project Overview

Eskom, as the primary supplier of electricity in South Africa, is currently responding to the growing electricity demand and predicted future demand within South Africa through the establishment of new generation and transmission capacity in South Africa.

Eskom uses a modelling tool called Integrated Strategic Electricity Planning (ISEP) to plan its future capacity strategy. By analysing usage patterns and growth trends in the economy, and matching these with the performance features of various generation technologies and demand side management options, ISEP identifies the timing, quantity and type (base load or peaking) of new generation capacity options required in the long-term (i.e. over the next 15–20 years). These options include the return-to-service of the three mothballed coal-fired Simunye Power Stations (i.e. Camden, Komati and Grootvlei), the establishment of new coal fired power plants, pumped storage schemes, gas-fired power plants, nuclear plants, renewable energy technologies (mainly wind and solar projects), and import options within the Southern African Power Pool. As the older Eskom power plants reach the end of their design life from approximately 2025 onwards, the use of all available technologies will need to be exploited to replace these in order to supply the country's growing electricity demand.

As part of its capacity expansion programme, Eskom is currently constructing the new Medupi coal-fired power station, in the Lephalale area of the Limpopo Province. In order to integrate this power station into the electricity transmission grid, Eskom Transmission is considering linkages to various points within the electricity transmission system. In addition, in order to support the upsurge in demand for the platinum group metals in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area, Eskom Transmission is therefore proposing the development and implementation of the Mokopane Integration project. This proposed project includes the construction of the following:

- » A new 132/400kV transmission substation on a site near Mokopane.
- » Two 400kV transmission power lines running in parallel, looping in and out of one of the existing Matimba-Witkop 400kV transmission lines (i.e. two lines in parallel for a maximum distance of 1 km) in order to integrate the new substation into the transmission system or grid.
- » Two new 400kV transmission power lines in parallel between the Delta Substation (a new substation to be located near the Medupi Power Station) and the

existing Witkop Substation (near Polokwane), as follows:

* A new 400kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km);
* a new 400kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km); and
* A new 400kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).

» Associated infrastructure to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing Witkop substation site).

Currently the existing Witkop Substation close to Polokwane is the only nodal point within the broader Polokwane area that supports the Platinum group metals' load growth and the associated electricity demand. The load forecast for this group, growth in population and new developments indicated a load shift towards the Mokopane area, which cannot be supplied from the Witkop substation alone as a result of thermal, voltage stability and spatial constraints. Therefore, Eskom is proposing the construction of a new 400/132kV substation in the Mokopane area.

Project Alternatives

From the scoping study, the following preferred alternatives were nominated for consideration in the EIA phase of the study:

» **Substation**
From a technical perspective, substation site Option 2 is not considered as a preferred site due to a watercourse partly traversing the site, as well as the presence of a rock outcrop. This option is therefore excluded as an option for further investigation on the basis of technical feasibility. Therefore, **Site Option 1** (Doornfontein 721 LS), **Site Option 3** (Zuid Holland), and **Site Option 4** (Noord Braband) will be investigated in further detailed within the EIA phase of the EIA process (refer to Figure 1).

» **Transmission power line corridors**
The Scoping Report concluded that all identified power line corridor alternatives should be investigated in detail in the EIA phase of the process (i.e. Corridors 1, 2 and 3, as well as the corridor of following the existing Matimba-Witkop lines (corridor 8)). However, following the submission of the final Scoping Report to DEA, it was

confirmed by Eskom that Corridor 3 was not considered feasible from a technical perspective. Therefore, it was agreed with DEA that this alternative will not be considered in detail in the EIA phase of the process. However, DEA does require that the rationale for not considering this alternative in detail in the EIA Phase be adequately detailed in the EIA Report such that stakeholders and I&APs can provide comment on this rationale.

A draft EIA Report was made available for public comment in November 2009. During the review period of this draft report, it was requested by the stakeholders and interested and affected parties that a deviation to Corridor 8 in the central portion of the study area where technical constraints were identified be investigated as part of the EIA process.

Alternatives to be assessed in the EIA phase, therefore, include **Corridors 1 and 2**, as well as the **alternative of following the existing Matimba-Witkop lines (corridor 8)** and a deviation to this corridor (**deviation to corridor 8**). In addition, **transmission power line corridors 4, 5, 6 and 7** are to be assessed (refer to Figure 2).

These are the alternatives which are assessed within this EIA Report.

Environmental Impact Assessment

The proposed Mokopane Integration Project is subject to the requirements of the EIA Regulations published in GN 28753 of 21 April 2006, in terms of Section 24(5) of the National Environmental Management Act (NEMA, No 107 of 1998). In terms of sections 24 and 24D of NEMA, as read with GNs R385 (Regulations 27–36) and R387, a Scoping and EIA are required to be undertaken for this proposed project.

The National Department of Environmental Affairs (DEA) is the competent authority for this project as Eskom is a statutory body. An application for authorisation has been accepted by DEA (under Application Reference number **12/12/20/1187**). Through the decision-making process, the DEA will be supported by the Limpopo Department of Economic Development, Environment and Tourism (DEDET) as the commenting authority.

A comprehensive public participation process was undertaken in accordance with Regulation 56 of Government Notice No R385 of 2006 during the Scoping phase of this EIA process.

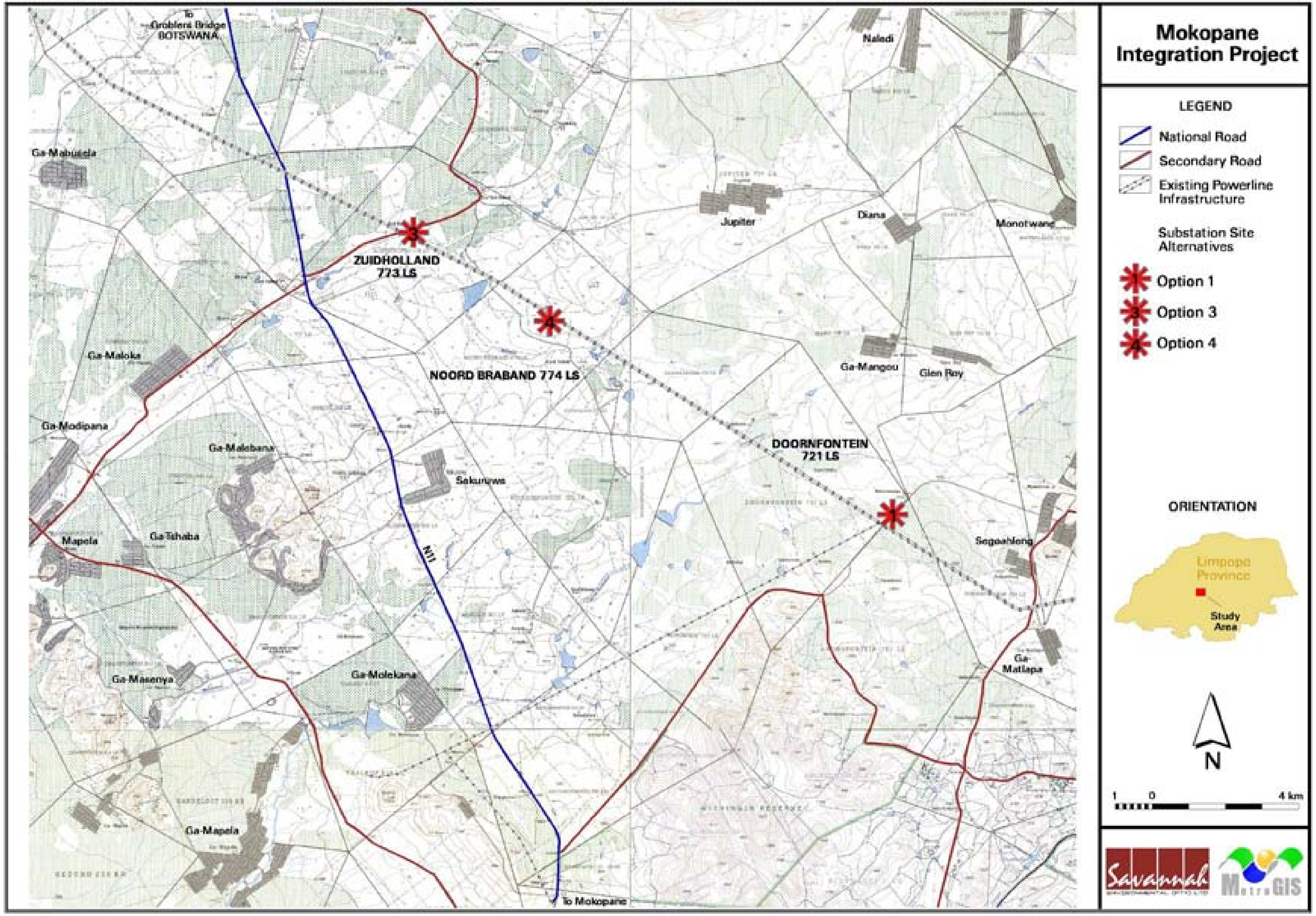

Figure 1: Alternative substation sites nominated for detailed investigation in the EIA phase of the process

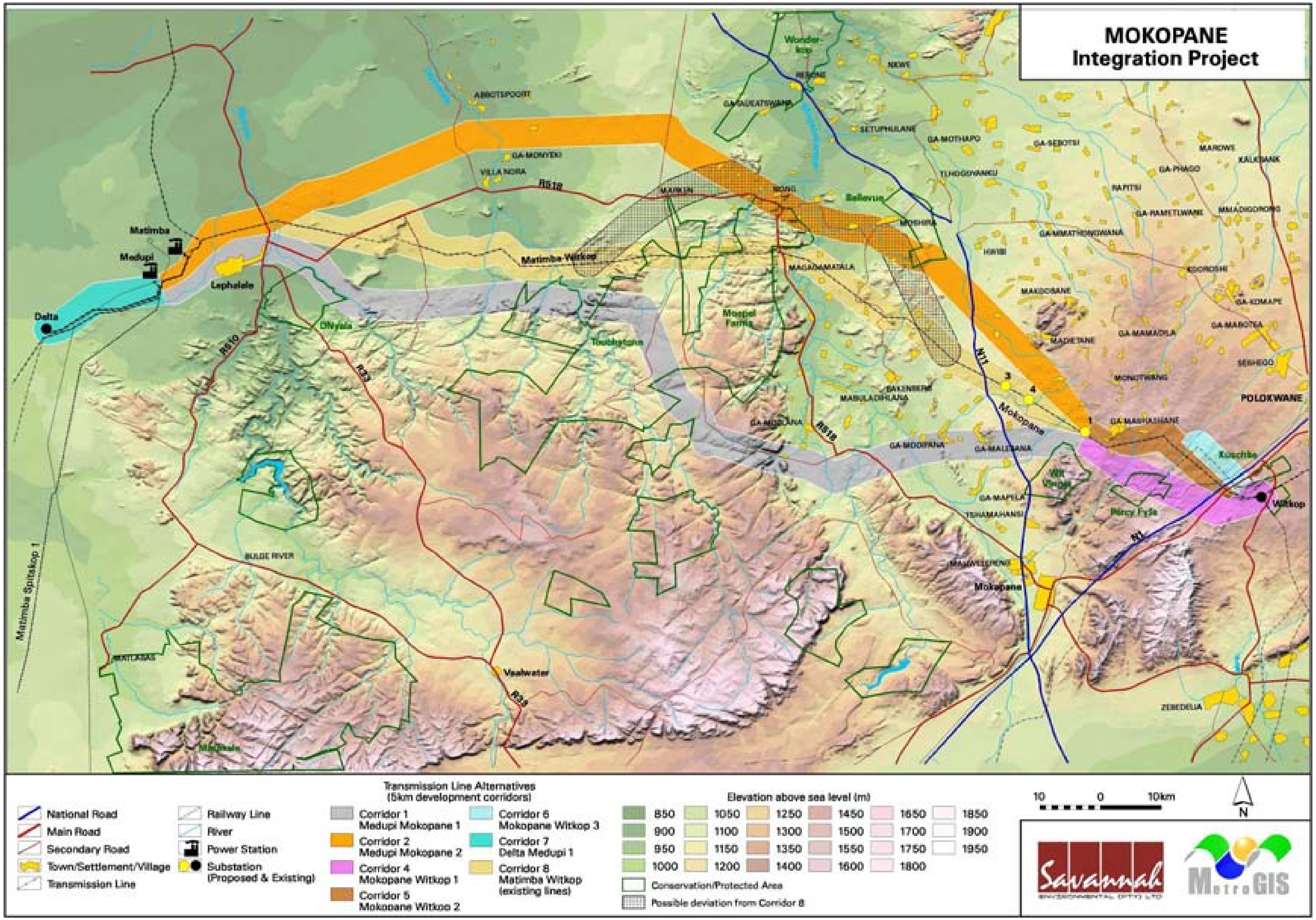

Figure 2: Alternative power line development corridors nominated for detailed assessment within the EIA phase of the process (corridors are 5 km in width)

This public participation process comprised the following:

» **Notification of the EIA Process** in the printed media and on site, as well as through written notification to identified stakeholders affected landowners
» **Identification and registration** of I&APs and key stakeholders.
» Compilation and distribution of a **Background Information Document** (BID) to all identified I&APs and key stakeholders
» **On-going consultation** with identified I&APs and stakeholders
» **Focus Group Meetings and Community Meetings** throughout the EIA process
» Compilation and maintenance of a **database** containing the names and addresses of all registered parties
» Preparation of a **Comments and Response Report** detailing key issues raised by I&APs as part of the EIA Process.
» Providing opportunities for **review of EIA reporting documentation** throughout the process in accordance with the requirements of the EIA regulations

Evaluation of Project Alternatives – Substation Site and turn-in Lines

In summary, the following conclusions can be drawn regarding preferred substation options and associated turn-in lines for further investigation in the EIA phase:

» Substation Site Option 1 has the lowest ecological sensitivity (moderate sensitivity) from a terrestrial fauna and flora perspective.
» Substation Site Option 1 is transformed compared to substation Site Options 3 and 4, and is therefore considered to be the preferred alternative from an avifaunal perspective.
» Substation Site 4 is preferred from an agricultural potential (soils) perspective.
» Substation Site Option 4 is the furthest removed from sensitive visual receptors.
» No heritage resources with outstanding significance were observed near any of the three substation site options.
» From a social perspective:
    * In terms of access roads, there is no preferred site.
    * Due to its distance from existing settlements, Site Option 4 is preferred. It is also possible to avoid settlements and not affect their development.

From an integration of the findings of the specialist studies, as well as from the conclusions & recommendations of the specialist workshop held in the EIA phase, Site Options 1 and 4 are both considered suitable locations for the proposed substation. **Substation Site Option 4** and associated turn-in lines is nominated as the preferred option, largely due to the lower potential social and visual impacts.

Evaluation of Project Alternatives - Transmission Power Line Corridors: Medupi Power Station to the Proposed Mokopane Substation (Corridors 1, 2 and 8)

» In terms of impacts on biodiversity, **Corridor 2** is regarded as the least sensitive in terms of ecological attributes and is therefore recommended. Corridor 8 Deviation is regarded as the second preferred with a moderate ecological sensitivity.

» In terms of Agricultural Potential the preferred route would be the **Corridor 1** (potentially fewer high potential soils) followed by the existing Matimba-Witkop corridor (Corridor 8).

» **Corridor 8 Deviation** is considered to hold the least risk from a bird-interaction perspective, provided that deviations indicated in Figure 7.2 are:
  * the only areas where the proposed lines will deviate from the existing lines
  * the deviation distances are kept short and
  * the deviations denoted in Figure 7.2 of this report are still located within the 5km corridor that was originally assessed during the EIA phase of the project.

  The proposed Medupi-Mokopane power lines alongside the nature reserve indicated in Figure 7.2 cannot be placed anywhere within the 5 km corridor. It is highly recommended that the proposed line be placed to the north of the existing lines, on the outer side of reserve's northern boundary as indicated in Chapter 7, Figure 7.3.

» The Visual Impact Assessment indicated a marginal mathematical preference for **Corridor 8 Deviation and Corridor 2** over Corridor 1 and 8. Corridor 2 however has a low potential to consolidate the visual impact of linear infrastructure within the region. Corridor 8 (utilising the proposed deviation) has a higher potential to succeed should this principle be followed in order to prevent the spreading of power line infrastructure across the region. The true benefit of this visual impact mitigation measure will only be achieved if the additional lines are placed directly parallel to the existing lines. **Alternative 8 Deviation** is therefore preferred from a visual perspective.

» From a heritage perspective, construction of the proposed power lines within **Corridor 2 or Corridor 8 Deviation** will affect the lowest number of heritage resources, the least types and ranges of heritage resources, as well as no outstanding significant heritage resources. Corridor 08 Deviation will be required to be constructed to the north of Tafelkoppe and Ga Mabula (along the R518) in order to avoid impacting on significant heritage resources in these areas.

» From a Social perspective, **Corridor 8** followed by **Corridor 2** are expected to have lower impacts on the social environment. Corridor 8 should follow the existing line without deviation, except for the alternative around Tafelkop and the deviation where it joins Corridor 2 for some distance (i.e. **Corridor 8 Deviation**).

» From an economic perspective, Corridor 8 or Corridor 8 Deviation are expected to have lower impacts.

From the conclusions of the specialist studies undertaken it was concluded that Corridor 1 is not preferred and development within this corridor should be avoided. The majority of specialist studies nominate Corridor 8 Deviation as the preferred alternative, while all specialist studies consider this alternative as acceptable for development. Therefore, **Corridor 8 Deviation** is nominated as the preferred alternative for the construction of the proposed 400kV power lines between the Medupi Power Station and the proposed Mokopane Substation. However, it is considered vital that construction of the power line within this corridor take the recommended conditions identified by the specialist studies into account. In addition, should the project be authorised by DEA, the final routing of the power lines within this corridor should be undertaken in consultation with the affected landowners and the following specialists:

» Biodiversity specialist
» Avifauna specialist
» Heritage specialist

In addition, once the final transmission power line alignment has been negotiated and the tower positions surveyed and pegged, a walk-though survey must be undertaken by these specialists in order to minimise potential environmental impacts associated with the proposed project.

Evaluation of Project Alternatives – Transmission Power Line Corridors: Proposed Mokopane Substation to the Existing Witkop Substation (Corridors 4, 5 and 6)

» In terms of impacts on biodiversity, **Corridor 5** is regarded as the least sensitive in terms of ecological attributes and is therefore recommended. Corridor 6 is the second preferred option in this regard.

» In terms of Agricultural Potential, there is **no preference** for any of the Mokopane – Witkop corridors based on soils.

