


2018

**DRAFT SCOPING REPORT FOR THE PROPOSED DEVELOPMENT OF
APPROXIMATELY 170KM 1X400kV MAPHUTHA-WITKOP POWERLINE
WITHIN THE SEKHUKHUNE AND CAPRICORN DISTRICT MUNICIPALITIES
IN THE LIMPOPO PROVINCE**

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"From the world we live to the world we seek "

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PROJECT TITLE:

Draft Scoping Report for the proposed 400kV Maphutha-Witkop powerline within the Sekhukhune and Capricorn District Municipalities, Limpopo Province.

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LIST OF ACRONYMS AND ABBREVIATIONS

ARC	Agricultural Research Council
CBA	Critical Biodiversity Area
CLN	Customer Load Network
COGHSTA	Cooperative Governance, Human Settlements and Traditional Affairs
DEA	Department of Environmental Affairs
LEDET	Limpopo Department of Economic Development, Environment and Tourism;
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HV	High Voltage
I&APs	Interested and Affected Parties
IBBA	Important Bird and Biodiversity Area
km	Kilometers
kV	Kilovolts
MTS	Main Transmission Substation
Mm	Millimetre
NEMA	National Environmental Management Act
NFEPA	National Fresh Water Ecosystem Priority Areas
SAHRA	South African Heritage Resources Agency
SOC	State Owned Company
SANBI	South African National Biodiversity Institute
Tx	Transmission
WULA	Water Use Licence Application

1. INTRODUCTION OF THE PROPOSED PROJECT

Eskom Holdings SOC Limited (Eskom) has identified the need to strengthen its transmission power network between the Witkop substation (located near Polokwane) and the Maphutha Substation (located near Steelpoort) within the jurisdiction of Sekhukhune and Capricorn District Municipalities in the Limpopo Province.

The forecasted high growth rate between 2013 and 2030 is expected to exceed the maximum transfer capability of the Eskom transmission network supplying the Tubatse area due to recent developments of platinum and ferrochrome mines. The existing 400kV powerline network will be unable to cater for these recent and other proposed developments in the area. Consequently, Eskom proposes to construct a new Maphutha-Witkop 400kV transmission powerline in order to mitigate the short-term network reliability constraints and also to create additional capacity for the forecasted load in the Tubatse area.

The aim of the proposed development is to increase the transfer capacity of the network beyond the forecasted 2030 load under all N-1 contingencies in Limpopo province and the country as a whole. The proposed development will directly and indirectly improve the standard of living for Limpopo communities as it will create employment opportunities, generate income and contribute to the local economy and to a larger extent the country as a whole.

Nsovo Environmental Consulting (Nsovo) has been appointed by Eskom Holdings SOC Limited (hereafter referred to as Eskom) to undertake the Environmental Impact Assessment (EIA) studies in terms of the National Environmental Management Act, 1998 Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of 2014 (as amended in April 2017) for the proposed construction of approximately 170km Maphutha-Witkop 400kV powerline and associated infrastructure (referred to as Maphutha-Witkop 400kV powerline) within the jurisdiction of Sekhukhune and Capricorn District Municipalities in the Limpopo Province.

The project proponent is Eskom whereas the Competent Authority is the National Department of Environmental Affairs (DEA).

2. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed by Eskom as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements as stipulated in regulations 13 (3) of the NEMA EIA 2014 Regulation as amended. Nsovo therefore:

- Is independent and Objective;
- Has expertise in conducting EIA's;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 1 below provide Details of the EAP and relevant experience. A detailed CV and Qualifications is attached as **Appendix E1**.

Table 1: Details of the Environmental Assessment Practitioner (EAP)

Name of Company	Nsovo Environmental Consulting
Person Responsible	Masala Mahumela
Professional Registration	South African Council for Natural Scientific Professions (SACNASP)
Postal Address	Private Bag x29 Postnet Suite 697 Gallo Manor 2052
Telephone Number	011 041 3689
Fax Number	086 602 8821
Email	Masala.mahumela@nsovo.co.za
Qualifications & Experience	B.Sc. Honours Environmental Management 09 years of experience
Project Related Expertise	In terms of project related expertise the EAP has completed the following projects: <ul style="list-style-type: none"> • EIA for the proposed Shongweni substation and Hector - Shongweni 400kV powerline in Kwazulu Natal Province.

	<ul style="list-style-type: none"> • EIA for the proposed Inyaninga substation and Inyaninga – Mbewu 400kV powerline in Kwazulu Natal Province. • EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province. • EMPr, WULA and EA amendment for the proposed Juno Gromis 400kV power line • Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power. • Basic Assessment for Bloemendal Substation and loop in and out lines.
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3. DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY

This section provides detailed information about the location of the Maphutha-Witkop 400kV powerline and associated infrastructure. The main aim is to provide the environmental aspects found within the location of the proposed development and to provide the baseline description of the surroundings.

3.1 LOCALITY OF THE PROPOSED PROJECT

Figure 1 below is a locality map showing the proposed study area at a scale of 1:50 000. The proposed study area is currently used for various purposes including farming residential, mining and other related activities. Refer to **Appendix A** for the locality and sensitivity maps.

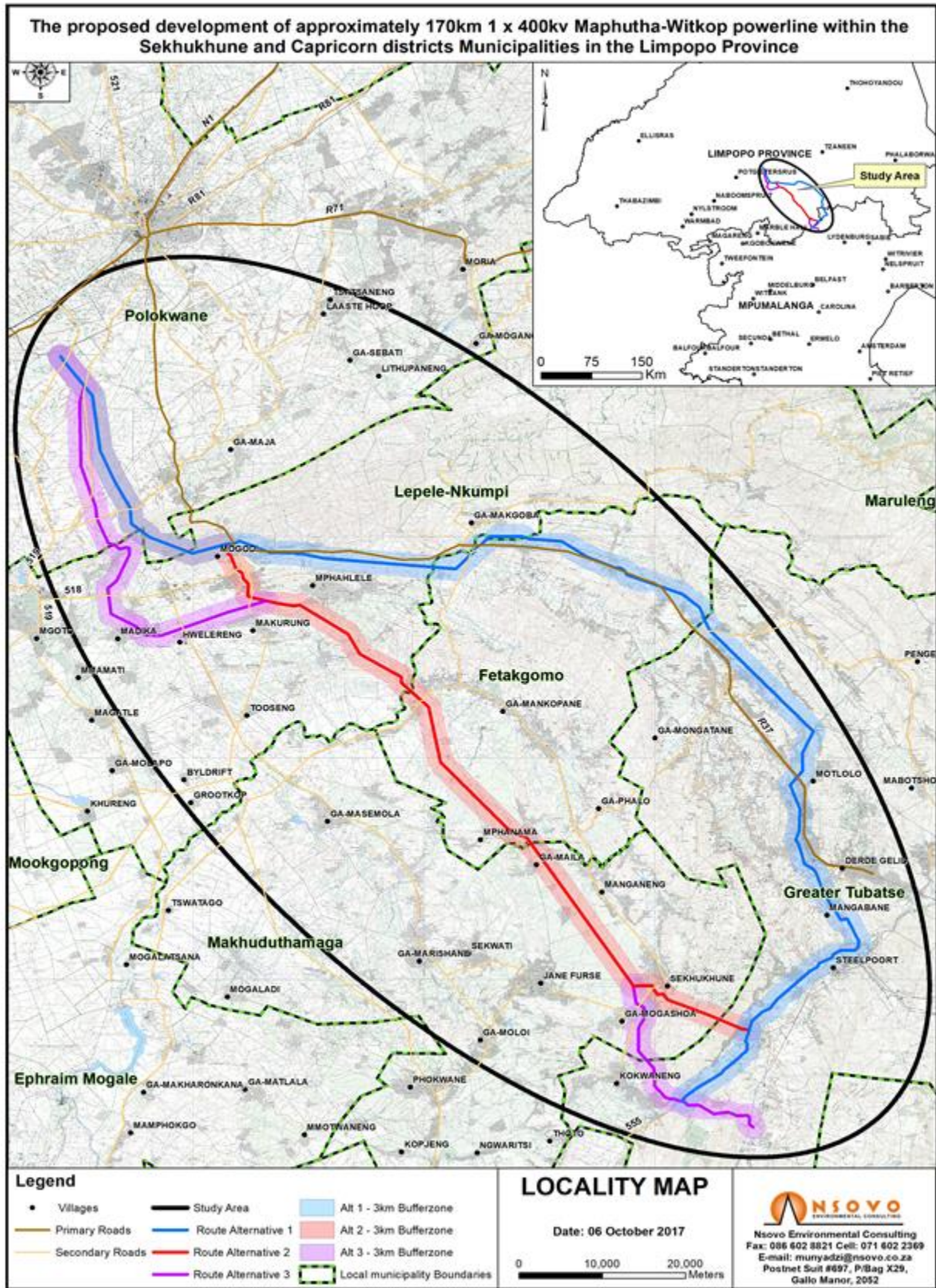


Figure 1: Locality map showing the proposed Maphutha-Witkop route alternatives

3.1.1 PROVINCE AND PROVINCIAL BOUNDARIES

The proposed development will be located within the Limpopo province which is in the northern part of South Africa. The province borders Gauteng, North-west and Mpumalanga Provinces.

3.1.2 MUNICIPAL WARDS

The proposed project will traverse various villages and farms in the following Municipalities and within the listed Wards as indicated in the Table 2 below as well as the locality map above:

Table 2: The Municipalities and their Wards within the proposed area

District Municipality	Local Municipality	Ward Number
Sekhukhune District Municipality	Fetakgomo Greater Tubatse	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 27, 28, 29 and 31.
	Makhuduthamaga	12, 13, 14, 16, 17, 19, 22 and 23.
Capricorn District Municipality	Polokwane	1
	Lepelle-Nkumpi	7, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27 and 28.

3.1.3 AFFECTED FARMS

The farms affected by the proposed development as well as the 21 digit Surveyor General Code are listed in **Appendix F**. The GPS start, middle and end coordinates for the proposed corridors are shown in **Table 3** below.

Table 3: Start, middle and end coordinates of the three proposed corridors

Alternatives	Start	Middle	End
Corridor alternative 1	24°02'52.13"S 29°21'24.71"E	24°18'16.61"S 29°59'57.28"E	24°53'15.23"S 30°01'53.68"E
Corridor alternative 2	24°02'52.13"S 29°21'24.71"E	24°24'30.30"S 29°43'27.32"E	24°48'25.15"S 30°06'06.32"E
Corridor alternative 3	24°02'52.13"S 29°21'24.71"E	24°24'00.32"S 29°42'35.45"E	24°54'59.95"S 30°06'22.35"E

3.2 SURROUNDING LAND USES

This section provides the description of the land uses within and around the proposed study area which includes mining and residential and are discussed as follows:

3.2.1 RESIDENTIAL

The residential properties located within the study area are rural household and are depicted in **Figure 2** below. Water scarcity is evident in the area; however, there is evidence of subsistence farming being practiced by the local communities. **Figure 2** below shows one of the affected villages (Mphanama) which is located along Corridor 2. The figure highlights the undulating nature of the landscape and how communities settle on relatively lower lying terrains.

Table 4: List of Villages along the Study Area

Corridors	Municipalities	Villages
Corridor 1	Lepelle-Nkumpi and Fetakgomo-Greater Tubatse	Malemang, Mogodi, Bolopa, Mphaaneng, Bogalatladi, Tsibeng, GaWannankaya, Seokodibeng, Ga-Mohlala, Ga-Podile, Ga – Mphethi, Ga-Mathipa, Driekop, Doornosch, Mahlakwana, Pelaneng, Ga-Mapodila, Degoedeverwaching, Ga-Mampuru
Corridor 2	Lepelle- Nkumpi and Fetakgomo Greater Tubatse	Lebowakgomo-S, Mamaolo, Mphahlele, Tiekiedraai, Geluk's location, Mphanama, Ga-Radingwana, Ga-Maila, Maseleseleng, Marulaneng, Ga-Moela and Ga-Mampuru
Corridor 3	Lepelle-Nkumpi and Makhuduthamaga	Schinsrand, Hwelereng, Makurung, Tshehlwaneng, Ga-Mogashoa, Ga- Malekana



Figure 2: The residential settlements within the proposed study area

3.2.2 COMMERCIAL AND INDUSTRIAL

The main economic sectors within the Municipalities of the proposed study area are presented in Table 4 below. These include agriculture, community services, construction, mining, electricity, finance, manufacturing, transport and trade.

Table 4: Main economic sectors (Integrated Development Plan (IDP), 2017)

Economic Sectors	Percentage Contribution	
	Capricorn District	Sekhukhune District
Agriculture	3.1%	9%
Community services	30.9%	41%
Construction	3.3%	-
Electricity	2.9%	-
Finance and business	27.6%	12%
Manufacturing	4.3%	-
Mining	-	20%
Transport	14.4%	-

Economic Sectors	Percentage Contribution	
	Capricorn District	Sekhukhune District
Trade	13.2%	17%

However, the primary load in the Tubatse area that is driving the strengthening project includes primarily the following:

- Residential;
- Industrial; and
- Mining.

3.2.3 MINING ACTIVITIES WITHIN THE STUDY AREA

There are several mining activities taking place within the Sekhukhune district and some of the mining houses include the Dilokong Mine and Tubatse Ferrochrome. It is evident that these mines are playing a considerable role in the general development of the surrounding communities, thus contributing to income generation, improvement of local economy and creation of employment of the locals. Other mines within the proposed study area include:

- Two Rivers Platinum mine;
- Anglo Platinum and Mototolo Platinum;
- Xstrata Thorncliffe & Helena Mines;
- Dwars Rivier Chrome mines;
- Samancor Eastern Chrome Mines;
- Chrome Smelter; and
- Xstrata Ferrochrome

3.3 SURFACE INFRASTRUCTURE

This section provides the description of the surface infrastructures within the study area which include the description of road network, existing substations and powerlines.

