

**DRAFT SCOPING REPORT FOR THE PROPOSED CONSTRUCTION OF 250km
400kV-POWERLINE FROM BORUTHO S/S IN MOKOPANE TO BOKMAKIERIE S/S IN
NZHELELE AND ASSOCIATED SUBSTATION WORKS TO ACCOMODATE THE
POWERLINE IN LIMPOPO PROVINCE.**

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HESSA REF NO: 2012_JHB.HESSA_ENV.PRO_0003

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DOCUMENT INFORMATION SHEET

TITLE:	DRAFT SCOPING REPORT FOR THE PROPOSED CONSTRUCTION OF 250km 400kV-POWERLINE FROM BORUTHO S/S IN MOKOPANE TO BOKMAKIERIE S/S IN NZHELELE AND ASSOCIATED SUBSTATION WORKS TO ACCOMODATE THE POWERLINE IN LIMPOPO PROVINCE.		
PURPOSE OF SCOPE:			
<p>The purpose of this draft Scoping Report/ document is to describe the environmental values and factors that may be impacted on by the proposed construction of a +- 250km 400kv Powerline project in Limpopo Province. The report is part of EIA study being conducted in compliance with the National Environmental Management Act (Act 107 of 1998) and Government Notices No. R. 544, R545 and R546 of June 2010. The EIA process is required in order to get approval for the project from a competent authority. As such, an application was lodged with the Department of Environmental Affairs (DEA) for the proposed construction of 400kv +- 250 km was assigned a reference number NEAS Reference DEA/EIA/0001049/2012 DEA Reference 14/12/16/3/3/2/287.</p>			
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1.1. Nzumbululo RAICE terms

R	Responsible: the person actually produces the document			
A	Accountable: the person who has to answer for quality assurances			
C	Consulted: those who are consulted before the document is finalised			
I	Informed: those who must be informed when the document is published			
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Caveat

DRAFTSCOPING REPORT FOR THE PROPOSED CONSTRUCTION OF THE 250km 400kV-POWERLINE FROM BORUTHO S/S IN MOKOPANE TO BOKMAKIERIE S/S IN NZHELELE AND ASSOCIATED SUBSTATION WORKS TO ACCOMODATE THE POWERLINE IN LIMPOPO PROVINCE.

Authorship: This Report has been prepared for Eskom SOC Limited (Transmission), by Nzumbululo Heritage Solutions.

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Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and data from Google Earth Pro were also utilised.

Disclaimer: Nzumbululo Heritage Solutions is not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

Signed by Principle EAP:

H Mlotshwa
April 2012



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DEFINITIONS

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

“**Alternative**” means a different means of meeting the general purpose and need of a proposed activity.” (National Environmental Management Act, 1998 (Act No. 107 of 1998), Guideline 5, June 2006).

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

“**Interested and affected party**”- refers to:

- (a) Any person, group of persons or organization interested in or affected by an activity; and
- (b) Any organ of state that may have jurisdiction over any aspect of the activity;” (R385, 2006).

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

“**Public participation process**- means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.”(R385, 2006).

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

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



ABBREVIATIONS

DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Electrical and magnetic field
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
HeSSA	Nzumbululo Heritage Solutions South Africa
IAPs	Interested and Affected Parties
ICNIRP	International Commission for Non- ionising Radiation Protection
MW	Megawatt
NEMA	National Environmental Management Act (Act No: 107 of 1998)
PPP	Public Participation Process
PSP	Public Service Provider
TRFR's	Transformers
NIRP2	National Integrated Resource Plan



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1. EXECUTIVE SUMMARY

1.2. Introduction

Eskom SOC Limited proposes to construct a 250km 400kV transmission power line from the Borutho (Bookmarie) Substation near Mokopane to Nzhelele Substation near Musina in Limpopo Province. The proposed power line would be associated with construction works of the Borutho Substation, which has already received environmental authorization (Authorisation Reference Number DEA 12/12/20/2084).. Three alternative powerline routes have been identified for this project, each planning and environmental studies servitudes of 3000m in width. The final servitude would be a corridor required to accommodate the installation of the 400kV power transmission towers. The receiving environmental for the proposed transmission power line consists of rural village settlements, traditional authority lands and commercial farmlands distributed between Borutho and Nzhelele Substation. The powerline would traverse across two districts, Capricorn and Vhembe in western and eastern regions of the Limpopo province respectively.

Eskom would apply and acquire the legal rights of the servitude in due course.

1.3. Motivation for the Development

The objective of the proposed power line is to improve the transmission network supply in the Limpopo Province. The region is experiencing exponential increasing in energy demand from various socio-economic development and land use activities such as mining, agriculture and local users in the region. The proposed powerline is therefore necessary in order to:

- Avoiding current and future possible voltage collapse;
- Contributing towards a more flexible electrical network;
- Improvement in the overall reliability of the electrical systems, which would benefit electricity users in the region; and
- To sustain economic growth in the region.

1.4. Legislative requirements

The construction of the 400kV transmission powerline, including associated infrastructures, is an activity identified in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), in respect of the Environmental Impact Assessment (EIA) Regulations No. R543 of 2010, DRAFT SCOPING REPORT BY NZUMBULULO HERITAGE SOLUTIONS, 2012



which stipulates that such developments may not commence without Environmental Authorisation (EA) from the National Department of Environmental Affairs (DEA).

1.5. Plan of Study

It is in this context that Eskom SOC Limited (Transmission) appointed Nzumbululo Heritage Solutions (Independent Environmental Management Consultants) to conduct a full EIA process for the proposed development. The study comprises of Scoping phase (Phase 1) and the EIA phase (Phase 2). The Scoping process, which commenced in February 2012, consists of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the environmental application. The purpose of the Scoping study is to describe the environment and identify the physical, biological, social, economic and cultural aspects of the environment that may be affected by the proposed activity. A Plan of Study (PoS) for the EIA phase is included in the Scoping report. It provides information on the methodology that would be adopted in assessing the potential impacts that have been identified. The PoS include details of any specialist studies that would be undertaken to obtain information that is more comprehensive and impacts on the environment. The scoping study is also a consideration of feasible and reasonable alternative activities.

1.6. Public Participation Process

Interested and Affected Parties (I&APs), are being identified, contacted and informed of the project through electronic mailing system and hard copies of registered letters sent through the post. Furthermore, notices of the project and invitation to register on the I&AP Register will be posted at different places along the proposed power line routes and the entire project area particularly in towns, villages and settlements located within close proximity to the proposed alternative powerline routes. Notices were also published in the following newspapers in English. The national paper, *Sowetan* on the 26 March 2012 and *The Capricorn* local newspaper on 28 March 2012.

The Draft Scoping Report (DSR) will be circulated to key stakeholders. I&APs will be able to access the report at public libraries and municipalities and schools in Makhado, Molemole, Mogalakwena, Blouberg, and Aganang Local Municipalities in Capricorn and Vhembe Districts. All I&APs will be afforded an opportunity to raise objections, issues and comments on the DS report and send all their comments and issues via e-mail; fax; telephone or post office to the Environmental Assessment Practitioner (EAP) at Nzumbululo Heritage Solutions.

All comments and issues to be raised by key stakeholders and I&APs will be recorded and considered by the EAP in finalising the Scoping report. The decision on the proposed development will be made after the Department of Environmental Affairs (DEA) has considered the scoping and



the final EIAR following which they may grant permission or Record of Decision (ROD). There after I&APs will have yet another opportunity to consider the DEA decision and appeal if they so choose to. The final approval of the development may be considered after all appeals have been successfully dealt with.

1.7. Preliminary Scoping

The preliminary assessment that has been done in the Scoping phase has not found any significant detrimental issues or permanent barriers to the proposed Borutho-Nzhelele 400kV transmission powerline. A conclusive decision will be made after:

- Taking into consideration stakeholders and I&APs' concerns; and
- Independent specialist studies have been carried out in the EIA phase as planned. The studies will help to identify suitable options for the proposed development.

2. ENVIRONMENTAL AUTHORISATION PROCESS

2.1. Scoping and Impact Assessment Process

This EIA process comprises of two phases namely, Scoping Phase and a detailed Environmental Impact Assessment Phase. Scoping is executed to determine the environmental issues to be addressed in relation to the project's receiving environment, the information to be collected, and the analysis required to assess the environmental impacts of a project. This Scoping process applied the following methods to:

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

There are two key concepts that this Scoping exercise addressed:

- Consultation with stakeholders to identify issues and concerns; and
- Evaluation and prioritisation of issues.

2.2. Objectives of Scoping Phase

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



To summarise the objectives of the Scoping study are:

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

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

2.3. Specialist Studies for the detailed EIA phase

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

- Ecological impacts,
- Avifaunal impacts
- Heritage Impact assessment study (Archaeological and Cultural Heritage resources)
- Wetland and Rivercrossing study
- Tourism study
- Social impact Assessment study
- Agricultural study



2.4. Way Forward

The issues raised during the Scoping Phase will be addressed further in the EIA Phase of the EIA process. Reconnaissance and preliminary field survey and alternative powerline route determination field survey indicates that the proposed project area is generally heavily disturbed from previous and current commercial and subsistence farming with a mixture of game and cattle husbandry and crop cultivation. The identified project routes and associated alternatives will traverse through traditional authority lands and commercial farmlands. It is anticipated that the proposed project will not introduce some radically new impacts to the receiving environment.

There are three potential corridors or servitude routes that were identified within the broader study area. As highlighted in the discussion above, by its nature, the proposed powerline development of the is defined as a listed activity in accordance with EIA Regulations. In terms of the NEMA, this means the project is considered to have potential to be detrimental to on the environment and therefore require Environmental authorisation from the relevant authority. In order to effectively assess the potential impacts, Eskom identified three possible alternative powerline route options for the project:

- The Preferred Route (Option 1),
- Alternative Route Option 2, and
- Alternative Route Option3.

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



DRAFT SCOPING REPORT FOR THE PROPOSED CONSTRUCTION OF THE 250km 400kV POWERLINE FROM BORUTHO S/S IN MOKOPANE TO BOKMAKIERIE S/S IN NZHELELE AND ASSOCIATED SUBSTATION WORKS TO ACCOMODATE THE POWERLINE LIMPOPO PROVINCE.

3. INTRODUCTION

Nzumbululo Heritage Solutions South Africa (HeSSA) was appointed by Eskom SOC Limited (Transmission) to conduct an Environmental Impact Assessment (EIA) study for the proposed construction of a 250-km-long 400kV transmission powerline and associated substation infrastructure. The powerline will traverse from the west of the Capricorn District to Vhembe District in Limpopo Province. The proposed line will start at Borutho substation in Mokopane to Bokmakierie substation in Nzhelele Limpopo Province.