» **Corridor 6** presents itself as the preferred alternative in terms of avifauna. This is directly attributed to the presence of an existing transmission line within the corridor. This placement of the proposed Mokopane-Witkop 400kV power line within this corridor will partially mitigate for all of the impacts on avifauna.

» The Visual Impact Assessment indicated that both Corridor 5 and 6 will follow existing power line infrastructure, but Corridor 4 will increase the length of the alignment by 2km. The preferred development corridor for the proposed Mokopane substation to Witkop substation section is therefore **Corridor 5**.

» **Corridor 5** is the preferred corridor from a social perspective.

The majority of specialists nominated Corridor 5 as the preferred alternative. From the conclusions of the specialist workshop undertaken, it was concluded that Corridor 4 is not preferred and development within this corridor should be avoided. **Corridor 5** was nominated as the preferred alternative from a holistic environmental perspective. However, it is considered vital that construction of the power line within this corridor take the recommended conditions identified by the specialist studies into account. The final routing of the power lines within this corridor should be undertaken in consultation with the affected landowners and the following specialists:

» Biodiversity specialist
» Avifauna specialist
» Heritage specialist

Evaluation of Project Alternatives – Transmission Power Line Corridors: Delta – Medupi (Corridor 7)

» No significantly sensitive faunal habitat or outstanding landscape features were observed within this corridor.
» Impacts on avifauna are considered to be relatively low in contrast with the larger Medupi-Mokopane and Mokopane-Witkop corridors and can be mitigated where necessary.
» Corridor 7, from Delta substation, should follow the existing lines in the corridor to consolidate the impact on sense of place
» No significant environmental impacts are expected to be associated with Corridor 7.

Conclusions and Recommendations

Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the construction and operation of the substation and transmission power lines, the findings of the EIA, and the understanding of the significance level of potential environmental impacts, it is the opinion of the EIA project team that the application for the proposed Mokopane Integration Project be authorised by the DEA to include the following (refer to Figures 3 and 4):

» Construction of the new **substation** at proposed **Site Option 4**.
» Construction of **two new 400kV transmission power lines in parallel** between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  * Within **Corridor 7** and **Corridor 8 Deviation** between the Delta Substation and the new Mokopane Substation.
  * Within **Corridor 5** between the new Mokopane Substation and the Witkop Substation.
» **Associated works** to integrate the proposed new substation and transmission power lines into Eskom's electricity Transmission grid.

The following conditions of this recommendation must be included within the authorisation issued:

» All mitigation measures detailed within this report and the specialist report contained within Appendices F to K must be implemented.
» The draft Environmental Management Plan (EMP) as contained within Appendix N of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed Mokopane Integration Project, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
» Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site and disturbance of protected vegetation.
» An ornithologist must identify the exact power line spans requiring marking in order to minimise the risk of collision of birds with the earth wire. Recommendations must be made regarding the installation of Bird Guards on all self-supporting towers according to the existing Eskom guidelines. This will prevent birds from perching in high risk areas on the towers directly above live conductors. It is likely that extensive marking will be required within Corridor 2 owing to the open nature of the vegetation and its ability to support the large terrestrial bird species recorded in the area.
» Avoid construction in the no go areas within Corridor 2 (Refer to Section 7.3 of this report, Figures 7.4 – 7.9).
» An ecological specialist must conduct a final walkthrough

before construction in order to identify and relocate any possible plant species of conservation importance.

» A heritage specialist must conduct a final walkthrough before construction in order to identify any important heritage resources. Transmission lines can be rerouted or realigned in order to avoid heritage sites and heritage resources can be conserved unaffected underneath power lines.
» The EMP for construction must be updated to include site-specific information and specifications resulting from the final walk-though surveys. This EMP must be submitted to DEA for approval prior to the commencement of construction.
» The transmission line towers should, in spatially constrained sections of the development corridors (i.e. in built-up areas), consist of monopole structures that are less bulky (albeit slightly taller) and less visually intrusive than conventional power line towers. Where space and technical considerations permit, the utilisation of cross rope suspension tower structures is recommended above the conventional self supporting strain towers that are more obtrusive.
» During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum.
» It is highly recommended that Eskom investigates the general use of wide service corridors between all major power generation areas that can accommodate further development in the future in order to avoid the "spider web" effect often associated with short term focused planning of economic development.
» Finally, to ensure that social impacts are mitigated during construction and operation it is recommended that the following be implemented and monitored by a Social Engagement Officer:
  * A Social Management Plan during construction and operation;
  * A social Impact Assessment during construction and operation;
  * A Local Labour and Workforce Plan;
  * An Influx Management Plan;
  * A Decommissioning and Closure Plan;
  * A Grievances Mechanism for the construction and operational phases; and
  * A Stakeholder Engagement and Education plan for construction and operation.

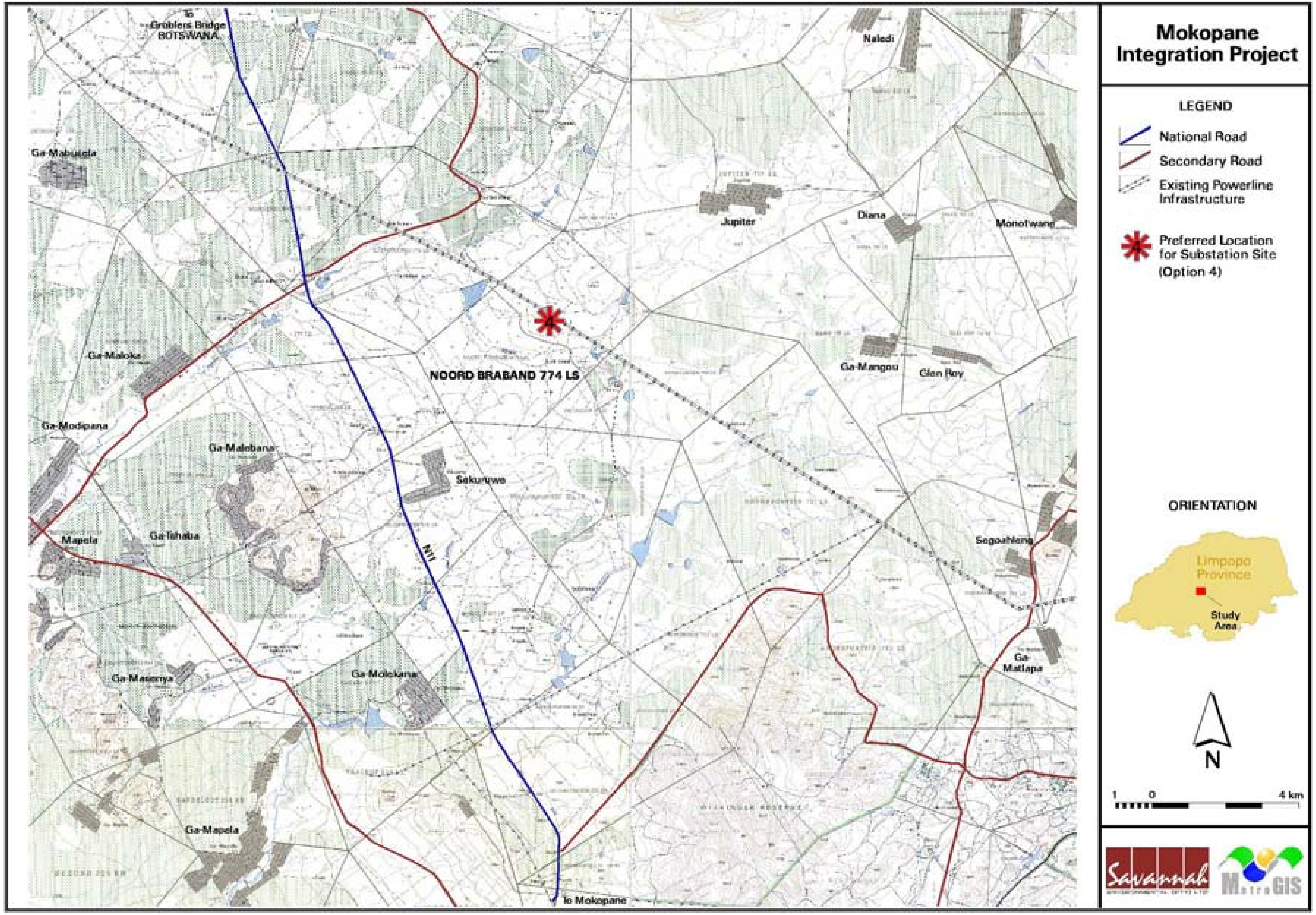

Figure 3: Nominated preferred alternative for the proposed Mokopane Substation

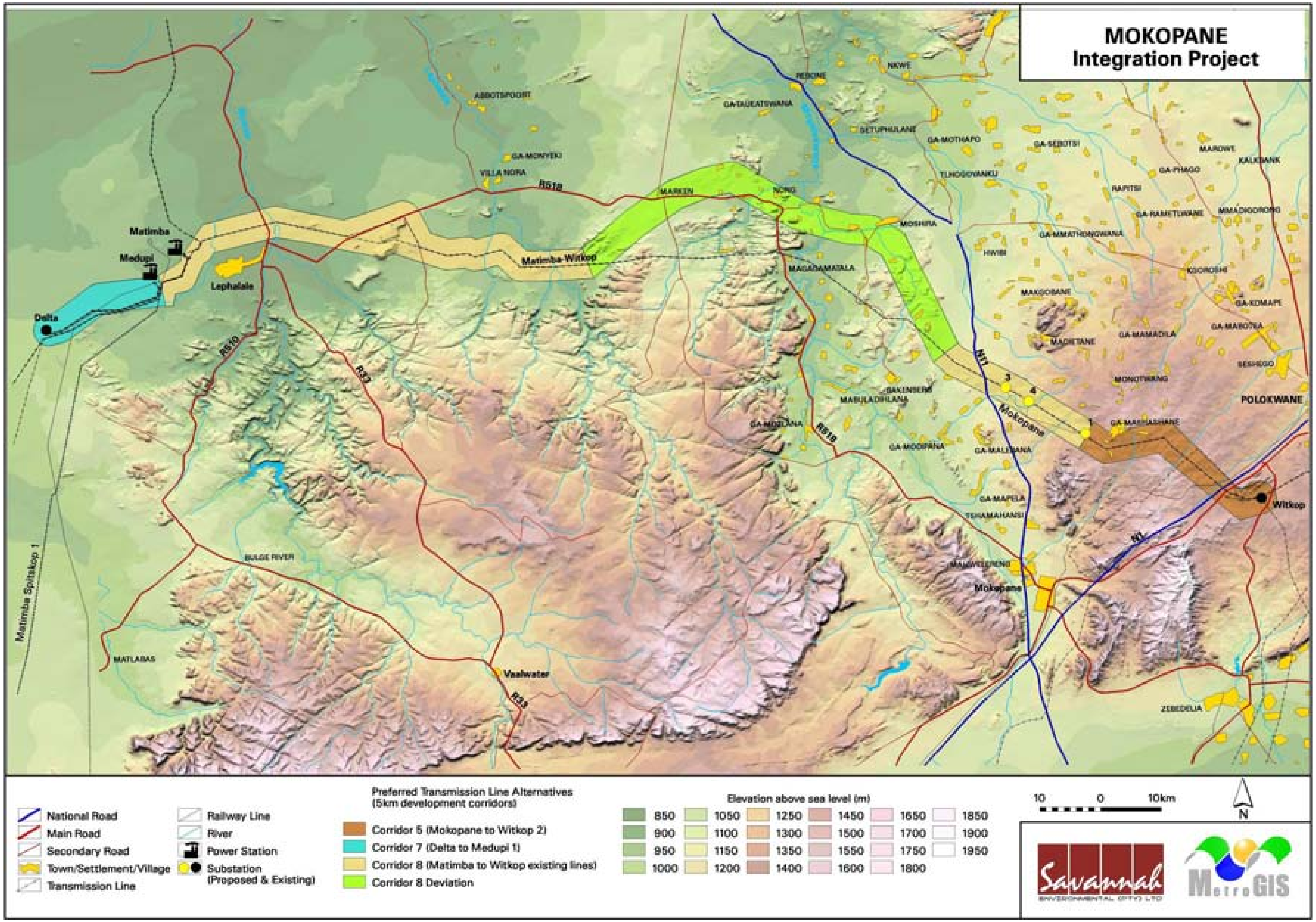

Figure 4: Nominated preferred alternative transmission line corridors for the proposed Mokopane Integration Project

TABLE OF CONTENTS

PAGE

APPENDICES

ABBREVIATIONS AND ACRONYMS

AC	Alternating Current
BID	Background Information Document
CAA	Civil Aviation Authority
CARA	Conservation of Agricultural Resources Act
DEA	National Department of Environmental Affairs (Formally DEAT)
DEAT	National Department of Environmental Affairs and Tourism
DEDET	Limpopo Department of Economic Development, Environment and Tourism
DFA	Development Facilitation Act
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EWT	Endangered Wildlife Trust
GDP	Gross Domestic Product
GG	Government Gazette
GGP	Gross Geographical Product
GN	Government Notice
GPS	Geographic Positioning System
HIV	Human Immuno-deficiency virus
I&AP	Interested and Affected Party
ICNIRP	International Commission for Non-Ionising Radiation Protection
IDP	Integrated Development Plan
ISEP	Integrated Strategic Electricity Planning
kV	Kilovolt
LED	Local Economic Development
LIHRA	Limpopo Heritage Resources Agency
LP	Limpopo Province
LPGDS	Limpopo Provincial Growth and Development Strategy
MW	Mega Watt
NEMA	National Environmental Management Act (No 107 of 1998)
NEMBA	National Environmental Management and Biodiversity Act (No 10, 2004)
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (No 25 of 1999)
OHS	Occupational Health and Safety
PAC	Protected Areas Act
PAJA	Promotion of Administrative Justice Act (No 2 of 2000)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SEIA	Socio-economic Impact Assessment
SIA	Social Impact Assessment
STD	Sexually Transmitted Disease

UNESCO	United Nations' Education, Scientific and Cultural Organisation
WDM	Waterberg District Municipality
WHO	World Health Organisation

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Biome: Any major ecological community of organisms, usually characterized by a dominant vegetation type.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Do nothing alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystems: Include living (e.g. plants, animals) and non-living (e.g. minerals, soil, water) components, which can be defined in terms of distinguishing characteristics (e.g. a wetland ecosystem, a freshwater ecosystem, a terrestrial ecosystem, a forest ecosystem, etc.).

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Endemic or range-restricted species or ecosystem: One whose distribution is confined to a particular and often very limited geographical region.

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

i. the land, water and atmosphere of the earth;
ii. micro-organisms, plant and animal life;
iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management plan: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Habitat: The place or type of site where an organism or population naturally occurs.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indigenous: Native to a particular area.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and Affected Party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

Irreplaceable loss: When it results in the loss of a resource without substitute, and which cannot be replaced. An impact leading to irreplaceable loss of biodiversity is, by definition, irreversible.

Natural resources: Include living and non-living materials that can be exploited or used by people. Natural resources form part of ecosystems, and our living natural resources contribute to biodiversity. Some people use 'natural resources' to mean the same thing as biodiversity or ecosystem services.

Precautionary Principle: States that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Protected area: As defined by National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003).

Protected species or ecosystem: One that is protected by law from particular activities and land uses.

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".

Red Data Book' or 'Red List': Provides information on threatened species.

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Species: A group of plants, animals, micro-organisms or other living organisms that are morphologically similar; that share inheritance from common ancestry; or whose genes are so similar that they can breed together and produce fertile offspring.

Sustainable development: Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations, or improving the quality of human life while living within the carrying capacity of supporting ecosystems.

Threatened species or ecosystem: Species/ Ecosystems that are at risk of going extinct in its natural range. It may be 'critically endangered' at extremely high risk, 'endangered' at very high risk, or 'vulnerable' at high risk. Species or ecosystems at low or no risk are not 'threatened', and fall into the 'Near Threatened' or 'Least Concern' categories.

INTRODUCTION CHAPTER 1

Savannah Environmental (Pty) Ltd has been appointed by Eskom transmission (a division of Eskom Holdings Limited), as independent environmental consultants to undertake the required Environmental Impact Assessment (EIA) process for the proposed **Mokopane Integration Project**. This project is proposed to include the construction of the following components:

» A **new transmission substation** on a site near Mokopane.
» **Two 400kV transmission power lines** running in parallel, looping in and out of one of the existing Matimba-Witkop 400kV transmission lines (i.e. two lines in parallel for a maximum distance of 1 km) in order to integrate the new substation into the transmission system or grid.
» **Two new 400kV transmission power lines in parallel** between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  * A new 400kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km);
  * a new 400kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km); and
  * A new 400kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).
» **Associated infrastructure** to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing Witkop substation site).

This project is required in order to evacuate the power from the new Medupi Power Station (near Lephalale), to support the upsurge in demand for the Platinum group metals in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area.

The environmental impacts of the proposed project have been investigated in detail throughout the EIA process. The need for the proposed project, the nature and extent of the proposed development as well as potential environmental impacts associated with the construction and operation of a development of this nature is explored in this Environmental Impact Assessment (EIA) Report. The EIA Report consists of the following chapters:

» **Chapter 1** provides background to the proposed Mokopane Integration project and the environmental impact assessment process
» **Chapter 2** provides an overview of the proposed project
» **Chapter 3** outlines the process which was followed during the EIA Phase of the EIA process
» **Chapter 4** provides a description of the environment which may be potentially affected by the proposed transmission power lines
» **Chapter 5** provides a description of the environment which may be potentially affected by the proposed substation and turn-in lines
» **Chapter 6** provides an assessment of the potential issues associated with the proposed substation and comparatively assesses the identified alternative substation sites
» **Chapter 7** provides an assessment of the potential issues associated with the proposed power lines and comparatively assesses the identified alternative corridors
» **Chapter 8** presents the conclusions and recommendations of the EIA and an Impact Statement

References and data sources used in the compilation of this report are contained within Chapter 9 as well as within the specialist reports included in Appendices F - K.

1.1. Project Background and Rationale

Eskom Holdings Ltd (Eskom) is responsible for the provision of reliable and affordable power to its consumers in South Africa. Electricity by its nature cannot be readily or inexpensively stored and, therefore, must be used as it is generated. Electricity must, therefore, be efficiently transmitted from the point of generation to the end-user.