3.3.1 ROAD NETWORK

Access roads to the proposed study area are R37, R518 and R555 which are primary and secondary roads. The proposed Corridor 1 is along the R37 while the Corridors 2 and 3 are along the R555 and R518.

3.3.2 POWER LINES AND ASSOCIATED INFRASTRUCTURE

There are existing power lines and substations within the proposed study area and such include Witkop, Merensky, Leseding, and Sinakangwendi. Further there is an existing 400kV powerline that runs parallel to the proposed Maphutha-Witkop 400kV Corridor 1.

The north-western parts of the Tubatse area are currently supplied from Leseding and Merensky substations via an interconnected 132kV distribution network. Merensky Substation also supplies the south-eastern towns of Ohrigstad and Lydenburg through the 132kV distribution network. Senakangwedi substation, which is situated in the southern parts of Tubatse, is dedicated to Xstrata Ferrochrome smelter. Other lines in proximity to the study area include 132kV and other distribution lines.

4. DESCRIPTION OF THE SCOPE PROPOSED ACTIVITIES

This section provides the description of the proposed activities which include the scope of the proposed project mainly focusing on the listed activities which triggers the EIA process.

4.1 BACKGROUND AND THE PROPOSED SCOPE OF WORK

The primary objective of the project is to develop a network strengthening solution for the Tubatse area, which will result in a Grid Code compliant network in response to the forecasted high growth rate between 2013 and 2030 which is expected to exceed the maximum transfer capability of the transmission network supplying the area. Consequently, Eskom proposes the development of Maphutha-Witkop 400kV powerline in order to mitigate the short-term network reliability constraints and to create additional capacity for forecasted load as well as to cater for future electricity demands.

4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT

The construction phase of the proposed project will take approximately 3 years and the activities included are discussed hereunder.

4.2.1 CORRIDOR WALK-DOWN

This will be undertaken for the authorised corridor and the main aim of conducting the corridor walk-down is to ensure that sensitive areas are identified, avoided where need be and buffers are created for conservation purposes.

4.2.2 ACCESS ROADS

As indicated above, primary access to the proposed alignments will be through the R37, R555 and R518 while secondary access will be other public roads as well as private farm roads negotiated with land owners. However, where there is no access, roads may need to be established which roads will be wider than 4 metres with a reserve less than 13, 5 metres. The access roads will be compliant with a Type 6 gravel road; which comprises of 6 meter wide raised gravel extended with meadow drainage in flat terrain, with additional meters to cater for the 'V' type drainage in rolling terrain. Where necessary, suitable erosion control measures such as the construction of gabions and culverts to control storm-water will be implemented.

4.2.3 VEGETATION CLEARANCE

Fifty-five meter (55m) servitude is required for the proposed 400kV power line; only the immediate footprint within the servitude will be cleared for construction. Further, clearance will be undertaken in accordance with the approved Environmental Management Programme (EMPr) as well as Eskom's policies and guidelines.

4.2.4 CONSTRUCTION OF POWERLINE

The civil works will include the establishment of foundations for the proposed 400kV pylons.

4.2.5 STEELWORKS STRUCTURES

Various types of pylons are under consideration and final selection will depend on the terrain and the possible visual aspects of the selected pylon will be taken into consideration. The pylons will be transported in segments and will be assembled on site.

4.2.6 STRINGING

Once the pylons have been erected, the conductors will be strung between the pylons and bird guards installed as recommended by the specialists.

4.2.7 COMPLETION OF CONSTRUCTION WORK

On completion of construction work, the site will be rehabilitated as per the specifications of the EMPr and approved Method Statements. The rehabilitation activities will include:

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

4.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of 2014 EIA Regulation as amended. The listed activities applicable to aforementioned proposed project are listed in Table 5 below:

Table 5: Listed Activities triggering EIA applicable to the proposed project

Listed activities	Activity/Project description
<p><u>GN R. 984 Item 9:</u> <i>“The development of facilities or infrastructure for the transmission and distribution with a capacity of 275 kilovolts or more, outside an urban area”</i></p>	<p>The proposed project entails the development of approximately 170km 400kV Maphutha-Witkop powerline outside an urban area.</p>
<p><u>GN R. 983 Item 12:</u> <i>“The development of–</i> <i>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</i> <i>Where such development occurs –</i> <i>(a) Within a watercourse</i> <i>(c) If no development setback exists within 32 metres of a watercourse, measured from the edge of a watercourse”.</i></p>	<p>The proposed project will entail the development of infrastructure or structures (pylons) with a physical footprint of 100 square meters or more within or in close proximity to watercourses.</p>
<p><u>GN R. 985 Item 4:</u> <i>“The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i></p>	<p>The proposed project entails the development of additional construction access roads wider than 4 metres with reserve less than 13.5 meters within</p>

Listed activities	Activity/Project description
<p>e. Limpopo</p> <p><i>i. Outside urban areas</i></p> <p>(aa) A protected area identified in terms of NEMPAA</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans”</p>	<p>protected areas and CBA outside urban areas.</p>
<p><u>GN R. 985 Item 12:</u></p> <p><i>“The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purpose undertaken in accordance with a maintenance management plan</i></p> <p>e. Limpopo</p> <p><i>ii. within critical biodiversity areas identified in bioregional plans”</i></p>	<p>The proposed corridors traverse Critical Biodiversity Areas (CBA) and the project will require clearance of an area of 300 square meters or more of indigenous vegetation within CBA.</p>
<p><u>GN R. 985 Item 14:</u></p> <p><i>“The development of development –</i></p> <p><i>(xii) infrastructure or structures with a footprint of 10 square meters or more</i></p> <p><i>Where such development occurs-</i></p> <p><i>(a) Within a watercourse</i></p> <p><i>(c) If no development setback exists within 32 metres of a watercourse, measured from the edge of a watercourse”.</i></p> <p>e. Limpopo</p> <p><i>i. outside urban areas:</i></p> <p><i>(ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</i></p>	<p>The proposed project entails the development of a powerline with a footprint of more than 10 square meters within or in close proximity to watercourses.</p>

5. APPLICABLE LEGISLATION AND GUIDELINES

The amended EIA Regulation, under Appendix 2 Section 1(e) requires description of applicable legislations in the scoping report. Therefore, this section list and describe the acts and legislations applicable to the proposed construction of the power-line and associated infrastructures. A list of the current South African environmental legislation, which is considered to be pertinent to the proposed development are described in **Table 6** below.

Municipal policies, plans and by-laws as well as Eskom policies and world best practices were considered during the undertaking of the EIA process. 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	<ul style="list-style-type: none"> • National Environmental Management: Act 1998, (Act No. 107 of 1998) as amended. • Environmental Impact Assessment Regulations, December 2014 as amended 	<p>The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) apply to all listed projects. Construction and operation of activities have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.</p> <p>The Environmental Impact Assessment (EIA) process followed is in compliance with the NEMA and the Environmental Impact Assessment Regulations of December 2014 as amended. The proposed development involves “listed activities”, as defined by NEMA. Listed activities are an activity which may potentially have detrimental impacts on the environment and therefore require Environmental Authorisation (EA) from the relevant</p>

Aspect	Relevant Legislation	Brief Description
		Competent Authority, in this case DEA.
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.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	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).
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act makes provision for measures to control

Aspect	Relevant Legislation	Brief Description
		<p>dust, noise and offensive odours.</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 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 or other measures aimed at the control of dust.</p>
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)	<p>This Act provides for fundamental reform of law relating to water resources and use. The preamble to the Act recognises 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.</p> <p>There is watercourses located proximity to the proposed Corridors. It is highly likely that proposed project will traverse or encroach on water resources;</p>

Aspect	Relevant Legislation	Brief Description
		therefore, the necessary licence will be obtained in due course.
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 No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). The state is obliged “to respect, protect, promote and fulfil the social, economic and environmental rights of everyone...”</p> <p>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.”
Waste	National Environmental	This act provides fundamental reform of the law regulating waste management in order to protect health and the environment by providing reasonable

Aspect	Relevant Legislation	Brief Description
	Management: Waste Act 59 of 2008	measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This act also ensures the provision of national norms and standards for regulating the management of waste by all spheres of government. The National Environmental Management: Waste Act provides for specific waste management measures; licensing and control of waste management activities; remediation of contaminated land; compliance and enforcement; and for matters connected therewith.

6. DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

This section provides justification for the need of the proposed development with focus on its associated benefits and importance to the both the locals and the region at large.

6.1 MOTIVATION FOR THE DEVELOPMENT

Eskom Transmission's ten year plan indicates that a reliable electricity supply of acceptable quality is essential for the economic development of South Africa. It is also a prerequisite for socio-economic development, as it paves the way to access to education, improved nutrition and health care, as well as jobs, amongst others. The transmission system plays a vital role in the delivery of a reliable, high quality electricity supply throughout the region and the country at large, by delivering electricity in bulk to load centres wherein the distribution networks owned by Eskom and municipalities deliver electricity to end-users. The transmission system needs to be well-maintained to deliver a reliable supply of electricity, and it also needs to be strengthened to meet changing customer needs.

As indicated the forecasted high growth rate between 2013 and 2030 is expected to exceed the maximum transfer capability of the transmission network supplying the Tubatse area. Consequently, Eskom proposes the development in order to mitigate the short-term network reliability constraints and also to create additional capacity for the forecasted load as well as to cater for future electricity demands. This

development forms part of the Tubatse Network Strengthening which is driven by residential, industries and mining. Further, it forms part of the new infrastructure that Eskom has planned, the objective being to ensure reliable electricity supply. The proposed project will ensure the following:

- the supply link between the existing Witkop substation via Merensky substation to the existing Maphutha substation is strengthened;
- Improvement in reliability of electricity supply which will benefit mining, tourism, residential and industries in the area; and
- Improvement of South Africa's socio-economic status.

6.2 BENEFITS OF THE PROJECT

The proposed project is beneficial as it will allow for load growth, mitigate short term network reliability and create additional capacity for forecasted load in the Tubatse area and the region as a whole. It is envisaged that the proposed development would ensure reliable supply to industry, predominantly the mining and manufacturing as well as residential settlements 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 including the following:

- Enables economic and human social development; and
- Encourages small and medium enterprise development, and as a result, contributes to a possible increase in disposable income.

At the local level, the benefits of the project would centre on ensuring improved reliability of supply as well as entrench the reach of electricity into communities. It is envisaged that the proposed project would ensure that marginal communities in the region are supplied with electricity. This will indirectly have an added benefit as it may reduce the community's reliance on firewood as their primary energy source, thus allow for sustainable livelihoods. For organs of state it allows for the following:

- Electrification of educational and training facilities (schools and the like).

- Electrification of health facilities (clinics, hospitals and the like).
- Electrification of security facilities (police stations, court houses and the like).
- Electrification for the provision of essential services (water supply pumps and the like).
- Electrification of religious and cultural facilities.
- Enables rural development.
- Enables the provision of lighting, thereby vastly improving the safety and security of communities.

For individuals and communities:

- Electrification of homes (for cooking, heating and lighting of homes which improves the lives of the individuals within the home).
- Encourages small and medium enterprise development, and as a result, contributes to a rise 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.

6.2.1 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 ahead 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 (Department of Minerals and Energy, 1998). The priorities to which this project would contribute are laying the groundwork for enhancing supply and electrification capacity.

7. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN THE SITE

The identification of alternatives is an important component of the EIA process. The identified alternatives are assessed in terms of environmental acceptability, technical as well as economic feasibility during the EIA process wherein the preferred alternative is highlighted and presented to the Authorities.

Three Corridors and the no-go alternative are being considered for the proposed development. The powerline is planned to connect from the existing Witkop substation near Polokwane to the existing Maphutha substation near Steelpoort. The project has also considered technical alternatives (Refer to Section 7.1) of which were found to be economically and environmentally viable compared to the other options. The alternatives are presented as part of this scoping report and will be scrutinised further during the EIA phase.

The selection of project alternatives was primarily based on Eskom's prefeasibility study that technically determined the broad location based on the need of the project. Subsequent site visits were undertaken by the environmental and specialist teams. Further, a detailed public consultation is being undertaken to assess the viability of the selected route alternative which may result in the identification of more corridors for consideration to assess the economic need and desirability of the project. The route selection process also focused on reviewing the municipal Integrated Development Plan, Eskom's 10 Year Development Plan and associated documents that address current and future development in and around the area.

7.1 DETAILS OF ALTERNATIVES CONSIDERED

This section describes the alternatives considered and includes the technical, structural, route and no-go alternatives which are discussed as follows:

7.1.1 TECHNICAL ALTERNATIVES

7.1.1.1 Underground vs. above ground

Two technical alternatives have been identified for the proposed project i.e. the overhead powerline and underground cabling. Instead of constructing the proposed powerline above ground, underground construction is considered to be an alternative. The advantages of the underground alternative would include a reduced impact on bird interaction and a distinct visual impact benefit.

However, for the proposed project, the underground powerline alternative would not be the most feasible owing to the undulating nature of the area. This could cause major technical problems and would have major cost implications. Technically, 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; however, on larger power lines (i.e. 400kV as proposed) the method of electrical and heat insulation becomes more burdensome.

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.

Bush fires, lightning strikes and bird related faults make up 80% of faults on overhead transmission power lines in South Africa; however, such risks are not associated with underground cables. Further, faulting on underground cable is rare. When 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. Underground cables have faults that are almost exclusively permanent, requiring inspection and correction on site. This usually requires excavating a section of the powerline. As a result, finding the 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 of the operation.