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

Activity 8 (l): *“The construction of facilities or infrastructure, for the transmission and distribution of electricity with a capacity of 275 kolovolts or more, outside an urban area or industrial complex.”*

The above mentioned activities requires a full Environmental Impact Assessment (EIA) study, in line with the 2006 Regulations in order to acquire the environmental authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The application for environmental authorisation was made on 2nd February 2012. The lead environmental authority for this application is the Department of Environmental Affairs (DEA). As such an EIA application was lodged with DEA (Application Reference 14/12/16/3/3/2/287) and NEAS: DEA/EA/0001049/2012. Acknowledgement letter is attached in Appendix 1.



4. EXPERTISE OF THE ENVIRONMENTAL ASSESSEMENT PRACTITIONERS

4.1. Introduction

The Environmental regulation specifically requires practitioners involved in the EIA process to list their qualifications and expertise in the report. An Environmental Assessment Practitioner (EAP) appointed in terms of regulation 17 (1) is required to:

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

Nzumbululo Heritage Solution, the independent consultants and the designated project EAP have met the above directives. The table below lists the EAP study team involved in this project. These will work with other independent scientists and specialists until and an Environmental Authorisation is issued by the DEA.

4.2. Details of the EAP

Table 1a: Details of EAP (H. Mlotshwa)

Name	Hellen S. Mlotshwa
Company	Nzumbululo Heritage Solutions
Physical Address	4 Berger Road, Vorna valley Midrand
Postal Address	P. O. BOX 4106; HALFWAY HOUSE 1685
Telephone Number	011 021 4937
Fax Number	086 544 2177
E-mail	hellen@hessa.co.za / hessa5@telkomsa.net
Role in Project	Environmental Consultant/Practitioner



Hellen Mlotshwa is a qualified and experienced environmental practitioner with almost 10 years of experience on various environmental impact assessment studies authorisation projects (For further details see attached curriculum vitae (CV) in Appendix 2).

Given the significance of this project, Nzumbululo has seconded a second EAP. H. S. Mlotshwa will be assisted by a second EAP for this project, Ms K. Mogajane.

Table 2: Details of Assistant EAP (K. Mogajane).

Name	Kelebogile Mogajane
Company	Nzumbululo Heritage Solutions for South Africa
Physical Address	4 Berger Road Vorna Valley Midrand
Postal Address	P. O. BOX 4106; HALFWAY HOUSE, 1685
Telephone Number	011 021 4937
Fax Number	086 544 2177
E-mail	hessa5@telkomsa.net
Role in Project	Environmental Consultant/Practitioner

Kelebogile Mogajane initiated the EIA study process for this project and was responsible for preparing and submitting the project EIA Application to the DEA. She has nearly a decade of environmental management experience in linear and powerline development projects authorisation (refer to CV is included in Appendix 2).

4.3. Detail of Applicant

Table 3: Details of the Proponent.

Name	Henry Nawa (Representative of Proponent)
Company	ESKOM SOC Limited
Postal Address	P.O. Box 1091, Megawatt Park Maxwell Drive Sunninghill Johannesburg
Telephone number	011 800 8111
Fax number	011 800 2122
Email	nawaH@eskom.co.za
Role in Project	Project Manager



5. DESCRIPTION OF THE PROPOSED PROJECT

5.1. Introduction

The proposed project will include the construction of a new 250km-long 400kv powerline from Borutho Substation Station to proposed Nzhelele Substation in the Limpopo Province.

5.2. Project Location

The affected project area is located in the Capricorn and Vhembe Districts in Limpopo Province. The powerline preferred and alternative routes will traverse through the following.

Table 4: List of individual farms affected by the proposed powerline development.

FARMNAME	SG_CODE	FARM_NO	MAJ_REGION	MUNICNAME	NM_NUM_DIV
PYLKOP	TOMS0000000005930000	593	MS	Makhado	PYLKOP593MS
KONIGGRATZ	TOLS0000000001350000	135	LS	Molemole	KONIGGRATZ135LS
KONIGGRATZ	TOLS0000000001350000	135	LS	Molemole	KONIGGRATZ135LS
BOOMZIEN	TOLS0000000001640000	164	LS	Molemole	BOOMZIEN164LS
INDERHIKEN	TOLS0000000001650000	165	LS	Molemole	INDERHIKEN165LS
	TOLS0000000000260000	26	LS	Makhado	26LS
LA PUCELLA	TOLR00000000006930000	693	LR	Mogalakwena	LA PUCELLA693LR
LUXEMBURG	TOLR00000000007720000	772	LR	Mogalakwena	LUXEMBURG772LR
ZUID HOLLAND	TOLR00000000007730000	773	LR	Mogalakwena	ZUID HOLLAND773LR
NOORD BRABAND	TOLR00000000007740000	774	LR	Mogalakwena	NOORD BRABAND774LR
HARTEBEESTPAN	TOLS0000000000220000	22	LS	Makhado	HARTEBEESTPAN22LS
BARROW	TOMS0000000000622000	622	MS	Makhado	BARROW622MS
KAMEEKOP	TOMS0000000000623000	623	MS	Makhado	KAMEEKOP623MS
SANDSLOOT	TOMS0000000000626000	626	MS	Makhado	SANDSLOOT626MS
LANGDRAAI	TOMS0000000000627000	627	MS	Makhado	LANGDRAAI627MS
OVERDYK	TOLS0000000001470000	147	LS	Molemole	OVERDYK147LS
BADBURG	TOLS0000000001680000	168	LS	Molemole	BADBURG168LS
WELVAREND	TOLS0000000001670000	167	LS	Blouberg	WELVAREND167LS
HOOGLAND	TOLS0000000000430000	43	LS	Blouberg	HOOGLAND43LS
SOLINGEN	TOLS0000000000860000	86	LS	Blouberg	SOLINGEN86LS
LUTON	TOLS0000000000870000	87	LS	Blouberg	LUTON87LS
WITTEN	TOLS0000000000910000	91	LS	Blouberg	WITTEN91LS
WESTPHALIA	TOLS0000000001390000	139	LS	Molemole	WESTPHALIA139LS
WELTEVREDEN	TOLS0000000001620000	162	LS	Molemole	WELTEVREDEN162LS
POTSDAM	TOLS0000000001280000	128	LS	Molemole	POTSDAM128LS
GROOTHOEK	TOLS0000000001290000	129	LS	Molemole	GROOTHOEK129LS
MEANDERTHAL	TOLS0000000001880000	188	LS	Molemole	MEANDERTHAL188LS
STETTIN	TOLS0000000001330000	133	LS	Molemole	STETTIN133LS
TRIEST	TOLS0000000001920000	192	LS	Molemole	TRIEST192LS
BRILLIANT	TOLS0000000001550000	155	LS	Molemole	BRILLIANT155LS
LISSA	TOLS0000000001610000	161	LS	Molemole	LISSA161LS



FARMNAME	SG_CODE	FARM_NO	MAJ_REGION	MUNICNAME	NM_NUM_DIV
MARINASPRUIT	T0LS0000000007500000	75	LS	Blouberg	MARINASPRUIT75LS
PURASPAN	T0LS0000000008200000	82	LS	Blouberg	PURASPAN82LS
WUPPERTOE	T0LS0000000008300000	83	LS	Blouberg	WUPPERTOE83LS
SCHROELEN	T0LS0000000008400000	84	LS	Blouberg	SCHROELEN84LS
DONSANNA	T0LS0000000014100000	141	LS	Blouberg	DONSANNA141LS
BOCHEM	T0LS0000000014500000	145	LS	Blouberg	BOCHEM145LS
FRAAIHOLT	T0LS0000000014800000	148	LS	Blouberg	FRAAIHOLT148LS
JOSLAND	T0LS0000000001300000	13	LS	Blouberg	JOSLAND13LS
MUNT	T0LS0000000013700000	137	LS	Blouberg	MUNT137LS
DE RUIGTE	T0LS0000000002700000	27	LS	Makhado	DE RUIGTE27LS
JAKHALSDRAAI	T0LS0000000010200000	102	LS	Makhado	JAKHALSDRAAI102LS
REDHILL	T0LS0000000010300000	103	LS	Makhado	REDHILL103LS
CLAUDIUS HOOP	T0LS0000000010600000	106	LS	Makhado	CLAUDIUS HOOP106LS
SCHOONVELD	T0LS0000000002500000	25	LS	Makhado	SCHOONVELD25LS
RIETBOKVLEI	T0MS0000000004490000	449	MS	Makhado	RIETBOKVLEI449MS
ZWARTKLIP	T0LS0000000002000000	20	LS	Makhado	ZWARTKLIP20LS
BALMORAL	T0LS0000000006000000	60	LS	Makhado	BALMORAL60LS
VULPAN	T0LS0000000006400000	64	LS	Makhado	VULPAN64LS
GRUISPAN	T0LS0000000006500000	65	LS	Makhado	GRUISPAN65LS
GRUISPAN	T0LS0000000006500000	65	LS	Makhado	GRUISPAN65LS
LEEUEWKNOP	T0LS0000000006600000	66	LS	Makhado	LEEUEWKNOP66LS
LEEUEWKNOP	T0LS0000000006600000	66	LS	Makhado	LEEUEWKNOP66LS
TER SCHELLINGEN	T0LS0000000001500000	15	LS	Makhado	TER SCHELLINGEN15LS
SCHIERMONIKOOG	T0LS0000000001600000	16	LS	Makhado	SCHIERMONIKOOG16LS
HOOGEPLAATS	T0MS0000000003990000	399	MS	Makhado	HOOGEPLAATS399MS
VERVULLING	T0MS0000000004010000	401	MS	Makhado	VERVULLING401MS
DU PLOOY	T0MS0000000006000000	600	MS	Makhado	DU PLOOY600MS
TAMBOTIE	T0MS0000000004220000	422	MS	Makhado	TAMBOTIE422MS
ROOS	T0MS0000000006050000	605	MS	Makhado	ROOS605MS
DIAMANT	T0MS0000000006280000	628	MS	Makhado	DIAMANT628MS
AFSTAP	T0MS0000000006080000	608	MS	Makhado	AFSTAP608MS
KORTDRAAI	T0MS0000000006090000	609	MS	Makhado	KORTDRAAI609MS
VOGELSTRUIS	T0MS0000000004150000	415	MS	Makhado	VOGELSTRUIS415MS
DANIE	T0MS0000000004160000	416	MS	Makhado	DANIE416MS
DE BEERS LOOP	T0LS0000000005320000	532	LS	Aganang	DE BEERS LOOP532LS
FAIR LAURIE	T0LS0000000005340000	534	LS	Aganang	FAIR LAURIE534LS
GRAAFF REINET	T0LS0000000005350000	535	LS	Aganang	GRAAFF REINET535LS
LONSDALE	T0LS0000000005380000	538	LS	Aganang	LONSDALE538LS
LOUISIANA	T0LS0000000005390000	539	LS	Aganang	LOUISIANA539LS
POUR LA PATRIE	T0LS0000000005400000	540	LS	Aganang	POUR LA PATRIE540LS
HONEYMOON	T0MS0000000006100000	610	MS	Makhado	HONEYMOON610MS
VRYHEID	T0MS0000000004170000	417	MS	Makhado	VRYHEID417MS
DUINEN	T0MS0000000004190000	419	MS	Makhado	DUINEN419MS
WITLAAGTE	T0MS0000000004210000	421	MS	Makhado	WITLAAGTE421MS
SANDHEUVEL	T0MS0000000004250000	425	MS	Makhado	SANDHEUVEL425MS