The Generation Pool is concentrated in the Mpumalanga province, with about 50% of the total generation originating from there; this is due to the abundance of coal in the region. Other provinces with significant generation are Limpopo, KwaZulu-Natal and the Western Cape. Transmission of the power generated at these power stations to Eskom's transmission substations is via thousands of kilometres of high voltage overhead transmission power lines (i.e. 765kV or 400kV transmission lines). At these transmission substations, the voltage is reduced and distributed to smaller distribution substations throughout the country through distribution lines (i.e. 132kV, 88kV or 66kV distribution lines). Here the voltage is reduced and distributed to local substations, which distribute the power via various small lines (i.e. 22kV and 11kV lines) to local users. The power generated by Eskom can only be utilised from points of supply which transform power into usable voltage. However, transmission power lines and substations play a vital role in ensuring the provision of distribution substations with sufficient power to be reticulated to the consumer.

If Eskom is to meet its mandate and commitment to supply the increasing needs of end-users, the organisation is required to plan, establish and expand its infrastructure of generation capacity and transmission power lines on an on-going basis, in parallel to the expanding electricity generation process. It is vital that transmission capacity keeps up with both electricity generation capacity and electricity demand.

Currently the existing Witkop substation close to Polokwane is the only nodal point within the broader Polokwane area that supports the platinum group metals' load growth and need for electricity. The load forecast for this mining group indicates a load shift towards the Mokopane area, which cannot be supplied from the Witkop substation alone as a result of thermal, voltage stability and spatial constraints. In order to support the upsurge in demand for the platinum group metals in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area, Eskom Transmission is therefore proposing the development and implementation of the Mokopane Integration project.

1.2. Requirement for an Environmental Impact Assessment Process

The proposed Mokopane Integration Project is subject to the requirements of the Environmental Impact Assessment Regulations (EIA Regulations) published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998). This section provides a brief overview of EIA Regulations and their application to this project.

NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. The National Department of Environmental Affairs (DEA) is the competent authority for this project. An application for authorisation was acknowledged by DEA (under Application Reference number **12/12/20/1187**[1]). Through the decision-making process, DEA are supported by the Limpopo Department of Economic Development, Environment and Tourism (DEDET).

---

[1] The project was initially registered under Application Reference numbers 12/12/20/1187 (substation & turn-in lines) and 12/12/20/1140 (transmission lines)

Compliance with the requirements of the EIA Regulations ensures that decision-makers are provided the opportunity to consider the potential environmental impacts of a project during the project planning process, and assess if environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the competent authority with sufficient information in order for an informed decision to be taken regarding the project.

In terms of sections 24 and 24D of NEMA, as read with Government Notices R385 (Regulations 27–36) and R387 of 2006, a Scoping and EIA process are required to be undertaken for this proposed project as it includes the following activities listed in terms of GN R386 and R387 of 2006 (promulgated in Government Gazette No 28753 of 21 April 2006):

Number & date of relevant notice	Activity No (s) (in terms of relevant Regulation or notice)	Description of listed activity
Government Notice R387 (21 April 2006)	1(l)	The construction of facilities or infrastructure, including associated structures or infrastructure, for the transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more
Government Notice R386 (21 April 2006)	1 (m)	The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 m from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including - (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs
Government Notice R386 (21 April 2006)	12	The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

Number & date of relevant notice	Activity No (s) (in terms of relevant Regulation or notice)	Description of listed activity
Government Notice R386 (21 April 2006)	14	The construction of masts of any material of type and of any height, including those used for telecommunications broadcasting and radio transmission, but excluding (a) masts of 15m and lower exclusively used by (i) radio amateurs; or (ii) for lighting purposes (b) flagpoles; and (c) lightning conductor poles
Government Notice R386 (21 April 2006)	15	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.
Government Notice R386 (21 April 2006)	16(a)	The transformation of undeveloped, vacant or derelict land to residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.
Government Notice R386 (21 April 2006)	7	The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1 000 cubic metres at any one location or site.
Government Notice R386 (21 April 2006)	1 (m)	The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including - (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs

This report documents the assessment of the potential environmental impacts of the proposed construction, operation and decommissioning of the proposed substation and associated transmission power lines. This EIA Phase followed the Scoping Phase, and was conducted in accordance with the requirements of the EIA Regulations in terms of Section 24(5) of NEMA (Act No 107 of 1998).

1.3. Overview of the Project Scope and EIA Process to Date

At the outset of the EIA process in May 2009, Eskom identified various power line and substation alternatives for the proposed Mokopane Integration Project within a broader study area (indicated as 'original alignments' in Figure 1.1). The proposal by Eskom at this stage was for the construction of a new substation in the Mokopane area and two 400kV power lines between the Medupi Power Station and the new Mokopane and existing Witkop Substations.

During the site inspection undertaken at the initiation of the process, Eskom identified the potential need to construct 765kV power lines as part of this proposed project in order to provide sufficient transmission infrastructure, in the event that additional power stations were constructed in the Lephalale area. The proposed power line corridors and alternative substation sites remained as initially identified by Eskom. However, in order to accommodate the 765kV lines, the project scope was amended to consider two 80 m wide servitudes (instead of two 55 m wide servitudes for 400kV power lines), and towers of up to 55 m in height (instead of 35 m for 400kV lines).

Input at the Focus Group meetings held in June 2008 and comments received from the public during the review period of the Draft Scoping Report in September and October 2008 identified various issues associated with the proposed power line corridors identified by Eskom. In addition, it was requested by the public that the option of constructing the new power lines adjacent to the existing Matimba-Witkop power lines be considered. As a result, revised corridors were proposed (refer to Figure 1.2), and a Revised Scoping Report released for public review. This Revised Scoping Report identified and described the issues associated with the revised corridors.

The Final Scoping Report and Plan of Study for the EIA phase were submitted to the Department of Environmental Affairs (DEA) for review and acceptance in March 2009. Following the review of the document and a site inspection by DEA, acceptance of the Scoping Report was received on 27 May 2009 (refer to Appendix A).

From the scoping study, the following preferred alternatives were nominated for consideration in the EIA phase of the study:

» **Substation**
From a technical perspective, substation site Option 2 is not considered as a preferred site due to a watercourse partly traversing the site, as well as the presence of a rock outcrop. This option is therefore excluded as an option for further investigation. Therefore, **Site Option 1** (Doornfontein 721 LS), **Site Option 3** (Zuid Holland), and **Site Option 4** (Noord Braband) were selected

for further investigation in the EIA phase of the EIA process (refer to Figure 1.2).

» **Transmission power line corridors**
The Scoping Report concluded that all identified power line corridor alternatives should be investigated in detail in the EIA phase of the process (i.e. Alternative 1, 2 and 3, as well as the alternative of following the existing Matimba-Witkop lines). However, following the submission of the final Scoping Report to DEA, it was confirmed by Eskom that Corridor 3 was not considered feasible from a technical perspective. Therefore, it was agreed with DEA that this alternative will not be considered in detail in the EIA phase of the process. However, DEA does require that the rationale for not considering this alternative in detail in the EIA Phase be adequately discussed in the EIA Report such that stakeholders and I&APs can provide comment on this rationale (refer to Chapter 2).

Alternatives to be assessed in the EIA phase, therefore, include **Alternative 1 and 2**, as well as the **alternative of following the existing Matimba-Witkop lines**. In addition, **Transmission line alternatives 4, 5, 6 and 7** are assessed (refer to Figure 1.3) in this EIA Report.

Following the acceptance of the Scoping Report by DEA, Eskom determined that 765kV lines would not be required to be constructed as part of the proposed Mokopane Integration Project. Eskom was at the early stages of developing Strategic Grid Plans for the whole country when the decision to construct the proposed 765kV power lines was taken at the outset of the EIA process. The inter-area transmission plans were not at a stage where they aligned with the long-term Strategic Grid Plans. The Strategic Grid Plans have since been completed and they resulted in a strongly meshed 400kV network that links the Polokwane, Steelpoort and Mpumalanga areas. The revised meshed 400kV network results in the following:

» The 765kV network does not merge well with the 400kV one; the 400kV network becomes the stronger network to distribute power to the load centres through 400/132kV transformation. The 765kV network requires 765/400kV then 400/132kV transformation to distribute power. The two stage transformation results in a network with a path of higher resistance for power flow than the 400/132kV network.
» The 400kV network can support the forecast load with no need for further line reinforcements with higher voltages beyond 400kV with no bigger line structures towards the Polokwane area.
» Thicker 400kV line conductors will be used for the proposed 400kV lines.

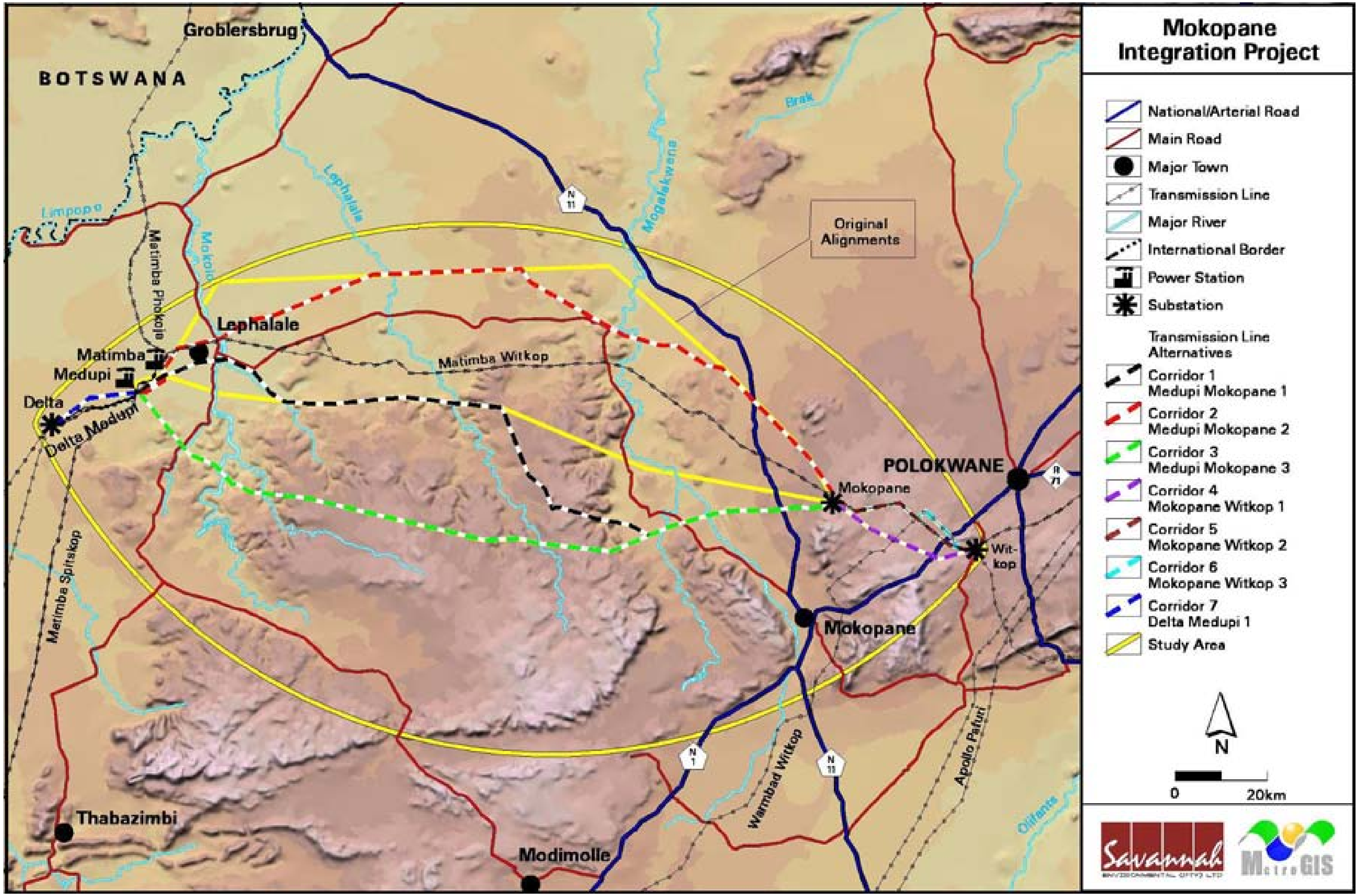

Figure 1.1: Map showing alternatives originally identified for investigation in the EIA process and the revised alternatives identified through the scoping process

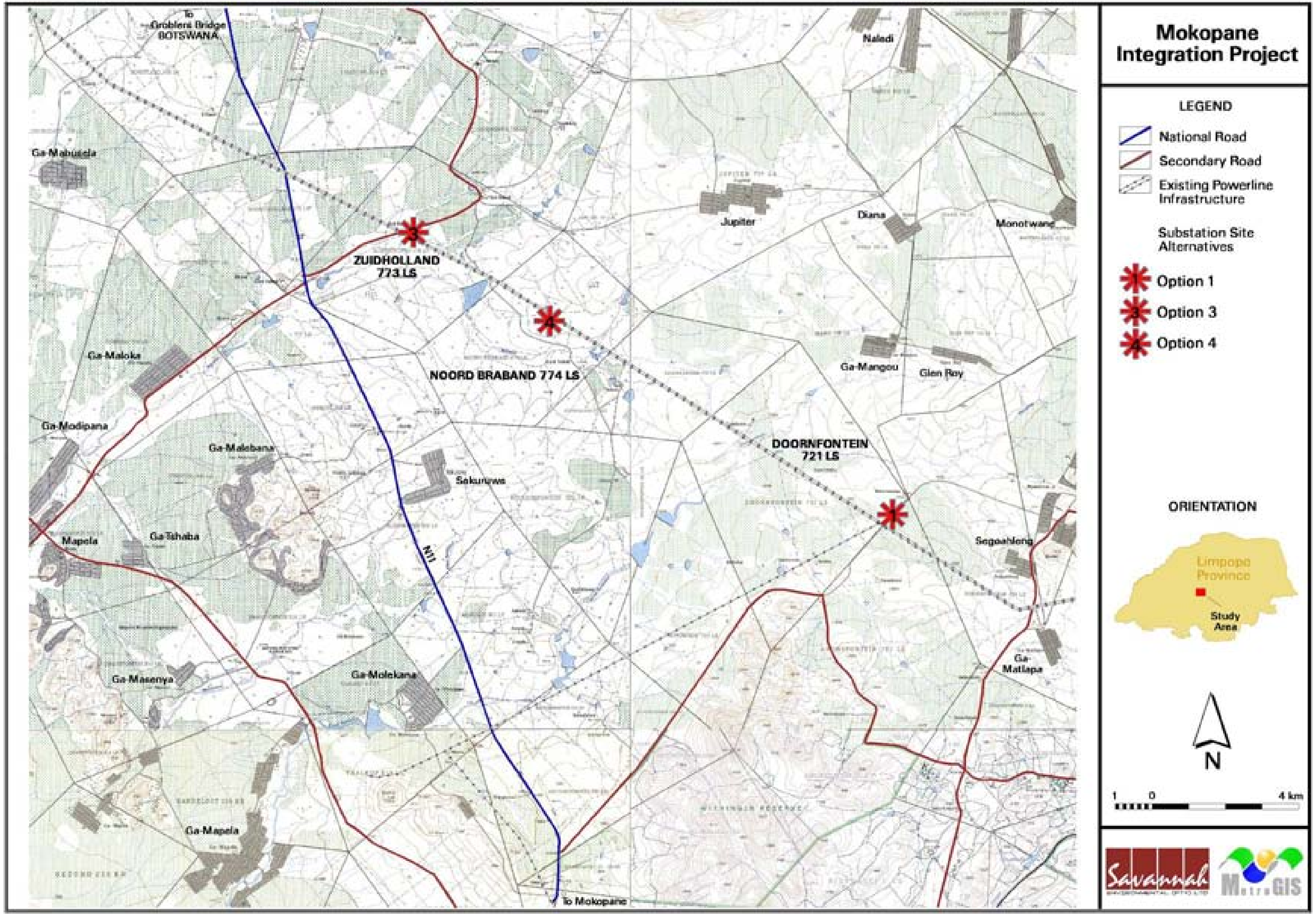

Figure 1.2: Alternative substation sites nominated for detailed investigation in the EIA phase of the process

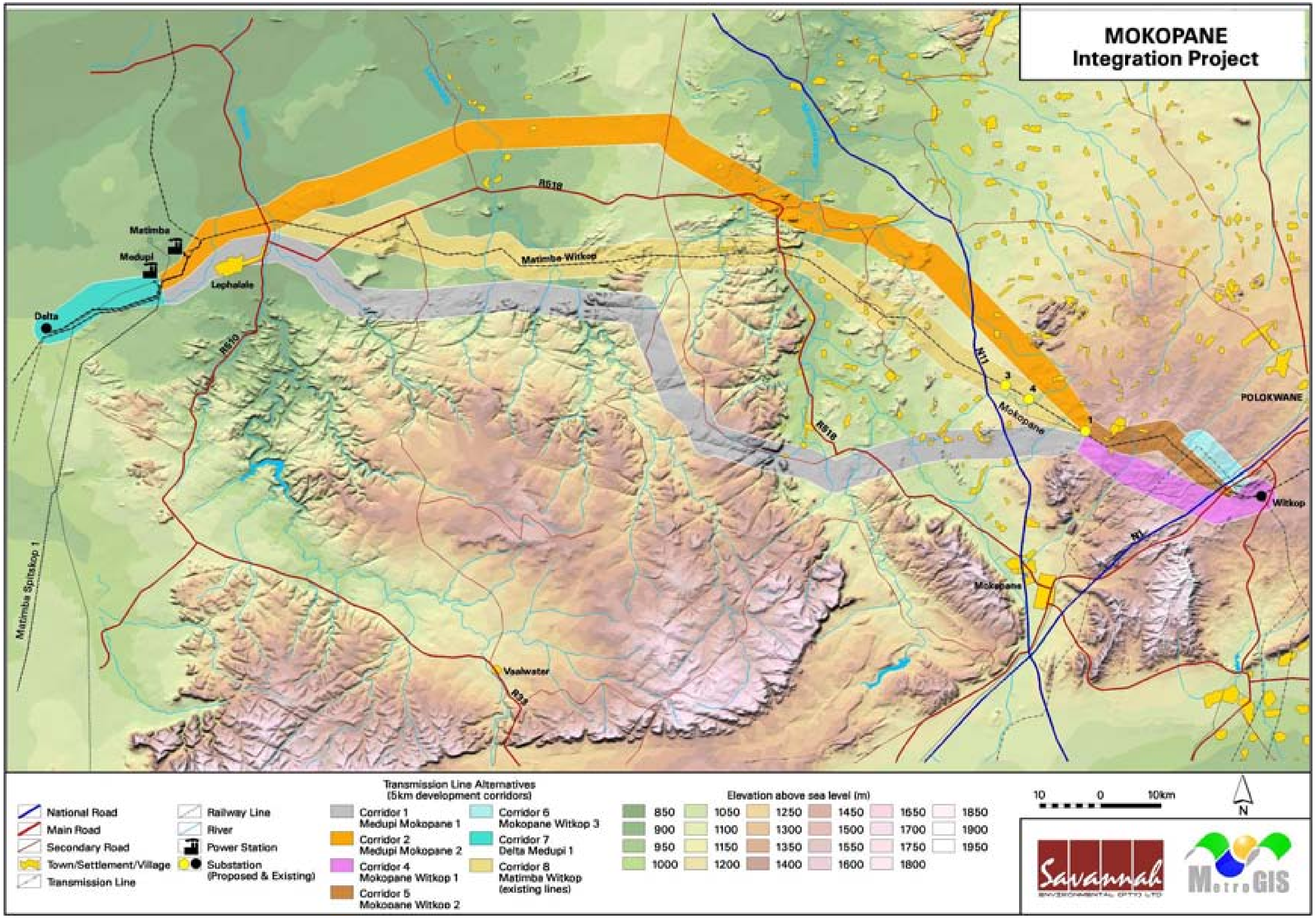

Figure 1.3: Alternative power line development corridors nominated for detailed assessment within the EIA phase of the process (corridors are 5 km in width)

- The 2 x existing 400kV line conductors are planned to be recycled to thicker conductors with line capacities that are 50% greater than the existing lines, with no further lines required towards Polokwane.
- There are possibilities of Independent Power Producers (IPP) in the area north of Polokwane. The IPPs could be integrated at 400kV and this will further strengthen the Polokwane 400kV network.