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 power lines. Underground 132kV is 3 to 10 times more expensive than overhead lines. There is not much expertise for higher voltage underground cabling in the country; as a result, 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 is harder to find the faults, and therefore the outages last much longer. The lifespan for underground cables is reported to be much shorter, about half that of overhead power lines.

The underground option is not viable for this project, particularly given the length and undulating nature of the terrain as such; it will not be assessed further during the EIA phase.

7.1.2 STRUCTURAL ALTERNATIVES

Several design alternatives have been proposed, and they include one or more of the following pylons:

- Cross-Rope suspension type;
- Self-supporting type; and
- Guyed V towers.

These are illustrated in Figures 3 – 8 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 steep, undulating terrains and when it changes direction at an angle, there will be a need to use self-supporting towers.

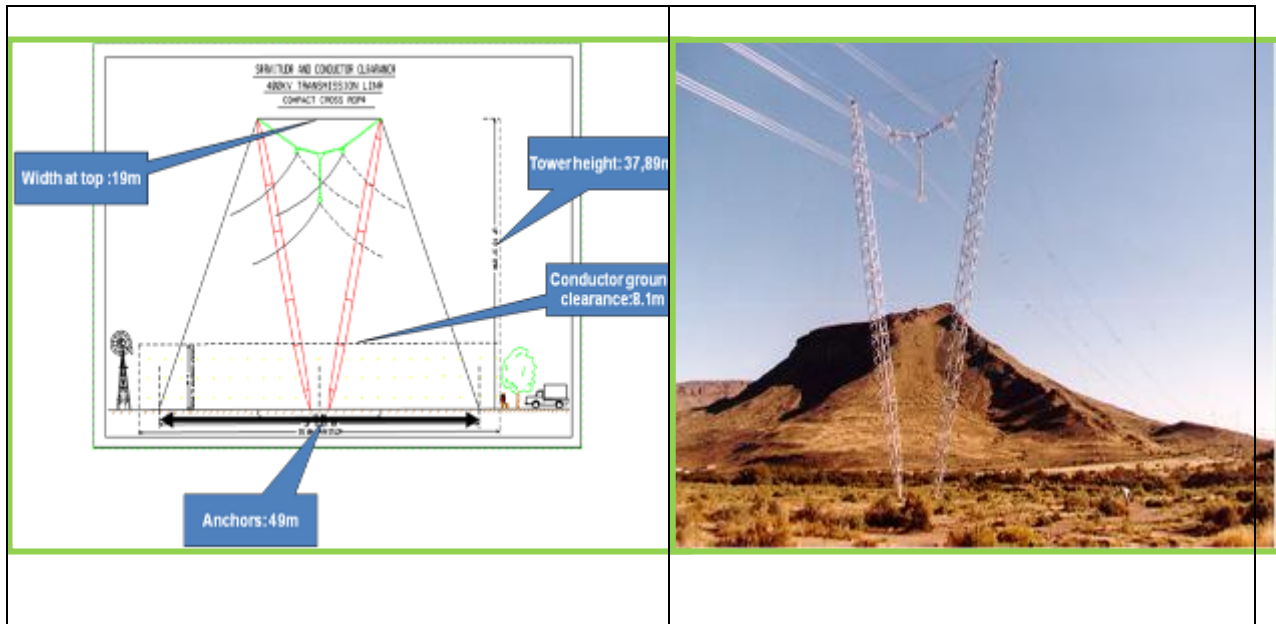


Figure 3: Guide V tower

Figure 4: Photographic Guide V tower

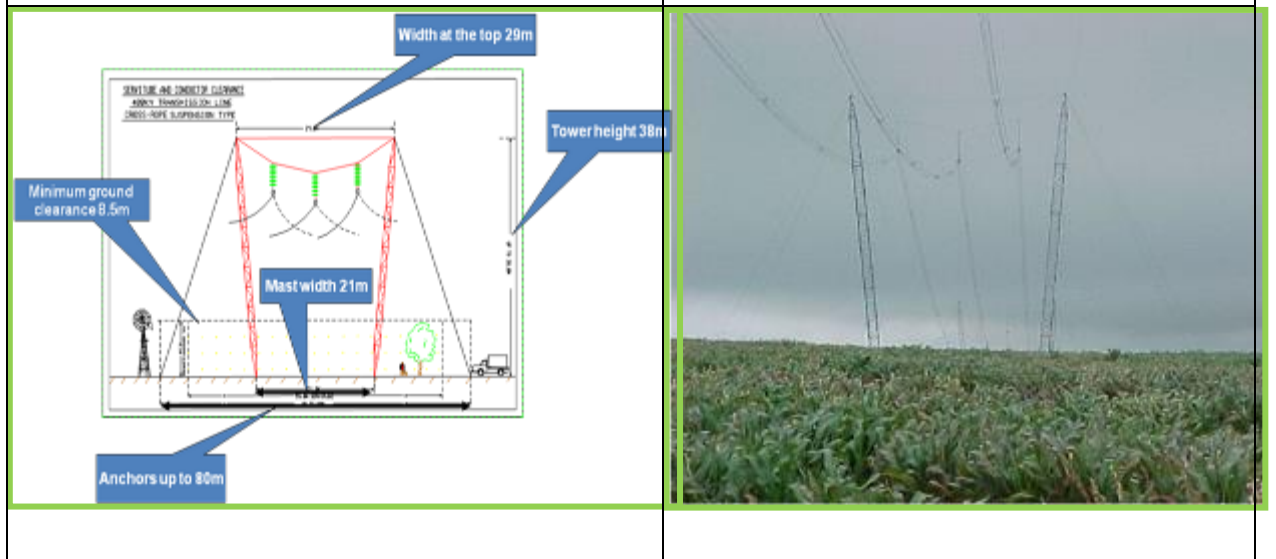
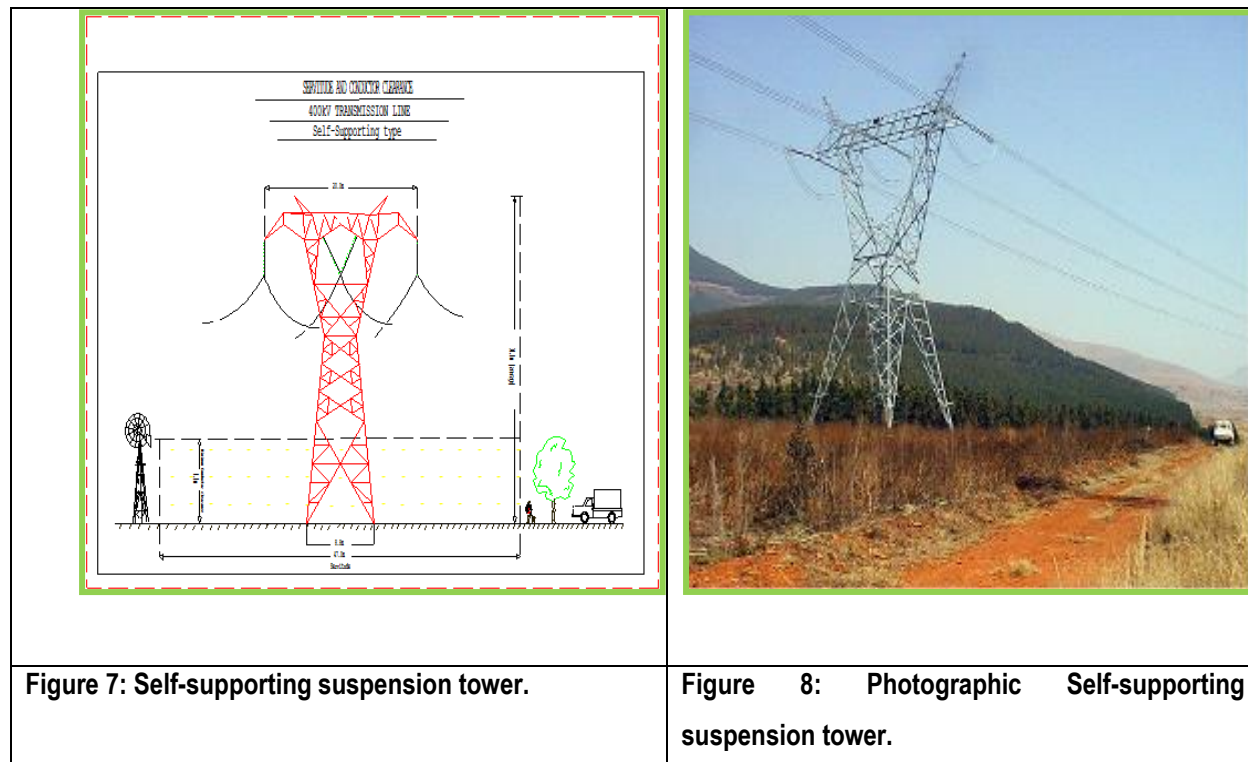


Figure 5: Cross rope suspension tower.

Figure 6: Photographic illustration of a Cross rope suspension tower.



None of the above options have been dismissed and remain alternatives depending on the terrain and topography. Taking into consideration aspects such as visual; the selection of the pylons to be used for the proposed powerline will take the potential impacts into consideration.

7.1.3 ROUTE ALTERNATIVES

This section provides detailed information of the corridor alternatives considered for the proposed powerline. This entails the description of three corridors and no-go alternatives which are discussed as follows:

Three route alternatives were identified as Corridors 1, 2 and 3. However, only one Corridor will be considered based on recommendations by the specialists and the assessment of the impacts by the EAP. Below is the baseline description of the Corridors.

Table 7: Corridor alternatives coordinates and length

Route alternatives	Latitude	Longitude	Length of route within corridor
Corridor 1			
Start	24°02'52.13"S	29°21'24.71"E	171km
Middle	24°18'16.61"S	29°59'57.28"E	
End	24°54'59.613"S	30°06'23.23"E	

Route alternatives	Latitude	Longitude	Length of route within corridor
Corridor 2			
Start	24°02'52.13"S	29°21'24.71"E	143km
Middle	24°24'30.30"S	29°43'27.32"E	
End	24°54'595.613"S	30°06'23.23"E	
Corridor			
Start	24°02'52.13"S	29°21'24.71"E	142km
Middle	24°24'00.32"S	29°42'35.45"E	
End	24°54'595.613"S	30°06'23.23"E	

7.1.3.1 Corridor 1

Corridor 1 is 3km wide and stretches for approximately 171km. The corridor starts at the existing Witkop substation and spans in a south easterly direction to the existing Maphutha substation. It starts within the Polokwane Local Municipality close to Ga-Maja village, proceeds through Lepele-Nkumpi Local Municipality near Ga-Makgoba village towards Fetakgomo Greater Tubatse Local Municipality via Steelpoort to Maphutha substation. The corridor has approximately 11 bends and it crosses NFEPA Rivers approximately 16 times including Doring, Chunies, Hlakaro, Morametsi Matadi, Moopetsi, Steelpoort and Tubatsane River. The following are the advantages and disadvantages of the proposed route alternative 1:

Table 8: Advantages and disadvantages of route alternative one

Route Alternative 1	
Advantages	Disadvantages
It follows the existing 400kV powerline for the longest distance.	It is the longest alternative.
It runs closest the primary access road.	It crosses NFEPA rivers 16 times
Runs the shortest distance (16km) through IBBA	It encroaches on a conservancy i.e. Potlake

7.1.3.2 Corridor 2

Similar to Corridor 1, this corridor is also 3km wide and it starts at the existing Witkop substation in a southerly direction to the existing Maphutha substation. Corridor 2 follows Corridor 1 from Witkop substation until it turns near Mogodi village in a southerly direction where it crosses the R518 secondary road and continues towards Maphutha substation.

It starts at the Polokwane Local Municipality close to Ga-Maja village, proceeds through Lepele-Nkumpi Local Municipality close to Makurung village. It proceeds through Makhuduthamaga Local Municipality passing Ga-Maila, Mphanama and Sekhukhune villages to Fetakgomo Greater Tubatse Local Municipality at Maphutha substation. The Corridor has approximately 13 bends and it crosses NFEPA Rivers approximately 8 times including Lepellane, Doring, Chunies, Morametsi Matadi and Moopetsi Rivers. The following are the advantages and disadvantages of the proposed route alternative 2:

Table 9: Advantages and disadvantages of Corridor 2

Corridor 2	
Advantages	Disadvantages
It follows same alignment as Corridor 1	It is relatively short with 13 bends.
It is relatively shorter	It runs within residential communities
It crosses IBBA minimally	Due to the several communities it transverses the prevalence of graves is higher.

7.1.3.3 Corridor 3

Corridor 3 is also 3km wide and stretches for approximately 142km. Unlike Corridors 1 and 2 it leaves the substation independently and joins Corridor 2 near Makurung village. It follows the same alignment as Corridor 2 for the longest distance and proceeds in a south westerly direction where in it splits more southward just before Maphutha; while Corridor 2 proceeds south eastward to join Corridor 1; they reunite and proceed towards Maphutha as Corridor 3.

From Polokwane Local Municipality, the alignment passes through Lepele-Nkumpi Local Municipality close to Madika and Hwelereng villages. It also passes through Makhuduthamaga Local Municipality within Ga-Maila and Sekhukhune villages to Fetakgomo Greater Tubatse Local Municipality at Maphutha substation. The corridor has approximately 19 bends and it crosses NFEPA Rivers approximately 9 times including Lepellane, Doring, Chunies, Morametsi Matadi, and Moopetsi River. The following are the advantages and disadvantages of the proposed route alternative 3:

Table 10: Advantages and disadvantages of route alternative three

Route Alternative 3	
Advantages	Disadvantages
It is the shortest corridor	It has the most bends (19).
	Crosses NFEPA river 9 times
	Runs the longest distance (46km) through IBBA
	Due to the several communities it transverses; the prevalence of graves is higher.