FARMNAME	SG_CODE	FARM_NO	MAJ_REGION	MUNICNAME	NM_NUM_DIV
FRAAIFONTEIN	TOMS0000000004470000	447	MS	Makhado	FRAAIFONTEIN447MS
KNOPJESDOORN	TOMS0000000004480000	448	MS	Makhado	KNOPJESDOORN448MS
KAALPLAATS	TOMS0000000004510000	451	MS	Makhado	KAALPLAATS451MS
LEENA	TOMS0000000004530000	453	MS	Makhado	LEENA453MS
TWYFEL	TOMS0000000006290000	629	MS	Makhado	TWYFEL629MS
RINGER	TOMS0000000004030000	403	MS	Makhado	RINGER403MS
BUCHAN	TOMS0000000004040000	404	MS	Makhado	BUCHAN404MS
BRUNO	TOMS0000000004070000	407	MS	Makhado	BRUNO407MS
VERLOOREN	TOMS0000000004090000	409	MS	Makhado	VERLOOREN409MS
BRUILOF	TOMS0000000005980000	598	MS	Makhado	BRUILOF598MS
BIERMAN	TOMS0000000005990000	599	MS	Makhado	BIERMAN599MS
KALKHEUVEL	TOMS0000000004540000	454	MS	Makhado	KALKHEUVEL454MS
JUPITER	TOLS0000000007170000	717	LS	Aganang	JUPITER717LS
BILLINGSGATE	TOLS0000000006510000	651	LS	Aganang	BILLINGSGATE651LS
VENUS	TOLS0000000006520000	652	LS	Aganang	VENUS652LS
RAMPIETJESFONTEIN	TOLS0000000005980000	598	LS	Aganang	RAMPIETJESFONTEIN598LS
CERES	TOLS0000000005990000	599	LS	Aganang	CERES599LS
LUTTIGSDALE	TOLS0000000005830000	583	LS	Aganang	LUTTIGSDALE583LS
KALKSPRUIT	TOLS0000000006330000	633	LS	Aganang	KALKSPRUIT633LS
UITZICHT	TOLS0000000006350000	635	LS	Aganang	UITZICHT635LS
VLAKLAAGTE	TOLS0000000006360000	636	LS	Aganang	VLAKLAAGTE636LS
EENSGEVONDEN	TOLS0000000006450000	645	LS	Aganang	EENSGEVONDEN645LS
COMMISSIEDRIFT	TOLS0000000006460000	646	LS	Aganang	COMMISSIEDRIFT646LS
LANGVERWACHT	TOLS0000000006470000	647	LS	Aganang	LANGVERWACHT647LS
VULCANUS	TOLS0000000005840000	584	LS	Aganang	VULCANUS584LS
PERSIE	TOLS0000000002000000	200	LS	Aganang	PERSIE200LS
ZOMERSFONTEIN	TOLS0000000006040000	604	LS	Aganang	ZOMERSFONTEIN604LS
OLYMPUS	TOLS0000000005850000	585	LS	Aganang	OLYMPUS585LS
JUNO	TOLS0000000005860000	586	LS	Aganang	JUNO586LS
CHLOE	TOLS0000000005870000	587	LS	Aganang	CHLOE587LS
VLAKFONTEIN	TOLS0000000005880000	588	LS	Aganang	VLAKFONTEIN588LS
WESTHEIM	TOLS0000000001910000	191	LS	Aganang	WESTHEIM191LS
WESEL	TOLS0000000001930000	193	LS	Aganang	WESEL193LS
BURGWAL	TOLS0000000001950000	195	LS	Aganang	BURGWAL195LS
TERBRUGGE	TOLS0000000001560000	156	LS	Aganang	TERBRUGGE156LS
LANARK	TOLS0000000001990000	199	LS	Aganang	LANARK199LS
LUCY'S TOWN	TOLR0000000006870000	687	LR	Aganang	LUCY'S TOWN687LR
CROMFORD	TOLR0000000006900000	690	LR	Aganang	CROMFORD690LR
SCHOONGELEGEN	TOLR0000000006950000	695	LR	Aganang	SCHOONGELEGEN695LR
SOUR APPLE TREE	TOLR0000000006910000	691	LR	Aganang	SOUR APPLE TREE691LR
GOEDGEVONDEN	TOLR0000000007320000	732	LR	Aganang	GOEDGEVONDEN732LR
WELGELEGEN	TOLR0000000003950000	395	LR	Aganang	WELGELEGEN395LR
PRAGUE	TOLR0000000007340000	734	LR	Aganang	PRAGUE734LR
ROZENKRANS	TOLR0000000004240000	424	LR	Aganang	ROZENKRANS424LR
MATALAS LOCATION	TOLS0000000005910000	591	LS	Aganang	MATALAS LOCATION591LS



These farms are within the Limpopo Province and comprises of rural settlements, commercial farming areas, urban settlements and agro-industrial with associated infrastructures.

5.3. Layout and design

The proposed project includes the following activities:

- Establish the Nzhelele Substation Site,
- Establish Borutho-Nzhelele 250km 400kV transmission power line,
- Install 2x 250MVA 400/132kV transformers at Nzhelele MTS and terrace Nzhelele for end state 3x 250MVA 400/132kV transformers,
- Terrace the Nzhelele 400kV yard for an end state of 4x 400kV feeders,
- Terrace the Nzhelele 132kV yard for an end state of 8x 132kV feeders,
- Establish the control building, telecommunication infrastructure, oil dam, and
- Establish the entire access road infrastructure to and within Nzhelele MTS.
- Commission all new infrastructure by year 2017.

5.4. Project Motivation

The project was initiated as part and parcel of power transmission network grid improvement and stabilisation within and across the Limpopo Province. Polokwane Customer Load Network (CLN), including the Tabor and Spencer power corridor, remains susceptible to voltage instability and is the weakest part of the Northern Grid network due to being operated beyond its reliability power transfer limit. In addition to this, the Polokwane CLN, i.e., Tabor and Spencer 275kV and 132kV network, is susceptible to low voltages regardless of the approved and commissioned network strengthening in year 2010:

- Tabor-Spencer 275kV line, and
- 2nd 250MVA 275/132kV transformer.

Listed below is another approved 400kV network re-enforcement in the Polokwane CLN which is expected for commissioning by the end of year 2012:

- Witkop-Tabor 400kV line, and
- Tabor 500MVA 400/132kV transformer.

The combined transformation capacity at Tabor and Spencer MTS of 846MW exceeds the installed and the approved transformation capacity of 712MW. In addition to this, the low voltages and thermal



constraints in the 132kV Distribution network for both existing and planned network remains far below operational par. The Tabor and Spencer 275/132kV transformation recorded peak in the year 2010 was 280MW and 210MW, respectively. The exceeded Tabor 275/132kV transformation firm capacity will be restored to optimal operational and transmission capacity once the Witkop-Tabor 400kV line and the 1st of the 500MVA 400/132kV transformer have been commissioned. The Spencer 275/132kV transformation firm capacity of 234MW will be exceeded by 40MW in year 2015, as shown in load forecast, therefore, compromising the network reliability by violating the set Grid Code N-1 transformation criteria.

Furthermore, the lengthy Tabor and Spencer 132kV Distribution networks stretching 200km from Polokwane to 50km away from the Mussina border-post result in low voltages and thermal constraints during N-1 transformation and line contingencies in year 2011 and beyond. The expected Tabor and Spencer 132kV load growth is located 100km north of Tabor and 70km from Spencer, therefore, the Transmission outreach constraint will cap the load growth. Following the findings after an assessment of the Tabor and Spencer 400kV, 275kV and 132kV network constraints for the 20 year horizon, Eskom SOC Limited Grid Planning has proposes the following:

- Establish 3x 250MVA 400/132kV Nzhelele Main Transmission Station (MTS),
- Construct Tabor–Nzhelele 130km 400kV line,
- Construct Borutho–Nzhelele 250km 400kV line, and
- Commission all the associated infrastructure by year 2017.