The implications of the change in scope of the project from 765kV to 400kV are that a **narrower servitude** would be required for the lines (i.e. 55 m for each of the lines and not 80 m as would be the case for a 765 kV line), and that **shorter towers** would be required (i.e. in the region of 35 m and not 50 m as would be the case for a 765kV line). No amendment to the power line corridors or substation site alternatives identified for investigation in the EIA phase of the process was proposed as a result of this change in the project details.

A draft EIA Report was made available for public comment in November 2009. During the review period of this draft report, it was requested by the stakeholders and interested and affected parties that a deviation to Corridor 8 in the central portion of the study area where technical constraints were identified be investigated as part of the EIA process. The proposed deviation corridor which has been assessed is indicated in Figure 1.4. The conclusions and recommendations of the assessment of all alternatives identified and investigated as part of the EIA process were presented in a Revised Draft EIA Report which was made available for public review from 19 May to 17 June 2010.

Through the EIA process, a preferred substation site and transmission power line corridor have been nominated for consideration in the decision-making process by the National Department of Environmental Affairs (DEA), as competent authority for this project. Should the proposed project be authorised by the DEA, Eskom will enter into a negotiation process with each affected landowner. Although based on the outcomes of the EIA process, the negotiation process is independent of the EIA process, and will be undertaken directly by Eskom Transmission.

1.4. Eskom's Planning Process and the Role of the Environmental Impact Assessment Process

Eskom Transmission's planning process is required to be based on anticipated load requirements, rather than immediate load requirements in order to timeously cater for the anticipated increased electricity demand in the country. This is due to the time-consuming process of acquiring the necessary permissions to construct such infrastructure from the DEA and the National Energy Regulator of South Africa (NERSA), servitude negotiations with landowners, and transmission power line design and construction.

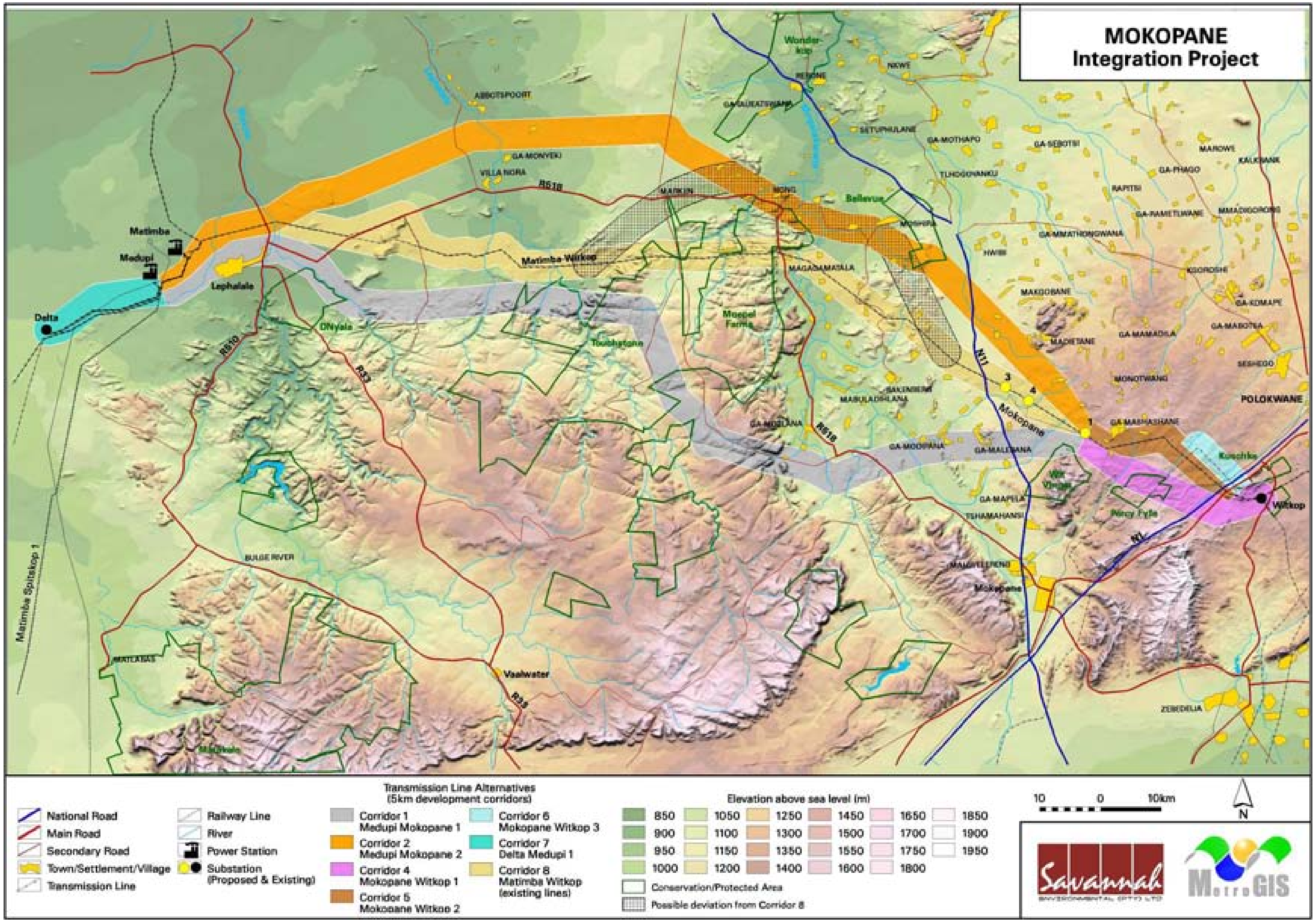

Figure 1.4: Alternative power line development corridors indicating the deviation to corridor 8 (corridors are 5 km in width)

The EIA process forms part of the initial planning process of a new substation and transmission lines. The substation site and transmission line route alternatives are identified (primarily based on technical feasibility), and the number of options will either be narrowed down or increased based on environmental criteria through the EIA process. The findings of the EIA determine those areas in which impacts can be anticipated to be significant, and results in the nomination of a preferred site and transmission line route alternative for consideration by DEA.

1.4.1. Servitude Negotiation and the EIA Process

Typically transmission power lines (such as the turn-in lines associated with the substation) are constructed and operated within a servitude (55 m wide for 400kV lines and 80 m for 765kV lines) that is established along the entire length of the line. Within this servitude, Eskom Transmission registers a 'Right of Way' and has certain rights and controls that support the safe and effective operation of the line. The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or just the negotiation process. The negotiation process is undertaken directly by Eskom Transmission and is independent of the EIA process. However, these processes are not entirely unrelated because the DEA uses the contents of the EIA Report as the basis on which the decision is made whether to grant or refuse authorisation for the activity. The servitude negotiation process is discussed in more detail within Chapter 2 of this report.

1.5. Objectives of the Environmental Impact Assessment Process

The Scoping Phase of the EIA process identified and described potential issues associated with the proposed project, and defined the potentially feasible alternatives and extent of the studies required within the EIA Phase. This was achieved through a desk-top evaluation of the proposed project using existing information. This study involved the project proponent, specialists with experience in undertaking EIAs for similar projects, and a public consultation process with key stakeholders that included both government authorities, key stakeholders and interested and affected parties (I&APs).

The EIA Phase of the EIA process assesses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction, operation and decommissioning, and recommends appropriate mitigation measures for potentially significant environmental impacts. The EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The EIA Report includes a draft Environmental Management Plan (EMP), which details environmental specifications required to be implemented to eliminate or minimise environmental impacts associated with the proposed project. Should the project be authorised, this EMP will be finalised and will form a legally binding part of the Contract documentation for construction and operation of the substation and transmission power lines.

The release of a draft EIA Report (including the draft EMP) provided stakeholders and I&APs with an opportunity to verify that the issues they had raised through the EIA process were captured and adequately considered. This **final EIA Report** incorporates all issues and responses raised during the public review of the draft EIA report prior to submission to DEA.

1.6. Details of Environmental Assessment Practitioner and Expertise to conduct the Scoping and EIA

Savannah Environmental was established in January 2006, and benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental staff have acquired considerable experience in environmental assessment and environmental management over the last 11 years, and have been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa. Strong competencies have been developed in project management of environmental EIA processes, as well as strategic environmental assessment and compliance advice, and the identification of environmental management solutions and mitigation/risk minimising measures.

Savannah Environmental has successfully completed various EIAs for transmission power lines, as well as EIAs for several substations, distribution power lines and power generation projects for Eskom Holdings Limited.

Jo-Anne Thomas and Karen Jodas, the principle Environmental Assessment Practitioners (EAPs) for the project and authors of this Environmental Impact Assessment Report, are both registered Professional Natural Scientists (in the practice of environmental science) with the South African Council for Natural Scientific Professions. They have gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through their involvement in related EIA processes over the past eleven (11) years. They have successfully managed and undertaken EIA processes for other power transmission projects for Eskom Holdings Limited throughout South Africa. They are supported by John von Mayer and Zama Dlamini. Curricula vitae for the Savannah Environmental project team consultants are included in Appendix B.

In order to adequately identify and assess potential environmental impacts as well as evaluate alternatives, Savannah Environmental has appointed several specialist consultants to conduct specialist studies, as required. Details of these specialist studies are included in Chapter 3. The curricula vitae for the EIA specialist consultants are also included in Appendix B.

DESCRIPTION OF THE PROPOSED PROJECT CHAPTER 2

Eskom, as the primary supplier of electricity in South Africa, is currently responding to the growing electricity demand and predicted future demand within South Africa through the establishment of new generation and transmission capacity in South Africa.

Eskom uses a modelling tool called Integrated Strategic Electricity Planning (ISEP) to plan its future capacity strategy. By analysing usage patterns and growth trends in the economy, and matching these with the performance features of various generation technologies and demand side management options, ISEP identifies the timing, quantity and type (base load or peaking) of new generation capacity options required in the long-term (i.e. over the next 15–20 years). These options include the return-to-service of the three mothballed coal-fired Simunye Power Stations (i.e. Camden, Komati and Grootvlei), the establishment of new coal fired power plants, pumped storage schemes, gas-fired power plants, nuclear plants, renewable energy technologies (mainly wind and solar projects), and import options within the Southern African Power Pool. As the older Eskom power plants reach the end of their design life from approximately 2025 onwards, the use of all available technologies will need to be exploited to replace them in order to supply the country’s growing electricity demand.

As part of its capacity expansion programme, Eskom is currently constructing the new Medupi coal-fired power station, in the Lephalale area of the Limpopo Province. In order to integrate this power station into the electricity transmission Grid, Eskom is considering linkages to various points within the electricity transmission system support the upsurge in demand for the platinum group metals (PGM) in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area. The Mokopane Integration project includes the construction of the following:

» A new 400/132kV transmission substation on a site near Mokopane.
» Looping in and out of Mokopane the existing Matimba-Witkop 400kV transmission lines (i.e. two lines in parallel for a maximum distance of 1 km) in order to integrate Mokopane substation into the transmission grid.
» Two new 400kV transmission power lines in parallel between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  * A new 400kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km); and
  * a new 400kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km).

  * A new 400kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).
- Associated infrastructure to integrate the new transmission power lines and substation into the Transmission Grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing Witkop substation site).

2.1. The Need and Desirability for the Proposed Project

A twenty-year electricity demand forecast is produced by Eskom Transmission annually. In this forecast, inputs from customers and various governmental and commercial associations regarding load growth are taken into account. Due to economic growth and the government's policy, *"Accelerated and Shared Growth Initiative for South Africa"* (ASGISA), it was calculated that the load will grow at an aggregated value of 4% per annum from the current load of 34 807 MW in 2007 to approximately 93 776 GW in 2030. The load demand mentioned here is subject to change as the prevailing economic climate changes and as other Eskom initiatives to conserve energy are widely adopted. The various developments are being monitored, and their effect will be incorporated in future plans.

In order to supply the increasing needs of end-users, Eskom is required to plan, establish and expand its infrastructure of generation capacity and transmission power lines on an on-going basis, in parallel to the expanding electricity generation process. Long-term generation planning is conducted within. Eskom's Grid Planning department studies how to pace generation capacity with the expected load growth without compromising on reliability and adequacy of electricity supply. Eskom Transmission Land and Rights identify possible line routes and proposed substation sites, hence this EIA project.

2.1.1. Load Forecasts for the Polokwane and Mokopane Areas

The load forecast for the National Grid is divided by Eskom into 6 Grids Customer and each Grid has its own forecast contributing to the system forecast. The Grid forecast forms the basis on which strengthening and generation plans are based.

The Polokwane and Mokopane areas fall within the Northern Grid. Polokwane is in the capital of the Limpopo Province, and it is anticipated that the load will continue to grow steadily in this city due to urbanisation and mining activities located within these areas. The expected load in the Polokwane area is shown in Table 2.1.

Table 2.1: Expected electricity loads in the Polokwane area up to 2018 (source: Transmission Ten Year Plan, 2009 – 2018)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Projected load (MW)	1126	1185	1260	1320	1384	1484	1550	1609	1667	1744	1799

2.1.2. The Need for the Proposed Mokopane Substation

Currently the existing Witkop Substation close to Polokwane is the only nodal point within the broader Polokwane area that supports the Platinum Group Metals' load growth and the associated electricity demand. The load forecast for the PGM, growth in population and new developments indicates a load shift towards the Mokopane area. These electricity needs cannot be supplied from the Witkop substation alone as a result of thermal, voltage stability and spatial constraints. Therefore, Eskom is proposing the construction of a new 400/132kV substation in the Mokopane area to remedy constraints.

2.1.3. The Need for new Transmission Power Lines between Medupi Power Station and the Mokopane and Polokwane Areas

Studies undertaken by Eskom Holdings Limited have predicted a steady 1 000 MW per annum average load growth for the period 2006 to 2025 in the National Transmission System. This is due to industrialisation, mining, urban growth and electrification. It is also a sign of good economic growth in the whole country. In order to meet this demand, Eskom has to generate additional electricity and reliably transmit it to load centres throughout the Eskom Transmission System.

A definite three-fold need for the new transmission power lines has therefore been identified:

» To evacuate power generated at Medupi to load centres;
» Achieve the transient stability of Medupi;
» to optimise the existing system;
» improve the reliability of the transmission system and
» to increase line capacity in the transmission system.

By improving the reliability, increasing generation capacity, and the transmission capacity the forecast load growth can be accommodated in an economic and reliable way.

2.2. Alternatives for Satisfying the Additional Power Need

The following alternatives for satisfying the needs for additional electrical supply to the Transmission system and optimising the existing infrastructure were investigated by Eskom Transmission:

2.2.1. The "Do Nothing" Option

The do nothing option would be the option of not constructing the new substation in the Mokopane area; or any new transmission power lines to the Mokopane and Polokwane areas.

Should the do-nothing option be adopted, Eskom will not be in a position to evacuate the power from the Medupi Power Station in the Lephalale area to the load centres in the Mokopane and Polokwane areas. Polokwane is a load centre that has an inadequate supply of electricity due to a small number of transmission power lines. An additional two 400kV transmission power lines into Polokwane will improve this situation, and reduce the chances of black outs in the Polokwane area. As Polokwane is the capital of Limpopo Province, an 'investor-friendly' reliable power supply is required to ensure economic growth within this region.

Polokwane's power needs can only be met by constructing power lines from the power stations in either Mpumalanga or Lephalale. Strengthening from the Mpumalanga area has already begun through the construction of the Duvha-Leseding power line (to be commissioned in 2010). Power from the Lephalale area to the Polokwane area will complement the power from Mpumalanga, and avoid a single source of supply to the Polokwane area.

Therefore, by not taking any action, Eskom may end with a situation of not being able to ensure firm supply into Mokopane and Polokwane in the very near future. This would eventually lead to load shedding which can cause major disruptions of power supply to different areas at different times. This will have a significant impact on the economy of the Mokopane and Polokwane growth areas, as no real economic growth would occur without additional electricity supply. The proposed project is also required in order to complement the reliability and stability of the National Grid. Therefore, without the implementation of this proposed project, there will be significant impacts on the reliability and stability of electricity supply to the Polokwane and Mokopane areas.

2.2.2. Demand Side Management

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

By reducing peak demand and shifting load from high load to low load periods, reductions in capital expenditure (for network capacity expansion) and operating costs can be achieved. Some of the basic tools are the price signals (such as time of use tariffs) given by the utility and direct load management. This option is practised to a certain extent, but is currently not considered feasible for expansion in this particular region. This is so as there will be large step loads in the Mokopane and Polokwane area in the 20 year horizon. If DSM were to be applied to the Northern Grid, based on end state of 3,000 MW this will be about 100 MW for the Polokwane and Mokopane areas. Single step loads in the pipeline are between 100 MW and 300 MW.

This option, therefore, is not considered to be feasible to meet the long term power demands associated with expansions in the Mokopane and Polokwane areas.