Table 11: Summary of Specialist Findings Route Alternatives

Specialist	Description of the Route Alternatives (Corridors)		
	Corridor 1	Corridor 2	Corridor 3
Biodiversity	<p>From the Witkop substation, Corridor 1 follows the same route as Corridor 2 and traverses about 20km of Polokwane Plateau Bushveld which is largely still intact and considered to be of moderate sensitivity. The Corridor then traverses a short extent of mountainous terrain consisting of Mamabolo Mountain Bushveld and Pong Dolomite Mountain Bushveld with a small extent of Ohrigstad Mountain Bushveld, considered to be of relatively high sensitivity. The route then deviates eastwards and is dominated by Sekhukhune Plains Bushveld with small sections of Sekhukhune Mountain Bushveld. The levels of transformation on the plains are relatively high and the majority of the route has been impacted by</p>	<p>From the Witkop substation, Corridor 2 follows the same route as Corridor 3 and traverses about 20km of Polokwane Plateau Bushveld which is largely still intact and considered to be of moderate sensitivity. The Corridor then traverses a short extent of mountainous terrain consisting of Mamabolo Mountain Bushveld and Pong Dolomite Mountain Bushveld with a small extent of Ohrigstad Mountain Bushveld, considered to be of relatively high sensitivity. The route then deviates south to join Corridor 2.</p> <p>Sensitive areas along Corridor 2 include the mountainous terrain towards the R37 as well as the mountains towards the R555. However, both these sections run adjacent to existing power lines, which would reduce the overall impact on these sections.</p>	<p>From the Witkop substation, Corridor 3 traverses about 23km of Polokwane Plateau Bushveld which is largely still intact and considered to be of moderate sensitivity. The Corridor then traverses a short extent of mountainous terrain consisting of Mamabolo Mountain Bushveld and Pong Dolomite Mountain Bushveld considered being of relatively high sensitivity. Thereafter, Corridor 3 traverses an area of Springbokvlakte Thornveld which is listed Endangered due to the high levels of transformation it has experienced. Areas of specific sensitivity along this route include the area of Springbokvlakte Thornveld which is listed as Vulnerable as well as the mountainous terrain towards the R555. The abundance of CBAs along the route is relatively low with CBA 1 areas in the mountainous areas at the start and terminal</p>

Specialist	Description of the Route Alternatives (Corridors)		
	Corridor 1	Corridor 2	Corridor 3
	<p>disturbance and transformation.</p> <p>Sensitive sections of the route include the initial mountainous section towards the R37 as well as the Olifants River crossing and the short section where the route runs through the Potlake Nature Reserve.</p> <p>This is considered to be a relatively favorable route option and is only less preferred to Corridor 2 due to its longer length as well as potential impact on the Potlake Nature Reserve.</p>	<p>This is considered to be the preferred route as it is relatively shorter and the sensitive sections present are adjacent to existing power line routes.</p>	<p>ends of the route as well as along the Olifants River.</p> <p>Overall, this is not considered to be a preferred route as it traverses several areas of intact vegetation where there is not currently an existing power line route and as such would generate a novel impact in these areas.</p>
Avifauna	<p>Factors considered:</p> <ul style="list-style-type: none"> • 171km long 30km adjacent to 132kV existing line – placing new line adjacent to existing partially mitigates for collision • 16km through Important Bird & Biodiversity Area – this is a 	<p>Factors considered:</p> <ul style="list-style-type: none"> • 143km long • 66km adjacent to 400kv line, 32km adjacent to 132kv line • 46km through IBBA <p>Crosses Olifantsrivier 3 times and is adjacent for some distance</p>	<p>Factors considered:</p> <ul style="list-style-type: none"> • 142km long • 38km adjacent to 400kV line, 16km adjacent to 132kV • 22km through IBBA • Crosses Olifantsrivier once

Specialist	Description of the Route Alternatives (Corridors)		
	Corridor 1	Corridor 2	Corridor 3
	<p>sensitive area and new power line through it should be minimised</p> <ul style="list-style-type: none"> • Crosses Olifantsrivier once. which is not recommended for avifauna as it is a sensitive area 		
Heritage	<p>Corridor 1 transverse active farmlands and is in proximity to an existing 400kV powerline. Although there are some villages in the vicinity of this Corridor, such are minimal and can be avoided. There only challenge along this corridor is that some of the section that it transverses are intact, and such land possesses a high possibility of archaeological finds, especially on mountainous areas. However, this can be avoided by remaining as close as possible to the existing. An attempt to stretch away from the existing powerline will pose potential threat to archaeological sites that are</p>	<p>This corridor also transverse over active farmlands and villages, especially towards Spencer Substation. Farmers and villagers in these areas are known to bury their loved ones at home. Making this an ideal place for finding either known or unknown burial. Although the general area around the proposed corridor is disturbed as a result of amongst others farming and residential activities, chances for finding graves in this Corridor is considered higher as evident in the several graves that were noted along this corridor. The prevalence was notably higher in this corridor than in any other proposed corridors. This area thus remains sensitive from an archaeological point of view.</p>	<p>Corridor 3 is located on an area which is by residential settlements, low scale-agriculture and state forest. Graves are also expected in along this Corridor especially in the higher density residential settlements Nonetheless the key challenge with this corridor is the Dwars river outcrop which is located on the southern side of the corridor. This outcrop has been declared a Provincial site, and has since become a world-famous site among geologists who frequent the place.</p>

Specialist	Description of the Route Alternatives (Corridors)		
	Corridor 1	Corridor 2	Corridor 3
	known to exist in the area.		
Agriculture	Alternative 1 crosses soils of varying levels of agricultural potential.	Alternative 2 is characterized by also high potential soils.	Alternative 3 is characterized by mostly high potential soils and should be avoided.
Social Impact Assessment	Alternative 1 leaves the Witkop Substation in a south, south-easterly direction turning easterly just north of the village of Mogodi where it crosses the R37 for the first time. The route continues in an easterly direction just south of the village of Ga-Makgoba crossing the R37 all-in-all on six occasions with the final crossing of the R37 at a point north west of the village of Motlolo. The route continues in a south south-easterly direction veering towards the southwest at a point north of Steelport and continues in that direction as it passes between two settlements and eventually joins either the red route, Alternative 2 or the magenta route, Alternative 3 to connect to the Maphutha Substation. Apart	Alternative 2 leaves the Witkop Substation and initially travels along the same route as Alternative 1 only deviating from that route at a point just north east of the village of Mogodi. At this location Alternative 2 veers in a south south-easterly direction passing between two settlements before swinging in a south-easterly direction passing a number of settlements as well as pass east of the villages of Mphanama and Ga-Maila and west of the village of Sekhukhune until re-joining the blue route, Alternative 1, where it moves in a south-westerly direction to again swing east southeast to follow the same route as Alternative 3 until connecting to the Maphutha Substation. Apart from the various settlements and villages mentioned above, this route also	Alternative 3 leaves the Witkop Substation in the same direction as Alternative 1 but shortly after leaving the Witkop Substation it veers south south-west of Alternative 1 and eventually loops eastwards just north of the villages of Madika, Hwelereng and Makurung where it joins the red route, Alternative 2. The route then follows the same route as Alternative 2 until a point west of the village of Sekhukhune where it changes direction to travel in a southerly direction east of the villages of Ga-Mogasha and Kokwaneng and then veering south easterly until connecting to the Maphutha Substation. As with both other alternatives this route also passes a number of settlements and villages and traverses a number of farms. Alternative 3 is also likely

Specialist	Description of the Route Alternatives (Corridors)		
	Corridor 1	Corridor 2	Corridor 3
	from the various villages and settlements indicated above the route also traverses a number of farms. Alternative 1 seems to affect most people and is the socially less preferred route.	crosses a number of farms. It seems that Alternative 2, would be the socially preferred route but this can easily be overridden for either technical or environmental reasons or both.	to have less of a social impact.

7.1.3.4 No-go alternative

In accordance with GN R.982, consideration must be given to the option not to act. This option is usually considered when the proposed development is envisaged to have 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 development of the proposed project. It would imply that the current electricity supply network is not strengthened, industrial development in the area will be hindered and the integration of potential renewable energy in the area will not be possible. Should the no-go alternative be adopted, the Limpopo grid will be deprived of a much needed essential service, particularly given the already existing energy supply challenge countrywide.

7.2 PUBLIC PARTICIPATION PROCESS

The EIA Regulations, require that during a Scoping and EIA process, the Organs of State together with Interested and Affected Parties (I&APs) and the general public be informed of the application for Environmental Authorisation (EA) 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; 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. The primary purpose of the PPP report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, I&APs; and
- To ensure that the EIA process fully address the issues and concerns raised.

Chapter 6, Regulation 39 through 44, of the 2014 EIA Regulations stipulates the manner in which the 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 or on the fence of-

- (i) The site where the activity to which the application relates is or is to be undertaken; and
- (ii) A place conspicuous to the public at the boundary of the site.

(b) Giving written notice to-

- (i) 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;
- (ii) The owners or persons in control of that land occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
- (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of rate payers that represent the community in the area;
- (iv) The municipality which has jurisdiction in the area;
- (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
- (vi) Any other party as required by the competent authority.

(c) Placing an advertisement in-

- (i) One of the local Newspaper within or around the proposed site

7.2.1 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 Regulation 39 - 44 of the EIA Regulations as amended.

7.2.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process is in line with the processes contemplated in Regulation 39 - 44 of the EIA Regulations as amended, in terms of NEMA, which provides that I&APs must be notified about the proposed project:

7.2.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government department), landowners and the general public. Notification and request for comments were submitted to the following key stakeholders:

- National Department of Environmental Affairs;
- Limpopo Department of Economic Development, Environment and Tourism;
- National Department of Water and Sanitation;
- Limpopo Department of Transport and Public Works;
- Limpopo Department of Water and Sanitation;
- Limpopo Heritage Resources Agency;
- South African Heritage Resource Agency;
- Wildlife and Environmental Society of South Africa;
- Polokwane Local Municipality;
- Lepelle-Nkumpi Local Municipality;
- Makhuduthamaga Local Municipality;
- Fetakgomo-Greater Tubatse Local Municipality;
- Cooperative Governance, Human Settlements and Traditional Affairs (COGHSTA) Sekhukhune;
and
- COGHSTA Lebowakgomo.

The notifications together with Background Information Documents were sent to stakeholders by registered mail; refer to **Appendices D3 and D6** respectively.

7.2.4 PUBLIC PARTICIPATION DATABASE

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, a Register of I&APs must be kept by the public participation practitioner. In fulfilment of this requirement, such a register is compiled and details of I&APs including their comments will be updated throughout the project cycle. The database is attached as **Appendix D5**.

7.2.5 SITE NOTICES

A2, size notices were fixed at different conspicuous locations within and around the proposed project study area on the 17th – 19th October 2017, in the Polokwane, Lepelle-Nkumpi, Makhuduthamaga and Fetakgomo Greater Tubatse Local Municipalities as well as at the existing Witkop and along Maphutha substations. Photographic evidence of the site notices is attached as **Appendix B**.

7.2.6 DISTRIBUTION OF NOTICES TO SURROUNDING LAND OWNERS / OCCUPIERS

Notification letters were posted via registered mail to stakeholders on the 16th October 2017 (Refer to **Appendix D3** for proof of postage), whereas site notices in English and Sepedi were hand delivered to landowners/occupiers on the 17th – 19th October. These notifications were informing stakeholders and the public of the project as well as affording them an opportunity to register as I&AP and also to comment or raise any issues pertaining to the proposed project.

7.2.7 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement was placed on The Star newspaper on the 23rd October 2017. The advertisement was aimed at further informing the I&APs of the proposed activity. A 30 day period was allowed for the public to submit their comments, issues and concerns. Proof of newspaper advertisement is attached as **Appendix D2**.

7.2.8 PLACEMENT OF DRAFT SCOPING REPORT FOR COMMENTS

The availability of the draft Scoping report for review and comment at public spaces will be advertised accordingly and copies will be made available on the Nsovo website. Further, copies of the draft Scoping report will be submitted to various departments and other stakeholders as highlighted above.

7.2.9 PUBLIC MEETINGS

Public and focus group meetings will be scheduled accordingly to address and iron out all issues and comments raised during the scoping phase.

7.3 A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Comments, issues and concerns raised together with the responses provided by the Environmental Assessment Practitioner (EAP) are presented as **Appendix D4**.

8. DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

This section outlines parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description in, and knowledge of the existing environment, potential interactions between the project and the environment are identified below. The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included.

8.1.1 SOCIO-ECONOMIC DESCRIPTION

This section presents the socio-economic aspects focusing on the Province and Municipalities within the proposed study area.

8.1.1.1 Provincial Description of the Proposed Project

Limpopo is located in the northernmost part of South Africa and it borders Mpumalanga, Gauteng and North West provinces. Limpopo is characterised by bushveld, majestic mountains, primeval indigenous forests, unspoiled wilderness and patchworks of farmland. The province covers an area of 125 754km² which has population of approximately 5 779 090. The capital city of Limpopo is Polokwane formerly known as Pietersburg.

The province is divided into five district municipalities viz. Vhembe, Mopani, Waterberg Greater Sekhukhune and Capricorn. The proposed development will traverse two of these municipalities i.e. Greater Sekhukhune and Capricorn. The five districts are further subdivided into 22 local municipalities of which only Polokwane, Lepelle-Nkumpi, Fetakgomo Greater Tubatse and Makhuduthamaga municipalities will be impacted by the proposed development.

