

2014

DRAFT SCOPING REPORT FOR THE PROPOSED TUBATSE STRENGTHENING PHASE 1 – SENAKANGWEDI B INTEGRATION WITHIN THE JURISDICTION OF GREATER TUBATSE LOCAL MUNICIPALITY IN THE LIMPOPO PROVINCE

DEA Ref: 14/12/16/3/3/2/606
April 2014

1 EXECUTIVE SUMMARY

Nsovo Environmental Consulting (hereafter referred to as Nsovo) was appointed by Eskom Holdings SOC Limited (hereafter referred to as Eskom) to undertake Environmental Impact Assessment for the proposed construction of the Tubatse Strengthening Phase 1 – Senakangwedi B Integration which will entail the following:

- Establishment of the new Senakangwedi B substation (1 x 800MVA, 400/275kV and 2X500, 400/132kV); to the south of existing Senakangwedi substation;
- Loop in and out of Senakangwedi B the existing Arnot – Merensky 400kV line;
- Construction of Tubatse – Senakangwedi B 400kV line;
- Construction of Senakangwedi – Senakangwedi B 275kV line;
- Construction of 4 x 132kV feeder bays;
- Construction of 2 x 275kV feeder bays (Senakangwedi and Senakangwedi B); and
- Construction of 3 x 400kV feeder bays.

The proposed development falls within Ward 31 of the Greater Tubatse Local Municipality which falls within the jurisdiction of the Greater Sekhukhune District Municipality in the Limpopo Province.

In terms of the National Environmental Management Act, 1998, (Act 107 of 1998) (as amended) (herein referred to as NEMA), the proposed development triggers activities which require authorisation from the National Department of Environmental Affairs (DEA). The activity triggered is in Chapter 3 of GNR 543 of the Environmental Impact Assessment Regulations (EIA) of June 2010, *Activity 8 (i.e. 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)*, and associated activities in line with the environmental legislation.

The Scoping Report:

- Contains the details and expertise of the Environmental Assessment Practitioner;
- Describes the proposed project and alternative activities;
- Describes the receiving environment;
- Outlines the applicable legislation and guidelines;
- Describes the environmental issues and potential impacts;

- Outlines the public participation process conducted;
- Describes the need and desirability of the proposed project; and
- Includes the Plan of Study for EIA.

Three alternative sites for the proposed Senakangwedi B substation and alternative power line routes have been identified and are being assessed.

The draft Scoping Report will be submitted to the Interested and Affected Parties and organs of State in order to afford them an opportunity to review and comment on the project. A forty day comment period will be afforded to all stakeholders. All comments received on the draft Scoping Report will be included in the Comments and Response Report and these will be incorporated into the final Scoping Report which will be submitted to the DEA together with the Plan of Study for the EIA.

The DEA will assess the final Scoping Report and the Plan of Study for EIA and advice on the way forward as to whether the project should go into EIA phase. The DEA will base their decision on the outcome of the EIA process which is required by NEMA.



DOCUMENT CONTROL

DRAFT SCOPING REPORT FOR THE PROPOSED TUBATSE STRENGTHENING PHASE 1 – SENAKANGWEDI B INTEGRATION

Quality Control

Report	Compiled By:	Peer Reviewed By:
Draft Scoping Report	M. Mahumela <hr/>	M. Rikhotso <hr/> <hr/> M. Makhado

Authorisation

Full Names: _____ Date: _____ Signature _____

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY.....	II
2	INTRODUCTION.....	10
3	DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER.....	10
4	DESCRIPTION OF THE PROPOSED ACTIVITIES.....	12
4.1	BACKGROUND.....	12
4.2	THE PROPOSED SCOPE OF WORK.....	12
4.3	ACTIVITIES ASSOCIATED WITH THE PROJECT.....	12
4.3.1	Access roads	13
4.3.2	Corridor walk-down	13
4.3.3	Construction Camps	13
4.3.4	Vegetation clearance	13
4.3.5	Substation and pylon construction	13
4.3.6	Steelworks structures.....	13
4.3.7	Stringing	14
4.3.8	Feeder bays.....	14
4.3.9	Completion of construction work.....	14
5	DESCRIPTION OF FEASIBLE AND REASONABLE ALTERNATIVES	14
5.1.1	Technical Alternatives	15
5.1.2	Structural alternatives	16
5.1.3	Sites alternatives	17
5.1.4	No-go alternatives.....	18
6	DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY	19
6.1	LOCAL AUTHORITY.....	19
6.2	SURROUNDING LAND USES.....	20
6.2.1	Mining	20
6.2.2	Farming	20
6.2.3	Residential.....	20
6.2.4	Commercial and industrial	20
6.2.5	Tourism	21
6.2.6	Sites of Archaeological and Cultural Significance.....	21
6.3	SURFACE INFRASTRUCTURE	21
6.3.1	Roads.....	21
6.3.2	Power lines	22

7	DESCRIPTION OF THE RECEIVING ENVIRONMENT	22
7.1	SOCIO-ECONOMIC DESCRIPTION	22
7.1.1	Provincial and District Municipality Description	22
7.1.2	Greater Tubatse Local Municipality.....	24
7.1.3	Ward 31 of the Greater Tubatse Municipality.....	27
7.1.4	National and Regional Economy	27
7.1.5	HIV, AIDS and other Sexually Transmitted Diseases.....	28
7.2	CLIMATE.....	28
7.3	GEOLOGY	29
7.4	TOPOGRAPHY	30
7.5	SURFACE WATER	30
7.6	AIR QUALITY AND POLLUTION.....	33
7.7	FLORA	33
7.8	FAUNA	37
7.9	AVIFAUNA	38
7.10	LAND TYPES AND AGRICULTURAL POTENTIAL.....	39
7.10.1	Soils.....	40
7.10.2	Agricultural Potential	41
7.11	SENSORY ASPECTS	42
7.11.1	Noise.....	42
7.11.2	Visual Aspects.....	42
8	APPLICABLE LEGISLATION AND GUIDELINES	42
9	DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED	56
10	PUBLIC PARTICIPATION PROCESS.....	64
10.1	PUBLIC PARTICIPATION PRINCIPLES.....	65
10.2	APPROACH AND METHODOLOGY	65
10.3	IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES	65
10.4	PUBLIC PARTICIPATION DATABASE.....	66
10.5	SITE NOTICES	66
10.6	DISTRIBUTION OF NOTICES TO SURROUNDING LAND OWNERS/ OCCUPIERS	66
10.7	MUNICIPALITY IN WHICH THE SITE IS SITUATED AND OTHER GOVERNMENTAL AUTHORITIES	66
10.8	PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER.....	67
10.9	PUBLIC MEETINGS.....	67
10.10	SYNTHESIS OF ISSUES AND RESPONSE	67
11	DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY	67
11.1	MOTIVATION FOR THE DEVELOPMENT	67

11.2	BENEFITS OF THE PROJECT	68
11.2.1	. Supporting Strategies	69
12	PLAN OF STUDY FOR EIA	69
13	CONCLUSION	69
14	REFERENCES	71

TABLES

Table 1: Details of the EAP	11
Table 2: Climate Data	28
Table 3: Some provincially protected species with a likelihood of occurrence on site	37
Table 4: The Red List bird species for the proposed project	39
Table 5: Soil properties per land type	41
Table 6: Legislation pertaining to the proposed project	43
Table 7: Listed Activities triggering Scoping and Environmental Impact Assessment.	46
Table 8: Environmental Potential impact Identified	57

FIGURES

Figure 1: Cross Rope	16
Figure 2: Self-supporting tower	16
Figure 3: Narrow base tower	17
Figure 4: Alternative substation sites and power lines	19
Figure 5: Greater Sekhukhune District Municipality (Source: Municipal Demarcation Board)	23
Figure 6: Population pyramid of the Greater Sekhukhune District Municipality	24
Figure 7: Greater Tubatse Local Municipality	25
Figure 8: Xstrata Lion Ferrochrome Smelter	26
Figure 9: Geological Map	30
Figure 10: Wetlands and riparian areas within 500m of the proposed within the proposed project	32
Figure 11: Representation of the vegetation types that the proposed project is situated in.	35
Figure 12: The site in relation to the Mpumalanga Biodiversity Conservation Plan (MBCP), Terrestrial categories	36
Figure 13: Distribution of land types within the study area	40

APPENDICES

Appendix A:	Locality Map
Appendix B:	Photographs
Appendix C:	Facility Illustration
Appendix D:	Specialist Reports
Appendix D1:	Draft Land Types and Agricultural Potential Report
Appendix D2:	Draft Avifaunal Specialist Report
Appendix D3:	Draft Social Impact Assessment Report
Appendix D4:	Draft Phase 1 Archaeological Impact Assessment Report
Appendix D5:	Draft Vegetation Assessment Report
Appendix D6:	Draft Vertebrate Assessment
Appendix D7:	Draft Wetland Assessment Report
Appendix E:	Public Participation process
Appendix E1a:	Site Notices
Appendix E1b:	Proof of Placement of Site Notices
Appendix E1c:	Newspaper Advert
Appendix E2a:	Notification Letters
Appendix E2b:	Proof of Registered Mail
Appendix E3a:	Public Participation Report
Appendix E3b:	Comments and Response Report
Appendix E4:	Registered Interested and Affected Parties
Appendix E5:	I&AP Database
Appendix E6:	DEA's Acknowledgement of the Application Form
Appendix F:	Details of EAP and Expertise
Appendix G:	Declaration of Specialists
Appendix H:	Details of Properties Affected by the Project
Appendix I:	Plan of Study for EIA

ACRONYMS

APPA	Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
DEA	Department of Environmental Affairs
EA	Environmental Authorisation
ECO	Environmental Control Officer
I&APs	Interested and Affected Parties
GTLM	Greater Tubatse Local Municipality
LEDET	Limpopo Department of Economic Development Environment and Tourism
NEMA	National Environmental Management Act
SAHRA	South African Heritage Resources Agency

2 INTRODUCTION

The electricity transmission network within the Greater Tubatse Local Municipality (GTLM) has been under pressure as it is fast approaching its capacity. Mining activities in general require a great deal of electricity supply and with the rapid development of mines within the Greater Tubatse Local Municipality, this has necessitated Eskom Holding SOC Limited (hereafter referred to as Eskom) to embark on a strengthening project which aims to strengthen the electricity network within the Municipality.

Eskom has proposed to construct the new Senakangwedi B substation and the associated loop in loop out power lines. The proposed power lines and Senakangwedi B substation will be constructed within a 20km radius from the existing Senakangwedi substation and it will affect various farms within the area. The existing Senakangwedi substation is located on farm Spitskop 333KT near the Xstrata smelters along the R555 leading to Steelpoort Town.

The proposed project includes activities that trigger Environmental Impact Assessment to be undertaken as prescribed in Chapter 3 of GNR 543 of the Environmental Impact Assessment Regulations (EIA) of June 2010, *Activity 8 (i.e. 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)*; other associated listed activities are included in **Table 7** below.

For this particular project, the project proponent or applicant is Eskom, the Competent Authority is the National Department of Environmental Affairs (DEA) and the independent environmental consultant is Nsovo Environmental Consulting (hereafter referred to as Nsovo). The proposed project will be undertaken in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the EIA Regulations as amended in June 2010, further, other applicable Acts and Regulations will be equally considered.

3 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo Environmental Consulting has been appointed by Eskom to be the independent Environmental Assessment Practitioner (EAP) for the proposed project. Below are the details of the details of the EAP responsible for the project as well as their qualifications and related expertise.

Nsovo is conversant with the definition of an EAP as defined in Regulation 17 of the EIA Regulations promulgated in June 2010 in terms of the NEMA. This includes, inter alia, the requirement that Nsovo is:

- Objective and independent;

- Has experience in conducting Environmental Impact Assessments;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 1: Details of the EAP

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Postal Address	P/Bag x29, Postnet Suite 696 Gallo Manor 2052
Telephone Number	C: 071 602 2369 T: 0113129984
Fax Number	086 602 8821
Email	munyadzi@nsovo.co.za
Qualifications & Experience	<ul style="list-style-type: none"> - BSc Honours in Environmental Management obtained from University of Johannesburg in 2004 - BSc in Geography and Archaeology obtained from Wits University in 2003 - Certificate in Project Management obtained From UNISA in 2007 - 10000 Women Certificate Programme in Business Management (GIBBS-current) <p>10 years of experience</p>
CV	Please find World bank CV attached
Project Related Expertise	<p>In terms of project related expertise the EAP has completed the following projects:</p> <ul style="list-style-type: none"> • EIA for the Wildebees Substation and loop in lines • EIA for the proposed Westgate DS 132kV Randfontein Strategic Servitude • Basic Assessment for Simmerpan Strengthening. • EIA for the proposed Wildebees infeed Station and associated power lines. • Basic Assessment for Marula Substation.

- Basic Assessment for Craighall Benmore 88kV Cable

4 DESCRIPTION OF THE PROPOSED ACTIVITIES

4.1 BACKGROUND

The continuous development of mines in the GTLM is resulting in a great demand of electricity provision in the area. Due this, the existing Eskom network is fast approaching its capacity and it will not be able to accommodate the expected load growth in the coming years. Consequently, in order to cater for the future electricity needs in the area, Eskom has proposed to strengthen the network. The proposed power lines corridor will be approximately 10km in length and 2km wide and the footprint of the Senakangwedi B substation will be approximately 1km².