2.2.3 New Generation Plants

Medupi 4 800MW coal-fired power station is currently under construction in the Lephalale area and is planned to be commissioned in phases, starting in 2011. Power from this power station has to be transmitted to the load centres some hundreds of kilometres away from the Lephalale area. Transmitting power through transmission power lines is currently the most economical way to supply bulk electricity.

The existing transmission power lines from the Lephalale area cannot evacuate the additional 4 800 MW of power from the new Medupi Power Station without violating network reliability and integrity. As all options of optimising the existing infrastructure have already been studied and implemented, new transmission power lines are required to transmit electricity from Medupi Power Station to transmission substations, including the proposed Mokopane and existing Witkop substations in the Mokopane and Polokwane areas.

The use of other types of generation such as wind and solar energy were suggested by some I&APs within the public participation process. However, the high cost and low output of such systems does not make these economically feasible for the supply of baseload electricity supply[9] to the Polokwane and Mokopane areas.

2.2.4. Upgrade Existing Transmission Power Lines by using Bigger Conductors

In the first instance, this option requires each of the two existing 400kV lines to be permanently off while being upgraded to thicker conductors. This will put the existing and future load at the risk of a partial blackout should the second 400kV line trip. The upgrade option would result in the physical load on the existing towers increasing substantially, hence sagging. To mitigate against sagging, more towers will have to be constructed within the existing line servitudes being upgraded. Furthermore, it would not be possible to remove one transmission power line from service to perform the upgrading work, as the remaining supply lines would not be able to supply the electrical loads in the transmission system.

The increased capacity will not help evacuate power from Medupi completely as Medupi requires its own separate paths for power flow. This might lead to possible tie-lines between Medupi and Matimba power stations. The inter-connection between the two power stations has been found to cause transient instability and was discarded as the two power stations' machines "hunt against each other". There will be transient instability in the Eskom network, which could result in local and regional black-outs.

2.2.5. Construct New Transmission Power Lines between Medupi Power Station and the Mokopane Area and Witkop Substation

The needs for increased capacity and the need for optimising the existing infrastructure would be met through the implementation of the construction of new lines between Medupi Power Station and the Mokopane and Polokwane areas. The advantages associated with this option are as follows:

» It will overcome the voltage instability and load shedding due to the loss of the existing 400kV lines between Matimba and Ppolokwane,
» It will create a more flexible network since it will form an interconnection between the loads fed from Medupi and Matimba (Lephalale area) and the Mpumalanga generation area. This will improve the overall reliability of the Transmission system, which will be of benefit to both Eskom and to all electricity users in the area
» It will improve the transient stability of the Lephalale generation pool. The Medupi and Matimba power stations' machines' rotor angles will not run into

[9] "Base load electricity generating capacity" refers to power station technology designed specifically to generate electricity continuously for all hours of the day and night

instability should there be a fault that trips any line from either power station. Transient instability manifests itself by way of rotors speeding out of control requiring a need to trip several transmission lines out of the power stations to avoid a cascade of runways of machines in the Eskom and SAPP systems. Should the network be designed without this checked, blackouts similar to those that occurred in New York in the late 1990s will occur.

Due to current land uses and developments in the country, very few open corridors remain for the installation of major transmission power lines and substation sites. New routes should, however, be secured to ensure the availability servitudes for the expansion of the network and to be able to meet the forecast demand. Therefore, Eskom is proposing that 2 x new 400kV power lines be constructed between the Medupi Power Station and the Mokopane and Polokwane areas.

The need for increased capacity and the need for optimising the existing infrastructure will be met through the implementation of this option, and this is the reason why this option was chosen as the most feasible option by Eskom Grid Planning to integrate Medupi Power Station.

Overhead lines have been proposed over underground cables as the disadvantages of underground cables outweigh those of overhead lines as follows:

» Underground cabling is more expensive, since the cabling entails excavating tunnels and blasting of rocks similar to train tunnels but of higher magnitude. The costs are several times greater than erecting overhead power lines.
» Whereas finding and repairing overhead power line faults can be accomplished in hours through ground patrols, underground fault finding and repairs can take days or weeks, and would require several repeat tunnels for strategic patrols,.
» Operations are more difficult since the high reactive power of underground cables produces large charging currents and so makes voltage control more difficult.
» Cables could take up a larger land footprint as compared to overhead lines. This is a due to cables being required to be in trenches from the source of supply to the will be rendered sterile. The land footprint of overhead power lines is much less due to the land only being required to construct the towers approximately every 300 m.
» The environmental impacts associated with underground cabling are considered to be significantly higher than those associated with overhead lines as trenches would be required to be excavated for long distances resulting in severe damage to habitats and surrounding areas.
» From a time perspective, it could take several years before the underground cables are installed due to construction complications, costs and specialised

equipment. By the time cabling could be achieved the country's energy needs would have spiralled to economic stagnation.

2.3. Identification and Description of Alternative Substation Sites

In order to strengthen the power supply to the Mokopane and Polokwane areas, Eskom Transmission is proposing the construction of a **new transmission substation** on a site near Mokopane. In order to integrate this new substation into the transmission system/grid, Eskom proposes the **looping in and out of one of the existing Matimba-Witkop 400kV transmission lines** (i.e. two lines running parallel for a distance of a maximum of 1 km).

Three technically feasible alternative substation sites have been identified for investigation within the EIA process (refer to Figure 2.1). The three options are situated north of Mokopane on the farms Doornfontein 721 LS (Option 1), Zuidholland 773 LS (Option 3) and Noord Braband 774 LS (Option 4). The proposed sites are all located in close proximity to the Matimba-Witkop 400kV transmission lines in order to allow for turn-in line infrastructure from these lines into the new Mokopane Substation.

Option 1 is located north of the Wit Vinger Nature Reserve and approximately 3 km west of the Segoahleng settlement (refer to Figure 2.1). The proposed site is a relatively flat piece of land with a small protrusion, Mokomowatlau, as the only higher part near this site. A part of Doornfontein 721LS, where the proposed substation may be established, is utilised for informal agricultural activities. Currently, farmers from Ga-Masasane are exploiting large parts of Doornfontein 721LS elsewhere for crop planting.

Option 3 is located along the Matimba-Witkop 400kV transmission lines at a distance of approximately 3 km from the N11 national road (refer to Figure 2.1). The proposed site slopes slightly south-westwards along the transmission line corridor. Patches of agricultural land occur towards the eastern perimeter of the proposed site.

Option 4 is located approximately 4.5 km south-east of Option 3. It is approximately 6 km from the N11 and the closest major settlement, Sekuruwe, is approximately 5 km south-west of the proposed site (refer to Figure 2.1). The site is located on a relatively undisturbed piece of veld (except for the fact that part of the site has been affected due to the presence of the existing 400kV transmission lines across this farm).

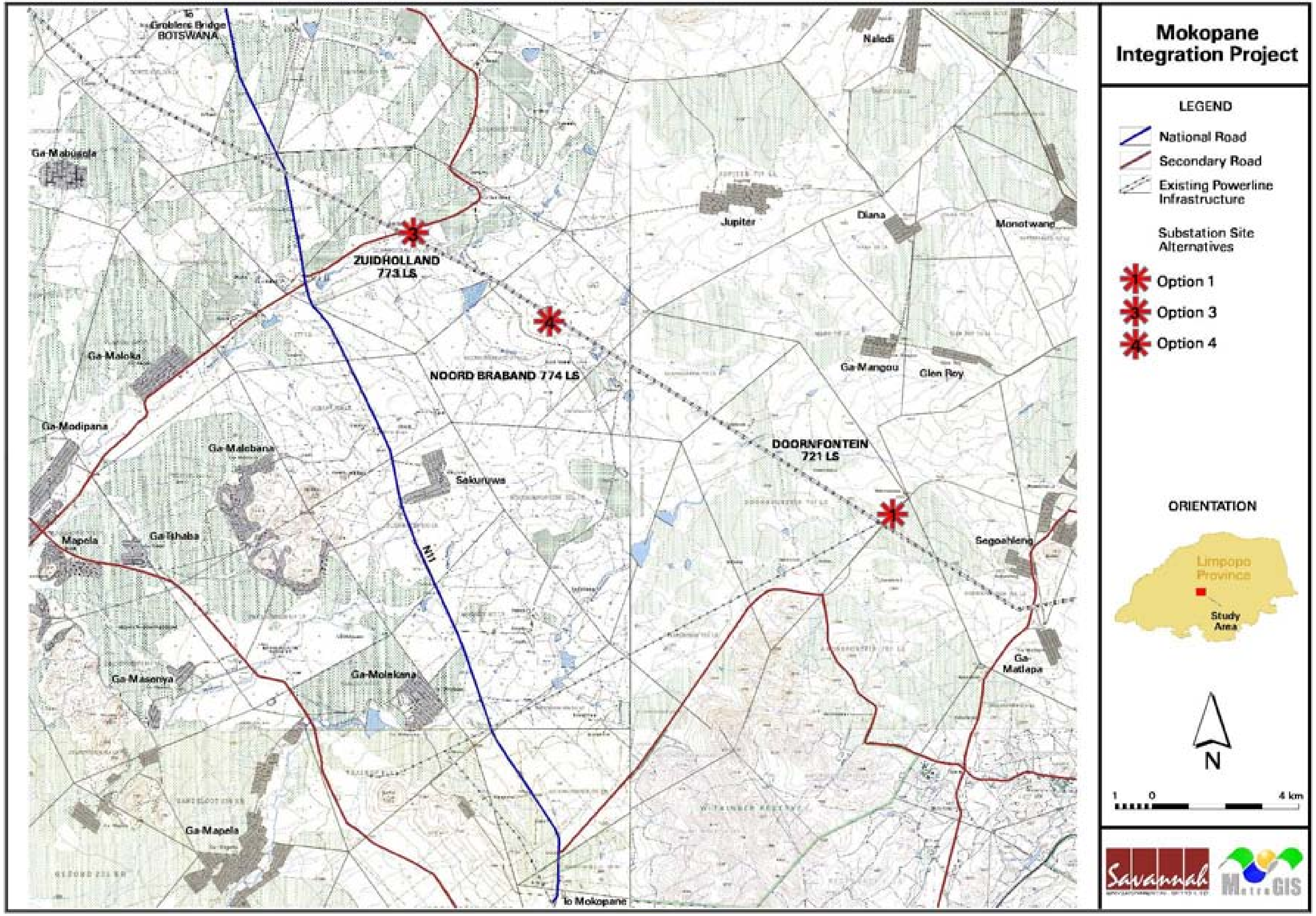

Figure 2.1: Map showing the alternate substation sites identified for consideration in the EIA process

From a technical and environmental perspective, substation site Option 2 was not considered a viable site due to a watercourse partly traversing the site, as well as the presence of a rock outcrop. This option was therefore excluded as an option for further investigation in the EIA process on the basis of technical feasibility (refer to the Final Scoping Report, Savannah Environmental, March 2009).

2.3.1. Construction Phase

The proposed substation would be constructed in the following simplified sequence, and will take approximately 12 months to complete:

Step 1: Survey of the substation site (including a final survey by environmental specialists and the compilation of a site-specific Environmental Management Plan (EMP))

Step 2: Site clearing and levelling and construction of access road to substation site

Step 3: Construction of terrace and substation foundation, including the installation of stormwater drainage on the surface to dispose of such stormwater on the terrace

Step 4: Assembly, erection and installation of equipment (including transformers and control building)

Step 5: Connection of conductors to substation infrastructure

Step 6: Rehabilitation of any disturbed areas and protection of erosion sensitive areas

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

Construction crews for construction of the substation will constitute mainly skilled and semi-skilled workers. No construction workers will reside on site. It is most likely that construction workers will be accommodated in formal housing within towns in the study area.

It is expected that construction of the substation would begin late 2010 or early 2011 and would take 3 years to complete.

2.3.2. Technical Details of the Proposed Substation

The main aspects of the proposed substation include:

» An area of land approximately 500 m x 500 m is required for the construction of the substation site. Approximately 40% of this area will be used for the High Voltage Yard, which will be fenced off for security purposes.
» Installation of new equipment (transformers, reactors, etc.) for operation up to 400kV capacity. This equipment will not contain hazardous substances (PCBs, etc.), but will contain cooling oils and similar potential pollutants necessary for the operation of the equipment. The equipment will be designed according to Eskom specifications.
» The maximum height of the substation development will be 45 m.

2.4. Identification and Description of Alternative Transmission Power Line Development Corridors

From the analysis of the various alternatives to satisfy the need for additional power transmission capacity, Eskom Transmission determined that the introduction of the Mokopane Integration Project was the most feasible and cost-effective solution in order to transmit the power generated at the Medupi power station to the load centres in the Mokopane and Polokwane areas. This project involves construction of the following:

» **Two new 400 kV transmission power lines running in parallel** between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  * A new 400kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km); and
  * a new 400kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km).
  * A new 400kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).
» **Associated works** to integrate the new transmission lines into the Transmission grid (such as access roads).

The following technical requirements were considered in the identification of feasible corridors for the establishment of the required transmission power lines:

» Technically viable and cost effective corridors of approximately 5 km in width were identified.
» As far as possible, the servitude lengths between power supply and load points should be minimised.

» As far as possible, the number and magnitude of angles along the line should be minimised in order to allow the use of less expensive and visually less-intrusive tower types.
» Crossing over of existing major power lines should be avoided as far as possible as this increases the potential for technical incidents during operation.
» The alignment should cater for known topographical/terrain constraints of the tower types to be used, and soil conditions for the foundations in terms of geotechnical suitability and costs.
» The proposed alignment should provide for the need of appropriate access roads to the servitude and tower positions for both construction and maintenance/operation phases.
» Care should be taken to avoid the following as far as tower positioning and access road construction are concerned:
  * extensive rock outcrops;
  * rugged terrain, hills and mountains;
  * active clay soil, vleis and floodplains;
  * potential unstable side-slope terrain; and
  * eroded and unstable areas.
» Other issues which technically affect the location of a transmission power line include:
  * agricultural lands, in particular those under irrigation;
  * large water bodies;
  * open-cast mining; and
  * crossing points with roads, rail and telecommunication lines at off-set angles less than 60°.
» The following obvious and observable environmental issues should be taken into account:
  * human settlements and communities;
  * land use (where possible);
  * passing between water bodies (bird flight paths usually extend between water bodies);
  * ecologically sensitive areas;
  * scenic areas with high visual/aesthetic quality; and
  * untransformed indigenous vegetation.

At the outset of the EIA process in May 2009, Eskom identified various power line and substation alternatives for the proposed Mokopane Integration Project within a broader study area (indicated as 'original alignments' in Figure 1.1). The proposal by Eskom at that stage was for the construction of a new substation in the Mokopane area and two 400kV power lines between the Medupi Power Station and the new Mokopane and existing Witkop Substations.

During the site inspection undertaken at the initiation of the process, Eskom identified the need to construct 765kV power lines as part of this project in order to provide sufficient transmission infrastructure in the event that additional power stations were constructed in the Lephalale area. The proposed power line corridors and alternative substation sites remained as initially identified by Eskom. However, in order to accommodate the 765kV lines, the project scope was amended to consider two 80 m wide servitudes (instead of two 55 m wide servitudes for 400kV transmission power lines), and towers of up to 55 m in height (instead of 35 m for 400kV transmission power lines).

Input at the Focus Group meetings held in June 2008 and comments received from the public during the review period of the Draft Scoping Report in September and October 2008 identified various issues associated with the proposed power line corridors. In addition, it was requested by the public that the option of constructing the new power lines adjacent to the existing Matimba-Witkop power lines be considered. As a result, revised corridors were proposed (refer to Figure 1.2), and a Revised Scoping Report released for public review. This Revised Scoping Report identified and described the issues associated with the revised corridors.

The Scoping Report concluded that all identified power line corridor alternatives should be investigated in detail in the EIA phase of the process (i.e. Alternative 1, 2 and 3, as well as the alternative of following the existing Matimba-Witkop lines). However, following the submission of the final Scoping Report to DEA, it was confirmed by Eskom that Corridor 3 was not considered feasible from a technical perspective. This corridor is considered to be *fatally flawed* in terms of construction and maintenance, largely due to the local topography. These challenges make the option to be *not viable for construction*. As the EIA Regulations require that the EIA process only needs to assess feasible and reasonable alternatives[3], it was agreed with DEA that this alternative will not be considered in the EIA phase of the process.

A draft EIA Report was made available for public comment in November 2009. During the review period of this draft report, it was requested by the stakeholders and interested and affected parties that a deviation to Corridor 8 in the central portion of the study area where technical constraints were identified be investigated as part of the EIA process.

Alternatives to be assessed in the EIA phase, therefore, include **Corridors 1 and 2**, as well as the **alternative of following the existing Matimba-Witkop lines (corridor 8)** and a deviation to this corridor (**deviation to corridor 8**). In

[3] Refer to the NEMA EIA Regulations 385 (Chapter 5, Section 29).

addition, **transmission power line corridors 4, 5, 6 and 7** are to be assessed (refer to Figure 2.2).

These alternative power line alternatives are described in further detail below.

» **Corridor 1 (Medupi-Mokopane):** From Medupi Power Station the transmission line corridor proceeds in an easterly direction south of Lephalale before traversing the D'Nyala Nature Reserve. It crosses the Waterberg plateau, Waterberg Biosphere Reserve buffer zone (Touchstone Nature Reserve) before spanning across the escarpment and dropping down towards the R518. It steers east for another 50km before joining the Matimba-Witkop transmission lines. The length of this corridor is ~172 km.

» **Corridor 2 (Medupi – Mokopane)** originates at the Medupi Power Station and proceeds in a north-easterly direction for approximately 30km before veering east for 85km. It traverses the Waterberg Biosphere Reserve's transitional zone before it turns south-east, crossing the southern section of the Bellevue Nature Reserve. It continues for roughly 40km before joining the Matimba-Witkop power lines near the proposed Mokopane substation site. The total length of this corridor is ~180 km.

» **Corridor 8 (Medupi-Mokopane; the existing Matimba-Witkop transmission line corridor)** originates at the Matimba Power Station and travels east for approximately 29km before reaching the R518. The lines split at this point and the northern section traverses adjacent to this road for almost 9km while the southern section crosses between two hills. The two lines meet up shortly thereafter and continue eastward for 30km before entering the Waterberg Biosphere Reserve's transitional, buffer (Touchstone) and core areas (Moepel Farms). After 32 km it crosses the escarpment and continues another 58 km to the proposed Mokopane substation site. The Matimba-Witkop transmission line covers a distance of over ~182 km from Matimba to the proposed substation site.