The Limpopo province is rich in mineral deposits including platinum-group metals, iron ore, chromium, high and middle-grade coking coal, diamonds, antimony, phosphate and copper, as well as mineral reserves such as gold, emeralds, scheelite, magnetite, vermiculite, silicon and mica. Similarly, mining is the primary driver of economic activity and some of the major players within the study area include Tubatse Ferrochrome and Dilokong mines.

The province is a typical developing area, exporting primary products and importing manufactured goods and services. This province is the largest producer of various crops in the agricultural market due to climatic conditions which allows for double harvesting seasons.

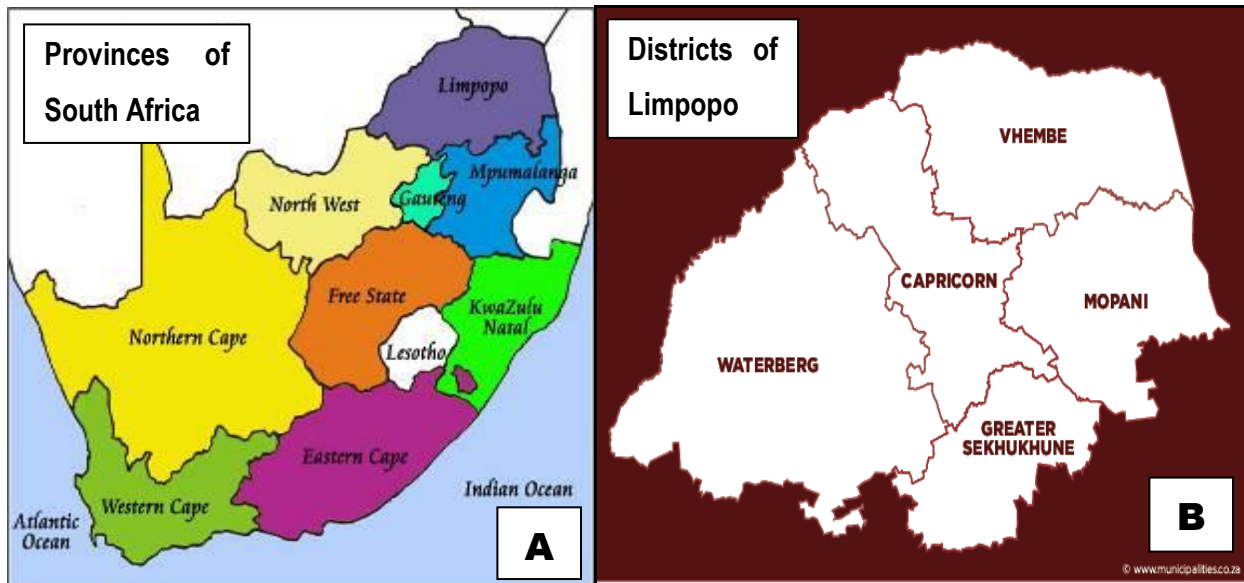


Figure 9: Photograph A shows the provinces of South Africa and Photograph B shows Limpopo province with Municipal Districts (Source: www.odm.org.za)

8.1.1.2 Districts Municipality within the study area

This section provides the description of the district municipalities with the proposed study area which is Sekhukhune and Capricorn District Municipalities.

a. Sekhukhune Districts Municipality

The Sekhukhune and Capricorn District Municipalities are Category C municipalities. Sekhukhune District Municipality is located in the south-eastern part of the Limpopo province bordering on the Capricorn and Mopani Districts in the north, Mpumalanga in the south and east, and the Waterberg District in the west as shown in Figure 10 below. The Sekhukhune District Municipality covers an area of approximately 13 528km².

The Sekhukhune District Municipality consists of four local municipalities namely: Elias Motsoaledi, Ephraim Mogale, Makhuduthamaga and Fetakgomo – Greater Tubatse. From the above mentioned four municipalities, the proposed powerline will traverse Makhuduthamaga and Fetakgomo – Greater Tubatse. The major towns in the Sekhukhune districts include the Burgersfort, Groblersdal, Marble Hall, Ohrigstad, Roosenekal and Steelpoort. The Main Economic Sectors in Sekhukhune are community services, mining (15-20%), trade (17%), financial and business services (10-12%), and agriculture (9.7%).

b. Capricorn District Municipality

The Capricorn District Municipality covers the area of approximately 21 705km². Capricorn District Municipality consists of the four local municipalities namely: Blouberg, Lepelle-Nkumpi, Molemole and Polokwane whereby only two local municipalities i.e. Polokwane and Lepelle-Nkumpi are within the proposed study area. The major towns in Capricorn include Alldays, Dendron, Morebeng, Polokwane, and Zebediela. The main economic sectors within Capricorn entail the following: community services (30.9%), finance (27.6%), trade (14%), transport (13.2%), manufacturing (4.3%), construction (3.3%), agriculture (3.1%) and electricity (2.9%).

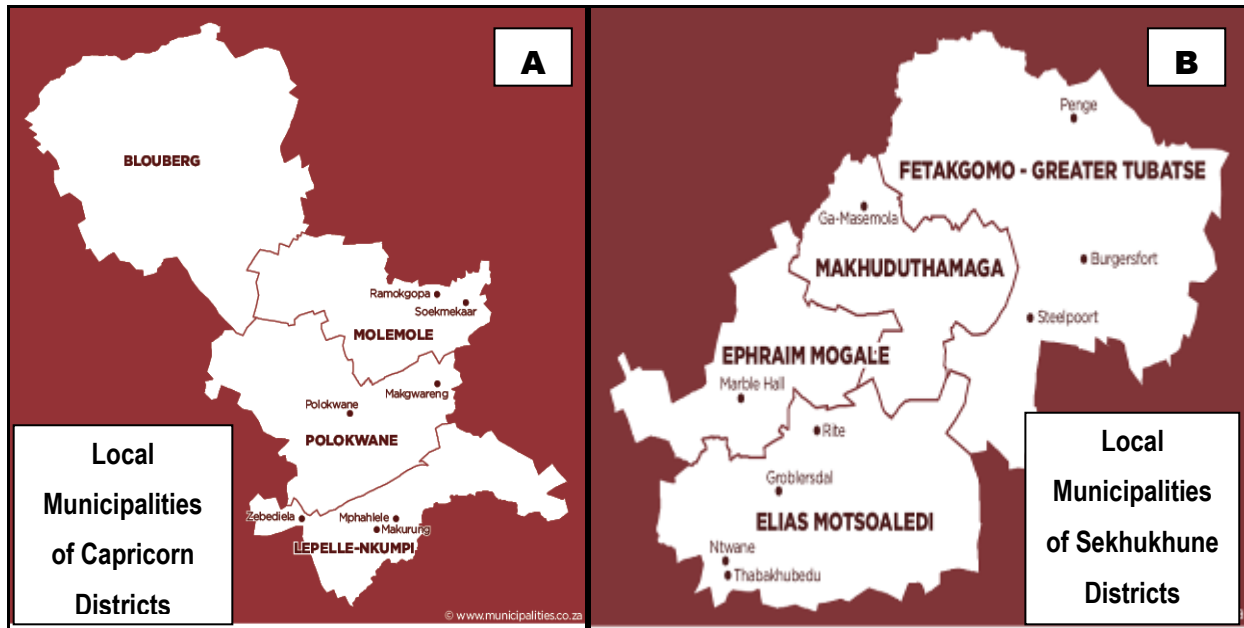


Figure 10: Photograph A shows the map of Capricorn districts municipalities while photograph B shows Sekhukhune Districts Municipalities

8.1.1.3 Local Municipalities within the proposed study area

This section provides a description of the local municipalities where the proposed development will be undertaken.

a. Polokwane Local Municipality

The Polokwane Local Municipality is a Category B municipality located within the Capricorn District and covers an area of approximately 3 766km². This Municipality accounts for 3% of the total surface area of Limpopo, however, over 10% of the population of Limpopo resides within this Municipality. The municipality serves as the economic hub of Limpopo and has the highest population density in the Capricorn District. The Main Economic Sectors include community services (32.1%), finance (21.5%), wholesale and retail trade (18.3%), transport (11.7%), manufacturing (4.8%) and mining (4.2%).

b. Lepelle-Nkumpi Local Municipality

The Lepelle-Nkumpi Local Municipality is a Category B municipality situated within the Capricorn District. This municipality covers an area of approximately 3 463km² and is located 55km south of the Capricorn district municipality as well as Polokwane City. The proposed development traverses Wards 7, 13, 14, 15,

16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27 and 28 of the municipality. It is the smallest of four municipalities in the district, making up 16% of its geographical area. It is predominantly rural and is divided into 29 wards, four of them being a township called Lebowakgomo and one of the Capricorn District's growth points. The major town in this Municipality is Zebediela.

c. Makhuduthamaga Local Municipality

The Makhuduthamaga Local Municipality is a Category B Municipality situated within the Sekhukhune District Municipality. It covers an area of approximately 2 097km². The proposed development traverses the municipal wards: 12, 13, 14, 16, 17, 19, 22 and 23. It is one of the four municipalities that make up the district, accounting for 16% of its geographical area. The main economic sectors are agriculture and farming.

d. Fetakgomo-Greater Tubatse Local Municipality

The Fetakgomo - Greater Tubatse Local Municipality is a Category B Municipality which covers an area of approximately 5 693km² and located within the Sekhukhune District. The proposed development traverses wards 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 27, 28, 29 and 31 within the Municipality. It is the largest of the four municipalities making up the district, accounting for 42% of its geographical area.

The area is known as the Middelveld as it is located between the Highveld and Lowveld regions. The vast majority of the area is made up of villages that are scattered throughout, particularly, the northern part. The major towns include Burgersfort, Ohrigstad, and Steelpoort. The main economic sectors within the municipality are agriculture; mining and quarrying; trade; tourism; manufacturing; general government; community, social and personal services; catering and accommodation.

8.1.2 CLIMATIC CONDITION OF THE PROPOSED AREA

The area falls within the Limpopo Province's Lowveld Climatic Zone which experiences typical subtropical, summer rainfall climatic conditions with hot summers and relatively warm winters. The area can experience periods of high humidity, particularly in the first half of the year. The humidity averages between 80% and 85% from January to June and reduces to between 76% and 80% for the remainder of the year. Maximums of 97% have been recorded. The rainy season is from November to March with maximum rainfall in January. The area is characterised by relatively low rainfall and the mean annual rainfall is 513 mm. Rainfall varies from 250 mm – 700 mm per annum in low-lying areas and rapidly increases up to 2000 mm per annum as the altitude increases

in the escarpment region of the Lowveld. The summer tend to be extremely hot and humid with temperatures often exceeding 35 degrees Celsius between the months of October and March, while the winters tend to be warm during the day and cool to cold at night and in the early mornings.

8.1.3 GEOLOGY WITHIN THE STUDY AREA

The proposed study area is mainly dominated by the granite, dolerite and gabbro. The area around Maphutha substation is characterized by gabbro and minimal lava. Corridor 1 traverses dolomite, clinopyroxente, andesite and norite to the existing Maphutha substation which is dominated by gabbro. Corridor 2 traverses mainly gabrro and minimal anderite. Corridor 3 spans on granite, dolomite and arsenate in the northwestern side of the study area then also traverses gabbro towards the southern side of the area to existing Maphutha substation as depicted on the map below.

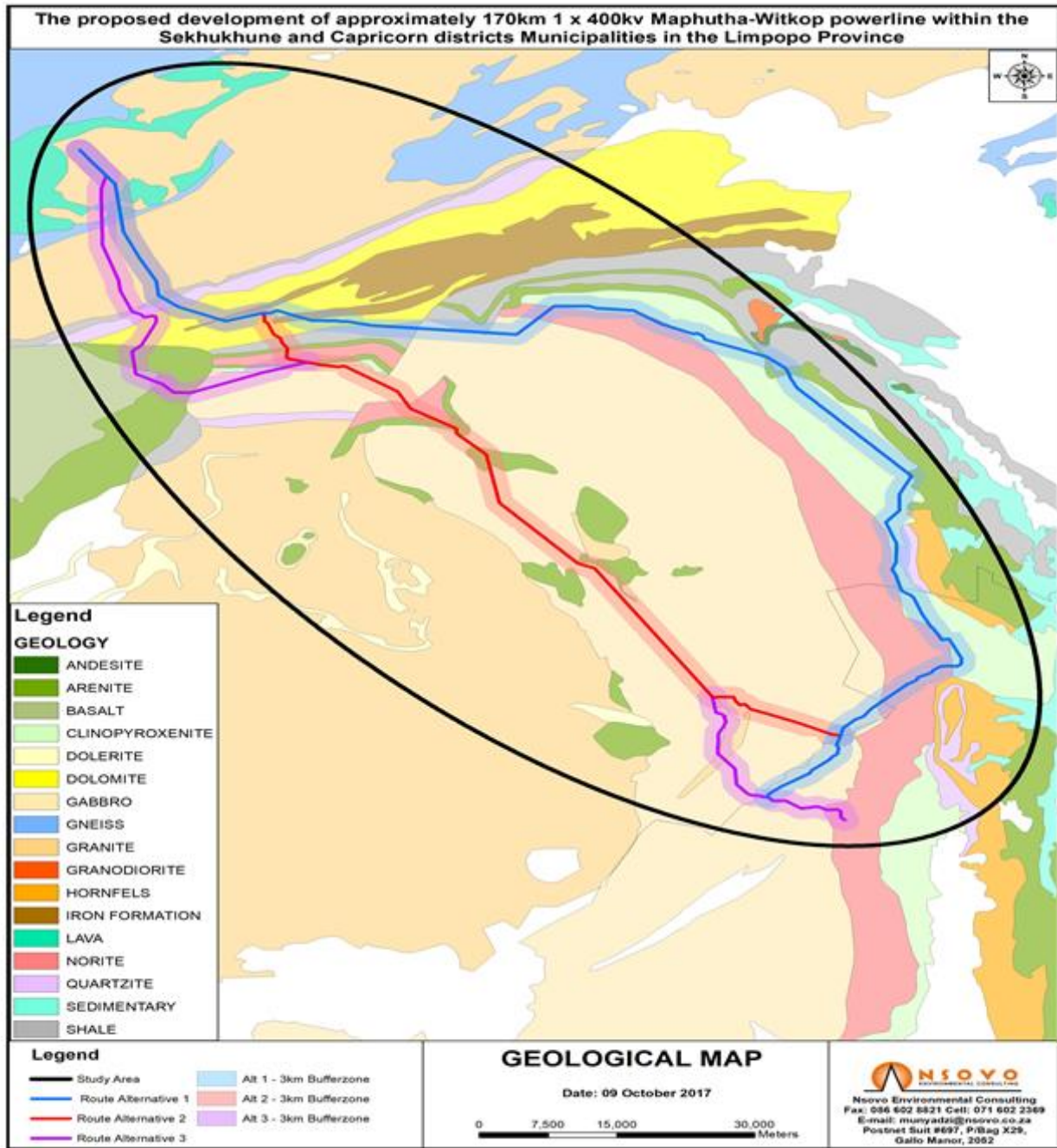


Figure 11: Geological map of the study area

8.1.4 TOPOGRAPHY OF THE STUDY AREA

The proposed study area is highly mountainous hence development occurs mostly in valleys. Settlements sizes are small and scattered due to extensive broken terrain. The ridges and the mountains form linear dividers between the residential communities. In certain areas within the proposed study area the