4.2 THE PROPOSED SCOPE OF WORK

The proposed scope of work will entail the following:

- Establishment of a new Senakangwedi B substation (1 x 800MVA, 400/275kV and 2X500, 400/132kV) to the south of existing Senakangwedi substation, three alternative sites have been identified (refer to the sites).
- Construction of a new loop in and out power line from Senakangwedi B substation, the line will be looped into the existing Arnot – Merensky 400kV power line.
- Construction of Tubatse – Senakangwedi B 400kV power line.
- Construction of Senakangwedi – Senakangwedi B 275kV power line.
- Construction of 4 x 132kV feeder bays.
- Construction of 2 x 275kV feeder bays (Senakangwedi and Senakangwedi B).
- Construction of 3 x 400kV feeder bays.

4.3 ACTIVITIES ASSOCIATED WITH THE PROJECT

The construction phase of the proposed project will take approximately 24 month and the activities included are discussed hereunder:

4.3.1 Access roads

Access roads will comprise of existing public roads and the use of private roads negotiated with land owners. However, where such roads do not provide access, access roads may need to be built. The construction of access will be compliant with a Type 6 gravel road. This comprises of 6 meter wide raised gravel extended to 14 meters with meadow drainage in flat terrain, increased to 16 meters with 'V' type drainage in rolling terrain. Where necessary, suitable erosion control measures will be implemented at storm watercourse crossings, culverts will also be constructed where necessary. Gravel required to build the road will be obtained from the nearest borrow pit/s.

4.3.2 Corridor walk-down

The primary objective of the corridor walk-down is to ensure that all the areas are avoided and where need be, buffers are created for conservation purposes. Furthermore, the walk-down will aim to establish the exact coordinates for the establishment of the pylons and Senakangwedi B substation.

4.3.3 Construction Camps

The need and exact locality for construction camps will be addressed in the site specific Environmental Management Programme.

4.3.4 Vegetation clearance

Forty seven and fifty five meter servitudes for the proposed 275kV and 400kV power lines are required respectively. Only flora within the servitude will be cleared for construction purposes. Clearance will be according the EMP as well as Eskom policy.

4.3.5 Substation and pylon construction

The civil works will include the construction of the foundations for the Senakangwedi B substation and the pylons as well as the associated infrastructure.

4.3.6 Steelworks structures

The exact type of pylons that will be constructed has not yet been determined, however, the pylons will be erected in segments.

4.3.7 Stringing

Once the pylons have been erected, the conductors will be threaded between the pylons.

4.3.8 Feeder bays

Feeder bays will be erected in the existing footprint of the existing Senakangwedi substation.

4.3.9 Completion of construction work

Once construction work is complete, the site will be rehabilitated as per the specifications of the site specific Environmental Management Programme. Among other activities, the rehabilitation activities will include:

- Removal of excess building material, and waste;
- Repairing any damage caused as part of the construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous grasses where necessary.

5 DESCRIPTION OF FEASIBLE AND REASONABLE ALTERNATIVES

The identification of alternatives is an important component of the EIA process. The various identified alternatives will be assessed in terms of both environmental acceptability as well as technical and economic feasibility during the EIA process wherein the preferred alternative will be highlighted and presented to the authorities.

Four alternative sites including the no-go alternative are being considered for the Senakangwedi B substation. Power lines will be constructed in order to connect the existing and the newly proposed substations. The power line corridor will be determined by the location of the substation site. A two kilometre corridor will be assessed on all the options within which a servitude of 55m and 47m for 400kVm and 275kV respectively will be utilised. The project has considered various technical options of which the proposed were found to be technically, economically and environmentally viable compared to the other

options. The various alternatives will be presented during the scoping and scrutinised further during the EIA. Some alternatives may be eliminated after the Scoping Phase.

5.1.1 Technical Alternatives

Instead of constructing the proposed line above ground, underground construction can be an alternative. The advantages of this alternative would include minimisation of the impact on land use, reduced impact on bird interaction and a distinct visual impact benefit.

From a technical perspective the undergrounding of cables would not be feasible owing to the mountainous nature of the area. This could cause major technical problems and would have major cost implications. Unlike aboveground cables Underground cables need to be insulated against the surrounding soil. On low voltage reticulation networks (11kV & 22kV) the heat generated by the cable is low enough for standard insulation to be used. But on larger lines the methods of electrical and heat insulation becomes more onerous.

Control of electrical losses and heat control are critical for underground cables. As a result, cables are as much as 4 times the diameter and 10 times the weight of equivalent overhead lines. Heat control is also a factor in the laying of the cables. The three phases of low and medium voltage cables (up to 132kV) can be placed in the same trench, while the phases for high voltage cables must be spaced apart, typically in a flat formation.

Faulting on underground cable is rare. Bush fires, lightning strikes and bird related faults make up 80% of faults on overhead transmission lines in South Africa. These are not risks associated with underground cables. When such faults occur on overhead lines they are usually re-energised by automatically reclosing the circuit-breaker within a few seconds of the fault. More serious faults, such as a damaged line may be easily found and repaired within a few days at most. On underground cables the faults are almost exclusively a permanent fault, requiring inspection and correction on site. This usually requires excavating a section of the line. However, location of faults is not easy unless there is clear evidence of excavation damage. Therefore, the search and repair of underground cables can take several weeks. This may severely compromise the network design standard.

Economically costs vary and are dependent on terrain, land use and size of line. However, underground cabling is in orders of magnitude greater than overhead cables. Underground 132kV is 3 to 10 times more expensive than overhead lines. The mark up for 'undergrounding' is therefore significant. There is not much expertise for high voltage underground cabling in the country therefore such expertise would have to be sourced from the international market.

In terms of maintenance underground cables are reported to be much more reliable, but outages are more difficult to fix as it's harder to find the faults, and therefore the outages last much longer. The lifespan of underground cables is reported to be much shorter, about half that of overhead cables.

5.1.2 Structural alternatives

Two design alternatives have been proposed and these are the Cross-Rope suspension type and the Self-supporting type. These are illustrated in **Figures 1** and **2** below. It is important to note that the topography will largely dictate the types of towers to be used. From this perspective, it should be noted that where the line crosses mountainous terrains and when it changes direction at an angle, there will be a need to use self-supporting towers. Narrow base towers may be utilised on sections where space is a challenge. These are illustrated in **Figure 3**.

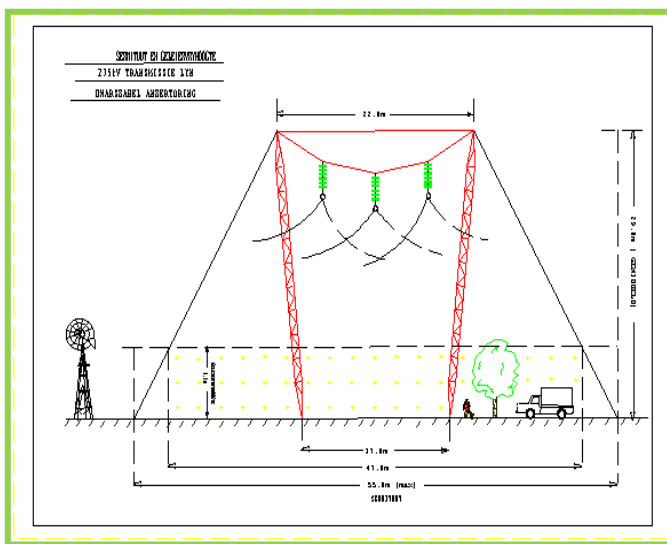


Figure 1: Cross Rope

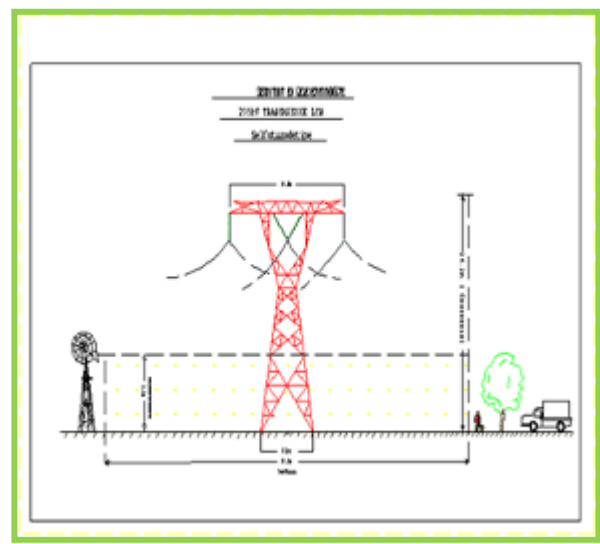


Figure 2: Self-supporting tower

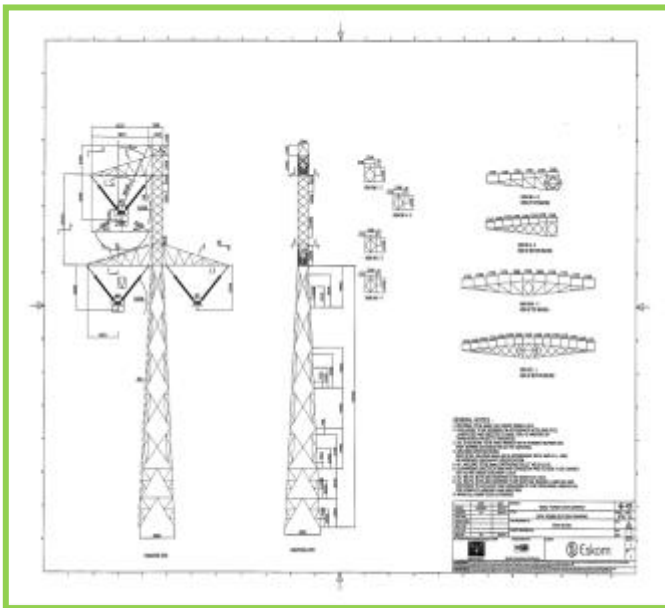


Figure 3: Narrow base tower

None of the above options have been dismissed and remain alternatives depending on the terrain and topography. Based on input from the public participation process as well as specialist, it is recommended that were at all possible the narrow base tower be used to reduce the visual impact as well as the impact on fauna. The narrow base minimise the footprint and possibility of birds flying and elephants pushing on stay wires of the cross rope type.

5.1.3 Sites alternatives

Alternative 1

This site is situated on farm Dwars Rivier 372KT adjacent to the existing Uchoba substation. The site is located in close proximity to an unnamed road that leads to Middelburg. Further, there is a quarry operation adjacent to the site and the Dwars Rivier mine within approximately a kilometre distance. The proposed substation will be connected to the existing Senakangwedi substation through the proposed power line which will traverse the R555 road, R577 Road and another unnamed road. Further, the line will traverse farms and the Tweefontein mine property. No residential communities were noted in proximity to the site.

Site alternative 1 is depicted in Orange in **Figure 4** below.

Alternative 2

Alternative 2 is situated on farm Tweefontein 360KT about 1km away from Nokaneng/Kalkfontein village. The site is also adjacent to the road which leads to Middelburg. The proposed substation will be connected to the existing Senakangwedi substation through a proposed power line which will traverse the R555 road, the R577 Road as well as farms.

Site alternative 2 is depicted in green in **Figure 4** below.

Alternative 3

Alternative 3 is situated on farm Frischgewaagd 359KT. This substation will be connected to the existing Senakangwedi substation through a proposed power line which will traverse the R555 road as well as farms.

Site alternative 3 is depicted in Orange in **Figure 4** below.

5.1.4 No-go alternatives

In accordance with GNR 543, consideration must be given to the option not act. This option is usually considered when the proposed development is envisaged to have such a significant negative environmental impacts that mitigation measures cannot ameliorate the identified impacts effectively.

The no-go alternative would be the option of not undertaking the construction of the proposed project. It would imply no improvement in reliability of electricity systems which would benefit electricity users including the mines. Should the no-go alternative be adopted, the mines will be deprived of a much needed essential service/facility, particularly given the already existing problem with energy supply countrywide.

The alternative substation sites and power lines are illustrated in **Figure 4** below. An A3 copy of the locality map is attached as **Appendix A**.