  The conclusions of a technical investigation undertaken by Eskom indicate that it will not be technically feasible to construct the new power lines directly adjacent to the existing lines for the entire length of the corridor. This is due to two narrow gorges along the existing Matimba-Witkop alignment within Corridor 8, as well as issues raised by landowners within the EIA process for the Matimba-Witkop No 2 400kV power line which must be taken into consideration. Therefore, should Corridor 8 be selected as the preferred option, the new lines would have to deviate from the existing lines in a number of places. These areas are illustrated and explained in Figure 2.3.

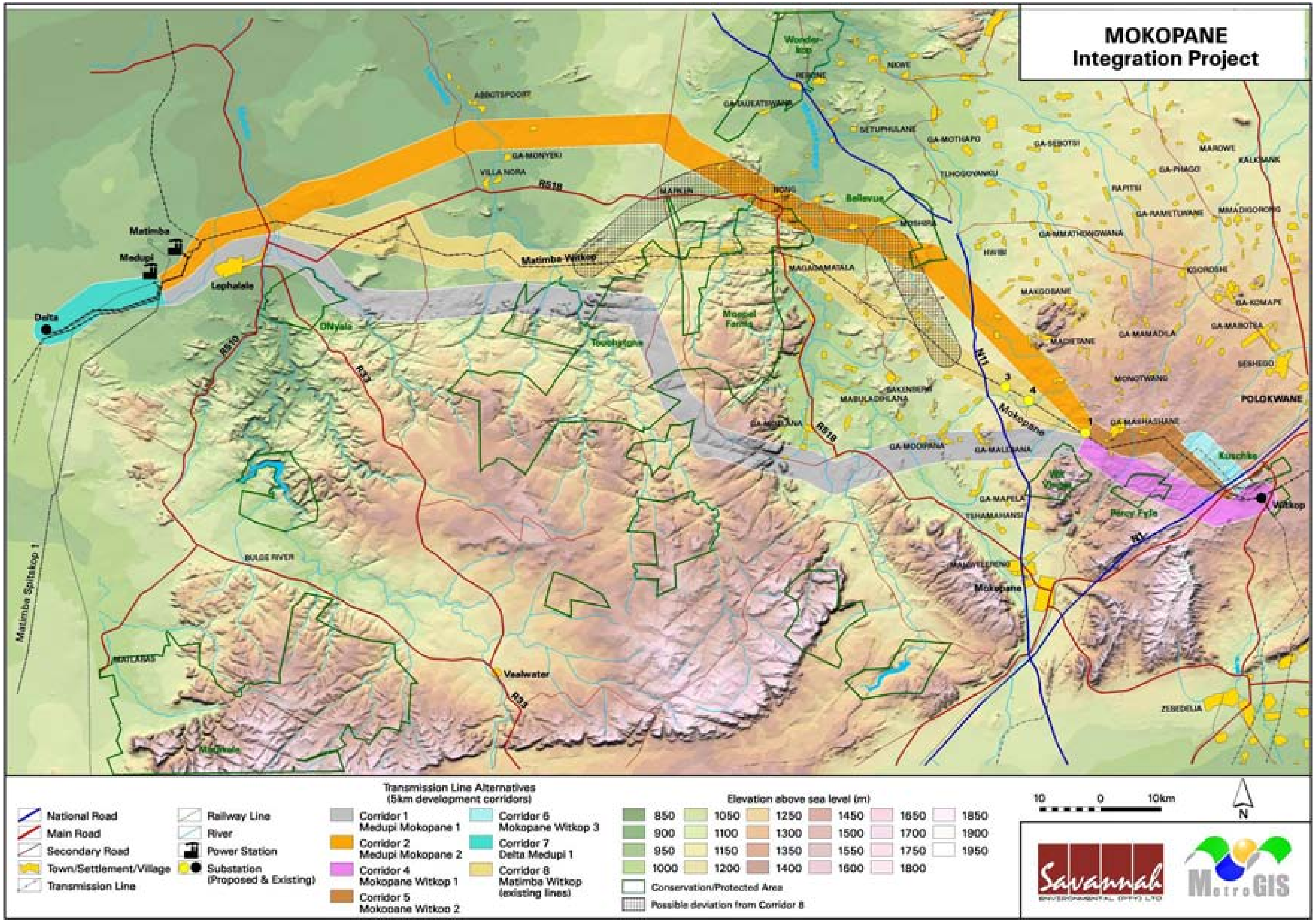

Figure 2.2: Map showing the alternate 5 km wide transmission line corridors to be investigated in the EIA process

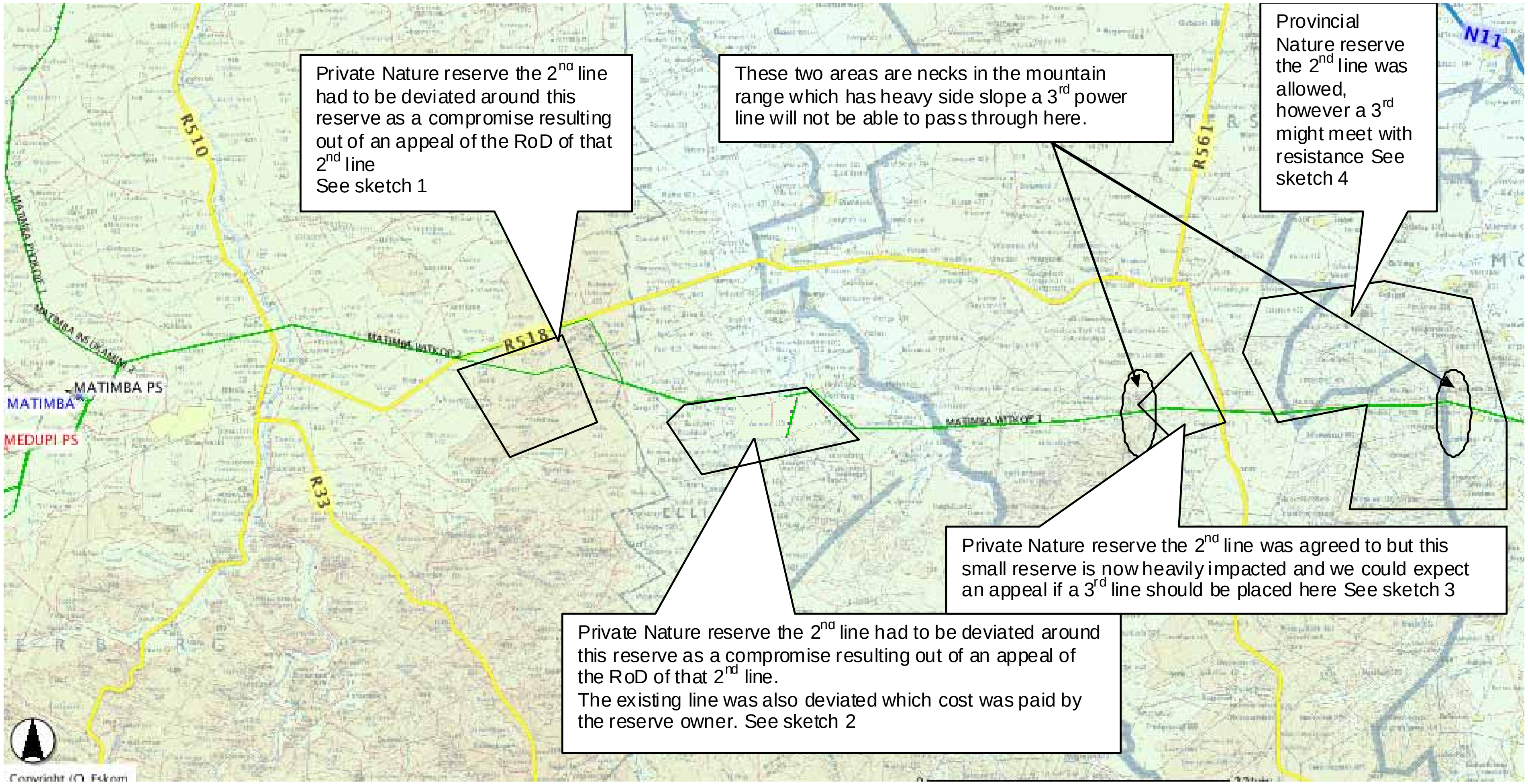

Figure 2.3: Map from Eskom of the existing Matimba-Witkop line indicating the two narrow gorges and sections of line where issues were raised regarding the Matimba-Witkop No 2 400kV line

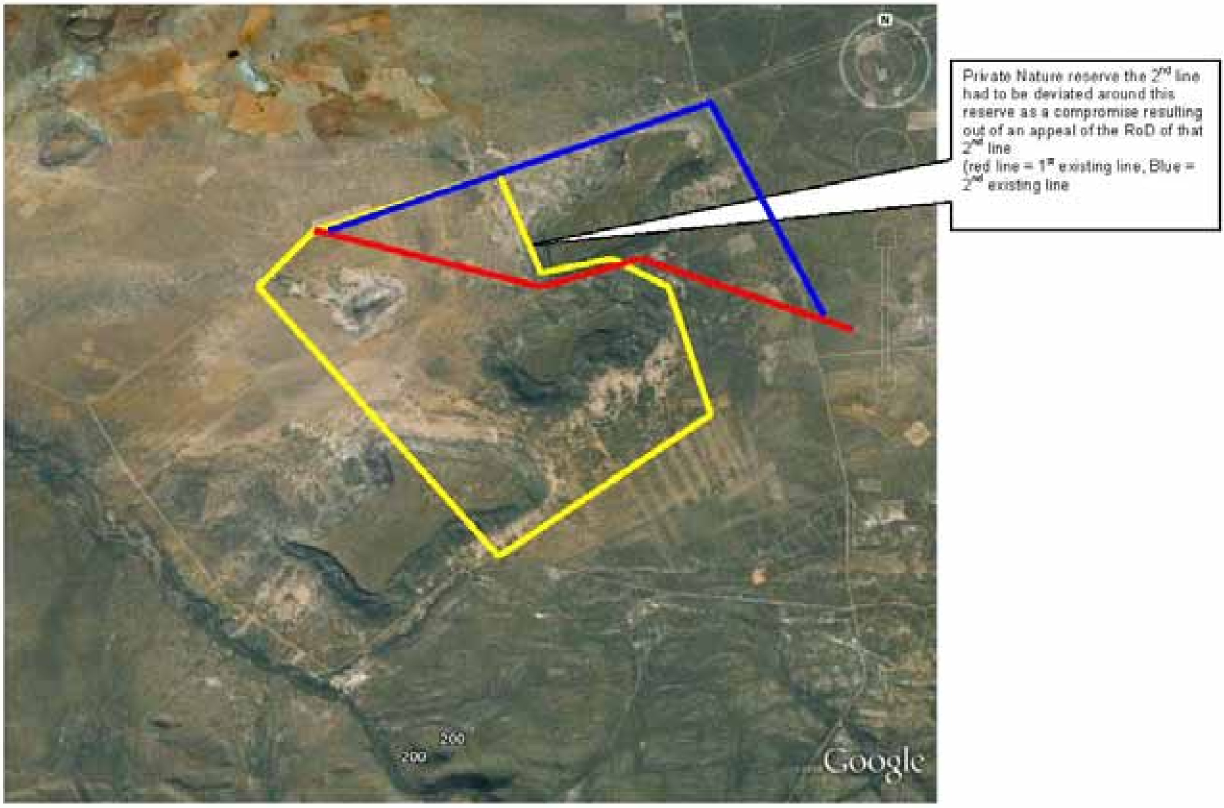

Figure 2.4: Sketch 1

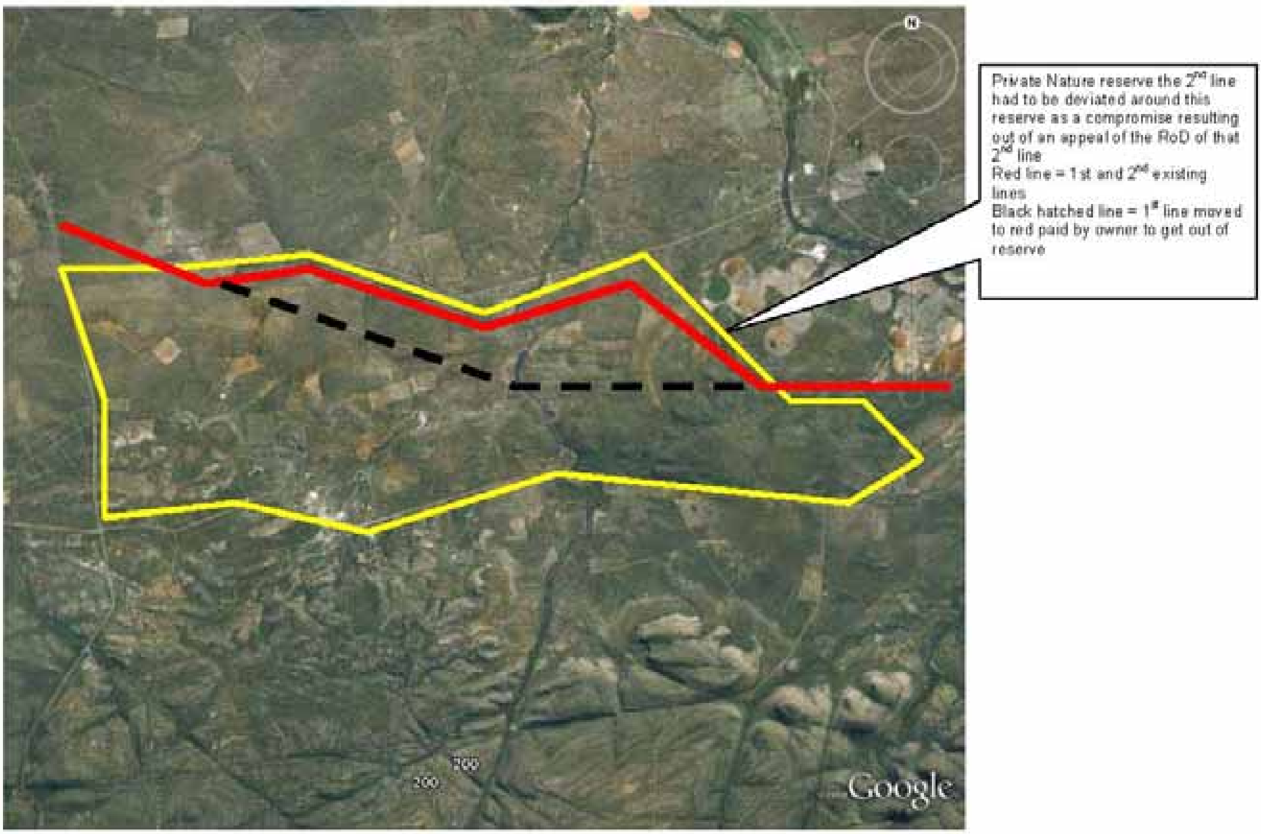

Figure 2.5: Sketch 2

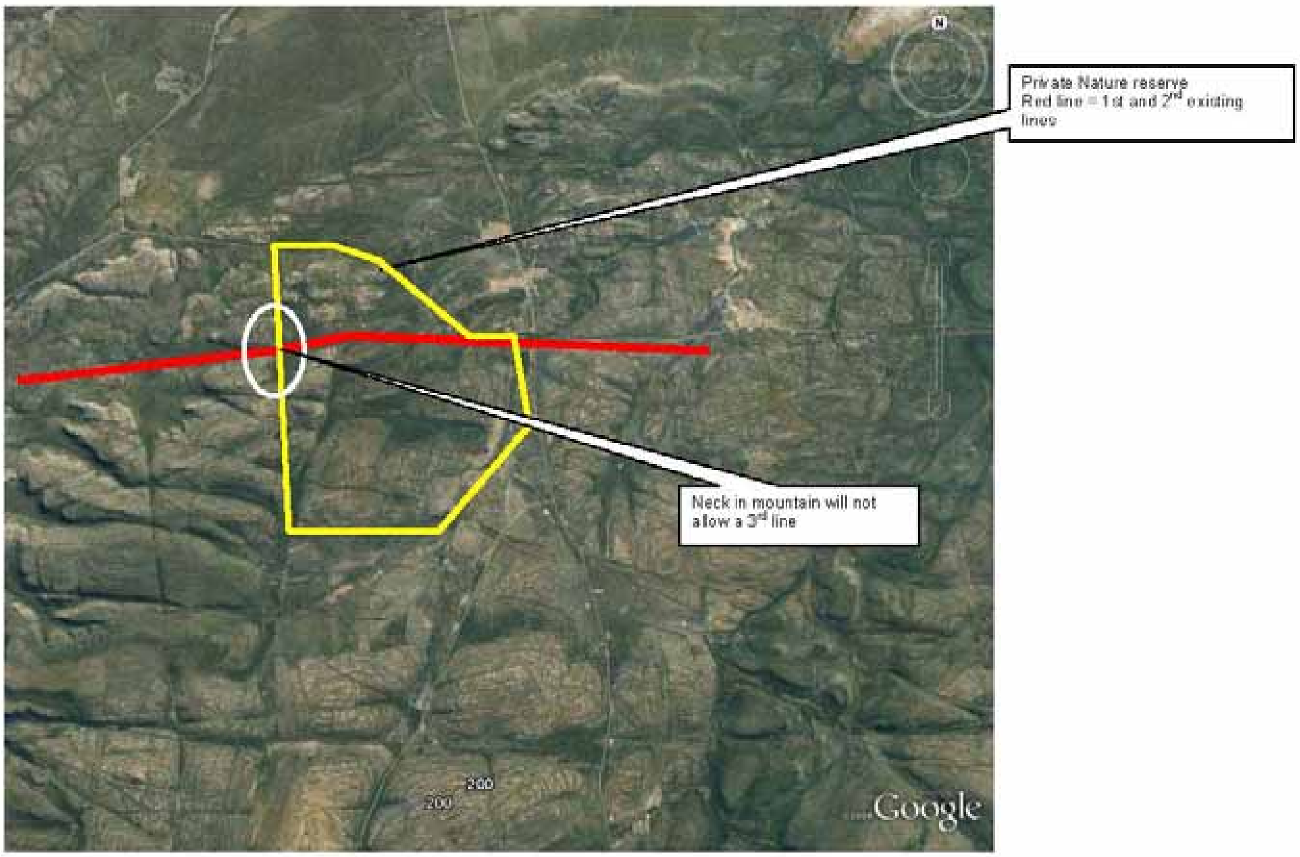

Figure 2.6: Sketch 3

» The **Deviation to Corridor 8** has as its purpose the circumvention of the Waterberg Biosphere Reserve's buffer and core areas as well as the Waterberg Mountain and eastern escarpment. These areas were identified as being technically constrained in terms of the space available to construct the proposed two power lines adjacent to the existing power lines in this area. The deviation occurs south-west of Marken where the proposed corridor deviates from corridor 8 in a north-eastern direction, continuing south-east of Marken, for approximately 25km before joining the Corridor 2 alternative. It follows this alternative for roughly 30km before veering south-east for approximately 20km before joining again with corridor 8.