topography is very steep creating mountainous terrain which is barely inhabited. The terrain dictates that larger settlement development occurs mainly in flat, low lying areas in-between the mountain ranges.

8.1.5 SURFACE WATER WITHIN THE AREA

Majority of the study area lies within the North Olifants Quaternary Catchment while a shorter distance of the line, towards the Witkop substation, falls within the Limpopo Quaternary Catchment. There are several wetlands and NFEPA Rivers within the buffer zone of the three Corridors (Refer to Figure 12). The quaternary catchments within the study area are presented in Table 12 below as follows:

Table 12: Quaternary catchments within the study area

North Olifants Quaternary Catchments		
B41H	B51H	B51G
B42G	B52B	B71B
B42H	B52E	B52J
B42F	B71E	B51F
B41J	B52A	B52F
B41K	B51E	B52C
B71H	B52D	B71A
B41G	B51C	B52G and B52H
Limpopo Quaternary Catchments		
A71A	-	-

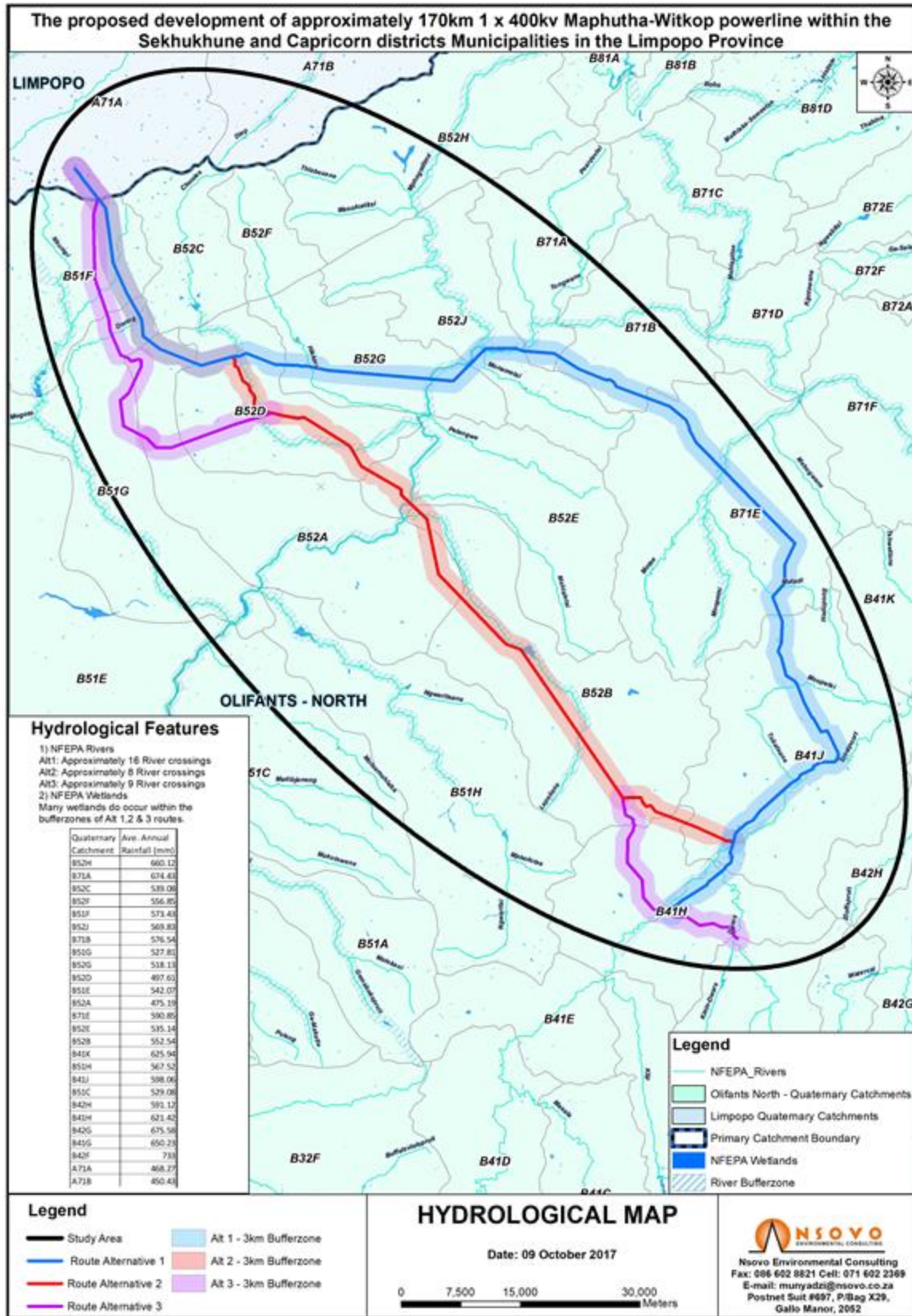


Figure 12: Hydrological map of the proposed location

8.1.6 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

According to the Phase 1 Archaeological Impact Assessment Specialist Study Report (refer to **Appendix C4**), there is indication that Iron Age people settled in some parts of the study area. According to Huffman (2007) Iron Age people preferred to settle in areas with rich alluvial soils close to rivers. Although no remains of Stone/ Iron Age sites were noted during site visit, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools.

Cultural heritage site identified within and around the study area are indicated in the sensitivity map below. It must be noted that none of the identified corridors are close enough to prompt a direct impact from the proposed development.

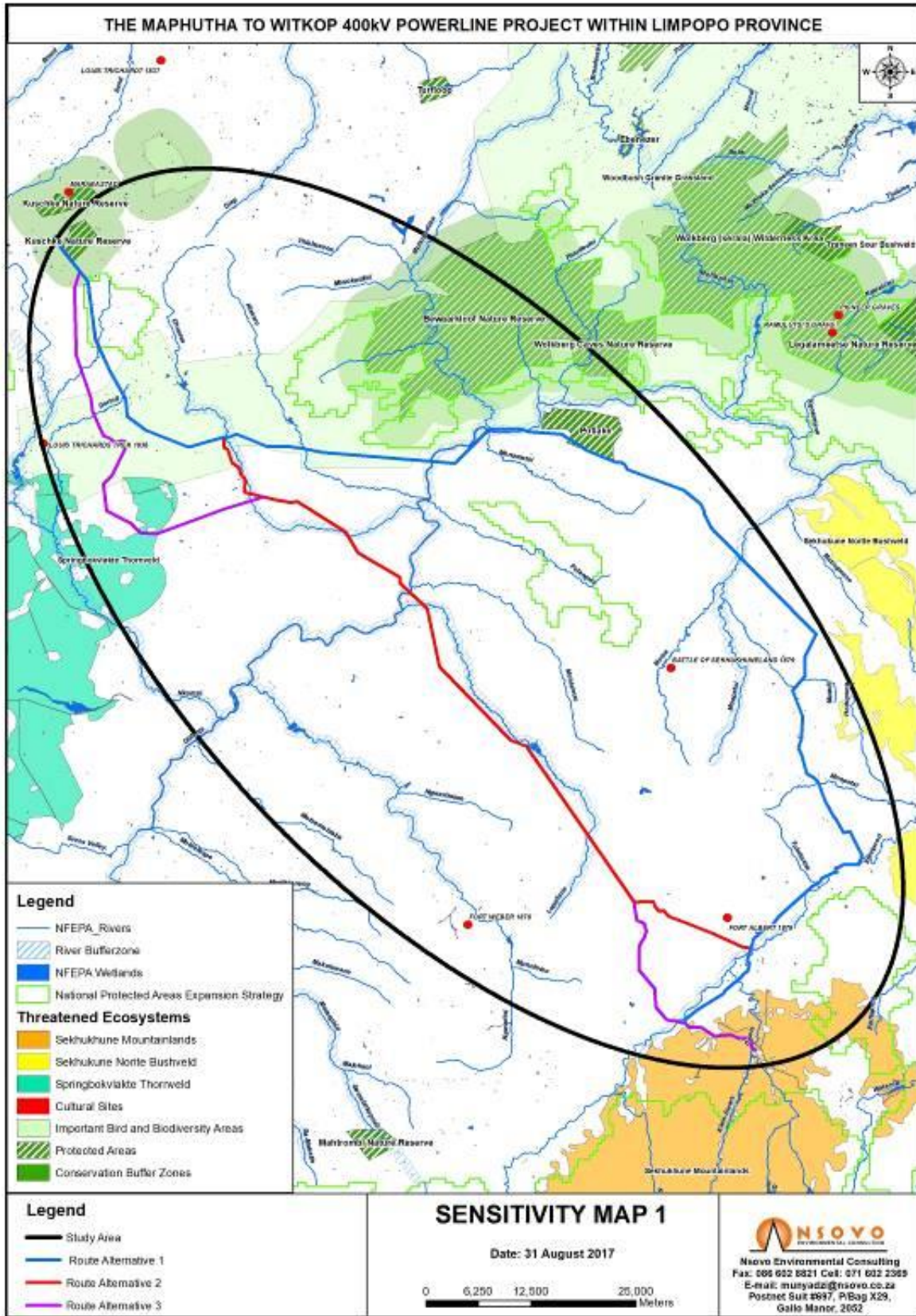


Figure 13: Sensitivity Map highlighting Cultural heritage sites within the study area

Sites of heritage significance noted during the investigation were mostly graves located within households.

Sensitive areas that were noted during survey include:

- Most of the households which are within the proposed corridors have family graves, the developers should thus avoid the corridor with the high percentage of households;
- Iron Age people preferred to settle on the alluvial soils close to rivers. As such, all river banks are viewed to be sensitive and should be avoided in the best way possible.

8.1.7 AIR QUALITY AND POLLUTION

Air quality defined includes noise and odour as well as all sources of air pollution (i.e. point, area and mobile sources). The Limpopo Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004 and more specifically, to provide guidance on Air Quality Management in the Sekhukhune and Capricorn Municipal Districts. The Plan identifies air pollution sources in the proposed locations as follows:

- Clay brick manufacturing;
- Agricultural activities
- Biomass burning (veld fires);
- Domestic fuel burning (wood and paraffin);
- Vehicle emissions;
- Waste treatment and disposal;
- Dust from infrastructural development;
- Dust from unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

There are few sources of air pollutants within the immediate proposed area. The ambient air quality is generally good; however, emissions from industrial boilers are likely to result in local areas of elevated concentrations of air pollutants. Ambient particulate concentrations are likely to be low in residential areas where wood is used as primary fuel source. The motor vehicle congestion in mining towns and along the

N1, R37, 518 and 519 roads results in elevated ambient concentrations of particulates and Nitrogen Oxides (NO₂) at times.

8.1.8 VEGETATION STRUCTURE AND COMPOSITION

The existing Witkop substation is located in an area characterised by the Petersburg Plateau Grassveld type of vegetation while the Maphutha substation is situated in an area characterised by mixed bushveld. The general vegetation along the study area is Acocks vegetation which consists of mixed bushveld, north-eastern mountain sourveld, north-eastern sandy highveld, Pietersburg plateau grassveld, sourish mixed bushveld; springbok flats turf thornveld and north-eastern mountain grassland as shown in **Figure 14**.

Corridor 1 is dominated by the mixed bushveld while Corridors 2 and 3 traverse areas dominated by the normal mixed bushveld and sourish mixed bushveld. The central section of the study area is dominated by large tracts of Sekhukhune Plains Bushveld and Sekhukhune Mountain Bushveld. Levels of transformation on the plains are relatively high, but the mountain bushveld areas are largely intact. The terminal section of the alignments towards Uchoba substation is considered more sensitive than the previous section of the alignments and is therefore considered a listed ecosystem while the Sekhukhune Mountainlands is considered to be endangered. However, the species of concern associated with the Sekhukhune Mountain lands ecosystem, are highly unlikely to occur within the affected area which is relatively low-lying and arid.