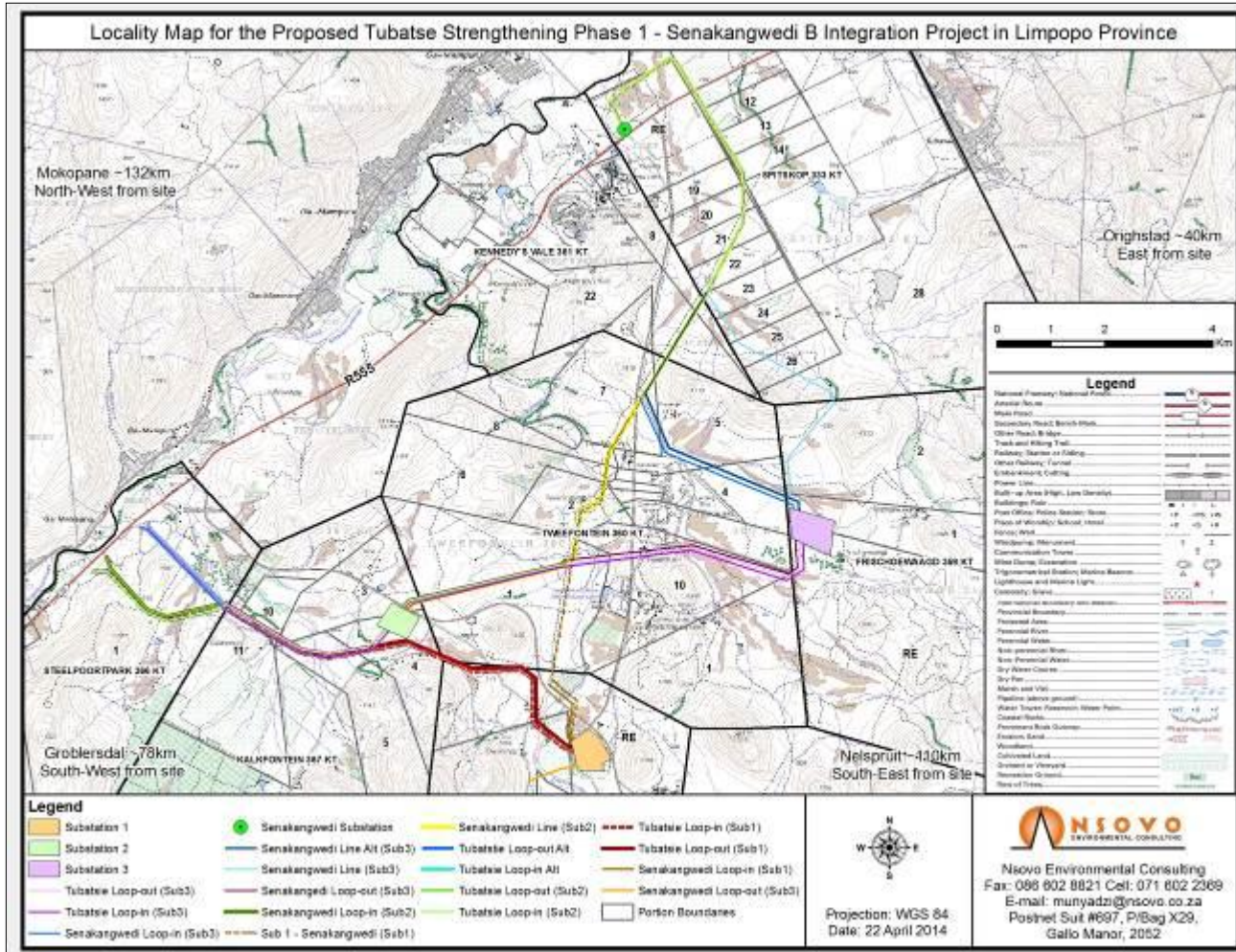


Figure 4: Alternative substation sites and power lines

6 DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY

The proposed substation will be constructed on an area of about 1km² whereas the power lines will be approximately 10km long. The proposed sites are located approximately 20km from Steelpoort town.

6.1 LOCAL AUTHORITY

The proposed development falls within Ward 31 of the Greater Tubatse Local Municipality which falls within the jurisdiction of the Greater Sekhukhune District Municipality in the Limpopo Province.

6.2 SURROUNDING LAND USES

6.2.1 Mining

Although largely rural, the municipal area is rich in mineral resources including iron ore, chrome, vanadium, platinum, and alusite and magnetite. This has resulted in some areas of the municipality and sections of Ward 31 becoming industrialised with the development of mines and smelters and large companies such as African Rainbow Minerals, Asmang, Samancor and Xstrata being active in the area.

6.2.2 Farming

The proposed project traverses various farms that are used for various purposes including stock farming, especially near substation alternative site 3. Some of the farms traversed are currently redundant with no indication of any activity taking place.

6.2.3 Residential

The proposed project stretches mostly across vacant properties, i.e. farms. Nokaneng/ Kalkfontein rural village is the only village that is located close to the project. The village is situated approximately a kilometre away from substation alternative site 2. There are no residential areas in proximity to the other two site alternatives.

6.2.4 Commercial and industrial

The commercial and industrial activities occurring around the proposed site include:

- Ngululu bulk Carriers;
- Conway Johnson Transport;
- Bohlabatsatsi Eastern Development;
- Spitskop Ready Mix;
- Limpopo Ready Mix; and
- Babata Pumps.

6.2.5 Tourism

Tourism in the GTLM is underdeveloped as most tourist attraction places are found beyond the boundaries of the GTLM, e.g. the Kruger National Park, Malamala Game Reserve etc. Tjale heritage site is one of the tourism projects in Tubatse and is currently being developed by the Sekhukhune District Municipality. The mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby diversify the economic base of the GTLM.

6.2.6 Sites of Archaeological and Cultural Significance

According to the Phase 1 Archaeological Impact Assessment Specialist Study Report (refer to **Appendix D4**), about 600m from the nearby river, there is indication that Iron Age people settled in the area. According to Huffman (2007) Iron Age people preferred to settle in areas with rich alluvial soils close to rivers.

The Dwars River heritage site is situated between the loop in and loop out lines associated with alternative Substation site 1. These lines are in close proximity (approximately 200 metres) to instigate a direct or indirect impact to the national heritage site.

6.3 SURFACE INFRASTRUCTURE

6.3.1 Roads

The primary road that exists in close proximity to the project site is the R555 (Middelburg to Burgersfort). Apart from this, there are more roads that are located close to the project area. Substation site alternative 1 and 2 are accessible through secondary roads, while substation site alternative 3 is also accessible through other roads. Generally access roads to all proposed sites exist, however, two of the proposed sites i.e. proposed substation 1 and proposed substation 3 have small areas as well as not having adequate access roads and is thus not the preferred substation site.

6.3.2 Power lines

There are several other existing power lines located in the study area. The power lines range from transmission to distribution power lines and these include Duvha-Leseding 400kV line and Merensky-Lavino 22kV power line and Arnot – Merensky 400kV power line.

7 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section outlines those parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description in Section 3, and knowledge of the existing environment, potential interactions between the project and the environment are identified in the next section (i.e. how, where and when could the project's activities affect various components of the environment). The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included.

Below is the description of the receiving environment.

7.1 SOCIO-ECONOMIC DESCRIPTION

7.1.1 Provincial and District Municipality Description

Covering a geographical area of approximately 13 527.72 km² with a population of 1 076 840 people living within 263 802 households, the Greater Sekhukhune District Municipality, illustrated in **Figure 5**, is situated in the Southeast of the Limpopo Province and encompasses 5 local municipalities namely;

- Ephraim Mogale Local Municipality (LIM471);
- Elias Motsoaledi Local Municipality (LIM472);
- Makhuduthamaga Local Municipality (LIM473);
- Fetakgomo Local Municipality (LM474);
- Greater Tubatse Local Municipality (LIM475).

The District Municipality has a population density of 80 people per km² and a household density of 19.5 households per square kilometer, further it is characterised by some 740 sparsely populated and poorly serviced rural villages scattered across the region. The road network links the districts to other areas, however, the roads are in a poor state, which is one of the many other service delivery challenges in the region.

Mining is the most dominant contributor to the economy of the region, particularly in the Greater Tubatse area, with the Greater Sekhukhune District being heavily reliant on government service delivery. Of the 5 local municipalities in the district, four, including Greater Tubatse, fall with the Department of Cooperative Governance and Traditional Affairs' classification of most vulnerable municipalities (Department of Cooperative Governance and Traditional Affairs, n.d., pp. 14-15).

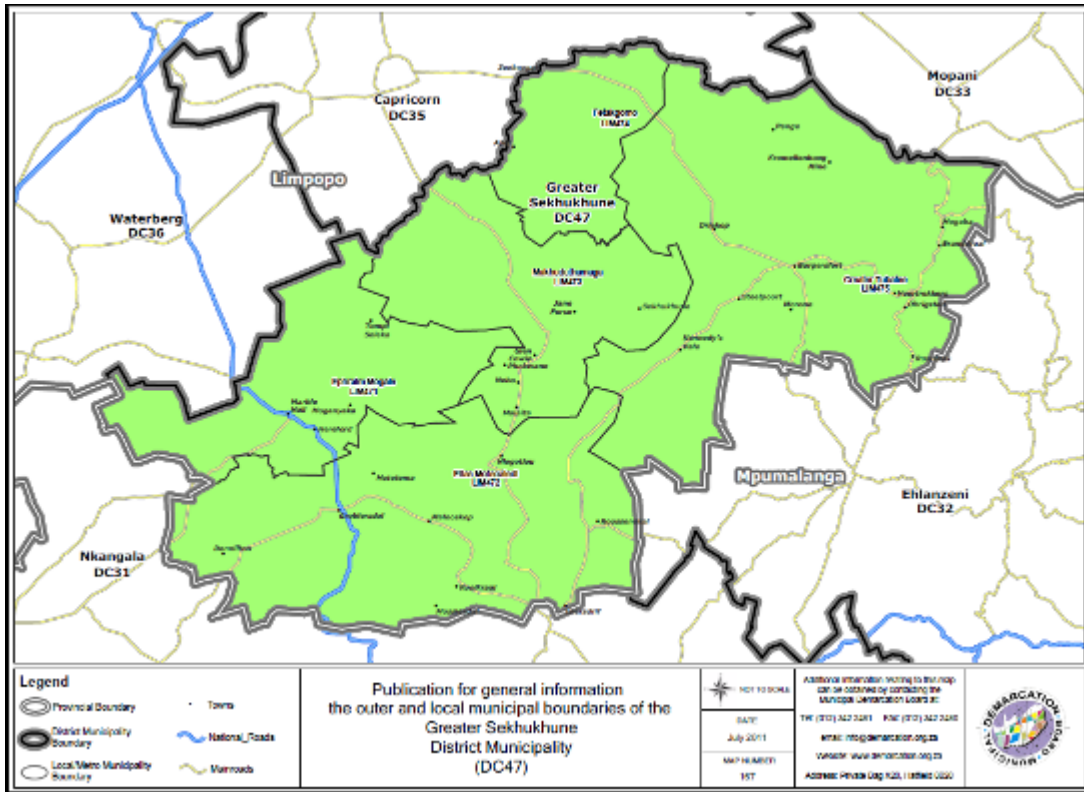


Figure 5: Greater Sekhukhune District Municipality (Source: Municipal Demarcation Board)

With regard to social indicators, Greater Sekhukhune has a dependency ratio of 74.7 and a sex ratio of 85.9. The population growth rate of the district, as measured between 2001 and 2011, was 1.07%. In 2011 the official unemployment rate was 50.9% with the official unemployment rate amongst the youth, aged between 15 and 34 years, being 60.6%. In respect of schooling amongst those aged 20 years and older, 20.9% have no schooling, 21.3% have a matric and 5.8% have a higher education. The population pyramid of Greater Sekhukhune is illustrated below in **Figure 6**.

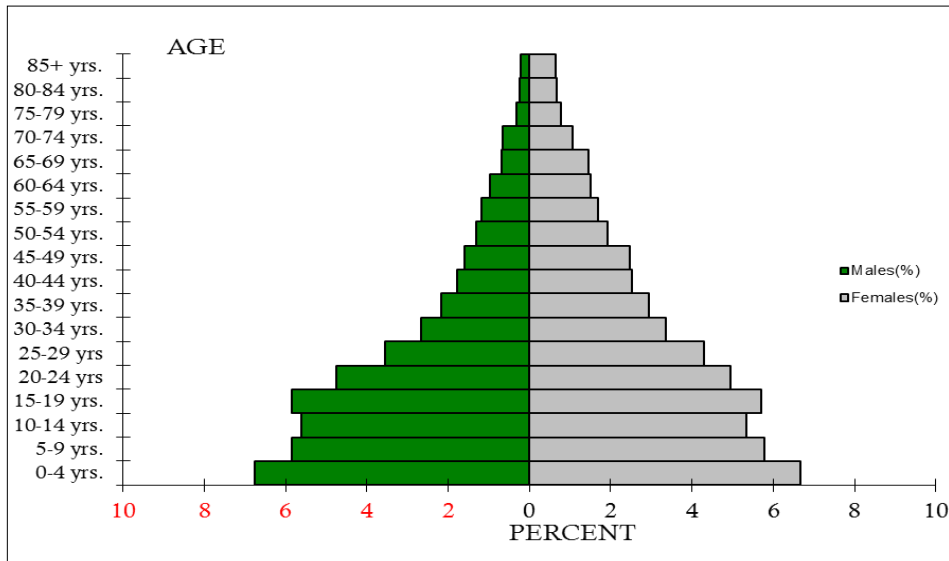


Figure 6: Population pyramid of the Greater Sekhukhune District Municipality

Data source: (Statistics South Africa, 2012)

With regard to household dynamics, the average size of households in Greater Sekhukhune is 4.1 and 52.9% of these households are headed by females. In respect of dwelling type 88.7% of housing is formal in nature while 58.2% are owned or are being paid off. Vis-à-vis household services, 6.3% have a flush toilet connected to a sewerage system, 8.2% have their refuse removed weekly, and 9.3% have piped water delivered inside the dwelling while 85.9% use electricity as an energy source for lighting.

7.1.2 Greater Tubatse Local Municipality

Greater Tubatse Local Municipality covers a geographical area of 4 550 km² and in 2011 had a population of 335 676 people accommodated in 83 199 households. This gives the area a population density of 73.77 per km² and household density of 18.28 per km². On a geographical basis the municipality covers the largest area in Greater Sekhukhune accounting for 34.3% of the district and is illustrated below in **Figure 7**.