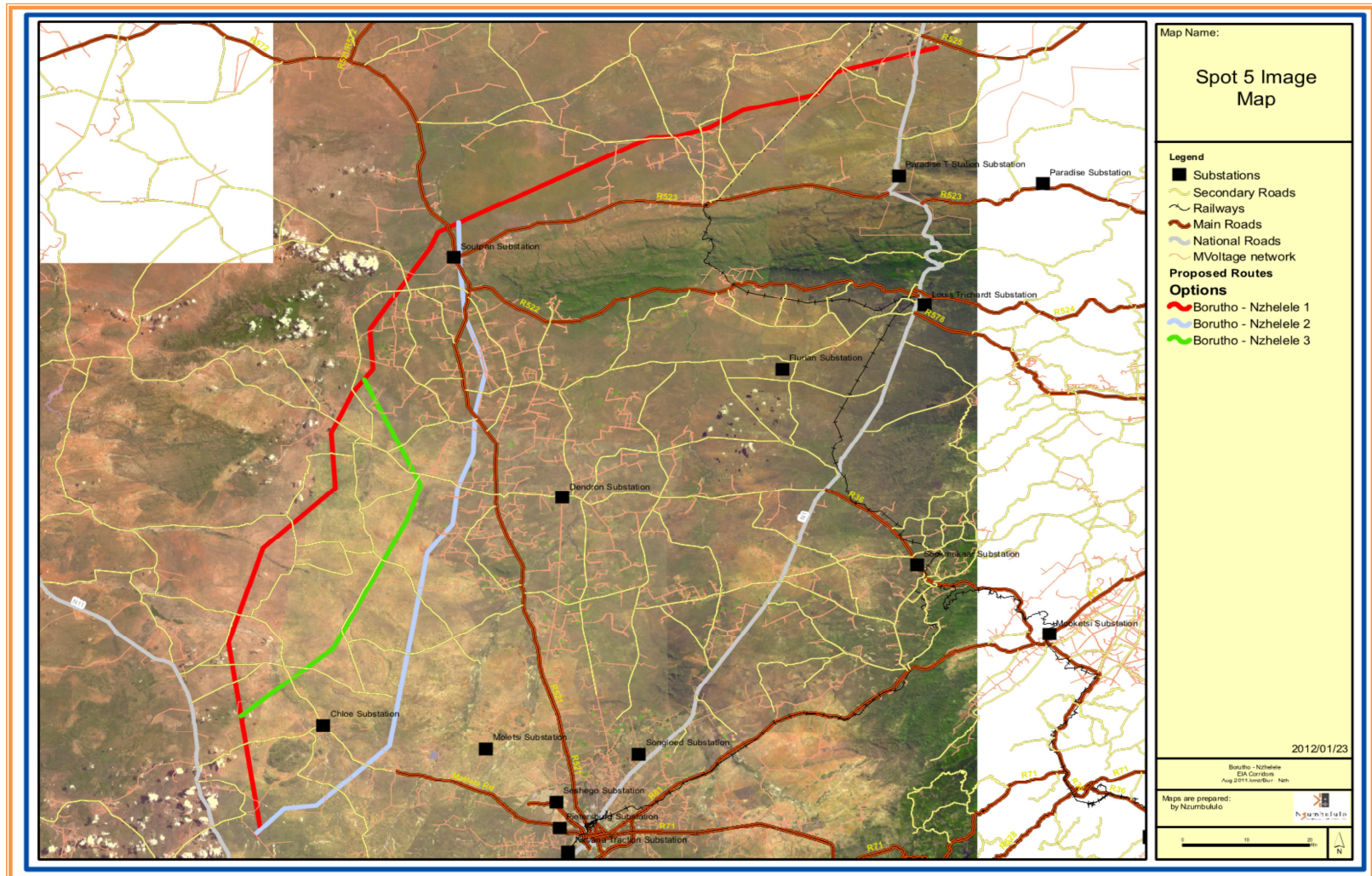
However, the proposed servitudes for the Tabor-Nzhelele-Borutho 400kV power line is likely to be more challenging to acquire due to the Soutpansberg mountain range section of which the lines will have to traverse through to feed into the Nzhelele MTS. However, the planned commissioning date of 2017 has taken into account the EIA approval processes and possible project planning challenges.

The above proposed network solution meets the 10 year Distribution load requirements in the Tabor and Spencer network areas and it is also informed by the 20 year Transmission and Distribution load forecast in meeting the Transmission 20 year plan.

It is in this context that this project is proposed and motivated to be considered for approval by compliance authorities in light of its highlighted significance and critical role in the future socio-economic and national development interests.



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





5.5. Technical Details of the Proposed Powerline

The proposed powerline will be approximately 250km long. Monotype structures are being considered for use during the construction in different sections of the line subject landscape features.

5.5.1. 400kv Tower types

Towers for the proposed powerline would be between 30m and 40m in height. Their total footprint area for each tower would be 80m x 50m. The distance between each tower would be approximately 400m. The actual number of towers, the type of towers and other support structures associated with the proposed powerline would be confirmed and detailed following approval of final route for the proposed development. In general, the type of towers to be used would consider weight, the area (e.g. topography characteristic), height, costs and erection time. In addition, from an engineering perspective, transmission powerline routes are planned with as few bends as possible.

Examples of some of the towers that Eskom would select from for the proposed 400kV transmission powerline and which have been widely used in similar development will be attached as Appendix 2. These self-supporting suspension towers are typical of most single structures, having been developed to support 400kV lines. The tower type generally carries twin Dinosaur conductors, a relatively light configuration. The use of a V-string assembly allows for compaction of phase spacing, which in turn results in both structural and electrical efficiency along the proposed +- 250km long power line. As such the monopole steel structure is considered most ideal and will be used in this development.

5.6. Proposed Activities and Project Timeline

The activities for the construction and operation will be finalised during EIA phase. Design details of the powerline will also be finalised during EIA phase. However, the powerline is expected to be operational in 2017.

5.7. Preconstruction

The project is currently on the pre-construction phase where the EA study is conducted. This study includes describing the project, determining the project alternatives, environmental management plan for the proposed project to be reported in the EIA Report. Permits from landowners (through EIA study) would be acquired. These will be produced in reports (Scoping and EIA), which are part of the EA studies and will inform authorities in making their decision. When the project is approved and Record of Decision is provided, the project will need to be advertised and await objections from IAPs for 30 days. Should all parties be satisfied and the ROD stands, only can the construction phase commence.



5.8. Construction

As illustrated above, construction will commence once pre-construction studies are completed. Construction is estimated to take about 12 months. We currently envisage construction to begin in 2014. The construction activities for the proposed development will include the following activities.

5.8.1. Access roads

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

5.8.2. Construction Camp

The construction camps will be located at the nearest appropriate areas within the approved servitude corridor of proposed location of power lines. The exact locations will be negotiated and finalised with relevant land owners, where applicable, after completion and approval of the EA study.

5.8.3. Construction of transmission powerlines

The following activities will be conducted as part of constructing the transmission powerlines:

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



5.8.4. Stringing of Conductors

Eskom has strict international best-practice methods of building powerline such the propose Borutho Nzhelele Transmission Power line. For example, the construction teams would guide wires, to string the conductors between towers. This can be undertaken mechanically or by hand. The line will generally be strung in sections. There will be cable drums placed at 2 km intervals during this stringing process. In order to minimise any potential negative impacts on the surrounding areas, these cable drums would be placed within the approved servitude.

5.8.5. Operation and maintenance

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



6. STATUTORY REQUIREMENTS

6.1. Introduction

The proposed development is guided and governed by Legislative Acts and Ministerial Guidelines (also see Table 5). In addition, EIA studies for electricity generation, transmission and distribution projects are also guided by additional internal Eskom Guidelines and Policies (also see www.eskom.co.za).

6.2. Legislations Related to the project

6.2.1. Constitution of South Africa (Act 108 of 1996)

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

“Everyone has the right:

a) to an environment that is not harmful to their well being and

b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that:

prevent pollution and ecological degradation;

promote conservation; and

secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.”

6.2.2. Energy Policy

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

Furthermore, the White Paper on Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between the energy demand and resource availability, whilst taking into account the health, safety and environmental parameters. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach



to provide a long-term cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

6.2.3. Electricity Regulation Act of 2006

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

- Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;
- Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in South Africa;
- Facilitate investment in the electricity supply industry;
- Promote the use of diverse energy sources and energy efficiency; and

Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. In addition, the Electricity Regulation Act (Act No 4 of 2006) in terms of section 46 (2c) projects involving new generation capacity that is needed to ensure the continued uninterrupted electricity supply would require authorisations or exemptions in terms of NEMA (No 107 of 1998) or as may be required by any other law for the purpose of authorisation for proposed Eskom developments (DME, 2006).

6.2.4. Integrated Energy Plan (IEP) – 2003

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

6.2.5. Integrated Resource Plan (IRP) – 2010-2030

The Department of Energy, under the New Generation Capacity regulations has authorised the System Operations and Planning Division in Eskom to produce the IRP for electricity in consultation with the Department and the National Energy Regulator of South Africa (NERSA) (DOE, 2011). The objective of



the IRP is to develop a sustainable electricity investment strategy for generation capacity and transmission infrastructure for South Africa over the next 25 years. In summary, the IRP is intended to:

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

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

The proposed development comprises certain activities (e.g. changing the nature of a site exceeding 5 000m² and linear development exceeding 300m or river crossing for more than 50m in length) that require authorisation in terms of Section 38 (1) of the NHRA, Act 25 of 1999. Section 38 (8) of the Act states that if heritage considerations are taken into account as part of an application process undertaken in terms of the ECA, there is no need to undertake a separate application in terms of the National Heritage Resources Act (NHRA). The requirements of the National Heritage Resources Act can thus be addressed as an element of the EIA process, specifically by the inclusion of a Heritage Impact Assessment (South African Heritage Resource Agency, 1999). In addition, for instance, NEMA section 24 (4) (b) (iii) appears to reinforce the provisions of NHRA by requiring that procedures for assessing impacts including heritage impacts for most of NHRA sections 38 (1) activities be addressed in an application for Environmental Authorisation.

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

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

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



6.2.8. Development Facilitation Act (No. 67 of 1995)

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

6.2.9. Expropriation Act (No. 63 of 1975)

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

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

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

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

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

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



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

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

6.2.13. National Water Act (No 36 of 1998)

The National Water Act states that duty of care to remedy the effects of pollution to water resources needs to be taken into consideration in all circumstances (section 19). The Act also stipulates procedures to be followed in the event of an emergency incident that may impact on a water resource (Section 20) as well as governing water use licences (Section 21) if required for construction purposes (DWAF, 1998).

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

The Promotion of Administrative Justice Act aims to give effect to the right to administrative action that is lawful, reasonable and procedurally fair, and to the right to written reasons for administrative action as contemplated in Section 33 of the constitution of the Republic of South Africa 1996 and provides for matters incidental thereto (PAJA, 2000). In particular, the proposed development was considered in accordance with this Act in terms of the following (PAJA, 2000:4):

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

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



- consider any comments received; and
- comply with the procedures to be followed in connection with notice; and
- comment procedures

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

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

NEMPAA provides for protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. The Act also supports the establishment of a national register of all national; provincial and local protected areas, for the management of those areas in accordance with national norms and standards, for intergovernmental cooperation and public consultation in matters concerning protected areas, for continued existence, governance and functions of South African National Parks and for matters in relation to protected areas. The proposed development would traverse environmental sensitive areas (to be identified by biodiversity specialists during field work). Nonetheless, mitigation measures will be adhered to with regards to avoid and / or minimise detrimental impacts on the environmental sensitive areas

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

Table 5: Activities listed within Government Notice No. R544, R545 and R546 applicable to this project (as per numbering in the Government Notice)

Number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
GNR545(Listing Notice 2) of 18 June 2010	8	the construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex
GNR544(Listing Notice 1) of 18 June 2010	10,	the construction of facilities or infrastructure for the transmission and distribution of electricity i).outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts ii) inside urban areas or industrial complexes with a capacity of 275