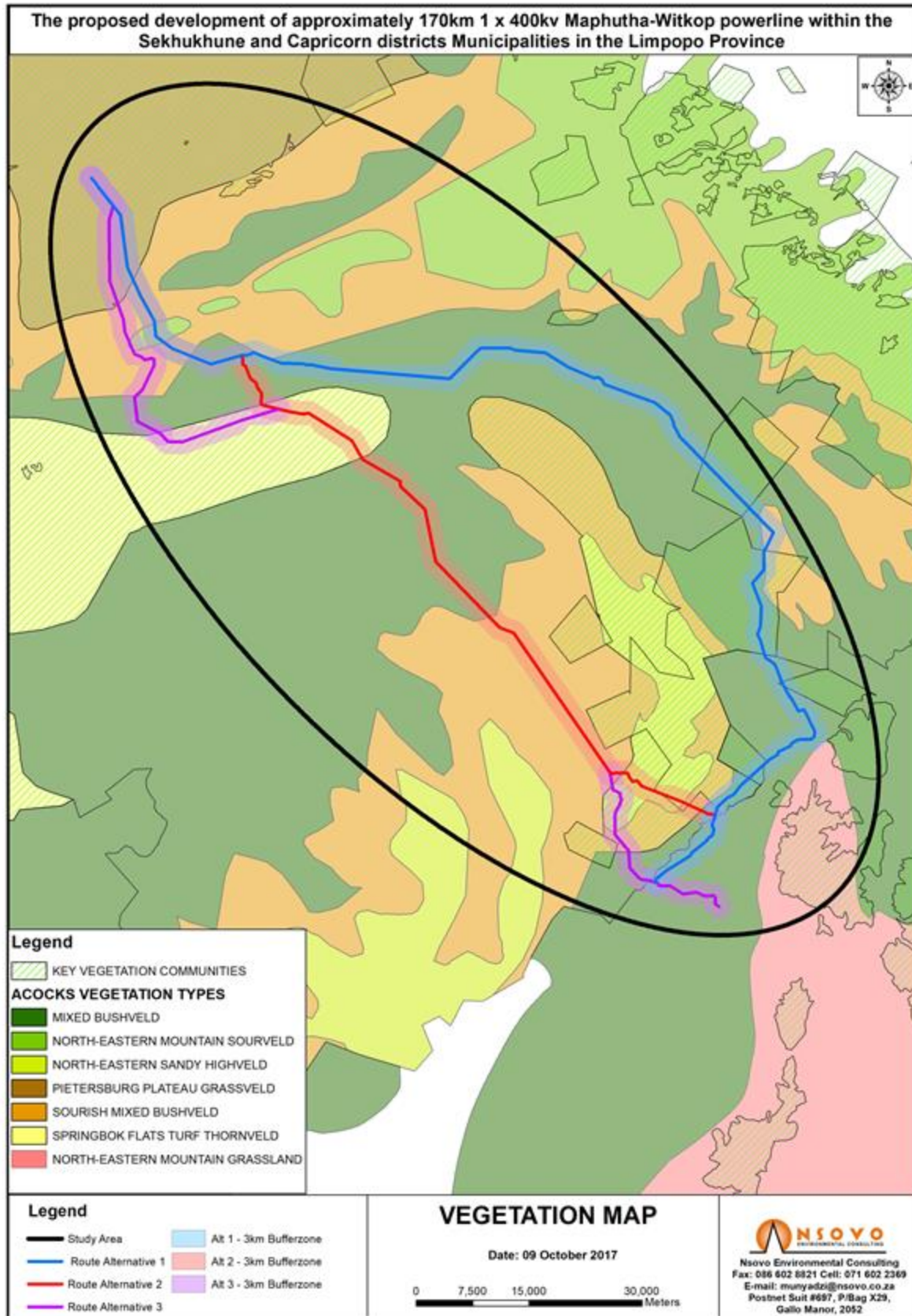


Figure 14: Vegetation types associated with the proposed area

8.1.9 TOPOGRAPHY

The terrain within the study area varies greatly. Parts of the area in the south-east and north consists of steep ridges, with slopes exceeding 100% (45°) in many places. However, most of the middle part of the corridor follows drainage valleys, which are relatively flat (Alternative 1), or the broad Sekhukhune plain (Alternatives 2 and 3), generally with slopes around 2-10%. Altitude above sea level is around 1 000-1 200 m for most of the corridors, rising to around 1 400 m on the top of the ridges and falling to around 850 m in the lowest parts.

8.1.10 AGRICULTURE

The climate of the study area shows that the rainfall is marginal for dry land (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. **Figure 15** below depicts the study area’s agricultural potential; accordingly it is evident that the longer spans of the alignment are within soils which are highly suitable for arable agriculture while the areas around both Witkop and Maphutha substations are within soil of low to intermediate agricultural potential.

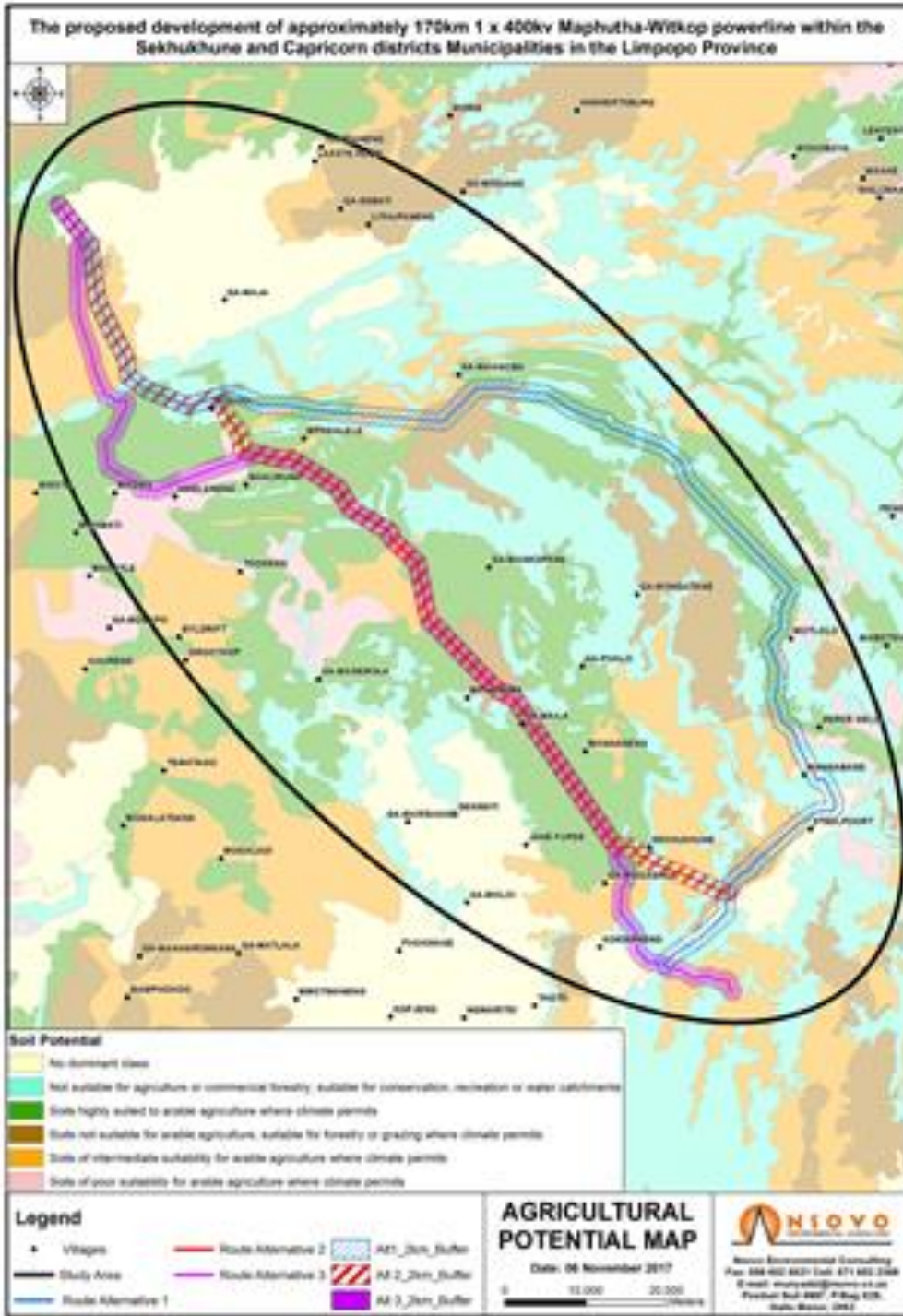


Figure 15: Agricultural potential along the alignment

8.1.10.1 Soil Type

According to the Soil specialist there is many separate land types occurring within the study area which are summarised in the table and shown on the map below as follows:

Table 13: Soil Types along the proposed corridors

Soil Type	Description
Ae27, Ae115, Ae117, Ae118, Ae122, Ae123, Ae131, Ae225, Ae233, Ae339, Ae342, Ae343, Ae346, Ae347, Ae348, Ae352, Ae354, Ae355, Ae386	Red, lightly weathered, structureless soils
Bd39	Non-red, lightly weathered, structure less soils, often with plinthic subsoils
Db244	Non-red duplex soils, sandy topsoil over structured clay subsoil
Dc31	Duplex soils with some black and red clay soils
Ea88	Black, swelling clay soils
Fa279	Shallow soils, sometimes rocky, little lime
Fb171, Fb172, Fb534, Fb535	Shallow soils, sometimes rocky, occasionally some lime
Fc733	Shallow soils, sometimes rocky, much lime
la175, la176, la177	Alluvial soils, usually deep
lb30, lb31, lb155, lb190, lb191, lb192, lb197, lb239, lb293, lb454, lb456, lb457	Rocky areas [>60% rock], often steep with shallow soils
lc154	Very rocky areas [>80% rock], usually steep with shallow soils

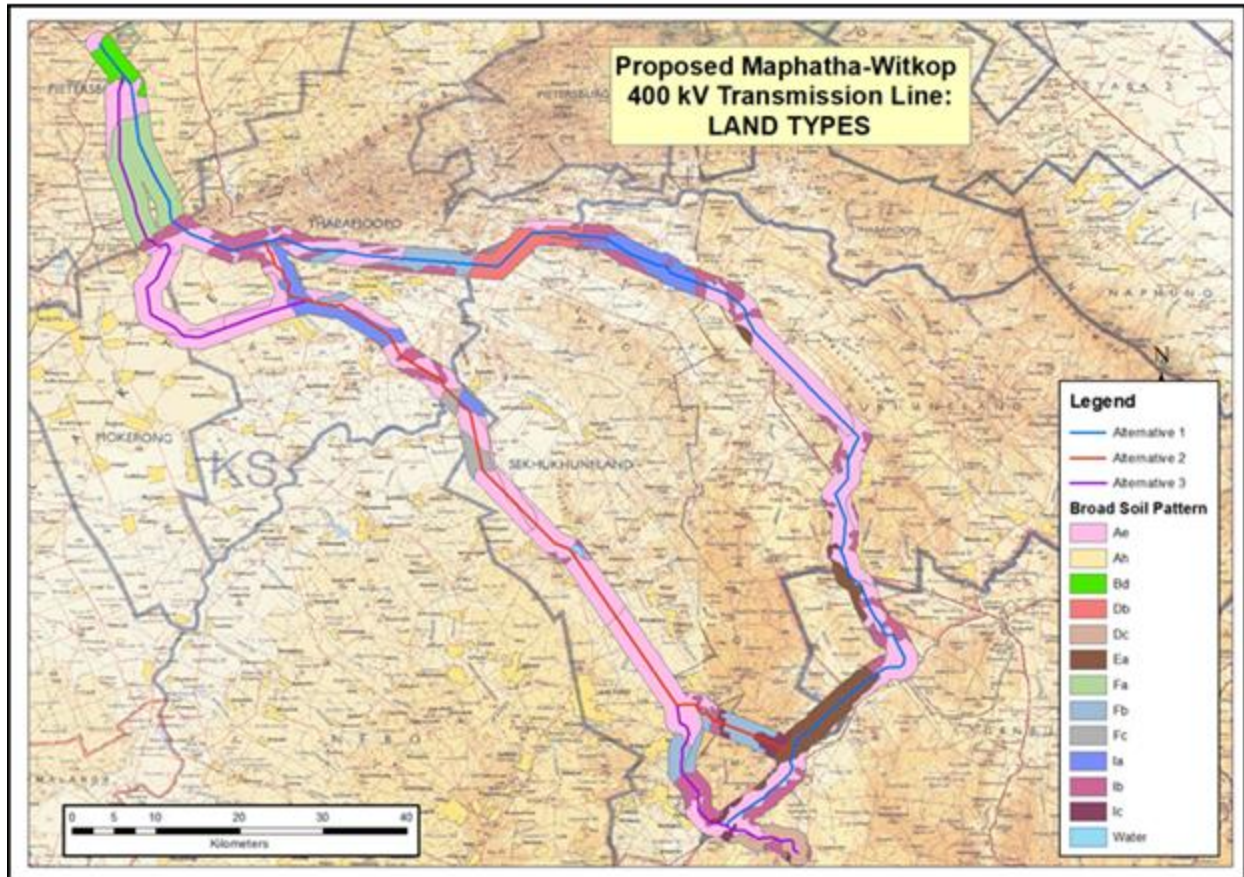


Figure 16: Broad soil patterns of land types occurring

8.1.10.2 Soil Erodibility

According to the agricultural specialist report, most of the study area is not inherently susceptible to erosion. Most of the high potential soils are on relatively flat topography, and have stable clay mineralogy, while on the steeper slopes, the rock outcrops and continuous vegetation cover mean that these areas are also not highly erodible. However, incorrect management practices in many of the rural areas along the corridors (mainly overgrazing or cultivation of unsuitable soils), have led to the development of severe gully erosion which is more evident along corridor one.