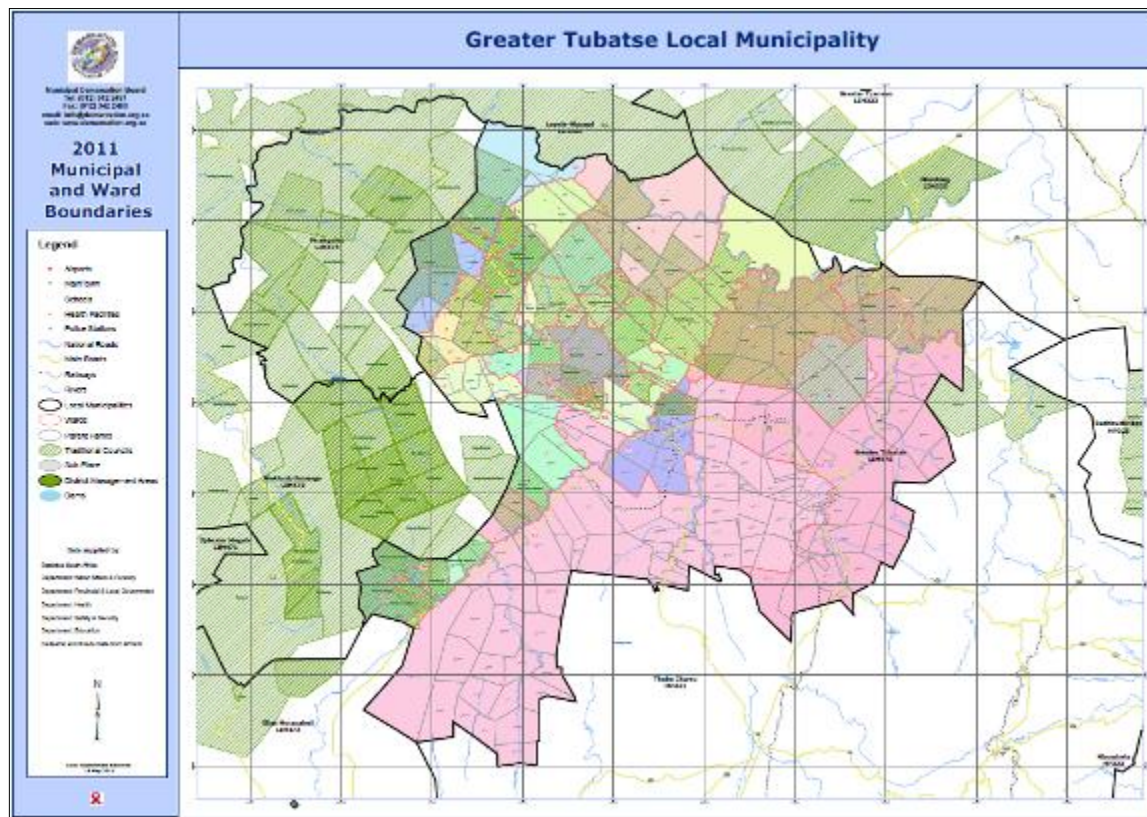


Figure 7: Greater Tubatse Local Municipality

Source: Municipal Demarcation Board

Greater Tubatse is largely rural in nature and consists of 31 municipal wards. These wards incorporate six proclaimed townships and approximately 166 villages. It is indicated in the Integrated Development Plan of the local municipality that;

“Due to its rural nature; the municipality is confronted with [a] high service delivery backlogs. Majority of the settlements are far apart which; makes the provision and maintenance of services very costly. Some of these areas are too small to attain the economic threshold required to provide social facilities in a cost-effective manner” (Greater Tubatse Local Municipality, 2014, p. 19).

Although largely rural, the municipal area is rich in mineral resources including chrome, vanadium, platinum, and alusite and magnetite. This has resulted in some areas of the municipality and sections of Ward 31 becoming industrialised with the development of mines and smelters and large companies such as African Rainbow Minerals, Asmang, Samancor and Xstrata being active in the area. In **Figure 8** a section of the Xstrata Lion Ferrochrome Smelter is viewed from the entrance to the Eskom’s Senakangwedi Substation.



Figure 8: Xstrata Lion Ferrochrome Smelter

The sex ratio of the municipality is 91.5 which implies that for every 100 women there are 91.5 males in the population. At 98.25% black Africans make up the largest quota of the population, followed by whites at 1.31% with the other population groups making up the remaining 0.43%. The dominant home language spoken across Greater Tubatse is Sepedi, which is spoken by 88.11% of the population followed by SiSwati spoken by 2.60%, isiZulu at 1.70% and Afrikaans at 1.52%. The remaining 7.59% constitutes the rest of the official South African languages.

The dependency ratio of the Municipality is 65.6% of which 60.4% of the population is of working age (between 15 and 64 years), with 34.5% under 15 years and 5.1% over 64 years of age. The official unemployment rate of Greater Tubatse is 50.3% with a high percentage of youth being officially unemployed at 59.6%. Amongst those aged 20 years and above, 15.1% have no schooling, 22.6% have a matric and 6.6% have a higher level of education. Between 2001 and 2011 the growth rate in the area was 2.19%.

Amongst the 83 199 households 25 347 are categorised as agricultural households and 46.9% are female headed. Formal dwellings account for 83.2% of the dwelling types in the municipality and 53.9% of the housing are either owned or are being paid off. Only 6.3% of households have flush toilets connected to the sewerage system, 7.9% have their refuse removed on a weekly basis, 9.5% have piped water delivered inside the dwelling and 75.7% use electricity for lighting.

As indicated above, the proposed project falls within Ward 31 of the local municipality illustrated in below.

7.1.3 Ward 31 of the Greater Tubatse Municipality

In comparison to the social indicators and population dynamics of Ward 31 against those of the local municipality, the population of the ward has a lower percentage of black African people at 88.06% compared to that of the local municipality at 98.25%. There is a significantly higher percentage of white people in Ward 31 at 10.69% compared to 1.31%. While the local municipality has a sex ratio of 91.5, indicating a higher percentage of females across the region, the situation is reverse in Ward 31 which has a sex ratio of 118, indicating a higher percentage of males. This is probably as a result of in migration due to at least a perception of job opportunities in the area. A lower percentage of the population of Ward 31 currently attends school compared to across the local municipality with the relative percentages being 26.11 and 34.92. There is also a lower percentage of people, 39.26%, having no income in Ward 31 compared to 47.84% across Greater Tubatse.

The population group of the head of household is predominantly black African across both the municipality and ward with Ward 31 having the highest percentage of white headed families at 10.32%. Ward 31 also has a relatively high proportion of households headed by males at 64.33% and the lowest percentage of households having no income at 11.86%, compared to 15.65% across Greater Tubatse. Refer to **Appendix D3**.

The highest percentage of rented accommodation, at 45.33% is found in Ward 31. At 49.49% the highest percentage of owned and fully paid off housing is in the Greater Tubatse Local Municipality. Most types of dwellings across the region are house or brick/concrete structures on a separate stand or yard or on a farm. Refer to **Appendix D3**

With regard to service delivery, this situation is virtually the same across both the municipality and Ward 31 except for refuse disposal and toilet facilities in respect of which Ward 31 enjoys somewhat of a higher service delivery level. Regarding refuse removal 27.23% of households in Ward 31 have their refuse collected on a weekly basis compared to 7.93% across the municipality. In Ward 31 the situation is marginally better when it comes to lavatory facilities with 35.01% of households having flush toilets connected to the sewerage system compared to the 6.31% across Greater Tubatse. Refer to **Appendix D3**

7.1.4 National and Regional Economy

The construction of the proposed substation and transmission line has become necessary as part of Eskom's undertaking to upgrade the country's existing electricity grid. Eskom has indicated that the proposed project is driven

by the requirements of mines and industry in the area and is necessary to improve the security of electricity supply and thus benefit users on both a regional and national basis.

7.1.5 HIV, AIDS and other Sexually Transmitted Diseases

The prevalence of HIV in Limpopo is 16.3% which is lower than its neighbouring provinces of Gauteng at 18.8% and Mpumalanga at 23.6% (Shisana, et al., 2014, p. 46). Further Shisana, et al (2014, p.48) highlights that in respect of the districts affected by the project the HIV prevalence rate ranges between 6 and 12% with the Greater Sekhukhune together with Capricorn having a rate of between 6 and 9%. It is therefore possible that an influx of contract workers from these areas could pose a risk to the HIV status of the province, particularly when this is considered against the fact that the area has a high level of poverty. Prostitution often follows contract workers due to there being a source of income. However, the limiting factor is that the contract workforce will not be that large and some labour will be sourced locally

7.2 CLIMATE

According to the Land Types and Agricultural Specialist Potential Report, the climate of the area can be regarded as typical of the northern edge of the Highveld, with cool to cold, dry winters and warm, moist summers (Paterson, Koch & Barrow, 1989). The main climatic indicators are given in **Table 2**.

Table 2: Climate Data

Month	Average Rainfall (mm)	Average Min. Temp (°C)	Average Max. Temp (°C)
Jan	98.6	17.6	30.1
Feb	81.8	17.4	29.7
Mar	62.6	15.7	28.2
Apr	37.1	11.4	27.4
May	11.0	7.0	24.5
Jun	6.3	3.4	21.7
Jul	6.3	3.8	21.6
Aug	4.1	6.3	24.0
Sep	19.2	10.5	27.5

Oct	43.3	13.9	28.5
Nov	88.4	16.4	29.1
Dec	97.3	17.4	30.7
Year	556.0 mm	19.3 °C (Average)	

The long-term average annual rainfall is 556 mm, of which 472 mm, or 84.9%, falls from October to March. Temperatures vary from an average monthly maximum and minimum of 30.1°C and 17.6°C for January to 21.6°C and 3.8°C for July respectively. The extreme high temperature that has been recorded is 39.7°C and the extreme low –2.3°C. Frost will occur occasionally, but will usually be light.

7.3 GEOLOGY

The GTLM is situated on the eastern side of the Bushveld Igneous Complex and Transvaal geological system and is therefore underlain by both sedimentary and volcanic rock formations. Owing to the geological composition, the area is characterised by steep rising mountains, which are linked to undulating river valleys.

The proposed lines are divided between two types of geology namely Gabbro and Norite as depicted in **Figure 9** below. Gabbro refers to a large group of dark, coarse-grained, intrusive mafic igneous rocks chemically equivalent to basalt. The rocks are plutonic, formed when molten magma is trapped beneath the Earth's surface and cools into a crystalline mass (King H, 2014).

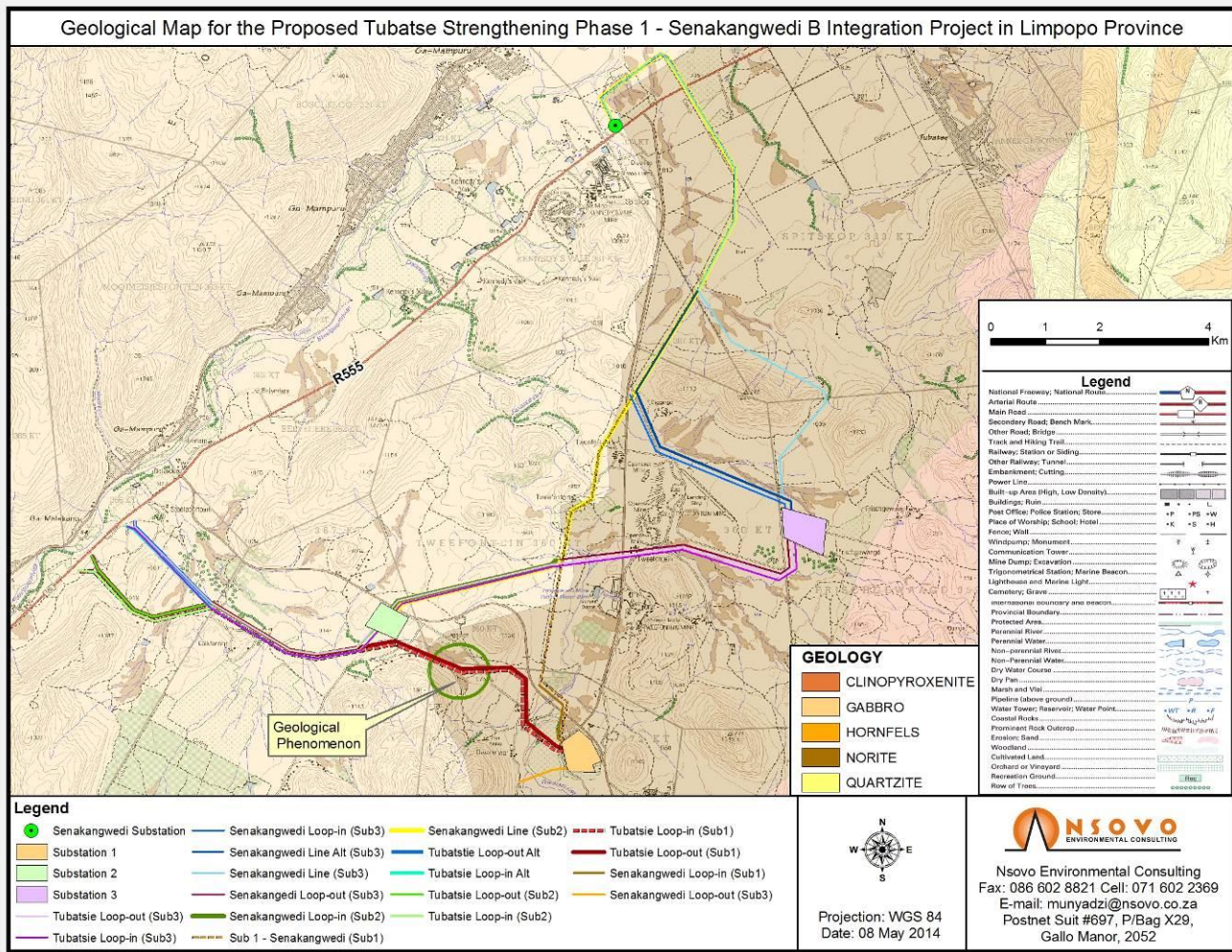


Figure 9: Geological Map

7.4 TOPOGRAPHY

The northern part of the GTLM is mountainous. The southern part is undulating and has a more moderate topography. Ridges and the mountains form linear dividers between the settlements. Ridges further divide the municipal areas creating pockets of homogeneous compositions, which determine growth and development potential

7.5 SURFACE WATER

According to the Wetland Assessment Report prepared (Attached as **Appendix D7**), two perennial riparian areas were recorded on site, namely the Steelpot River and the Dwars River. The study site falls within Quaternary Catchment B41J, B41H and a small area is located in B41G. The existing Tubatse substation and associated proposed power line infrastructure is located in quaternary catchment B41J. These riparian areas are linked to

numerous smaller tributaries. The majority of the tributaries are temporary (ephemeral or episodic) streams with only a few being perennial.