Number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
	11	<p>kilovolts or more</p> <p>the construction:</p> <ul style="list-style-type: none"> (i) canals (ii) channels (iii) bridges (iv) dams (v) weirs (vi) bulk storm water outlet structures (vii) marinas (viii) jetties exceeding 50 square metres in size, (ix) slipways exceeding 50 square metres in size (x) buildings exceeding 50 square metres in size, or (xi) infrastructure or structure covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of watercourse, excluding where such construction will occur behind the development setback line. <p>the construction of a road, outside urban areas</p> <ul style="list-style-type: none"> (i) with a reserve wider than 13,5 meters or (ii) where no reserve exists where the road is wider than 8 meters, or (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in government Notice 387 of 2006 or activity 18 in Notice 545 of 2010 <p>The transformation of land bigger than 1000 square meters, to residential retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space or had an equivalent zoning.</p>
	22,	
	24,	<p>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). The decommissioning of existing facilities or infrastructure for</p> <ul style="list-style-type: none"> (i) electricity generation with a threshold of more than 10MW (ii) electricity transmission and distribution with a threshold of more than 132kV (iii) nuclear reactors and storage of nuclear fuel (iv) activities, where the facility or the land on which it is located is contained (v) storage or storage and handling of dangerous goods of more than 80 cubic metres
	26,	<p>the expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and</p>



Number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
GNR546(Listing Notice 3) of 18 June 2010	38, 47 4,	<p>the development footprint will increase.</p> <p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre</p> <p>(i) where the existing reserve is wider than 13, 5 meters, or</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres- excluding widening or lengthening occurring inside urban areas.</p> <p>The construction of a road wider than 4 metres with a reserve less than 4 metres with a reserve less than 13, 5</p> <p>(i) in an estuary:</p> <p>(ii) outside urban areas, in</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies</p> <p>(bb) National Protected Area Expansion Focus area</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the act and as adopted by the competent authority</p> <p>(dd) Sites or areas identified in terms of an international Convention</p> <p>(ee) Critical biodiversity areas as identified systematic biodiversity plans adopted by the competent authority in bioregional plans</p> <p>(ff) core areas in biosphere reserve</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected areas identified in terms of NEMPAA or from the core areas of a biosphere reserve.</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high- water mark of the sea if no such development setback is determined</p> <p>(iii) in urban areas</p> <p>(aa) Areas zoned for use as public open space</p> <p>(bb) Areas designated for conservation use in Spatial Development Framework adopted by the competent authority or zoned for a conservation purpose,</p> <p>(cc) seawards of the development setback line or within urban protected areas.</p> <p>the clearance of an area of 3000 square metres or more vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>(a) within any critical endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004</p> <p>(b) within critical biodiversity areas identified in bioregional plans</p> <p>(c) Within the littoral active zone or 100 metres inland from high water</p>



Number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice)	Describe each listed activity as per project description
	12,	<p>mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban area</p> <p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre</p> <p>(i) in an estuary</p> <p>(ii) outside urban areas, in</p> <p>(aa) A procted area identified in terms of NEMPAA, excluding conservancies</p> <p>(bb) National procted Area Expansion Strategy Focus areas</p> <p>(cc) Sensitive areas as identified in an environmental management framework as completed in chapter 5 of the Act and as apoted by the completed authority:</p> <p>(dd) Sites or areas identified in terms of an international convection</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional,</p> <p>(ff) Core areas in biosphere reserves</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in tems of NEMPAA or from the core area of a biospheree reserve,</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined,</p>
	19	<p>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse when no such setback line has been determined</p> <p>iii inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competed authority or zoned for a conservation purpose.</p>

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



14/12/16/3/3/2/287 and NEAS: DEA/EIA/0001049/2012, scoping study for the project was formulated in line with the applicable regulation to achieve the following:

- a) Conduct at least the public participation process set out in Regulation 54-57
- b) Give notice in writing of the proposed application to any organ of state which has jurisdiction in respect of any aspect of the activity
- c) Open and maintain a register of all interested and affected parties in respect of the application in accordance with Regulation 57
- d) Consider all objections and representations received from interested and affected parties following the public participation process
- e) Subject the application to scoping by identifying
 - i. Issues that will be relevant for consideration of the application
 - ii. The potential environmental impacts of the proposed; and
 - iii. Alternatives to the proposed activity that are feasible and reasonable
- f) Prepare a scoping report in accordance with Regulation 28; and give all registered interested and affected parties an opportunity to comment on the scoping report in accordance with Regulation 57

6.3. Eskom guidelines

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

- Air Quality Management Policy (ESKPBA3)
- The Control Of Dust Exposure Within Eskom (ESKADAAD6)
- Environmental Impact Assessment (ESKPVAAL7)
- Passive Fire Protection For Oil Filled Equipment In High Voltage Yards (FSGASAAQ8)
- Standard For Bush Clearance And The Maintenance Of Overhead Powerlines (ESKASABG3)
- Guidelines For Weed Eradication At Eskom Substations Using Herbicides (TRR/S.92/034)
- Oil Spill Clean-Up And Rehabilitation (ESKAGAAD7)



7. DESCRIPTION OF STUDY AREA

7.1. Introduction

This section discusses the key characteristics of the biophysical and human environmental aspects of the potentially affected area. For this project, the study area is defined as the development footprint and its immediate surroundings as well as to a larger scale; the local municipal areas, the broader district and region. The information pertaining to the receiving environment has been complemented with information from desktop studies. During the EIA stage, the biophysical and human environmental aspects would be supplemented with results from the various specialist impact assessments comprising: Vegetation; Fauna; Avifauna; Wetland; Agriculture; Visual; Heritage; and Socio-economic impact assessments.

7.2. Biodiversity

7.2.1. Fauna

The proposed powerline would pass through sections that are heavily degraded, others slightly changed and others with limited sections of primary vegetation cover. Based on observations and preliminary reconnaissance survey, the primary vegetation cover is most likely limited to the grassland biome. The grassland can be subdivided into numerous vegetation units depending on the presence of different soil types that ranges from sandy to clay, as well as a moisture gradient. The chemical composition of the soil also plays a major role in determining the vegetation unit. In the grassland, the absence of a dominant tree or shrub layer is characteristic. The grassland is dominated by grasses such as Finger grass (*Digitaria eriantha*), Red grass (*Themeda tiandra*), various love grasses (*Eragrostis chloromelas*, *E. lehmanniana*, *E. superba*), Horse grass (*Triraphis andropogonoides*), Carrotseed grass *Tragus koeleroides*, Three-awned grass species (*Aristida congesta*, *A. adscensionis*) (Beater, 2006).

There is a possibility that protected fauna and flora species may be found in the proximity of the study area from Borutho to Nzhelele. The majority of this study area is in a state of transformation, with a number of settlements and small towns dotted throughout the immediate surrounds intermingled with agricultural areas, rural settlements and business developments. As a result, a great deal of the vegetation within the study area is being transformed (Beater, 2007).

The fauna and vegetation studies that will be conducted would help in identifying the species and methods of handling them. The findings would be available during the EIA phase. The powerline will



also run through agriculture fields as shown Plate 1 below.



Plate 1: Agriculture circle based on the central pivot point of irrigation such disturbed land sections dominate the proposed powerline servitude.

The project area is currently degraded predominantly by agricultural land use activities. The preliminary field survey did not record any major wild faunal species colonies along the powerline routes. Several bird species were recorded. There are number cattle ranches within the project area.

7.2.2. Birds

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



7.3. Climate

The Limpopo region has a wide climatic variation. The Polokwane to Musina region is reflective of the province and offers pleasant climate for most of the year. Blessed with year round sunshine, (<http://www.myforecast.com/bin/climate.m? city=77209&metric=false>) it can get hot in the summer period (October- March), averaging 27 Degrees Celsius. Winter is a sunny season of chilly mornings, warm middays, dry afternoons and cool to cold nights.

7.4. Land use

The project area is predominantly a commercial farming area with a mixture of game, cattle and crop cultivation both dry land and rural residential areas forms part of the land use, (see Plate 2). Large tracts of land within the study area are still in a natural state (largely undisturbed by human development) particularly close Nzhelele end of the powerline. Relatively some land portions within the project can be classified as degraded. And also some sections have been disturbed by past impacts (e.g. access roads,



construction substations, boundary fence lines, distribution powerlines, etc.).

Plate 2: View of residential areas in Moetagare, in Mokopane area where the powerline will traverse.



Plate 3: View of selected sections of farming areas, the powerline will pass through farming areas. Note that 70% of the powerline servitude traverses through farming areas.

7.5. Geology and Soils

Soil itself is created by the physical and chemical weathering of bedrock, deposition of other sediments and soils and the breakdown of organic matter. Soil formations affected by a series of factors including the organisms that live on and in it, the climate of the region, the topography (aspect, slope, etc), bedrock below and time (Pidwirny 2008). The study of soils is known as Pedology and the evolution of soils is often referred to as Pedogenesis. The geology of the lower portion of the Limpopo River consists largely of consolidated and unconsolidated sedimentary rocks (Ashton *et al.* 2001), including argillites, fluvial sandstones and mudstones (Chinoda *et al.* 2009). These sediments form a region of shallow sloping plains interrupted occasionally by exposed granitic intrusions (SARDC 2002). The sediments of this region are largely alluvial in origin, including Ferruginous arid sands (Chinoda 2009). The coastal zone is lined with interior dunes, including some consolidated dunes, and coastal dunes (Chinoda *et al.* 2009).

7.6. Existing infrastructure

The study area is within rural communal and commercial agricultural areas, hence there some existing infrastructure. There are access roads (see Plate 4 and 5) and the distribution powerlines and telecommunications, main roads running through the study area.



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



Plate 5: View of proposed powerline route running next to the existing railway line.

7.7. Noise

The main source of high noise level associated with the proposed project area derives from traffic from the local communities, and also from agricultural machinery and activities.

7.8. Water features

The area may consist of a number of water bodies such as pans, rivers, streams and drainage lines. The proposed development is anticipated to cross a number of small streams. A wetland assessment would therefore be conducted and address mitigation measure for potential impacts on any



watercourses during the EIA phase of the project (See plate 6).



Plate 6: View of a water body located in the vicinity of the proposed powerline route near alternative 1.

7.9. Air quality

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

The only potential source of air pollution for sensitive receptors in the project area (such as surrounding farmlands and Eskom employee temporary dwellings) from the proposed development would be dust that may be generated during the construction phase. Dust levels depend on the type and level of construction activity being undertaken as well as the prevailing meteorological conditions. Dust emissions are typical caused by land clearing, drilling, blasting and cut and fill operations. The excavation for new development is likely to generate dust, which may travel into surrounding farmlands areas.



However mitigation measures, which will be put in place during the construction phase, are likely to prevent dust from affecting areas beyond the boundaries of the site. The Environmental Management Plan will specify measures such as the damping down of exposed surfaces to prevent dust travel.

7.10. Human environment

The individual local municipalities (affected by the proposed project) have demographic features that resemble the districts in which they are located. The following socio-economic characteristics have been gathered from the Capricorn and Vhembe Districts Integrated Development Plans (IDPs).