» **Corridor 4 (Mokopane-Witkop):** from the proposed substation site to the Witkop substation, this corridor extends in a south-easterly direction for ~11 km before traversing the Percy Fyfe Nature Reserve. After 6 km it leaves the nature reserve and continues for 16km across predominantly thicket and bushland before entering the Witkop substation. The total length of this corridor is ~33 km.

» **Corridors 5** and **6 (Mokopane –Witkop)** follow the existing Matimba-Witkop 400kV power lines from the proposed substation site to the Witkop substation. Corridor 5 (34.5km total length) follows these power lines for the entire length of its alignment, while Corridor 6 veers off after 19 km to follow the Warmbad-Witkop 275kV line for 17 km. The total length of this corridor (including the joint section with Corridor 5) is ~37 km.

» The **Delta-Medupi** transmission line corridor (**Corridor 7**) originates at the Delta substation and travels in a north-easterly direction towards the Medupi Power Station. The alignment occurs north of the Matimba-Marang/Pluto/ Midas transmission power lines at distances varying between 1.7 km at the closest to 3km at the furthest. The total length of the alignment is ~21 km

The two proposed 400kV transmission power lines between the Medupi Power Station and the Witkop Substation (i.e. Medupi-Delta-Mokopane-Witkop) are **proposed to be constructed parallel within one corridor**.

2.4.1. Construction Phase

Transmission lines are constructed in the following simplified sequence:

Step 1: Determination of technically feasible alternatives
Step 2: EIA input into route selection
Step 3: Negotiation of final route with affected landowners (refer to Section 2.6 below)
Step 4: Survey of the route (by air)
Step 5: Determination of the conductor type
Step 6: Selection of best-suited conductor, towers, insulators, foundations
Step 7: Final design of line and placement of towers (including final walk-though survey by environmental specialists and compilation of site-specific Environmental Management Plan (EMP))
Step 8: Issuing of tenders, and award of contract to construction companies
Step 9: Vegetation clearance and construction of access roads (where required)
Step 10: Tower pegging
Step 11: Construction of foundations
Step 12: Assembly and erection of towers
Step 13: Stringing of conductors
Step 14: Rehabilitation of disturbed areas and protection of erosion sensitive areas
Step 15: Testing and commissioning

Construction of the power lines proposed as part of the Mokopane Integration Project will take approximately 24 months to complete. Construction of these lines is anticipated to begin in 2011.

Construction crew for the transmission power lines will constitute mainly skilled and semi-skilled workers. It is most likely that construction workers will be accommodated within formal housing within towns surrounding the study area. Construction camps can be located within the construction area but only in consultation and agreement with the landowner. It is generally preferred that the construction camps be in close proximity to the construction site.

2.4.2. Technical Details of Tower and Transmission Line Designs

All components of a Transmission line are interdependent, but are distinct in the roles which they fulfil. The primary components include towers, foundations, insulators and hardware, and conductors.

» *Towers*

Transmission line conductors are strung on in-line suspension towers and bend (strain) towers. Various designs are available for use by Eskom on the proposed power lines (refer to Figure 2.7 to 2.9). The types of towers which to be used will be dependent on the final alignment of the power lines and individual agreements with affected landowners.

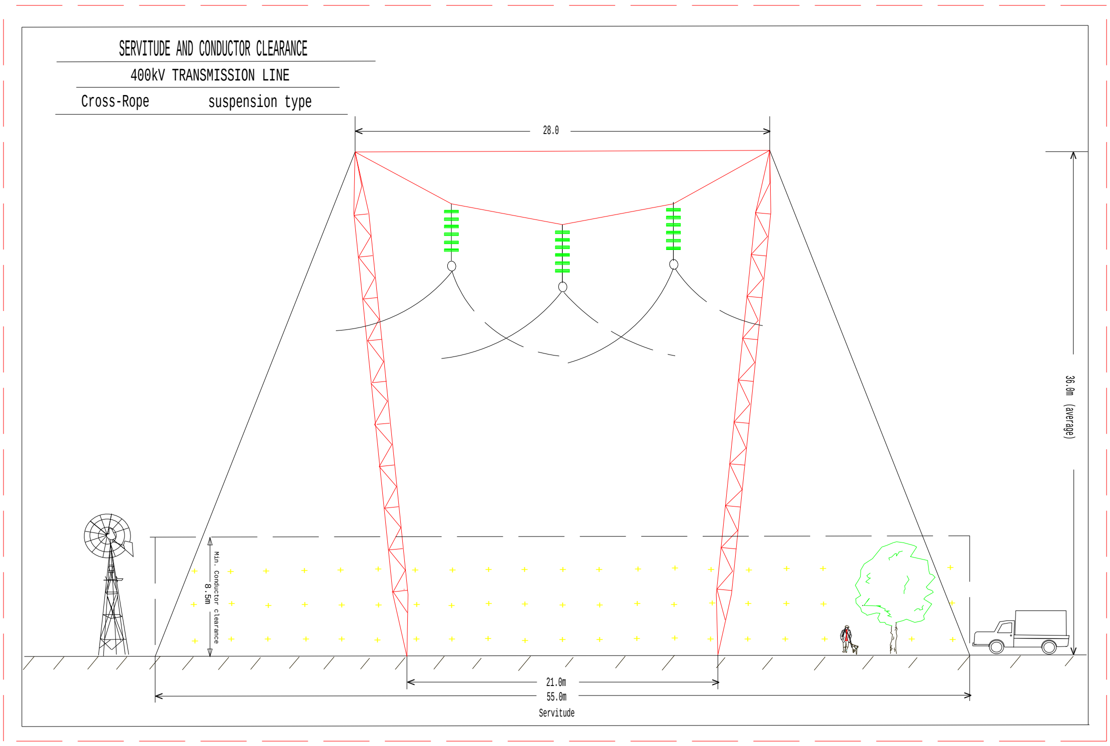

Figure 2.7: Cross Rope Suspension Tower

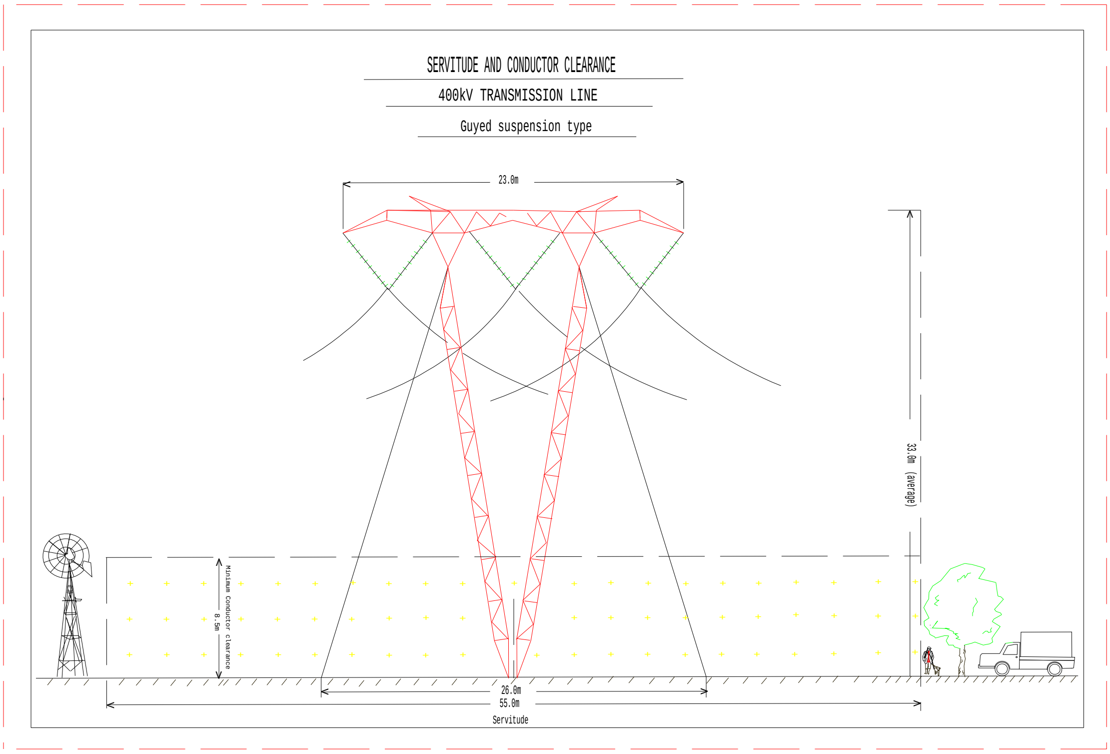

Figure 2.8: Guyed Suspension Tower

Photograph 2.1: Monopole structure which can be used in areas where there are space constraints

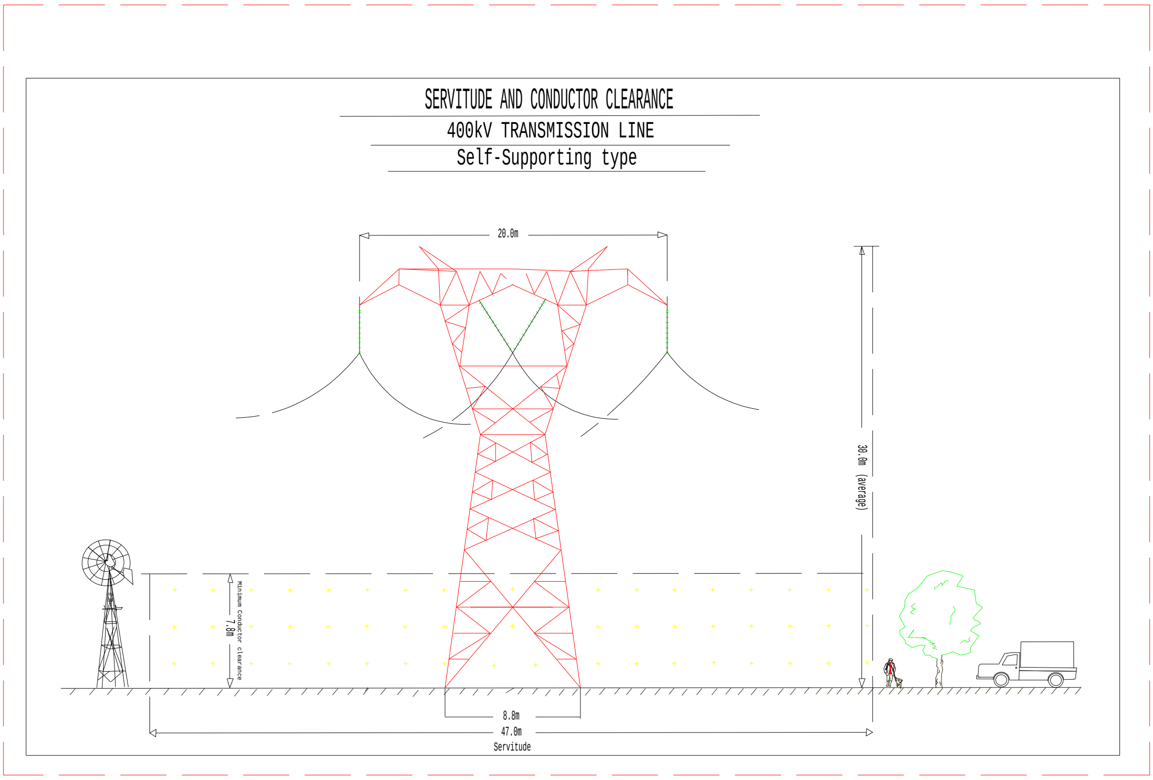

Figure 2.9: Self-Supporting Tower

» *Servitude Requirements*

The servitude width for a 400kV transmission power line is 55 m. The servitude is required to ensure the safe construction, maintenance and operation of the line, and thereby entitles Eskom Transmission Division certain rights (e.g. unrestricted access).

Where 400kV transmission power lines are constructed in parallel, a minimum separation distance of 55 m is required in order to ensure the reliable operation of both lines. The minimum vertical clearance to buildings, poles and structures not forming part of the power line must be 10.4 m, while the minimum vertical clearance between the conductors and the ground is 15 m. Farming activities can be practised under the power line, providing that safe working clearances and building restrictions are adhered to under all circumstances.

The minimum distance of a 400kV transmission power line structure from a proclaimed public roads is between 60 m and 120 m from the centre line of the road (according to the road type), from the centre of the structure to the centre of the road servitude. The minimum distance between any part of a tree or shrub and any bare phase conductor of a 400kV transmission power line must be 10 m.

On receipt of an authorisation of the final corridor by the environmental authorities and after negotiations with landowners, the final definition of the centre line for the transmission line and co-ordinates of each bend in the line will be determined by the surveyors. Optimal tower sizes and positions will be identified and verified using a ground survey (in terms of the Environmental Management Plan (EMP) requirements).

A 4-8 m wide strip is generally required to be cleared of all trees and shrubs down the centre of a transmission power line servitude for stringing purposes only. Any tree or shrub in other areas which will interfere with the operation and/or reliability of the transmission line must be trimmed or completely cleared. The clearing of vegetation will take place, with the aid of a surveyor, along approved profiles and in accordance with the approved EMP, and in accordance with the minimum standards to be used for vegetation clearing for the construction of the proposed new transmission power lines as listed in Table 2.1.

Table 2.1: Minimum standards to be used for vegetation clearing for the construction of a new transmission power line

Item	Standard	Follow up
Centre line of the proposed transmission power lines	Clear to a maximum (depending on tower type and voltage) of a 4-8m wide strip of all vegetation along the centre line. Vegetation to be cut flush with the ground. Treat stumps with herbicide.	Re-growth shall be cut within 100 mm of the ground and treated with herbicide, as necessary.
Inaccessible valleys (trace line)	Clear a 1 m strip for access by foot only, for the pulling of a pilot wire by hand.	Vegetation not to be disturbed after initial clearing – vegetation to be allowed to re-grow.
Access/service roads	Clear a maximum (depending on tower type) 6 m wide strip for vehicle access within the maximum 8 m width, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil.	Re-growth to be cut at ground level and treated with herbicide as necessary.
Proposed tower position and proposed support/stay wire position	Clear all vegetation within proposed tower position in an area of 20 x 20 m (self-supporting towers) and 40 x 40 m (compact cross-rope suspension towers) around the position, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil. Allow controlled agricultural practices,	Re-growth to be cut at ground level and treated with herbicide as necessary.

Item	Standard	Follow up
	where feasible.	
Indigenous vegetation within servitude area (outside of maximum 8 m strip)	Area outside of the maximum 8 m strip and within the servitude area, selective trimming or cutting down of those identified plants posing a threat to the integrity of the proposed transmission line.	Selective trimming
Alien species within servitude area (outside of maximum 8 m strip)	Area outside of the maximum 8 m strip and within the servitude area, remove all vegetation within servitude area and treat with appropriate herbicide.	Cut and treat with appropriate herbicide.

Once the centre line has been cleared, the contractor's surveyor will peg every tower position and mark the crossing point with existing fences for new gate installations. Where required, once the tower positions have been marked, the vegetation clearing team will return to every tower position and clear vegetation (in accordance with the specification outlined in the Environmental Management Plan (EMP)) for assembling and erection purposes.

» *Foundations*

The choice of foundation is influenced by the type of terrain encountered, as well as the underlying geotechnical conditions. Geotechnical requirements for all tower types are catered for by using various foundation types, which are designed to withstand conditions varying from hard rock to waterlogged marshes. The main types of foundations include piles, pad-and-chimney, and rock anchors. The actual size and type of foundation to be installed will depend on the type of tower to be erected, and the actual sub-soil conditions. Strain towers require more extensive foundations for support than in-line suspension towers, which contribute to the construction expenses.

The construction of foundations is the slowest part of the line construction, and is typically started some time ahead of tower erection. Prior to filling of the foundations and tower erection, excavated foundations are covered or fenced in, in order to safe-guard unsuspecting animals and people from injury. The foundations also represent the biggest unknown in the cost and construction time, since access to the tower sites is required for earth-moving machinery and concrete.

All foundation excavations are back-filled, stabilised through compaction, and rehabilitated at ground level.

» *Insulators and Hardware*
The insulators and hardware are used to connect the conductors to the towers. The main types are glass, porcelain, and composite insulators.

Glass and porcelain have been used for many years, and are the most common. They are, however, heavy and susceptible to breakage by vandals, as well as contamination by pollution. Composite insulators have a glass-fibre core with silicon sheds for insulation. The composite insulators are light-weight and resistant to both vandalism and pollution. They are, however, more expensive than the more common glass insulators.

» *Conductors*
The conductors are made of aluminium with a steel core for strength. Power transfer is determined by the area of aluminium in the conductors. Conductors are used singularly, in pairs, or in bundles of three, four or six. The choice is determined by factors such as audible noise, corona, and electro-magnetic field mitigation.

Many sizes of conductor are available, the choice being based on the initial and life-cycle costs of different combinations of size and bundles, as well as the required load to be transmitted.

2.5. Identification and Description of Alternative Transmission Power Line Development Corridors

In order to accommodate the new 400kV transmission lines proposed to be constructed from the new Medupi Power Station in the Lephalale area, Eskom Transmission is proposing the **construction of new feeder bays within the existing Witkop substation site to accommodate the new lines**. As no significant impacts were identified to be associated with this proposed expansion (as the expansion is proposed within the existing Witkop Substation footprint), this component of the project is not further assessed in this report.

2.6. Servitude Negotiation and the EIA Process

Transmission power lines are constructed and operated within a servitude (55 m wide for 400kV lines) that is established along the entire length of the power line. Within this servitude, Eskom Transmission has certain rights and controls that support the safe and effective operation of the power line. The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or simply just the negotiation process. The following important points relating to the negotiation process should be noted:

- » Servitude negotiation is a matter between Eskom Transmission and the appropriate landowner and falls outside of the EIA process.
- » The negotiation process involves a number of stages (see below), and culminates in the 'signing' of a servitude. Here Eskom Transmission enters into a legal agreement with the landowner.
- » The servitude is registered as a 'right of way', and Eskom do not purchase the servitude from the landowner. Compensation measures are agreed in each case.
- » The agreements will detail such aspects as the exact location and extent of the servitude, and access arrangements and maintenance responsibilities, as well as any specific landowner requirements.
- » The negotiation process may take place at any time in the planning of a new power line.
- » This process must be completed (i.e. the agreement must be signed) with the relevant landowner before construction starts on that property.
- » The negotiation process is undertaken directly by Eskom Transmission and is independent of the EIA process. It is important that the aims of the two processes are seen as separate. Although the negotiation is process is independent of the EIA, the two processes are related in the sense that a final route for the proposed power lines will be selected within the corridor approved through the EIA process. In addition, environmental aspects and issues identified during the EIA process have to be considered during negotiations.