Numerous artificial dams were also recorded throughout the study area and especially in the mining areas. Substation site Alternative 1 has a small temporary stream and it is also located within 500m of the perennial Dwars River. Substation site Alternative 2 is located directly adjacent to a regional road and no riparian or wetland conditions occur on this site.

Wetland conditions are associated with numerous of the perennial rivers and temporary streams recorded in the region of the study area. The proposed routes cross perennial rivers or temporary streams a total of 37 times. Refer to **Figure 10** below for the wetland and riparian areas within 500m of the proposed project site.

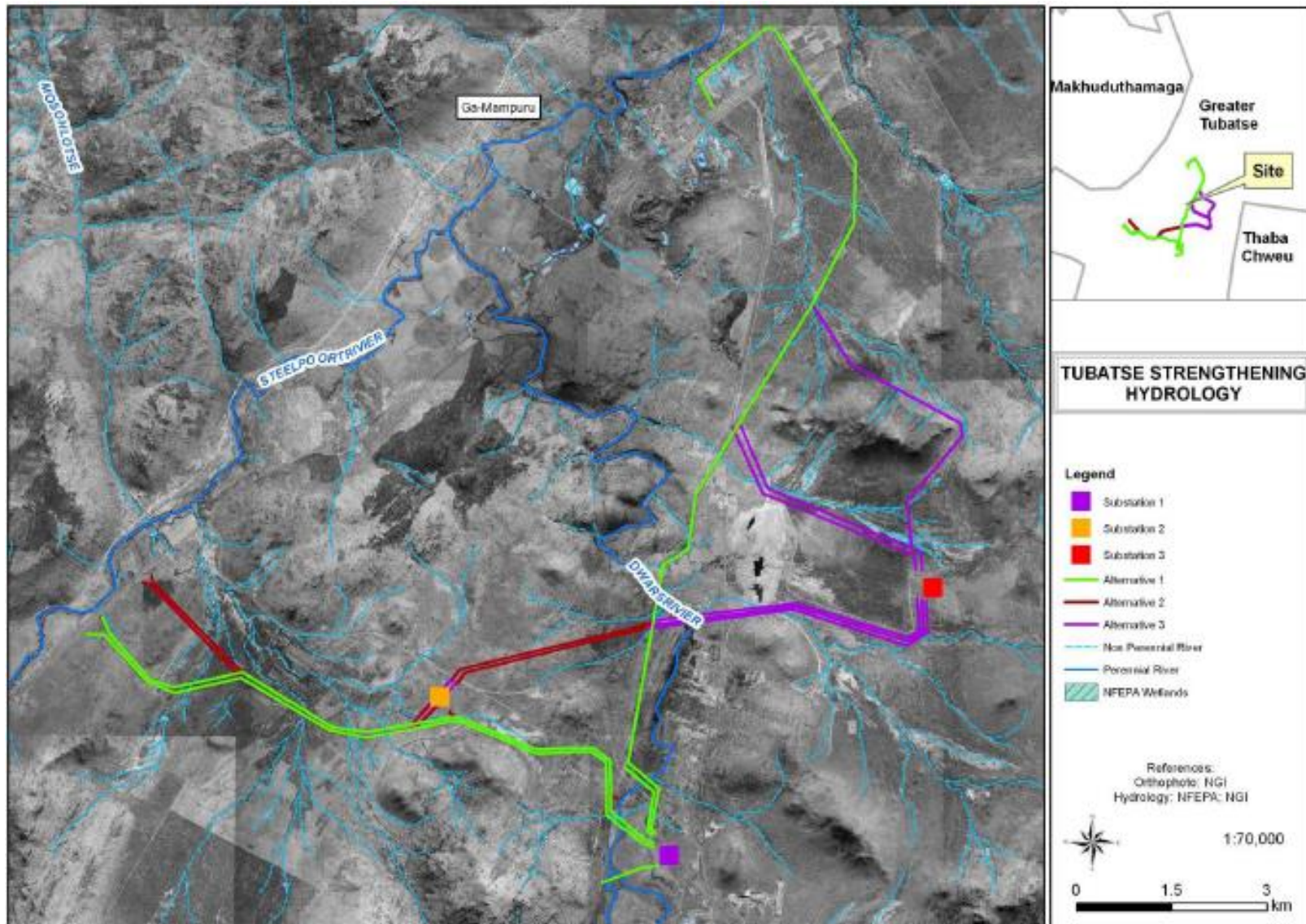


Figure 10: Wetlands and riparian areas within 500m of the proposed within the proposed project

7.6 AIR QUALITY AND POLLUTION

The GTLM is found in the Northern part of the District. The main towns in the area are Burgersfort and Steelpoort. The main activity in this area is the mining of chrome and platinum. There are also three chrome smelters in the area. This implies that the area is likely to have air pollutants such as sulphur dioxide, nitrous oxide, chromium (VI) and particulate matter. There is also significant traffic in the area due to the transportation of minerals which introduces a substantial form of pollution from vehicles in the form of carbon monoxide (CO) and other noxious gases.

7.7 FLORA

The proposed project site is situated within the Savanna Biome of South Africa (Mucina & Rutherford, 2006). The Savanna Biome is the largest Biome in southern Africa, occupying over one-third of the surface of South Africa (Mucina & Rutherford, 2006). It is characterized by a grassy ground and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as shrubveld, where it is dense, as woodland, and the intermediate stages are locally known as Bushveld (Mucina & Rutherford). The vegetation includes wooded, shrubby hill slopes and grassy plains with scattered trees or bush-clumps. Diversity in Savanna is provided by variation in soil-type and topography; koppies, river lines and anthills (*termitaria*) provide localized changes in soil moisture and nutrients which create different habitats for plants and animals.

The Savanna Biome consists of various different vegetation types. The substation alternative sites are situated within the Sekhukhune Mountain Bushveld, while the most northern extent of the proposed power lines are situated with the Sekhukhune Plains Bushveld (Mucina & Rutherford, 2006). These vegetation types are characterized by dry micro-phyllous species (e.g. *Acacia* species) and broadleaved Savanna (e.g. *Combretum* species) on hills and mountain slopes (Mucina & Rutherford, 2006).

Both vegetation types include a number of biographically important plant taxa as well as plants endemic to these vegetation types as well as endemic to the Sekhukhune area (i.e. these plants only occur within this vegetation type and / or area). The Sekhukhune Mountain Bushveld vegetation type is not considered to be threatened although mining activities, cultivation and urbanization have already transformed at least 15% of the current extent of the Sekhukhune Mountain Bushveld (Mucina & Rutherford, 2006).

Conversely, the Sekhukhune Plains Bushveld is considered to be vulnerable to becoming completely transformed. Only about 2% has already been transformed by mining, urbanization and cultivation. Furthermore, the soils are vulnerable to erosion and subsistence grazing has resulted in donga formation and the invasion of the vegetation by alien invasive plant species (weeds). Refer to **Figure 11** for vegetation affected by the proposed project.

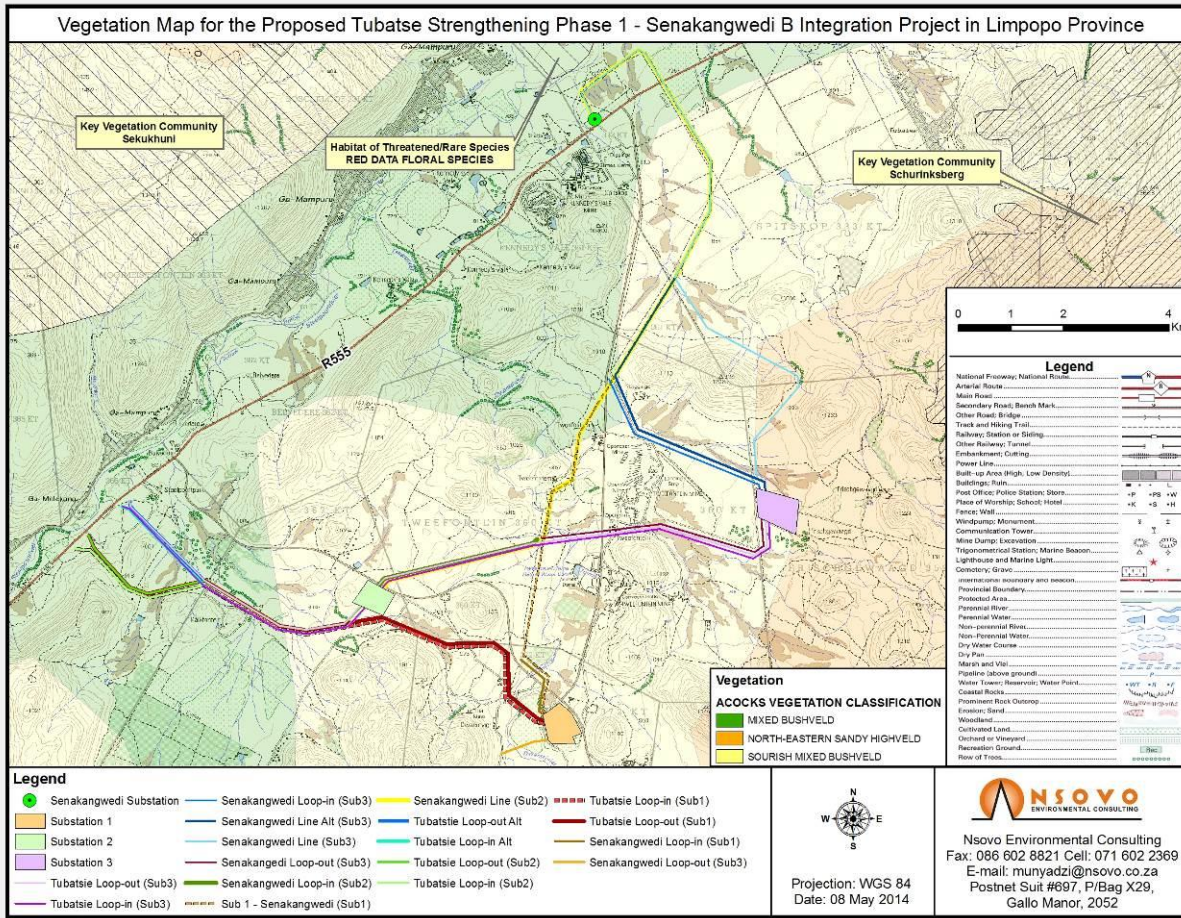


Figure 11: Representation of the vegetation types that the proposed project is situated in.

All three substation site Alternatives are located in areas that are of ‘Least Concern’ or has ‘No Natural Habitat’ remaining. Substation site Alternative 3 is situated in close proximity to areas classified as ‘Important and Necessary’ to reach conservation targets. Refer to **Figure 12** below.

The proposed power lines may have an impact on some areas that are classified as ‘Important and Necessary’ as well as ‘Highly Significant’ in reaching conservation targets.

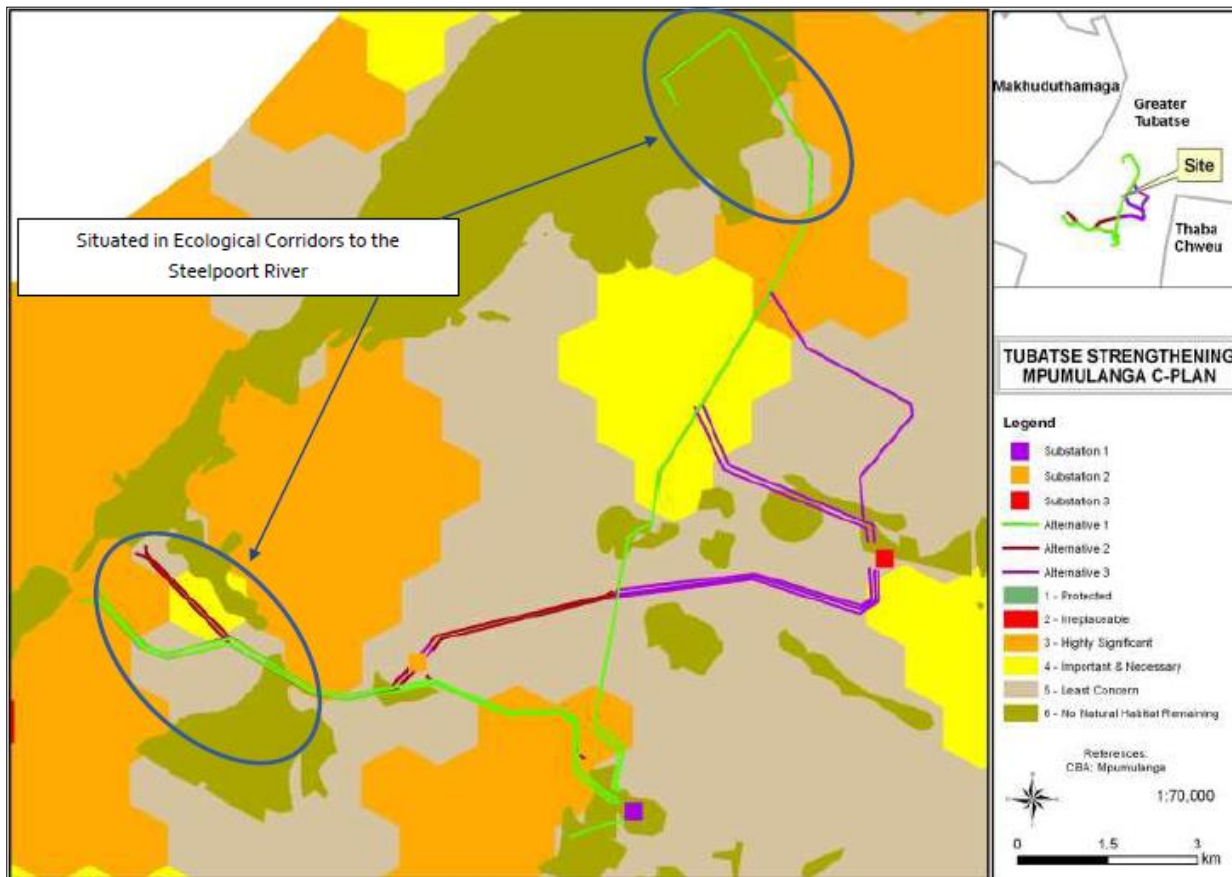


Figure 12: The site in relation to the Mpumalanga Biodiversity Conservation Plan (MBCP), Terrestrial categories.