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

A question that is regularly raised by interested and affected parties is whether the installation of powerlines will have a detrimental medical effect on these living in close proximity of the powerlines. In 2006, Eskom commissioned an independent study conducted by Empetus Close Corporation to assess the effect of electric and magnetic fields (EMF) on the surrounding environment. The report, and several others from international researchers and experts, highlights that all household appliances and other electrical equipment generate electrical and magnetic fields (EMF). Therefore people are generally exposed to varying levels of EMF in their daily lives at work and at home. EMF is always created, in varying levels, with the generation of electricity and the frequency of the electrical power system. Overhead powerlines generate electric and magnetic fields but not any different from what people are already exposed to from other sources in their daily lives.

Table 46: Summary of typical electric field levels measured in the vicinity of the Eskom Powerlines (Empetus Close Corporation).

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



Table 7: Summary of magnetic field in the vicinity of the Eskom Powerlines (Empetus Close Corporation).

Voltage (kV)	Current	Max Magnetic field	Magnetic field at Servitude Boundary	Servitude Width
132	150	4,0	1,0	15,5
275	350	6,0	1,0	23,5
400	650	10,5	2,5	23,5
765	560	6,0	1,5	40,0

The above tables (Table 6 and Table 7) illustrate that the electric and magnetic fields fall to lower levels with an increase in distance from the line. The main concern that is raised with regard to powerlines is that they are thought to increase chances of cancer. No evidence of a causal relationship between magnetic field exposure and childhood leukaemia or breast cancer has been found and no dose-response relationship has been shown to exist between EMF exposure and biological effects (Ibid).

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

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

The proposed development may traverses through section where it is near residential areas on the Mokopane side, however it is not anticipated to result in prohibitive and high significant or unmitigatable impacts.

Nonetheless, one class of impact that has been identified relates to heritage resources associated with the proposed servitudes. These are usually fixed in space and Eskom will have to consider applicable mitigation or apply avoidance measure where applicable should the line be cleared to proceed as planned.



7.11. Heritage

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

7.12. Construction camp

The proposed powerline will require the erection of a temporary construction camp. Due to the time limits nature of this project the construction camp will also be small and will be located within the existing servitude boundaries. The EMP will include strict mitigation measures, which will manage the construction camp during construction. Eskom and the independent contractors both appoint Environmental Control Officer (ECO), who will be responsible for the implementation of these measures. Due to these mitigation measures, the presence of a construction camp is not expected to impact negatively on the Socio economic environment of the site.

7.13. Visual landscape

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

8. In general, the visual character of the study area is largely natural. Man-made interventions include the existing railway and road servitudes, existing power lines, as well as the infrastructure and buildings associated with the farmsteads. Distant views include the extensive mines and power station infrastructure located towards the west of the study area (Beater, 2007). A visual impact study would be conducted, as the proposed transmission line would traverse residential



areas impacting on their sense of place, as well as impacts on tourists and motorists.

9. DISCUSSION OF THE PROJECT ALTERNATIVES

9.1. Introduction

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

9.2. Strategic alternatives

As part of the planning exercise, the division of Eskom SOC Limited responsible for Transmission investigated different alternatives to the preferred powerline. They identified the preferred technical and cost effective options for the proposed development. The power line will be approximately 250 km long traversing through terrain of almost uniform environmental sensitivity. Hence, preference is given to developing a power line running directly from and to the proposed substations at Borutho and Nzhelele Sites. The shortest possible route will also ensure minimum impact on the receiving environment.

9.3. Technical and Process Alternatives

9.3.1. Overhead Powerlines

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

Overhead lines allow high voltage operations and the surrounding air provides the necessary electrical insulation to earth. Further, the surrounding air-cools the conductors that produce heat due to lost energy (Swingler *et al*, 2006). The overall weather conditions in the Limpopo Province are less likely to cause damage and faults on the proposed overhead transmission powerline. Nonetheless, if a fault occurs, it can be found either quickly by visual means using a manual line patrol or, in urgent cases, by helicopter patrol. Repair to overhead lines is relatively simple in most cases and the line can usually be put back into service within a few days.

In terms of impacts caused by the proposed development, factors such as visual intrusion and threats to sensitive habitat are not generally the same along the whole route. Should the alignment be proposed in sensitive areas such as river crossings, the tower dressing method may be used. This



would involve lowering the conductors into position using an aerial method of construction such as a helicopter, which would require little or no clearing on the ground.

9.3.2. Underground lines

Underground cables have generally been used where it is impossible to use overhead lines. This is often because of space constraints, for example, in densely populated urban areas or for sea crossings. Underground cables are oil cooled and are also at risk of groundwater contamination. Maintenance is also very difficult on underground lines compared to overhead lines. When a fault occurs in an underground cable circuit, it is almost exclusively a permanent fault due to poor visibility. Underground lines are also more expensive to construct than overhead lines. Factors that may increase the cost of an underground system include (Swingler *et al*, 2006):

- Rock Excavation;
- Installation in Pavement (Streets or Sidewalks);
- Requirements to Bore Underneath Street Crossings;
- Right of Way Acquisition Costs;
- Reactive Compensation Requirements at Substations. Underground cable is capacitive in nature and the longer the length of circuit, the more likely the need for compensation; and
- Radial Configuration of the Line. Absence of another transmission source to maintain service during an outage of the line may require installation of additional underground cable redundancy.

9.4. Route Alternatives

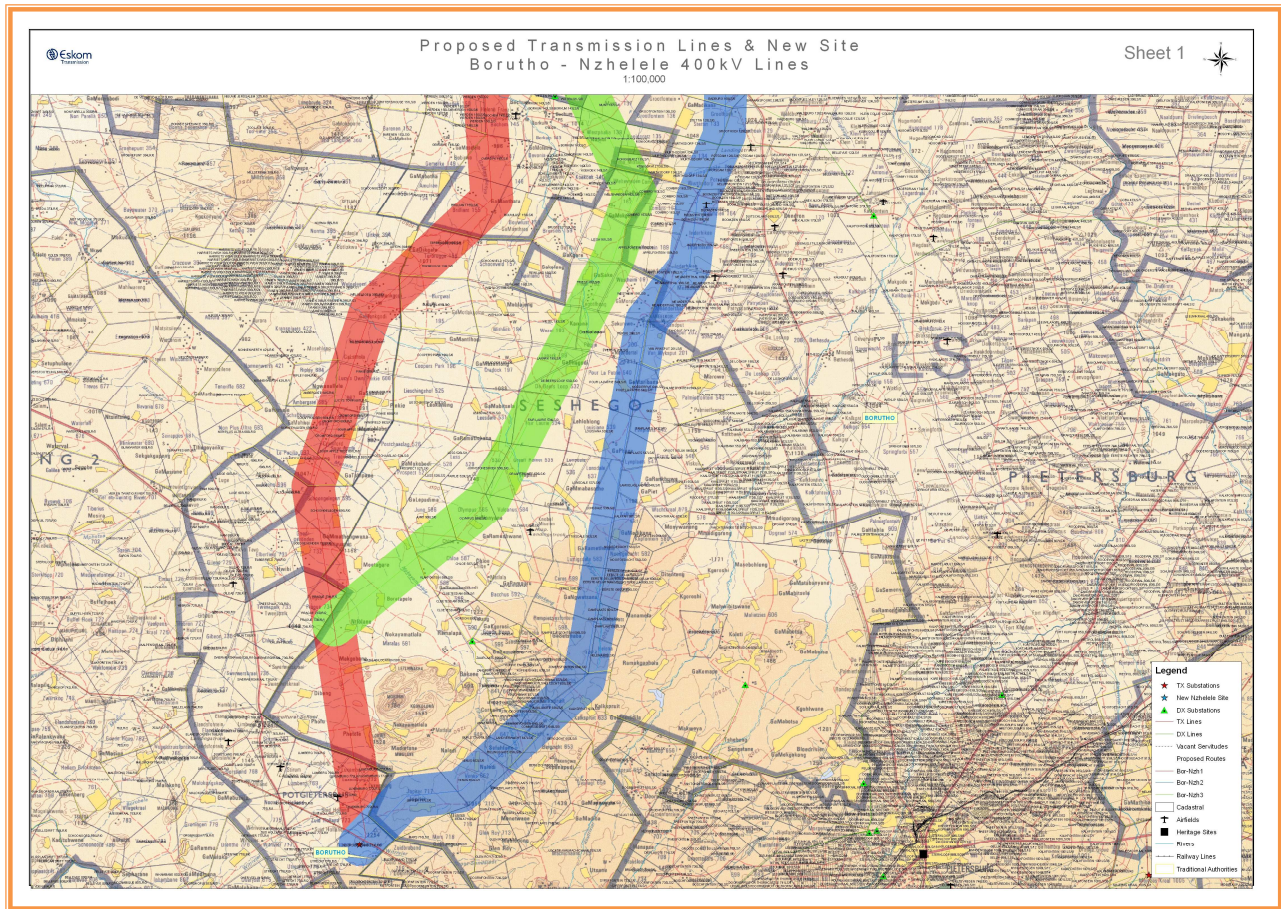
For this study, three alternative routes are being considered each estimated to be 250km long with a 3000m wide corridor being considered. However, the final approved servitude corridor would be reduced to the appropriate width according to the final engineering designs and approvals by the DEA.

9.4.1. Preferred Power Line (Option 1)

The preferred powerline route starts from Borutho substation located near Mokopane. The route runs in a slightly straight alignment for about 60km. It continues with a few bends in and out of rural village settlement. Along the route, it traverses through subsistence farming areas passing a number of graveyards, schools, communities and farms. The route also traverses across streams and possible wetlands. Therefore this corridor affects the communities of Mokopane. The line will also cut through flat topography dominated by commercial farming with a mixture of game, cattle and crop cultivation in its midsection.



Figure 2: The locational Maps and proposed alternative route of the powerline.