The EIA process has become important in the initial planning and route selection of new transmission lines. For this reason, it is usually preferable that the negotiation process begins after the EIA has been completed. At this stage there is greater confidence in the route to be adopted, and it would be supported by environmental authorisation. However, it may be required that the negotiation process begins earlier, and may begin before, or run in parallel with the EIA process. This may be due to urgent timeframes for the commissioning of the new power line, knowledge of local conditions and constraints, etc. Eskom Transmission has a right to engage with any landowner at any time, though they do so at risk if environmental authorisation has not been awarded.

2.6.1. The Negotiation Process

Eskom Transmission is responsible for the negotiation process for all new transmission power lines. It is critical that the process is correctly programmed and incorporated into the planning of a new line. The negotiation process involves the following steps:

i. Initial meeting with the landowner.

ii. The signing of an 'option' to secure a servitude (this indicates that the owner will accept that the power line will traverse his property, subject to conditions to be finalised in the negotiation of the servitude agreement). An option is valid for one year.

iii. Once the route is confirmed (i.e. options are signed with the upstream and downstream landowners), the servitude agreement will be finalised with the individual landowners. This agreement will set out the conditions for the establishment, rehabilitation and maintenance of the servitude, and will be site-specific (as different landowners may have different requirements). Compensation payments would be made when the servitude is registered at the Deeds Office[4].

iv. Once construction is complete and the land rehabilitated to the landowners satisfaction (and as agreed prior to construction), the landowner signs a 'Final Release' certificate. Until the 'Final Release' certificate has been signed, Eskom Transmission remains liable for the condition of the land.

v. Once the clearance certificate is signed, the responsibility for the power line and servitude is handed over to the regional Eskom Transmission office.

2.7. Project Operation Phase

The expected lifespan of the proposed transmission power line is between 35 and 40 years, depending on the maintenance undertaken on the power line structures.

During the life-span of the transmission power line, on-going maintenance is performed. Power line inspections are undertaken on an average of 1–2 times per year, depending on the area. During this maintenance period, the power line is accessed via the access routes, as agreed with affected landowners during the negotiation phase. Maintenance of the power line is required to be undertaken in accordance with the specifications of the Environmental Management Plan (EMP).

The expected lifespan of the proposed substation is between 35 and 40 years, depending on the maintenance undertaken. During the life-span of the substation, on-going maintenance is performed. Substation inspections are undertaken on an average of 1–2 times per year, depending on the area. During this maintenance period, components may require replacement in order to significantly extend the lifespan of the substation. Maintenance of the substation

[4] Compensation will be based on present day property valuations for all properties obtained from registered evaluators. Eskom only pays compensation for the strip of land that is affected at 100% of present day property value. In cases where properties are significantly affected, Eskom may consider purchasing the whole property at present day market value. All improvements will be valued. Sentimental value and loss of visual amenity are not considered in any valuations as they are not measurable. Valuations are done according to the Expropriation Act.

is required to be undertaken in accordance with the specifications of the EMP, which is to form part of the appointed contractor's contract documentation.

The creation of additional employment opportunities during the operational phase of the substation will be limited, and will be restricted to skilled maintenance personnel employed by Eskom.

2.7.1. Servitude Maintenance Responsibilities

The management of a transmission power line servitude is dependent on the details and conditions of the agreement between the landowner and Eskom Transmission, and are therefore site-specific. These may, therefore, vary from one location to another. However, it is a common occurrence that there is a dual responsibility for the maintenance of the servitude:

- » Eskom Transmission will be responsible for the tower structures, maintenance of access roads, watercourse crossings, and gates and fences relating to servitude access.
- » The landowner will retain responsibility for the maintenance of the land and land use within the servitude (e.g. cropping activities, veld management, etc.).

Exceptions to the above may arise where, for example dual use is made of the access roads and gates or specific land use limitations are set by Eskom Transmission within the servitude which directly affects the landowner (e.g. forestry). Maintenance responsibilities are, ultimately, clearly set out in the servitude agreement.

APPROACH TO UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT — CHAPTER 3

An Environmental Impact Assessment (EIA) process refers to that process (as per the EIA Regulations) which involves the identification of and assessment of direct, indirect and cumulative environmental impacts associated with a proposed project. The EIA process comprises two phases: **Scoping Phase** and **EIA Phase**. The Scoping Phase culminates in the submission of a Scoping Report to the competent authority (DEA in this case) for review and acceptance before proceeding onto the next phase of the process. The EIA Phase culminates in the submission of an EIA Report (including a draft EMP) to the competent authority for decision-making.

The phases of the EIA process are as follows:

The EIA process for the proposed Mokopane Integration Project has been undertaken in accordance with the EIA Regulations published in Government Notice 28753 of 21 April 2006, in terms of Section 24(5) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). This chapter serves to outline the process that was followed during the EIA phase of the process as well as outlining the applicable legislation for the project.

3.1. Phase 1: Scoping Study

The Scoping phase provided I&APs with the opportunity to receive information regarding the proposed project, participate in the process and raise issues of concern.

The Scoping Report described the baseline environmental conditions within the study area, described the proposed project, identified potential environmental issues associated with the proposed project, and defined the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project, involving the project applicant, specialists with experience in EIAs for similar projects, and a consultation process with interested and affected parties

(I&APs) and key stakeholders (including relevant government authorities, Tribal Authorities, non-governmental organisations (NGOs) and community-based organisations (CBOs). In accordance with the requirements of the EIA Regulations, feasible project-specific alternatives (including the “do nothing” option) were identified for consideration within the EIA process.

The revised draft Scoping Report was made available at public places for I&AP review and comment. All the comments, concerns and suggestions received during the Scoping Phase and the draft report review period were included in the Final Scoping Report. The Final Scoping Report and Plan of Study for EIA were submitted to the National Department of Environmental Affairs (DEA) and the Limpopo Department of Economic Development, Environment and Tourism (DEDET) in January 2009. The Final Scoping Report was accepted by DEA, as the competent authority in May 2009 (refer to Appendix A). In terms of this acceptance, an Environmental Impact Assessment was required to be undertaken for the proposed project.

3.2. Phase 2: Environmental Impact Assessment

Through the Scoping Study, feasible alternatives were identified for further investigation in the EIA Phase of the process. A number of issues requiring further study for all components of the project (i.e. the substation and transmission power lines) were highlighted. A comparative assessment of identified issues associated with the identified feasible alternatives has been undertaken within the EIA phase of the process.

The EIA Phase aimed to achieve the following:

» Provide an overall description and assessment of the social and biophysical environments affected by the proposed alternatives put forward as part of the project.
» Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed Mokopane Integration Project.
» Comparatively assess identified feasible alternatives put forward as part of the project.
» Nominate a preferred power line alternative corridor and substation site for consideration by DEA.
» Identify and recommend appropriate mitigation measures for potentially significant environmental impacts.
» Undertake a fully inclusive public involvement process to ensure that I&AP are afforded the opportunity to participate, and that their issues and concerns are recorded.

The EIA addresses potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction, operation and decommissioning, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

3.3. Overview of the EIA Phase

The EIA Phase has been undertaken in accordance with the EIA Regulations in terms of NEMA. Key tasks undertaken within the EIA phase included:

» Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
» Undertaking a public involvement process throughout the EIA process in accordance with Regulation 56 of Government Notice No R385 of 2006 in order to identify any additional issues and concerns associated with the proposed project.
» Preparation of a Comments and Response Report detailing issues raised by I&APs as part of the EIA Process (in accordance with Regulation 59 of Government Notice No R385 of 2006).
» Undertaking of independent specialist studies in accordance with Regulation 33 of Government Notice No R385 of 2006.
» Preparation of this Draft EIA Report in accordance with the requirements of the Regulation 32 of Government Notice No R385 of 2006.

These tasks are discussed in detail below.

3.3.1. Authority Consultation

As Eskom is a Statutory body (i.e. an Organ of State), the National Department of Environmental Affairs (DEA) will act as the relevant competent authority for this proposed project. As the project falls within the Limpopo Province, the Limpopo Department of Economic Development, Environment and Tourism (DEDET) will act as a commenting authority for the project. Consultation with these authorities has been undertaken throughout the EIA process. This consultation has included the following:

» Pre-application consultation regarding the proposed project and the EIA process to be undertaken
» Submission of an application for authorisation to DEA, with a copy submitted to DEDET. The Notice of Intent and the application were acknowledged, approved and given the reference number 12/12/20/1187. Authorisation was therefore granted to continue with the Scoping Phase of the project

» A consultation meeting with DEA and DEDET when the final scoping report has been submitted to the DEA in order to discuss the proposed project, alternatives identified, public consultation process undertaken and the issues identified for consideration in the EIA process.
» An authority site inspection and consultation meeting in order to discuss the proposed project, alternatives identified, the public consultation process undertaken and the issues identified for consideration in the EIA process.

The following will also be undertaken as part of this EIA process:

» Submission of a Final Environmental Impact Assessment (EIA) Report following the public review period.

A record of all authority consultation undertaken during the EIA Phase is included in Appendix A.

3.3.2. Comparative Assessment of Alternatives

The following project alternatives were investigated in the EIA (refer to Figure 2.1 and 2.2):

» Substation site options 1, 3 and 4
» Power line corridors 1, 2, 4, 5, 6, 7 and 8

These alternatives are described in detail in Chapter 2 of this report.

3.3.3. Public Involvement and Consultation

The aim of the public participation process was primarily to ensure that:

» Information containing all relevant facts in respect of the proposed project was made available to potential stakeholders and I&APs.
» Participation by potential I&APs was facilitated in such a manner that all potential stakeholders and I&APs were provided with a reasonable opportunity to comment on the proposed project.
» Comment received from stakeholders and I&APs was recorded and incorporated into the EIA process.

Through on-going consultation with I&APs and key stakeholders, issues raised through the Scoping Phase for inclusion within the EIA study were confirmed. All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to Appendix C for a listing of recorded parties and landowner consultation map). While I&APs were encouraged to register their interest in the project from the onset of the process, the identification and registration of I&APs has been ongoing for the duration of the EIA process and the project database has been updated on an on-going basis. 455 parties have registered their interest in the project to date.

In order to accommodate the varying needs of I&APs, as well as ensure the relevant interactions between stakeholders and the EIA specialist team, the following opportunities were provided for I&APs issues to be recorded and verified through the EIA phase:

» Focus group meetings (pre-arranged and stakeholders invited to attend).
» One-on-one consultation meetings and telephonic consultation sessions (consultation with various parties, for example with directly affected landowners, by the project participation consultant as well as specialist consultants).
» Written, faxed or e-mailed correspondence.

Application for exemption from complying with Regulation 56 (b) (i) and (ii), Chapter 6 of the GN R385 was requested from the DEA at the start of the Scoping process. This regulation requires that (i) written notice is to be given to owners and occupiers of land adjacent to the site where the activity is or is to be undertaken and (ii) the owners and occupiers of land within 100 m of the boundary of the site or alternative site who are or may be directly affected by the activity. It is however, important to indicate that the application for exemption from complying with Regulation 56 (2)(b) (i) and (ii) was not a deliberate attempt to exclude land owners and occupiers of the land adjacent to the project area. Because of the length of the project (200km), some of the land owners would be notified as the EIA process progressed. Exemption from complying with the requirements of this Regulation was granted by DEA (Refer to Appendix A).

In terms of notification of landowners and occupiers on the proposed power line routes, the following activities have been undertaken in order to provide them the opportunity to become involved in the EIA process:

» Advertisements were placed in local and regional newspapers in the area announcing the commencement of the EIA process and inviting interested and affected parties to become involved in the project (as detailed below)
» Notice boards were placed in the area of concern during the announcement of the project (as detailed below)
» Written notices and Background Information Documents (BIDs) were distributed and placed at public places, sent to the relevant municipal officials and councillors, several community organisations as well as the Tribal Authority councillors of the area as part of the public participation process for the project.

» Focus group and public meetings were held in the scoping phase and in the EIA phase of the project at appropriate locations within the study area. Public meetings were advertised in local and regional newspapers and registered parties were invited to attend these meetings by letter.
» A detailed questionnaire was developed requesting property specific information from the landowners regarding sensitivities on their properties. Responses received were forwarded onto the specialist team for inclusion in their detailed comparative assessments.

Networking with I&APs will continue throughout the duration of the EIA process.

Table 3.1 below provides details of the focus group and public meetings held during the EIA process.

Table 3.1: Details of the meetings held during the EIA process

Date	Parties present	Venue
10 June 2008	Batlokwa T/A, Bakone T/A, Lebelo T/A	Bakone Traditional Council Office
11 June 2008	Nkidikitlane T/A, Babirwa T/A	Babirwa Traditional Council Office
12 June 2008	Dikgale T/A[5], Bakone T/A, Maraba T/A, Mashashane T/A	Capricorn DM Office
12 June 2008	Lekalakala T/A	Lekalakala Traditional Council Office
13 June 2008	Langa (Bekenburg) T/A, Langa (Mapela) T/A, Mokopane T/A	Mapela Traditional Council Office
17 June 2008	Public meeting	Polokwane - The Golden Pillow Hotel
18 June 2008	Public meeting	Mokopane - The Protea Park Hotel
19 June 2008	Public meeting	Marken - Marken Primary School Hall
20 June 2008	Public meeting	Lephalale, The Mogol Club
18 July 2008	Anglo Coal	ILISO Consulting, Centurion
04 August 2008	Lephalale Focus Group Meeting	Lephalale – Lephalale College (corner Nelson Mandela & Ngwako Ramathlodi Rd)
04 August	Lephalale Municipality	Lephalale Municipality - Civic Centre (social services)
05 August 2008	Vaalwater Focus Group Meeting	Vaalwater Farmers Hall
05 August	Polokwane Municipality	Polokwane - Environmental Management Office
06 August 2008	Marken Focus Group Meeting	Marken – Marken Farmers Hall

[5] Moletsi T/A were invited to attend this meeting, but sent an apology

Date	Parties present	Venue
06 August 2008	Mokopane Focus Group Meeting	Potgietusrus - DLU (Chamber of Business – Mokopane Thabo Mbeki 97)
07 August 2008	Waterberg District Municipality	Modimolle - municipal office
30 September 2008	Lephalale Focus Group Meeting	Marken – Auction Hall
16 February 2009	Lephalale Focus Group Meeting	Lephalale – Mogol Club
16 February 2009	Marken Focus Group Meeting	Marken – Marken Farmers Hall
17 February 2009	Vaalwater Focus Group Meeting	Vaalwater – Vaalwater Farmers Hall
19 March 2009	Thandululo Coal	Hyde Park – Beacon Rock Offices
28 July 2009	Lephalale Focus Group Meeting	Lephalale – Mogol Club
28 July 2009	Marken Focus Group Meeting	Marken – Marken Farmers Hall
29 July 2009	Vaalwater Focus Group Meeting	Vaalwater – Vaalwater Farmers Hall
29 July 2009	Anglo Coal	Vaalwater – Vaalwater Farmers Hall
11 November 2009	Ellisras DLU and Lephalale Agricultural Association and Lephalale Local Municipality	Lephalale - Palm Park Hotel
11 November 2009	Marken Farmers Association	Marken – Marken Farmers Hall
12 November 2009	Waterberg Biosphere Reserve and Conservation groups	Vaalwater – Vaalwater Farmers Hall
12 November 2009	Waterberg District Municipality	Modimolle - municipal office
23 November 2009	Seleka Traditional Council	Seleka Traditional Council Office
23 November 2009	Laka Traditional Council	Babirwa Traditional Council Office
24 November 2009	ShongoaneTraditional Council	Shongoane Traditional Office
24 November 2009	Lekalakala Traditional Council	Lekalakala Traditional Council Office
25 November 2009	Bakoni Traditional Council Lebelo Traditional Council Machaka Traditional Council	Bakoni Traditional Offices
26 November 2009	Babirwa Traditional Council Nkidikitlane Traditional Council	Babirwa Traditional Offices
26 November 2009	Bakenberg Traditional Council Mapela Traditional Council Mokopane Traditional Council	Mapela Traditional Offices[6]

[6] Although the Mokopane and Bakernberg traditional councils had agreed to come to the meeting at Mapela traditional council office, no one came from either of the councils. Mapela traditional council said that they did not invite any of their leaders because they did not get the invitation letter. They requested that the letter should be sent to the district municipality. They said every time they went to collect the invitation they were told that the invitation has not come through. Proof of the sending of the fax to the municipality is available.

Date	Parties present	Venue
27 November 2009	Dikgale Traditional Council Moletsi Traditional Council Matlala Traditional Council Maraba Traditional Council Mashashane Traditional Council	Capricorn DM Offices[7]
11 March 2010 (specialist feedback meeting)	Landowners and stakeholders in study area	Lephalale – Machauka Lodge

Stakeholders were invited to attend these meetings by letter and through the local Tribal Authority structures and Farmers' Associations. Parties registered on the project database were invited to attend the meetings in writing.

It must be noted that, following the first round of meetings, the Tribal Authorities indicated that further public consultation meetings with them would not be necessary until a preferred alternative was recommended by the process. These follow up meetings will be held during the review period for the draft EIA Report. An undertaking has been made by the Tribal Authorities that the affected community members will be made aware of the proposed project and will be provided the opportunity to comment through the Tribal Authority structure.

A landowner consultation map indicating the landowners identified and contacted during the public participation process for the project was compiled (refer to Appendix C)[8].

Records of consultation undertaken in the EIA phase of the process are included in Appendix D and in the Comments and Responses Report contained in Appendix E.

3.3.4. Comments and Responses Report

Issues and concerns raised by I&APs during the EIA process have been synthesised into the Comments and Responses Report (refer to Appendix E for comments compiled from both scoping and EIA phases). The Comments and Responses Report includes responses from members of the EIA project team and the applicant. In some cases, immediate responses and clarification are provided. Where issues are raised that the EIA team considers beyond the scope and purpose of this EIA process, clear reasoning for this view is provided.

[7] Only Mashashane and Maraba traditional council were represented

[8] It must be noted that not all the landowners consulted as part of this process have provided details of the properties which they own and/or are resident on. Therefore, the information reflected on this map is not inclusive of all landowners consulted. Details of all parties consulted are included in the project database (refer to Appendix C).