The Draft Vegetation Assessment Report also indicates that fifteen (15) plants of conservation concern that could occur within the area of the proposed development was compiled using information from the South African National Biodiversity Institute’s (SANBI) checklist (SANBI, 2009), Raimondo *et al*, (2009), information from the Mpumalanga Tourism and Parks Agency (MPTA) and relevant literature pertaining to the area. **Table 3** below indicates the plants that have the likelihood of occurrence.

Table 3: Some provincially protected species with a likelihood of occurrence on site

Species	Growth form
<i>Adenia fruticosa simpliciflora</i>	Succulent climber
<i>Boscia angustifolia var. corymbosa</i>	Tree
<i>Rhus batophylla</i>	Small tree
<i>Erythrophysa transvaalensis</i>	Tree
<i>Pterocarpus angolensis</i>	Tree
<i>Aloe castanea</i>	Aloe
<i>A. marlothii</i>	
<i>A. arborescens</i>	
<i>Brachystelma spp</i>	Succulent
<i>Huernia spp</i>	Succulent
Family Orchidaceae (all genus and species)	Orchid
<i>Freylinia tropica</i>	Shrub
<i>Zantedeschia jucunda</i>	Arum lilies
<i>Z. pentlandii</i>	

7.8 FAUNA

According to the Vertebrate Assessment Report (**Appendix D6**) the three substation sites and the servitude routes fall outside the natural range of the striped harquin snake, Swazi rock snake, Transvaal quill-snouted snake, Eastwood's long-tailed seps, Soutpansberg flat lizard, Woodbush legless skink, Muller's velvet gecko, Methuen's dwarf gecko and Natal hinged tortoise. It is thus concluded that these species are absent on the study site. Eastwood's long-tailed seps is furthermore officially extinct.

Further, the report indicates that the study falls inside the distributional range of the Southern African python. Due to the extensive size and diverse habitats and sub-habitats of the study site and adjoining areas, the South African python can be expected on the study site. According to Bradley (1990), Southern African pythons favour moist, rocky, well-wooded valleys, plantations or bush country and seldom if ever, stray far from permanent water (such as the Steelpoort River). The overall study area thus provides suitable habitat for the Southern Africa python, although the three substation sites are far too small to support a viable population (it is estimated that a single python needs at least a 100ha area to forage). The occasional Southern African python may occasionally venture onto one of the three substation sites or on the ultimately densely vegetated power lines servitude.

No potential breeding sites for the giant bullfrog is present on any of the three study sites. Considering the size of the three substation sites and that no breeding sites for bullfrogs are found on or near any of these or in sample points along the servitude routes, the possibility of giant bullfrogs occurring on the study site is regarded very minimal. Refer to **Appendix D** for Vertebrate Assessment Report.

7.9 AVIFAUNA

The draft Avifaunal specialist report indicates that it is widely accepted within ornithological circles that vegetation structure and not species composition is most important in determining which bird species will occur in an area. The most prevalent vegetation type present on the site is “Sekhukhune Mountain Bushveld” (Mucina & Rutherford, 2006). The main relevance of this classification to this study is that bushveld is the dominant vegetation type on site. We can therefore expect the avifaunal community to be dominated by bushveld dependent species.

The micro habitats identified on, or within close proximity to the study site include: woodland, grassland patches, arable lands, wetland areas, and a river.

The first atlas data was collected over an eleven year period between 1986 and 1997 (Harrison *et al*, 1997). The provided data remains the best long term data set on bird distribution and abundance available at present.

A full list of approximately 295 bird species recorded in the broader area within which this site falls, by the above two atlas projects, is shown in Appendix 2 of the Avifauna specialist report. **Table 4** below details the Red List bird species (11) amongst these. Appendix 2 of the Avifauna specialist report and **Table 4** below should be viewed as the species that could potentially occur on the site, provided that conditions and habitat are favourable.

Table 4: The Red List bird species for the proposed project

Common name	Species name
Eagle, Tawny	<i>Aquila rapax</i>
Eagle, Verreaux's	<i>Aquila verreauxii</i>
Falcon, Lanner	<i>Falco biarmicus</i>
Kestrel, Lesser	<i>Falco naumanni</i>
Kingfisher, Half-collared	<i>Alcedo semitorquata</i>
Roller, European	<i>Coracias garrulus</i>
Stork, Abdim's	<i>Ciconia abdimii</i>
Stork, Black	<i>Ciconia nigra</i>
Stork, White	<i>Ciconia ciconia</i>
Secretarybird	<i>Sagittarius serpentarius</i>
Vulture, Cape	<i>Gyps coprotheres</i>
Vulture, White-backed	<i>Gyps africanus</i>

Red List species face considerable conservation challenges and can ill afford additional mortality factors associated with the construction and operation of electrical infrastructure. In addition to the Red List species, the White Stork has also been included, as they are afforded international protection under the Bonn Convention on Migratory Species. Most species in **Table 4** above are large birds (i.e. the Secretary bird and storks) and could potentially be impacted on directly by the proposed power line, through collision. Those species that are physically smaller could face disturbance effects and habitat destruction during the construction of the proposed project.

It is important to note that due to the already disturbed nature of most of the site, the likelihood of many of the Red List species in **Table 4** above frequenting the site has been judged to be low. As a result, the impacts of the proposed project could be more important for the common bird species, which are generally more tolerant of human disturbance and hence more likely to regularly make use of this site. These include waterfowl such as ibises, geese, ducks, herons and many others.

Refer to **Appendix D1** for the Avifauna specialist report.

7.10 LAND TYPES AND AGRICULTURAL POTENTIAL

7.10.1 Soils

According to the Land Types and Agricultural Potential specialist report, the various proposed infrastructure (substations and transmission lines) is covered by a total of 4 land types, namely:

- **Ae27** - high base status, red, structureless soils, often deep)
- **Dc31** - mixed soils, with structureless soils and duplex soils (sandy topsoil over structured clay subsoil)
- **Ib192** - rock outcrops (>60% of the landscape) with shallow soils
- **Ic154** - mostly rock (>80% of the landscape) with little soil

Refer to **Figure 13** below for the distribution of the land types (marked by black lines) within the study area.

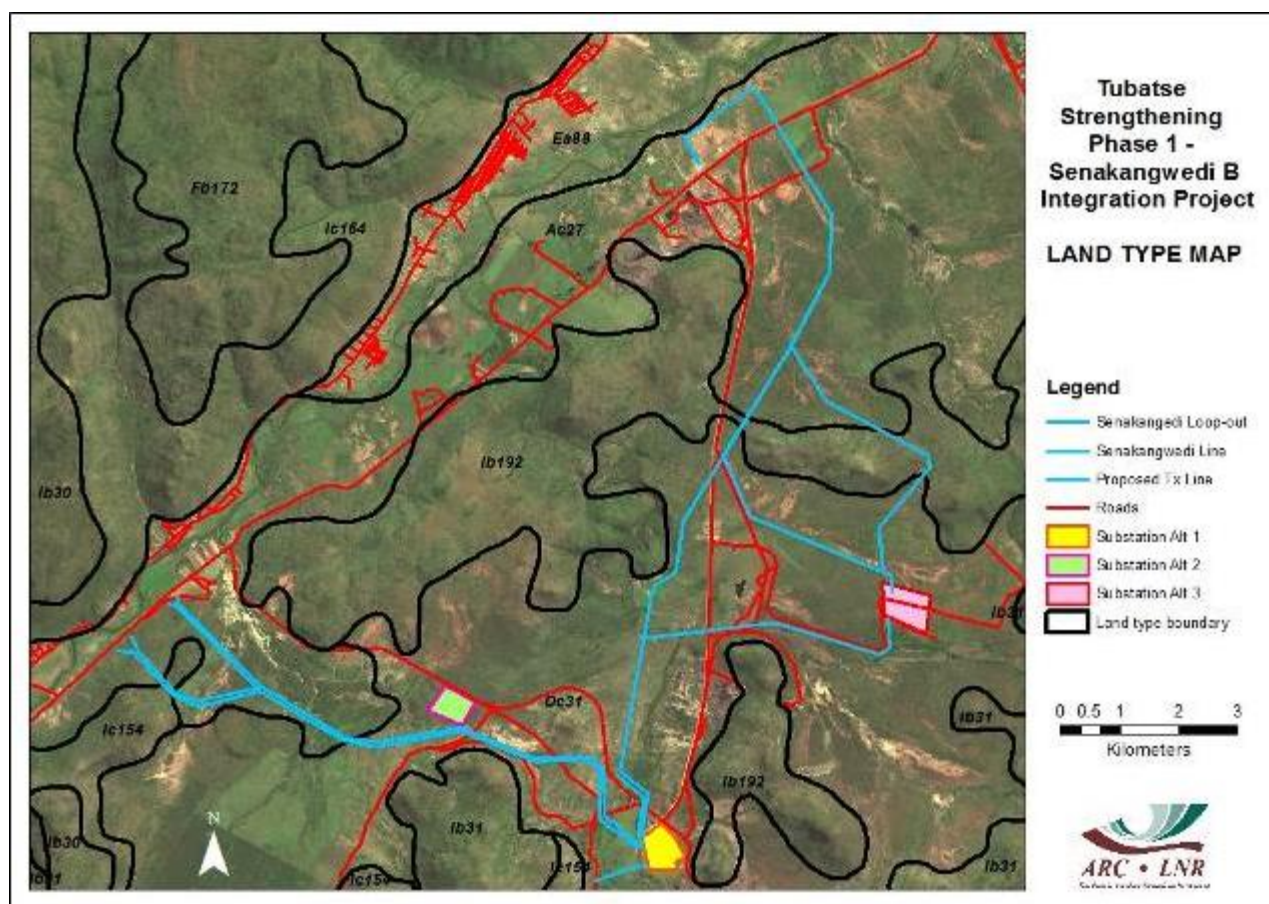


Figure 13: Distribution of land types within the study area.

The dominant soils occurring in each of the land types are shown in **Table 5** below. The right-hand column shows the total estimated percentage per land type of high, moderate and low potential soils, with the dominant category **in bold**. However, it should be noted that this refers to soil potential only, and that climatic restrictions are not taken into account.

Table 5: Soil properties per land type

Land Type	Dominant soils	Sub-dominant soils	Dominant Slopes	Agricultural Potential (%)
Ae27	Hutton 36/46; 450-1200+ mm SaCILm 39%	Valsrivier/Swartland 41; 600-1200+ mm; Cl 30%	2-12%	H: 52.1 M: 30.8 L: 17.1
Dc31	Hutton 36/46; 450-1200+ mm SaCILm 29%	Valsrivier/Swartland 21/41; 450-1200+ mm; Cl 20%	1-5%	H: 38.5 M: 44.5 L: 27.0
Ib192	Rock 64%	Mispah/Glenrosa; <300 mm; SaLm-SaCILm 24%	3-40%	H: 0.0 M: 0.6 L: 99.4
Ic154	Rock 85%	Mispah 10; 50-150 mm; SaLm-SaCILm 5%	6-100%	H: 0.0 M: 0.4 L: 99.6

7.10.2 Agricultural Potential

From **Table 5** and the land type distribution map on **Figure 13**, it can be seen that most of the infrastructure (including all three substation alternatives) fall in land type **Dc31**, with smaller portions of the proposed transmission lines in the north and west falling in land type **Ae27**. Only a very small portion of the infrastructure crosses either of the other two land types.

The soils across the study area are a mixture of red, structureless, freely-drained sandy clay loam soils of the Hutton (and occasionally Shortlands) form, with varying depth. Where these soils are deep, they have a high arable potential. However, there are also significant areas of duplex soils of the Valsrivier and Swartland forms, where a relatively sandy topsoil layer abruptly overlies a subsoil clay layer, usually structured. These soils are problematic for cultivation, as the removal of surface vegetation can often result in the exposed topsoil being eroded, leading to the formation of gullies, which can be very difficult to rehabilitate.

The climate of the study area (**Table 2**) shows that the rainfall is marginal for dryland (rain-fed) cultivation, especially in this area of warm to hot summer temperatures, exacerbated by the “bowl effect” of the surrounding steeper topography. The variable nature of the rainfall, both within seasons and across seasons, means that arable cultivation has significant risks, if no source of irrigation water is available to supplement the rainfall in times of shortfall.

7.11 SENSORY ASPECTS

7.11.1 Noise

The ambient noise levels of the proposed study area are within acceptable limits.

7.11.2 Visual Aspects

Visual appreciation or dislike is subjective and thus what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape the impact of new developments and structures tends to be complicated and it is evident from previous experience that when dealing with reaction to landscape changes, a large diversity of opinion exists.

Much of the study area is managed for purposes of conservation, agriculture, forestry or is communal land devoid of any imposing infrastructure such as transmission lines. The natural landscapes of much of the study area are sensitive and important to preserve for their aesthetics. It is, thus, necessary to maintain a near natural visual landscape, with limited aesthetic affects, to enable the continuation of nature-based economic activities such as ecotourism.