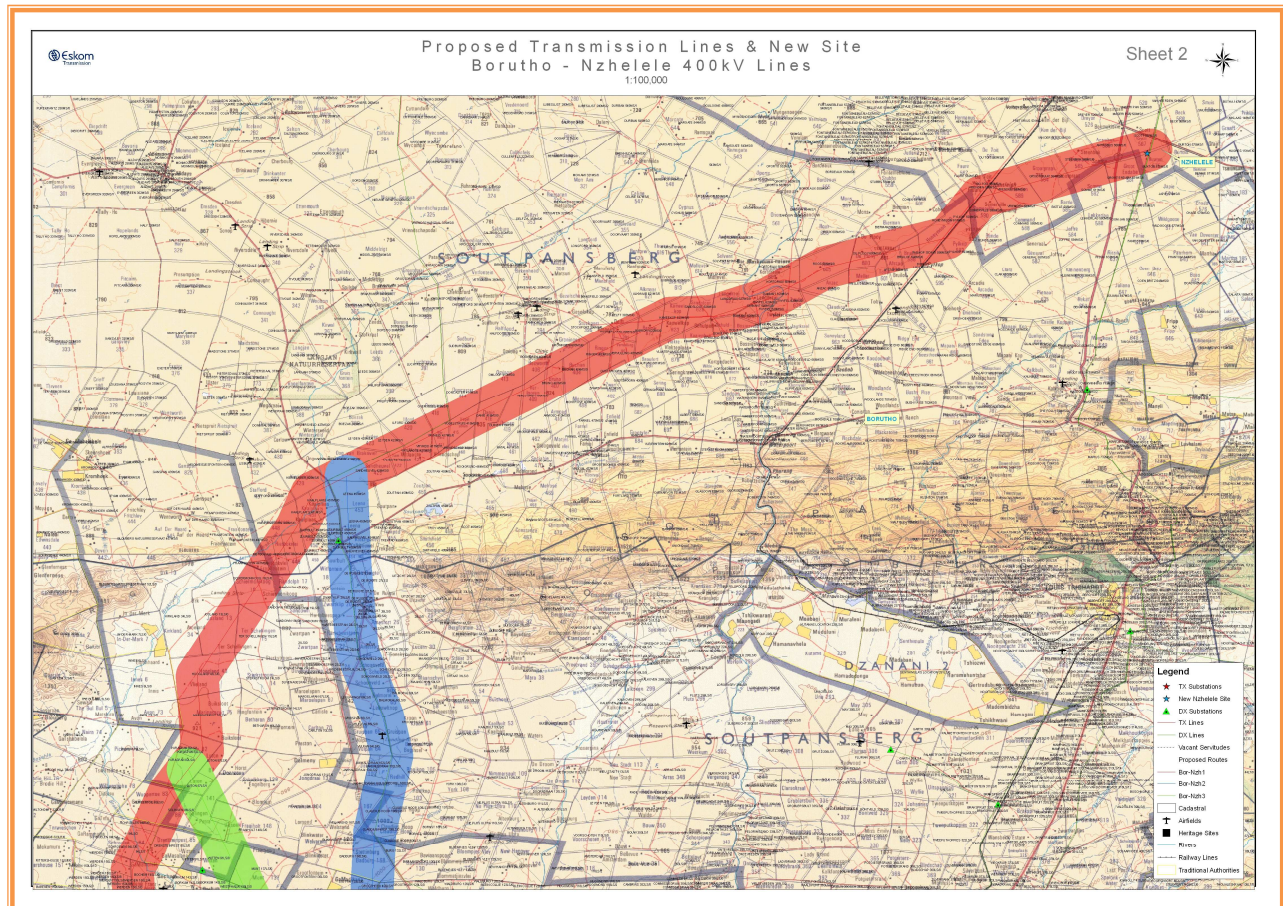


Figure 3: Continuation of 3 routes traversing through already developed project area.

9.4.2. Alternative Powerlines Option 2

The Alternative Route 2, (which is blue in colour as shown by the attached map Figure 3 starts from the main route or the preferred route at Ntolane Village. It will run slightly straight, bending towards and avoiding some villages. The route Option 2 is estimated to be 80km and pass farmhouses and crossing two rivers within the corridor. There is a tarred district road, so the powerline would cross R567 Road close an existing cemetery. It bends to avoid an existing communication tower going towards Maponto village, then it re-joins the route on Option1.

9.4.3. Alternative Powerlines Options 3

Alternative Option 3 starts from Borutho substation and slightly bends on the right as shown on the map. It traverses into similar environment crossed by Option 1 and 2 approximately. It passes Venus village, Sefahle village, Lepotlaka village, Road 567, Maribara village and a few cemeteries as compared to Route Opton 1. Most deviations are due to avoiding environmental features and dwellings



where possible. However findings of the specialist surveys will confirm what environmental sensitive features are to be avoided within the study area during the EIA Phase.

9.5. Demand alternatives

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

By reducing peak demand and shifting load from high load to low load periods, reductions in capital expenditure (for network capacity expansion) and operating costs can be achieved. Some of the basic tools are the price signals (such as time of use tariffs) given by the utility and direct load management. This option is practised to a certain extent. No other alternative energy sources have been identified at this stage.

9.6. No-go option

The “do nothing” Alternative is the option of not undertaking the proposed development, which implies that the 400kV powerline line would not be constructed. Retention of the status quo would mean that it would not be possible to meet the growing electricity demands in the area and other surrounding towns. This option is not economically feasible because electricity users such as farmers and domestic users would be unable to avoid interruptions. Consequently, without the proposed new power line there is an increasing possibility that outages could occur, resulting in economic losses that could run into millions of Rands, particularly for the various industries, farmers in the area. The ‘No Go’ option is usually considered when the proposed activity is envisaged to have such significant long-term negative environmental impacts that mitigating measures cannot ameliorate the

Based on the identified need for the proposed development to proceed and the fact that although there could be negative impacts associated with the proposed development, there will be mitigating measures to minimise or eliminate negative impacts, where possible, associated with the construction and operational /maintenance phases for power line developments. It is reasonable to indicate that the “No Go” alternative is not an option to be considered for this activity.

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



The most prominent envisaged of the proposed activity would be the provision of electricity. Electricity supply developments are generally intended to promote economic development and improve the social welfare of communities, industries and mines. A steady growth in electricity demand is expected to continue in South Africa for some time because required electrification of housing projects and developments such roads, schools and railway lines.



10. POTENTIAL ENVIRONMENTAL IMPACTS

10.1. Introduction

The environmental impacts of a project are those consequential changes in environmental parameters, in space and time, compared with what would have happened had the project not been undertaken. The table below gives a simplistic summary of the anticipated negative environmental impacts of the proposed development and mitigation measures. It must be acknowledged that the intended overview of issues does not highlight a wide range of details such as: the differences in impacts between the different phases (for example, construction, operation and closure); spatial extent and predicted lifetime of the impact. Detailed significant impacts and mitigation analyses would be presented alongside impact assessment findings and from issues raised by I&APs during the EIA phase.

10.2. Biodiversity

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

As a result of the noise during construction activities, animal species may migrate in search of other habitat; this may disturb the ecosystem in the area. In addition, birds may be electrocuted by power line in three possible ways. The possible ways are: simultaneously touching two live wires and simultaneously an energised wire and any other piece of equipment on a pole or tower that is bonded to the earth through a ground wire.

10.3. Land use

Current or future land uses may be affected due to the proposed construction of the power line. Powerlines usually run across various property boundaries and livestock camps. Boundary fences may be damaged during construction or gates may be left open resulting in the unplanned integration of livestock. The land earmarked for the proposed development is currently mine land and other areas are farmlands and are used for subsistence farming thus the construction of the power line will result in changes of the land use.



10.4. Visual impact

All construction activities would involve the use of variety construction equipment, stockpiling of soils, materials and other visual signs. While evidence of such will be visual to the farm owners and others in the nearby vicinity, such visual disruptions will be short term and limited to the construction phase only.

10.5. Archaeological/heritage resources

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

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

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



Plate 7: view of cemeteries at the Sefahlane.



10.6. Water resources

Construction grading and utility excavations for the pylon installations would increase the sediment load in storm water during rainfall events. Sediment sources created during construction include soil stockpiles and soil tracked across construction areas, debris resulting from the installation of electric pylons foundation. These sediment loads could be deposited into the water bodies close to the site. Due to the vast spatial extent of power line developments, it is often impossible for the power line corridor not to cross over water bodies such as rivers and wetlands. Construction activities within the vicinity of these water bodies create problems if not taken care of to prevent them. These range from erosion into rivers, which creates water pollution to draining of wetlands in order to give way for the construction equipment. Some of the construction equipment could be located within floodplains and/or within 1:50 year flood lines. The combination of all these presents threat to water resources.

10.7. Soil

Soil has an important role in the environment as it supports biodiversity and provides for a physical base for plants, buildings and other infrastructure. Soil structure will be disrupted during the digging of foundation for the new, pylons for the power line and during excavation works.

Continuous movement of heavy machinery to and from the construction site will result in soil compaction thereby reducing its capacity to hold water which will in turn result in increased runoff during the rainy season. Fuel leakages and accidental oil spills from construction vehicles and machinery have the capability of contaminating soil once they infiltrate into the soil, this indirectly also affects plant growth in the near future.

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

10.8. Noise

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

10.9. Air quality

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



10.10. Health and safety

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

10.11. Infrastructure and services

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

10.12. Socio economic

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

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

10.13. Topography

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



11. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGIES

11.1. Measuring environmental impacts

There are guidelines and universal formulas developed for assessing or measuring identified or anticipated impacts on a given development's receiving environment. This study would apply such standards. There are at least seven generic rating scales that are used into this EIA study. These are:

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

11.1.1. Duration

Table 8: Period of Impact Rating.

RATING	DESCRIPTION
Short term	0-5 years
Medium term	5-15 years
Long term	Where the impact will cease after the operational life of the activity
Permanent	The impact will occur even after the operational and decommissioning of the project has occurred.

11.1.2. Extent

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

Table 9: Extent of Impact Rating.

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

11.1.3. Intensity

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



Table 10: Impact Intensity Rating.

RATING	DESCRIPTION
Low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
Medium	Where the affected environment is altered but natural, cultural and social functions and processes continue, although in a modified way.
High	Where natural, cultural and social functions or processes are altered to the extent that they will temporarily or permanently cease.

11.1.4. Significance

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

Table 11: Significance Rating.

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

11.1.5. Status of Impact

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

11.1.6. Probability

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

Table 12: Impact Probability Rating.

RATING	DESCRIPTION
Improbable	The possibility of the impact occurring is very low or unlikely



Probable	There is a possibility that the impact will occur.
Definite	The impact will definitely occur

11.1.7. Degree of confidence

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

Table 13: Degree of Confidence.

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

Table 14: Risks identified.

RISK IDENTIFIED	PROBABILITY	IMPACT	PROPOSED MITIGATION
A number of grave yards, the Mexican shows that the province, mostly in open air locales or in sediments alongside rivers or pans, document Earlier, Middle and Later Stone Age habitation.	High	High	A heritage specialist will have to form part of the team and all the necessary applications to relevant government departments will have to be processed accordingly.
The Limpopo Province has an upper hand in terms of Agricultural Practices	High	High	A socio-economic assessment study should be conducted to mitigate the risk on economic loses as a result of the proposed development.
Negotiations with the landowners for construction of the proposed powerline.	High	High	Challenges may be faced in terms of negotiations with the landowners regarding the project. Acquisition of properties may be a challenge
Farming activities around the study area might pose a risk on positioning of towers.	High	High	Careful planning should be involved.
Visual Impact of powerline	High	High	A visual impact study will have to be conducted as part of the proposed powerline may affect "sense of place" of the nearby towns and villages



12. SPECIALIST STUDIES

12.1. Introduction

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

The following specialists were sub-contracted by HeSSA to investigate key potential impacts further (Table 15)

Table 15: Specialists Studies.