In this regard, it is an imperative that Eskom be sensitive from a visual impact perspective, to the requirements of the local people, notably rural communities, farmers and operators involved in eco-tourism activities. Many topographical features influence this environment and these features will need to be utilised when selecting an alignment so as to minimise visual impacts and intrusions.

8 APPLICABLE LEGISLATION AND GUIDELINES

Documented in the subsequent section is a list of the current South Africa environmental legislation, which is considered to be pertinent to the construction and operation of the proposed Senakangwedi B substation and associated power lines. A description of legislation pertaining to the project is summarised in **Table 6** below.

The Environmental Impact Assessment (EIA) process followed is in compliance with the NEMA and the Environmental Impact Regulations of 2010 (GNR 543, 544 and 546 of 18 June 2010). The proposed development involves “listed activities”, as defined by NEMA. Listed activities are activities which may potentially have detrimental impacts on the environment and therefore require environmental authorisation from the relevant

Competent Authority. Refer to **Table 7** below, for the listed activities triggering the project. The proposed development occurs within the Limpopo Province and thus, the provincial authority is the Limpopo Department of Economic Development Environment and Tourism (LEDET) while the DEA is the decision-making authority.

The list of legislations that are applicable to the project is not an exhaustive analysis; however, it provides a guideline to the relevant aspects of each Act.

Table 6: Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998, (Act No. 107 of 1998)	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), The principles set out in the National Environmental Management Act, 1998 (Act No. 107 of 1998), hereafter referred to as NEMA, apply to all listed projects. Construction and operation have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.

Aspect	Relevant Legislation	Brief Description
	2003)	
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	<p>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).</p>
Air quality management and control	<p>Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965) (APPA)</p> <p>National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)</p>	<p>The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air and to prevent pollution of air and ecological degradation.</p> <p>Part 6 of the Act makes provision for measures to control dust, noise and offensive odours. Section 33 specifically provides for the submission of plans to prevent pollution once mining operations have ceased.</p> <p>This provision must be read together with the statutory requirements of the as well as the National Environmental Management: Air Quality Act. The Proposed Area has not been declared as a dust control area in terms of section 27 of the APPA.</p> <p>Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it</p>

Aspect	Relevant Legislation	Brief Description
		provides that the Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance by dust or other measures aimed at the control of dust.
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMP. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation , 1989 (Act 73 of 1989).
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of law relating to water resources and use ¹ . The preamble to the Act recognizes that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act
Human	The Constitution of South Africa, 1996 (Act	The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained

Aspect	Relevant Legislation	Brief Description
	No. 108 of 1996	<p>in the Bill of Rights, Chapter 2). In terms of Section 7, the state is obliged to respect, promote and fulfil the rights in the Bill of Rights. The environmental right states that:</p> <p>“Everyone has the right -</p> <p>a) To an environment that is not harmful to their health or well-being; and</p> <p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> -Prevent pollution and ecological degradation; -Promote conservation; and -Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

These Acts must be read with the Eskom policies and environmental guidelines.

The listed activities triggered by the project are as follows indicated below.

Table 7: Listed Activities triggering Scoping and Environmental Impact Assessment.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description:
544	11(iii,v, xi)	<p>The construction of:</p> <ul style="list-style-type: none"> (v) weirs; (Xi) infrastructure or structures covering 50m² or more <p>Where such construction occurs within a watercourse or within 32m of a watercourse, measured from the edge of a</p>

		<p>watercourse, excluding where such construction will occur behind the development setback line.</p> <p>This listing is applicable only in certain special areas, namely within a distance from a watercourse. The study area contains number of wetlands, rivers and other watercourses that may be affected depending on the route alternative selected for the transmission lines. Once the preferred alternative is identified the applicability of this activity will be reviewed and presented in the EIA phase.</p>
544	13	<p>The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.</p> <p>It is understood that the construction phase of the project may include provision for the storage and handling of fuels, oils and other dangerous goods.</p>
544	18 (i)	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i) a watercourse;</p> <p>But excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <p>(i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</p> <p>(ii) occurs behind the development setback line.</p> <p>During construction it is anticipated that the proposed project will involve the infilling and removal of material into the watercourse/streams for crossing purposes. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses)</p>
544	22 (i, ii)	<p>The construction of a road, outside urban areas,</p> <p>(i) with a reserve wider than 13,5 meters or,</p> <p>(ii) where no reserve exists where the road is wider than 8 metres, or</p> <p>(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</p>

		<p>of 2010.</p> <p>It is understood that there may be a requirement to widen or lengthen existing access roads for the purposes of the construction and operation of the proposed project.</p>
544	23	<p>The transformation of undeveloped, vacant or derelict land to-</p> <p>(ii) residential, retail, commercial, recreational, industrial, or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;-</p> <p>except where such transformation takes place for linear activities.</p> <p>The proposed project will involve the transformation of vacant land for the construction of a new transmission line.</p>
544	24	<p>The transformation of land bigger than 1000 square metres in size, 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, conservation or had an equivalent zoning.</p> <p>The proposed project will involve the transformation of land bigger than 1000 square metres for the construction of a new transmission line.</p>
544	26	<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).</p> <p>The proposed study area includes various wetlands and streams and may include other sensitive biodiversity. The applicability of this listed activity will be confirmed during the EIA process.</p>
544	37	<p>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</p> <p>(a) the facility or infrastructure is expanded by more than 1000 metres in length; or</p> <p>(b) where the throughput capacity of the facility or infrastructure will be increased by 10 percent or more excluding where such expansion:</p> <p>(i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p> <p>It is anticipated that during construction of the facility stormwater facilities will be constructed or upgraded as well. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA</p>

		process progresses)
544	39 (iii, iv,v)	<p>The expansion of</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) weirs; (v) bulk storm water outlet structures; (vi) marinas; <p>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.</p> <p>The study area contains number of wetlands, rivers and other watercourses that may be affected depending on the route alternative selected for the transmission lines. Once the preferred alternative is identified the applicability of this activity will be reviewed and presented in the EIA phase.</p>
544	40 (i)	<p>The expansion of</p> <ul style="list-style-type: none"> (i) jetties by more than 50 square metres; (ii) slipways by more than 50 square metres; or (iii) buildings by more than 50 square metres <p>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.</p> <p>The study area contains number of wetlands, rivers and other watercourses that may be affected depending on the route alternative selected for the transmission lines. Once the preferred alternative is identified the applicability of this activity will be reviewed and presented in the EIA phase. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses)</p>
544	47	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1km-</p> <ul style="list-style-type: none"> i) where the existing reserve is wider than 13,5m; or ii) where no reserve exists, where the existing road is wider than 8m. <p>excluding widening or lengthening occurring inside urban areas.</p> <p>It is understood that there may be a requirement to widen or lengthen existing access roads for the purposes of the construction and operation of the proposed project.</p>

546	4 (ii)	<p>The construction of a road wider than 4 metres with a reserve less than 13, 5 metres.</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 Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas as identified in Systematic biodiversity plans adopted by the competent authority or in bioregional plans;</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 terms of NEMPAA or from the core areas of a biosphere reserve;</p> <p>It is understood that there may be a requirement to widen or lengthen existing access roads for the purposes of the construction and operation of the proposed project. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses).</p>
545	8	<p>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.</p> <p>The project includes construction of a new Senakangwedi B 400/275kV substation and both 400 and 275kV loop in Power lines.</p>
546	10 (ii)	<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</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 Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental</p>

		<p>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 in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</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 terms of NEMPAA or from the core areas of a biosphere reserve;</p> <p>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined;</p> <p>It is understood that the construction phase of the project may include provision for the storage and handling of fuels, oils and other dangerous goods. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses).</p>
546	12	<p>The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</p> <p>The construction of the proposed transmission line will involve the clearing of vegetation for the final preferred route (tower footprints and vegetation clearing heights).</p>
546	13 (ii)	<p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list.</p> <p>(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010.</p> <p>ii. Outside urban areas, the following:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental</p>

		<p>management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Core areas in biosphere reserves;</p> <p>(ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>The construction of the proposed transmission line will involve the clearing of vegetation for the final preferred route (tower footprints and vegetation clearing heights). (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses)</p>
546	14. i	<p>The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</p> <p>(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;</p> <p>(3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.</p> <p>i. All areas outside urban areas.</p> <p>The construction of the proposed transmission line will involve the clearing of vegetation for the final preferred route (tower footprints and vegetation clearing heights). (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses)</p>
546	16 (i)ii	<p>The construction of:</p> <p>(i) jetties exceeding 10 square metres in size;</p> <p>(ii) slipways exceeding 10 square metres in size;</p> <p>(iii) buildings with a footprint exceeding 10 square metres in size; or (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</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 Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an International Convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>The study area contains number of wetlands, rivers and other watercourses that may be affected depending on the route alternative selected for the transmission lines. Once the preferred alternative is identified the applicability of this activity will be reviewed and presented in the EIA phase. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses)</p>
546	19 (ii)	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</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 Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</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 terms of NEMPAA or from the core area of a biosphere reserve;</p>

		<p>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</p> <p>It is understood that there may be a requirement to widen or lengthen existing access roads for the purposes of the construction and operation of the proposed project. (Some of the listed activities might not be applicable, however, this will be determined and clarified as the EIA process progresses).</p>
546	24 (a)ii	<p>The expansion of</p> <p>(a) jetties where the jetty will be expanded by 10 square metres in size or more;</p> <p>(b) slipways where the slipway will be expanded by 10 square metres or more; (c) buildings where the buildings will be expanded by 10 square metres or more in size; or (d) infrastructure where the infrastructure will be expanded by 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</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 Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</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 terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>The study area contains number of wetlands, rivers and other watercourses that may be affected depending on the route alternative selected for the transmission lines. Once the preferred alternative is identified the applicability of this activity will be reviewed and presented in the EIA phase. (Some of the listed activities might not be applicable,</p>

		however, this will be determined and clarified as the EIA process progresses).
546, 18 June 2010	10	<p>The construction of a road wider than 4 metres with a reserve less than 13.5 metres.</p> <p>(a) In Limpopo (ii) outside urban areas, in:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p>

9 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section of the draft Scoping Report describes the potential impacts that the proposed project may pose on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified, have been assessed based on the consultant's opinion after numerous visits to the site and previous experience on similar undertakings. Refer to **Table 8** below, for the potential impacts identified.

Table 8: Environmental Potential impact Identified

Issue	Rating	Description
Employment	Positive-No mitigation required	Job creation and investments into the project will result in opportunities during the planning and design phase. This impact will typically be limited to skilled engineers and planning professionals. Proposed project will result in very limited opportunities to the skilled local community during the construction phase. This impact will be positive and provincial in extent.
Air Pollution	Neutral	The only potential air pollutant during construction may be dust emanating from site preparation and excavations during construction. Given the nature and magnitude of the proposed project it is anticipated that if not mitigated the impact may be local in extent, and short term. Mitigation measures such as regular dust suppression can reduce the impact to become site specific.
Visual Impact	Negative	<p>The visual impact of the proposed Senakangwedi B substation and power lines would be at its maximum at distances of 500m or less. However, the visual impact of an object in the landscape decreases quickly as the distance between the observer and the object increases. The visual impact at 1 km is approximately a quarter of the impact viewed from 500m, and at 2km, is one eighth of the impact viewed from 500m. Therefore, objects appear insignificant in any landscape beyond 5km.</p> <p>The visibility of the proposed structure and infrastructure would be a function of several factors, including: landform, vegetation, views and visibility, genius loci (or sense of place), visual quality, existing and future land use, landscape character and scale.</p> <p>The proposed activity will indeed change the visual character of the site particularly considering that the proposed site is located in an area that is sloping; the elevated points of the site can be viewed from the nearby roads, however, it must be noted that there are already existing overhead power lines located within</p>

		<p>the vicinity of the proposed project site. Local variations in topography and man-made structures could cause local obstruction of views in certain parts of the view shed. Given the topography of the site and the exact location of the station the impact can be considered definite, long term, local in extent but low in significance.</p>
Fauna	Negative	<p>As indicated above, the proposed project will traverse several properties where fauna exists. The species richness on the campus of the Senakangwedi B substation will be displaced, the impact will be local and insignificant.</p> <p>Considering the insignificant extent of the substation campus and the relatively narrow and linear servitude co-incidentally transformed towards rank grassland, it is not expected that any endangered species' conservation will be put at risk.</p> <p>Other than endangered species, no sensitive species or sensitive areas are flagged. The project will not substantially change the reigning ecological character of the general area. The projected swath grassland in the power line servitudes can be seen as positive biodiversity development (albeit unnatural). Further, the proposed project will not significantly impact negatively on the assemblages and conservation of the general area.</p>
Flora	Negative	<p>The most significant impact of power lines are expected to occur during the construction phase, whereas the new pylons and power lines, once in use, have relatively contained impacts on the vegetation and can be successfully mitigated to limit or even negate the negative impacts.</p> <p>The greatest threat to the rehabilitation of disturbed areas, are potential of invasive plant species to colonise the disturbed soil and spread into adjacent and natural areas. If remedial measures and monitoring is</p>

		<p>properly employed, the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation and faunal habitats could thus be minimal. Furthermore, where existing roads or servitudes are employed during construction and implementation, the impacts of these when compared with extensive agriculture, rural settlements or urbanization, can be considered as medium to low.</p>
Surface Water	Negative	<p>The proposed routes cross perennial rivers or temporary streams a total of 37 times. A development like this has several impacts on the surrounding environment and on wetlands. The development changes habitats, the ecological environment, infiltration rate, amount of runoff and runoff intensity of the site, and therefore the water regime of the entire site if not properly managed.</p> <p>An increased volume of stormwater runoff, peak discharges, and frequency and severity of flooding is therefore often characteristic of transformed catchment.</p>
Noise	Negative	<p>In South Africa, the assessment of noise levels in the environment is governed by the South African Bureau of Standards (SABS) noise standard 0103 – ‘The measurement and rating of environmental noise with respect to annoyance and to speech communication’ (SABS 1994). Additional SABS standards cover the measurement of noise over different distances from the source (SABS 0357 – ‘The calculation of sound propagation by the Concave method’), and standards for different sectors (e.g. industry). SABS 0103 (SABS 1994) and SABS 0357 (SABS 2000) are used extensively in this report.</p> <p>An increase in noise is expected due to construction, which might have an impact especially on the surrounding Nokaneng/ Kalkfontein village. Noise associated with the construction activities can be mitigated by limiting the construction operation to business hours, during which noise will not be of such a big concern to surrounding residents. According to the SABS 103 acceptable noise levels at day time is 45DbA. A noise</p>

		<p>intrusion is disturbing if it exceeds 7Dba or more. Given the nature of the project, it is highly unlikely that the stipulated noise levels will be exceeded at any given time. During the operational phase the impact of noise will also be reduced to almost insignificant levels, given the nature of the proposed project.</p> <p>Given the proximity (approximately 1Km away) of the site to the Nokaneng/Kalkfontein village, noise has been identified as a potentially low impact aspect. The noise impact may be local during construction and site specific during operations.</p>
Land Use	Negative	<p>The proposed study area has varying land uses ranging from mining to small scale farming. The primary uses identified are game and livestock farming as well as limited crop farming. The proposed project may have a considerable impact particularly during construction while the extent and severity of the operational impact will be greatly reduced as the land uses will continue.</p>
Bird Population	Negative	<p>Due to its size and prominence, electrical infrastructure constitutes an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are electrocution of birds (and other animals) and birds colliding with power lines. With proper mitigation measures implemented, these potential impacts will be reduced to acceptable levels.</p> <p>For the proposed project, major risks to wild and domestic birds may be caused by the proposed facilities are disturbance by construction activities (temporary), on-going disturbance during operation phase (semi-permanent), collision wires, collision with supporting power line and electrocution on associated power line.</p> <p>This impact is local, long term, high probability and significant. If proper measures are in place the impact can be reduced to medium or low in significance.</p>
Waste	Negative	<p>Naturally, the inhabitation of the land will result in the accumulation of various forms of waste in the area. The aesthetic value of the area would decrease if such waste is not collected and disposed of appropriately.</p>

		<p>Waste material will be generated during the construction phase. Such waste may accumulate from the workers campsite or from litter left around the work area by the construction staff. Other waste substances may accumulate from cement bags amongst other construction material.</p> <p>The impact of waste is definite and will last for the duration of the construction phase.</p>
Soil Erosion	Negative	<p>Movement of heavy machinery across the land as well as vegetation clearance may cause destabilisation of soils which then become susceptible to erosion. Continuous movement of vehicles over the land during the construction phase may leave it susceptible to erosion.</p>
Heritage	Negative	<p>The heritage significance of each site has been assessed in terms of the National Heritage Resources Act, 1999 (No 25 of 1999). A Phase 1 Archaeological Impact Assessment has been conducted and identified two significant sites areas located near substation alternative 1. The findings are as follows:</p> <ul style="list-style-type: none"> • Substation site Alternative 1 is fairly flat and encroached by vegetation. According to the Phase 1 Archaeological Impact Assessment Specialist Study Report (refer to Appendix D4), about 600m from the nearby river, there is an indication that Iron Age people settled in the area. Iron Age people preferred to settle in areas with rich alluvial soils close to rivers (Huffman 2007). • The Dwars River heritage site is situated between the loop in and loop out lines associated with substation site alternative 1. These lines are in close proximity (approximately 200 metres) to instigate a direct or indirect impact to the national heritage site. <p>It is recommended that an archaeologist conduct a walk-down survey of the particular area.</p>

Servitudes	Neutral	Existence of servitudes needs to be taken into consideration in the design and layout of the proposed project. Regulations pertaining to servitudes needs to be taken into consideration. There are existing lines in the area which will be taken into consideration. Potential impacts on this servitude will be investigated during the EIA phase.
Surface and Ground Water Pollution	Neutral	<p>The proposed alternatives cross rivers, streams and dams. The impact on water quality if any could be decrease in quality and contamination of surface and ground water. This could result from fuel spillages, sewer systems etc. The impact on water is site specific but can be local or regional if proper measures are not put in place.</p> <p>The may be a need to apply for water use licences with DWA considering the number of crossings and proximity of the line to surface water bodies.</p>
Social Environment	Negative	The construction phase may have an impact on the surrounding residents if not properly managed. It could result to disturbance of residents as a result of construction related activities. The potential increase in traffic may pose a safety risk to surrounding residents, particularly scholars. Other social related issues may include theft. This impact will be local.
Climate	Neutral	Local climate conditions do not appear to be of a significant concern to the proposed project. The stretch between the Greater Tubatse areas is highly mountainous, hence prone to lightning. Measures will have to be put in place during the design of the structures to ensure diversion. In a broader scale the project will have no impact on the local and/or global climate change.
Topography		The topography of the study area is flat to undulating, this map pose design challenges particularly in the highly mountainous area.

10 PUBLIC PARTICIPATION PROCESS

The Environmental Impact Assessment Regulations of June 2010, requires that during a Scoping and EIA process, the organs of State together with interested persons and the general public be informed of the application and also be afforded an opportunity to comment on the application.

Public Participation Process (PPP) is any process that involves the public in problem solving and decision-making and it forms an integral part of the Scoping and EIA process. The PPP provides people who may be interested in or affected by the proposed development, with an opportunity to provide comments and to raise issues or concern, or to make suggestions that may result in enhanced benefits for the project.

Chapter 6, Regulation 54 through 57, of the EIA Regulations stipulates the manner in which PPP should be conducted as well as the minimum requirements for a compliant process. These requirements include (but not limited to):

- (a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken;
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of rate payers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper

The primary purpose of the report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, interested and affected parties; and
- To ensure that the BA process fully address the issues and concerns raised, if any.

10.1 PUBLIC PARTICIPATION PRINCIPLES

The principle of the Public Participation holds that those who are affected by a decision have the right to be involved in the decision-making process i.e. the public's contribution will influence the decision. One of the primary objectives of conducting the PPP is to provide interested and affected parties with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meet the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- Is as inclusive and transparent as possible, it must be conducted in line with the requirements of Regulations 54 - 57 of the EIA Regulations.

10.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process was in line with the processes contemplated in Regulation 54 - 57 of the National Environmental Management Act, 1998 (Act 107 of 1998) ("the Act"), which provides that:

10.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government department), landowners, Greater Tubatse Local Municipality as well as other interested and affected parties.

10.4 PUBLIC PARTICIPATION DATABASE

In accordance with the requirements of the EIA Regulations under Section (24) 5 of NEMA, (Regulation 55 of GNR 543), a Register of I&APs must be kept by the public participation practitioner.

In fulfilment of this requirement such a register has been compiled and has been updated with the details of the I&APs including their comments. The database is attached as **Appendix E5**.

10.5 SITE NOTICES

On the 5 - 6 December 2013, five A2 size notices were fixed at different conspicuous sites at the proposed project area i.e. the Greater Tubatse Local Municipality, existing Senakangwedi substation, Babinanoko Ba Mampuru Traditional Council Office, at the intersection of R577 and Richmond Road (near Uchoba substation). Photographic evidence of the site notices are attached as **Appendix E1a**.

10.6 DISTRIBUTION OF NOTICES TO SURROUNDING LAND OWNERS/ OCCUPIERS

Notification letters were posted via registered mail to stakeholders on 26 November 2013 (Refer to **Appendix E2a** for proof of postage), whereas other site notices were hand delivered to landowners/occupiers on the 5th and 6th of December 2013. These notifications were informing the public and government stakeholders of the project as well as affording the public of an opportunity to register as I&AP and also to comment or raise any issue that they might have. This process was run for a 40 day calendar period as per the NEMA Regulations.

10.7 MUNICIPALITY IN WHICH THE SITE IS SITUATED AND OTHER GOVERNMENTAL AUTHORITIES

The project falls under the Greater Tubatse Local Municipality. Governmental authorities were informed by means of formal letters explaining the proposed activity on which they were invited to comment. Notification and request for comments were submitted to the following governmental stakeholders:

- Greater Tubatse Local Municipality;
- Limpopo Heritage Resource Agency;
- Limpopo Department of Roads and Transport;
- Limpopo Department of Agriculture ;
- Limpopo Department Economic Development, Environment and Tourism; and

- Limpopo Department of Water Affairs.

The notifications were sent by registered mail; refer to **Appendix E2b** for proof of this.

10.8 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement was placed on the Legal Classifieds section of The Star newspaper and Gemeenskap (Steelburger/Lydenburg News) on 22 November 2013. On 14 December 2013, the advertisement was amended and published again on The Star newspaper. The advertisement was aimed at further informing the interested and affected parties of the proposed activity and to invite them to submit their comments. A period of 72 days was allowed for the public to submit their comments, issues or concerns this was over and above the NEMA prescribed 40 days and was done so as to include public and school holidays. Proof of newspaper advertisement is attached as **Appendix E1c**.

10.9 PUBLIC MEETINGS

Given the response received from the stakeholders and I&APs, the public meeting was deemed unnecessary, therefore no public meeting has been held thus far.

10.10 SYNTHESIS OF ISSUES AND RESPONSE

Appendix E3b contains the comments, issues and concerns raised together with the responses provided by the Environmental Assessment Practitioner.

11 DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

11.1 MOTIVATION FOR THE DEVELOPMENT

As part of the long term solution, Eskom has undertaken a series of projects to upgrade the existing electricity infrastructure and to construct new infrastructure where there is a need in the country. The Proposed Tubatse Strengthening Phase 1 – Senakangwedi B Integration is driven by mine development and it forms part of the new infrastructure that Eskom has planned, the objective being to ensure reliable energy supply.

The propose project will ensure the following:

- The power line will form part of the link to strengthen the supply network between the existing Senakangwedi substation and the proposed Senakangwedi B substation;
- Improvement in reliability of electricity supply which will benefit mines; and
- Improve the economic status of South Africa.

11.2 BENEFITS OF THE PROJECT

The proposed project is beneficial as it will allow for load growth in the region. It is envisaged that the proposed project would ensure reliable supply to industry, predominantly the mines in the area; this will indirectly benefit communities as reliable electricity will result in uninterrupted production and therefore growth in industry, which could potentially yield additional jobs. The overarching impact will be positive economic spinoffs, which benefit the community, the region and country at large.

Electrification has significant positive benefits from a socio-economic and ecological perspective. The provision of electricity leads to a number of social benefits for organs of state, individuals, industries and communities such as:

For organs of state:

- Enables rural development.
- Enables the provision of lightning, thereby vastly improving the safety and security of communities.

For individuals and communities:

- Encourages small and medium enterprise development, and as a result, contributes to a possible increase in disposable income.

From an ecological perspective, the availability of electricity can lead to a decrease in the harvesting of firewood with resultant biodiversity benefits. This also leads to a decrease in respiratory disease due to a reduction of biomass burning. The relative efficiency of using electricity will reduce overall air emissions and can lead to an improved quality of life.

11.2.1. Supporting Strategies

At the regional level, the project would contribute to reliability of power supply. There would also be a less tangible but nonetheless important benefit of positioning the municipalities on the lead in terms of sustainable energy supply.

At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (DME 1998). The priorities to which this project would contribute are laying the groundwork for promoting electrification and off-grid power supply.

12 PLAN OF STUDY FOR EIA

Please refer to **Appendix I** for Plan of Study for EIA.

13 CONCLUSION

The Scoping study was performed as dictated by the NEMA and associated Regulations as well as the EIA Regulation of 18 June 2010.

The sites have been under detailed assessment and the primary objective is to assess the suitability of the site for the intended use as well as to assess the impacts of the proposed development i.e. the Senakangwedi B substation and the power lines on the environment. This report has comprehensively addressed the baseline environment which will form the backdrop of the impact assessment. Information provided has been supported by specialist studies that were undertaken and attached hereto.

No fatal flaws or highly significant impacts were identified during the scoping phase that would necessitate substantial redesign or termination of the project. The main impacts are outlined below, and mitigation recommendations and a summary of site suitability and residual impacts will further be detailed during the EIA phase.

The key issues identified during the Scoping process, and to be assessed in detail during the EIA phase are as follows:

- impact on the Social;
- impacts on flora;

- Impacts on fauna;
- impact on Avifauna;
- Impact on water resources; and
- impacts on heritage and archaeology.

The subsequent EIA phase will assess the identified issues, rate the significance accordingly and propose mitigation measures as applicable.

14 REFERENCES

- DEAT. 1998. A National Strategy for Integrated Environmental Management in South Africa. Compiled by Environomics
- Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V & Brown, C.J. (eds). 1997. The atlas of southern African birds. Vol. 1&2. BirdLife South Africa: Johannesburg.
- Mucina, L. & Rutherford, M.C. (2006): The vegetation of South Africa, Lesothi and Swaziland. *Strelitzia 19. South African National Biodiversity Institute, Pretoria.*
- Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. & Manyama P.A., (eds) (2009): Red List of South African plants 2009. *Strelitzia 25*, South African National Biodiversity Institute.
- Huffman, T. N. 2007. *A handbook to the Iron Age: The archaeology of Pre-colonial Farming societies in southern Africa*. University of KwaZulu-Natal Press: Pietermaritzburg.
- Shisana, O. et al., 2014. *South African National HIV Prevalence, Incidence and Behaviour Survey, 2012.*, Cape Town: HSRC Press.