Specialist studies	Requirements
Flora and fauna	<ul style="list-style-type: none"> • Provide status of habitat and identification of all ecologically sensitive areas. • Identification of endangered species and their locations. • Identify conservation worthy areas and how the proposed development can avoid them. • Identify potential impacts of the fauna and flora, if any, on the proposed infrastructure per alternative route to be assessed • Identify potential impacts and mitigation measures of the proposed infrastructure on the fauna and flora per alternative route to be assessed. • Provide recommendations for clearing of plants and acceptable heights. • Recommendation of the best alternative route and technology to be used. • Provide status of bird habitats in the area and any endangered species including their migration patterns. •
Avifauna	<ul style="list-style-type: none"> • Provide status of bird habitats in the area and any endangered species including their migration patterns. • Identification of areas where bird interactions may play a major role. • Classification of potential bird impact, if any, on the proposed infrastructure and infrastructures impact on the bird species in the area. • Recommendations regarding how to mitigate any potential impacts on both • birds and the proposed infrastructure. • Recommendation of the best alternative route and technology to be used



<p>Wetland assessment</p>	<ul style="list-style-type: none"> • Identification of wetlands and river crossings. • Mapping of information digitally on all alternatives being assessed. • Analyses of both negative and positive impacts on the proposed infrastructure, if any, and on the natural environment by the proposed development. • Recommendations for mitigation measures for each potential impact identified. • Recommendation of the best alternative route and technology.
<p>Agricultural assessment</p>	<ul style="list-style-type: none"> • Identification of agricultural activities taking place in the area and the significance to the local economy and livelihoods. • Identification of stakeholders in this sector to be engaged on the proposed development, • Analyses of both negative and positive impacts on the agriculture by the proposed development. • Recommendations for mitigation measures for each potential impact identified. • Identification of potential impacts of the proposed powerline on the agricultural sector in the area. • Recommendation of the best alternative route and technology.
<p>Heritage Impact Assessment</p>	<ul style="list-style-type: none"> • Identification & location of archaeologically, historically important areas, heritage declared sites, paleontology sites. • Mapping of all areas to be affected and the identification of mitigation measures. • Recommendation of the best alternate route.
<p>Visual Impact Assessment</p>	<ul style="list-style-type: none"> • Identification and location of visual impact that may affect no-go areas. • Development of mitigation measures. • Recommendation of the best alternative routes and technology.
<p>Social Impact Assessment</p>	<ul style="list-style-type: none"> • Social and economic impact assessment of the proposed development. • Identify service crossings, railways, roads, airfields, and local settlements with people who will be affected by the proposed development. • Provide a brief background of the area (i.e. language, population composition) • Identify socio-economic factors of locally affected communities and how they will be impacted by the proposed development. • Identification of various land uses e.g. agricultural areas, nature reserves, zonings and future land use to be considered during corridor selection. • Identification of proposed townships lodged with local municipalities within the study area, • Identify potential impacts of the proposed development on those settlements



	<p>and land-uses or economy.</p> <ul style="list-style-type: none"> • Identify areas of tourism potential in the study area that may be affected by the proposed development. • Recommendation of the best alternative route and technology.
<p>Geographical Information Systems</p>	<ul style="list-style-type: none"> • All maps to be produced in a format, which will enable the process of corridor and route selection and assessment of issues for inclusion in the Scoping report and EIR. The maps will include information like land use, access routes, conservation areas and locality. The locality maps must be printed on A3 size to ensure clear illustrations.



13. AUTHORITY CONSULTATION AND PUBLIC PARTICIPATION

13.1. Introduction

Nzumbululo Consulting will continue to gather information on the potential impacts of the project from various stakeholders, registered I&APs, and local authorities. In addition, secondary and primary information was also gathered from existing literature on the study area. Information gathered and preliminary reconnaissance field surveys was used to compile the DSR which will be circulated to the stakeholders and I&APs for review before being finalized to a FSR which will be submitted to DEA for final review and acceptance

Public Participation Process (PPP) is a cornerstone of any EIA. It is an integral requirement of the National Environmental Management Act (Act 107 of 1998). The nature and manner in which the public participation process (PPP) should take place is governed by Chapter 6 of the Environmental Impact Assessment Regulations (GN No. R.543 of 02 August 2010). This chapter outlines the PPP should be advertised on site and in the media, the requirement of maintaining a register of Interested and affected parties (IAPs) and the entitlement of Registered IAPs to comment on written submissions to the Decision- Making Authority. The process followed during the public participations has taken into account all aspects of public participation as stipulated in legislation.

13.2. Public Participation Process

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

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

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



issues and is thus useful to the decision maker whose obligation is to review the report and either authorise or reject the application.

13.2.1. Objectives of Public Participation

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

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

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

13.2.2. On-Site and Press Advertising

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

- On 15 March on site notices were erected primarily on the main transportation routes adjacent to the proposed route alignment, the substations and also at the local shops (Appendix 6.1).
- The newspaper adverts were placed on Sowetan and Capricorn newspaper 28 March 2012 Appendix 6.2).



Plate 8: View of onsite notice placed at Nzhelele substation.

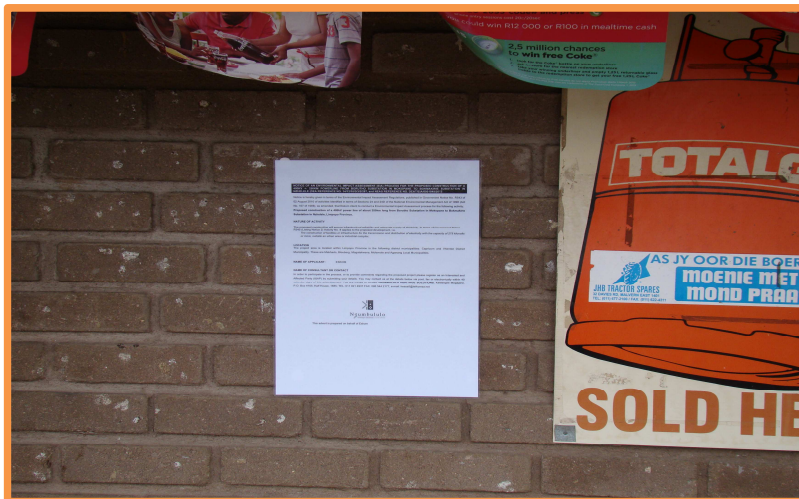


Plate 9: EIA Process Notice placed at Vivo Shopping centre in Limpopo.

13.3. Background information document (BID)

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



13.4. Public review of Draft Scoping Report

The draft Scoping Report will be sent to different departments and posted on different public areas for review and commenting by the key stakeholders and the I&APs from the 15th of April 2012. I&APs will be notified with posted letters on the same day. The report will be sent to:

- Department of Water Affairs and Forestry,
- Limpopo Department of Minerals and Energy,
- Limpopo Department of Agriculture and Land Affairs
- Limpopo libraries.
- Limpopo municipalities, Aganang, Blouberg, Makhado, Mogalakwena, Molemole. .

13.5. Public meetings

I&APs will be invited with registered letters, direct invitations through the local Councillors and community leaders and emails for Public meetings. The public meetings for the project will be held during the week of 23 April 2012. All samples have been attached as appendices as follows:

- Appendix 6.5: Letter of Invitation to attend meetings councillors
- Appendix 6.6: Letter of Invitation to attend meetings
- Appendix 6.7: Original copies of minutes
- Appendix 6.8: Letters received from IAPs
- Appendix 6.9: List of registered IAPs

13.6. Issues and Response Report

Government Regulation 543, Section 56, dictate that comments received from IAPs should be kept and response thereof recorded. Appendix 6.10 presents a comments sheet, which will be attached with comments.



14. RECOMMENDATIONS

14.1. Introduction

The proposed power line, and associated auxiliary developments will take place in an area, which was previously disturbed by other developments activities such as construction of the powerlines, substations, access roads, boundary fence line and the mines. No major or radical natural or human environmental impacts are anticipated during the construction and operational phases of the project given the fact that similar and other developments already exist in the general project area.

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

14.2. General Recommendations

Further general recommendations are:

- It is recommended that Eskom clarify issues relating to servitude access, maintenance and fire management in the servitude and associated responsibilities. It is suggested these responsibilities are clearly set out in the servitude agreements. A greater level of integration with local fire fighting associations is also recommended.
- Construction camps for the project should also be located on sites recommended in the EMP to be compiled as part of the final EIAR.
- The construction program should set out anticipated rehabilitation activities and timing. These should be included in the final EIAR. Emergency rehabilitation measures should also be identified (e.g. for spillage containment, erosion, plant damage, etc.).
- It is important that the PPP proceed as the EIA process moves through different phases.



15. CONCLUDING REMARKS

15.1. Introduction

This section concludes the Draft Scoping Report for the proposed construction of 400kV power line running for approximately 250km from Borutho to Nzhelele Substation in Limpopo Province. The proposed location of the power line is in an area, which has already been disturbed especially in the first part of the project from Borutho to the residential areas of Bochum region. While the other part of the study area consists of commercial farming with a mixture of game, cattle and crop cultivation, the preliminary study data does not anticipate permanent barriers to the proposed development. Some sections of the study area contain subsistence farming. As such, several localities along the powerline route and project area are directly affected by the proposed development. Nonetheless, the proposed new power line will provide electricity to the local people and farmers and future developments in Limpopo Province. It is of critical importance that the proposed powerline be considered for approval as proposed subject to all applicable legislative and regulatory conditions being met.

15.2. Final Remarks

The power line route is located in an area of medium to high visual quality, and every effort should be made to minimize any further disturbances on the cultural landscape. Where they exist, heritage resources such as graves sites would be protected or avoided during the proposed development. However, given that there are other significant linear developments existing in the area (distribution power lines, railway line, telecommunication and dirt small access roads in some areas in the farming areas etc), and other substation sites, the proposed development will result in similar impacts to the existing infrastructure or landscape in the area. Eskom Transmission had Preferred Option 1 to be considered for approval. Therefore, studies, which will further be done on EIR, should also make detailed research along the entire route and associated alternatives. The results will allow relevant authorities adequate information to assess and decide on the most suitable powerline route.

Furthermore, given the relative homogeneity of the area, local deviations are likely to affect the overall impact of the power line. It is recommended that more public input and that further specialist avifauna, ecologists and archaeological and heritage specialists inputs be sought. These should form part of the EIAR to be submitted for final evaluation to DEA.



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