Subsequently, if vegetation cover is disturbed or removed (such as during the construction phase of a transmission line) and especially on steeper slopes, then erosion will most likely occur. Therefore, clear mitigation measures should be implemented.

8.1.11 SENSORY ASPECTS

8.1.11.1 Noise

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

8.1.11.2 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.

In this regard, it is imperative that the applicant be sensitive from a visual impact perspective, to the requirements of the local people, notably rural communities, and farmers. 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.

9. METHODOLOGY FOR ASSESSING SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria given in the tables below will be used to conduct the evaluation. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance and probability of occurrence attached to it. This will be assessed in detail during the EIA phase.

Table 14: Methodology used in determining the significance of potential environmental impacts:**Status of Impact**

The impacts are assessed as either having a:
negative effect (i.e. at a `cost' to the environment),
positive effect (i.e. a `benefit' to the environment), or
Neutral effect on the environment.

Extent of the Impact

- (1) Site (site only),
- (2) Local (site boundary and immediate surrounds),
- (3) Regional (within the City of Johannesburg),
- (4) National, or
- (5) International.

Duration of the Impact

The length that the impact will last for is described as either:

- (1) immediate (<1 year)
- (2) short term (1-5 years),
- (3) medium term (5-15 years),
- (4) long term (ceases after the operational life span of the project),
- (5) Permanent.

Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- (0) none,
- (2) Minor,
- (4) Low,
- (6) Moderate (environmental functions altered but continue),
- (8) High (environmental functions temporarily cease), or
- (10) Very high / Unsure (environmental functions permanently cease).

Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

- (0) None (the impact will not occur),
- (1) improbable (probability very low due to design or experience)
- (2) low probability (unlikely to occur),
- (3) medium probability (distinct probability that the impact will occur),
- (4) high probability (most likely to occur), or
- (5) Definite.

Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.

$$S=(E+D+M)P$$

The significance ratings are given below

(<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

(30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

10. DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section 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 EAP's opinion as well as consultation with specialist studies. Refer to **Table 13** below, for the potential impacts identified. These impacts are similar for all three alternatives and will be comprehensively assessed during the EIA phase.

10.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified are described in **Table 13** below.

Table 15 Potential Environmental 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	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 before mitigation the impact will be local in extent, and short term. Mitigation measures such as dust suppression can reduce the impact to become site specific.
Visual Impact	Negative	<p>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 1km is approximately a quarter of the impact viewed from 500m; and the visual impact 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</p>

Issue	Rating	Description
		<p>land use, landscape character and scale.</p> <p>The proposed activity will 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 and substations located within 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 study area the impact can be considered definite, long term, local in extent but low significance.</p> <p>A visual impact study will be commissioned and included as part of the EIA phase.</p>
Fauna	Negative	<p>No sensitive species or sensitive areas are flagged so far. The project will not substantially change the reigning ecological character of the general area. Further, the proposed project will not significantly impact negatively on the assemblages and conservation of the general area. Considering the insignificant extent of the relatively narrow and linear servitude it is not expected that endangered species of conservation will be put at risk; however, should any species of conservation concern be encountered, these will be protected.</p>
Flora	Negative	<p>Potential ecological impacts resulting from the proposed development would stem from a variety of different activities and risk factors associated with the preconstruction, construction and operational phases of the project potentially including the following:</p>

Issue	Rating	Description
		<p>Construction Phase</p> <ul style="list-style-type: none"> • Vegetation clearing for access roads, laydown areas and the powerline site route may impact intact vegetation. • Increased erosion risk would occur due to the loss of plant cover and soil disturbance during the construction phase. Some of the site options are steep and risk of erosion would be high. This may impact downstream riparian and wetland habitats if a lot of silt enters the drainage systems. • Increased human presence can lead to illegal plant harvesting and other forms of disturbance such as fire. <p>Operational Phase</p> <ul style="list-style-type: none"> • The presence of the powerline may disrupt the connectivity of the landscape for some species which may impact their ability to disperse or maintain gene flow between subpopulations. • The powerline will require maintenance and if this is not done appropriately, it could impact adjacent intact areas through impacts such as erosion, alien plant invasion and contamination from pollutants, herbicides or pesticides. <p>Cumulative</p> <p>The development would contribute to the cumulative fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.</p>

Issue	Rating	Description
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).</p> <p>An increase in noise is expected to emanate from construction activities, which might have an impact especially on the surrounding farms. 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 0103 acceptable noise levels at day time is 45dBA. A noise 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>Noise has been identified as potentially low due to the nature of the proposed development. The noise impact may be local during construction and site specific during operations.</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 collision of birds with power lines. With proper mitigation measures implemented, these potential impacts can be reduced.</p>

Issue	Rating	Description
		<p>For the proposed development, major risks to birds that may be caused by the proposed facilities are disturbance by construction activities (temporary), on-going disturbance during operation phase, collision with and electrocution on the power line.</p> <p>The proposed development will pose a limited threat to the birds occurring in the vicinity of the new infrastructure. This is largely due to the extensive impacts already evident at the site (the existing 400kV power line, transformed landscape and few suitable avian micro-habitats) coupled with the relatively short length of the proposed power line. The power line poses a low collision risk and a low electrocution risk. The impact of displacement due to habitat transformation will have a low impact on avifauna due the largely transformed nature of the proposed site.</p> <p>Species will be particularly sensitive to this disturbance during the breeding season. The proposed site alternatives pass along residential and mining areas close to national and regional roads as well as Witkop and Maphutha substations. Therefore, species within this landscape often experience disturbance and as a result disturbance of birds by the proposed powerline is anticipated to have low significance. The impact assessment phase will be undertaken to determine the extent of the impact at all alternative corridors.</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. 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.</p>

Issue	Rating	Description
		<p>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 as well as the operational phase, although reduced.</p>
Soil Erosion	Negative	<p>Movement of heavy machinery 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 alternative site has been assessed in terms of the National Heritage Resources Act, 1999 (No 25 of 1999). A Phase 1 Archaeological Impact Assessment was conducted and the results are incorporated in the report. Sites of heritage potential noted during the investigation were mostly graves. Although no remains of Stone/ Iron Age sites were noted during site visit, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools.</p> <p>(Refer to Appendix C4 for specialist Phase 1 Archaeological Impact Assessment Report).</p>
Surface and Groundwater Pollution	Negative	<p>The proposed alternatives are in close proximity to a number of watercourses. The impact on water quality, if any, could be sedimentation, decrease in quality and possible contamination of surface water and groundwater. This could result from fuel spillages, sewer systems, liquid waste, etc.</p> <p>An increased volume of storm water runoff, peak discharges, and frequency and severity of flooding is therefore often characteristic of transformed catchment. The impact on water is site specific but can be</p>

Issue	Rating	Description
		<p>local or regional if proper measures are not put in place.</p> <p>There may be a need to apply for a Water Use Licence with Department of Water and Sanitation considering the proximity of the study area to surface water bodies which will then require Wetland delineation.</p>
Social Environment	Negative/Positive	<p>The construction phase may have a negative impact on the surrounding landowners if not properly managed. It could result to disturbance of residents as a result of construction related activities. Other social impacts that have been identified and will be assessed further include access across site, access to servitude across private property, crime and security, disturbance of cultural, spiritual and religious sites, disturbance of sense of place, fencing, fire risk, and health issues among others.</p> <p>Conversely, a positive impact can emanate from the proposed development through employment of local residents. Also, a micro-economic environment could be created through vending/trade between contract workers and the locals.</p>
Climate	Neutral	Local climate conditions do not appear to be of a significant concern to the proposed project. In a broader scale the project will have no impact on the local and/or global climate change.
Topography	Neutral	The topography of the study area is undulating; this may pose design challenges particularly in the steeper area; however, the development will not have significant impact on the topography.
Tourism	Neutral	The positioning of the power line must take into consideration the potential impact on the minimal tourism

Issue	Rating	Description
		in the area
Traffic	Negative	A significant amount of material and equipment will be delivered to the site during the construction phase of the development. As the line crosses a number of regional roads (including R37, R555 and R518) there is the likelihood that, during the stringing process traffic disruption could occur, however, construction techniques are available that will keep these disruptions to a minimal level. Traffic disruptions during the maintenance phase, when considered across the lifespan of the project, will be minimal.

This section presents the assessment of anticipated impacts as well as mitigation measures. Potential impacts associated with the proposed project will include:

- Impact on avifauna (Bird electrocution and collision with power lines);
- Biodiversity (flora and fauna);
- Heritage;
- Agriculture
- Social; and
- Visual impacts.

Table 16: Impacts ratings of each route alternative by specialists

10.1.1 BIODIVERSITY

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
10.1.1.1 Impact on vegetation and plant species of concern							
Corridor 1	No	Negative	Local	Long Term	Moderate	Certain	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Corridor 2	No	Negative	Local	Long Term	Moderate	Certain	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Corridor 3	No	Negative	Local	Long Term	Moderate	Certain	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Mitigation Measures							

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> Placement of pylons and other infrastructure within the High Sensitivity areas and drainage lines should be avoided. Preconstruction walk-through of the approved development footprint to ensure that sensitive habitats and species are avoided where possible. Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna. 							
10.1.1.2 Impact on fauna due to construction activity							
Corridor 1	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Corridor 2	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Corridor 3	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium
	Yes	Negative	Local	Long Term	Low	Probable	Low
Mitigation Measures							

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> • Preconstruction walk-through of powerline corridor to identify areas of faunal sensitivity. • During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. • Any trenches that are required for cabling etc, should not be left open for extended periods as fauna such as tortoises will fall in and become trapped. Any open trenches should be checked regularly for trapped fauna. • The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • No fuel wood collection should be allowed on-site. • No dogs or cats should be allowed on site apart from that of the landowners. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • No unauthorized persons should be allowed onto the site and site access should be strictly controlled • All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. • All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and snakes which are often persecuted out of fear or superstition. 							
10.1.1.3 Increased erosion and degradation risk							
Corridor 1	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Long Term	Moderate	Probable	Medium-Low
Corridor 2	No	Negative	Local	Long Term	Moderate	Probable	Medium
	Yes	Negative	Local	Long Term	Low	Improbable	Low
Corridor 3	No	Negative	Local	Long Term	Moderate	Probable	Medium
	Yes	Negative	Local	Long Term	Low	Improbable	Low
Mitigation Measures							
<ul style="list-style-type: none"> • There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as a result of the disturbance, and if they do, to immediately implement erosion control measures. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All disturbed and cleared areas should be re-vegetated with indigenous perennial shrubs and grasses from the local area. 							
10.1.1.4 Impact on CBAs and Listed Ecosystems							
Corridor 1	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium
	Yes	Negative	Local	Long Term	Moderate	Probable	Medium-Low
Corridor 2	No	Negative	Local	Long Term	Moderate	Probable	Medium
	Yes	Negative	Local	Long Term	Low	Improbable	Low
Corridor 3	No	Negative	Local	Long Term	Moderate	Highly Probable	Medium
	Yes	Negative	Local	Long Term	Moderate	Probable	Medium

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Mitigation Measures							
<ul style="list-style-type: none"> Minimise the development footprint within the CBAs and high sensitivity areas. Formal conservation areas should be avoided where possible. All disturbed areas should be rehabilitated with locally occurring shrubs and grasses after construction and decommissioning to reduce the overall footprint of the development. 							

10.1.2 AVIFAUNA

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
10.1.2.1 Collision of birds with earth wires							
Corridor 1	No	Negative	Local	Permanent	Medium	Medium	Medium
	Yes	Negative	Local	Permanent	Medium	Low	Low
Corridor 2	No	Negative	Local	Permanent	Medium	Medium	Medium
	Yes	Negative	Local	Permanent	Medium	Low	Low
Corridor 3	No	Negative	Local	Permanent	Medium	Medium	Medium
	Yes	Negative	Local	Permanent	Medium	Low	Low
Mitigation Measures							

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> Choose optimum route for power line. Conduct avifaunal walk through to ground truth final alignment and identify high risk sections of power line. Install line marking devices on high risk sections to make cables more visible to birds and reduce risk of collisions. Monitor line annually to measure how many birds are killed through collision. 							
10.1.2.2 Destruction of bird habitat during construction							
Corridor 1	No	Negative	Local	Permanent	Low	High	Low
	Yes	Negative	Local	Permanent	Low	High	Low
Corridor 2	No	Negative	Local	Permanent	Low	High	Low
	Yes	Negative	Local	Permanent	Low	High	Low
Corridor 3	No	Negative	Local	Permanent	Medium	High	Medium
	Yes	Negative	Local	Permanent	Medium	High	Medium
Mitigation Measures							
<ul style="list-style-type: none"> Choose optimum route for power line. Conduct avifaunal walk through to ground truth final alignment and identify sensitive habitats Minimise any vegetation clearing required 							

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
10.1.2.3 Disturbance of birds							
Corridor 1	No	Negative	Local	Short term	Low	Low	Low
	Yes	Negative	Local	Short term	Low	Low	Low
Corridor 2	No	Negative	Local	Short term	Low	Low	Low
	Yes	Negative	Local	Short term	Low	Low	Low
Corridor 3	No	Negative	Local	Short term	Low	Low	Low
	Yes	Negative	Local	Short term	Low	Low	Low
Mitigation Measures							
<ul style="list-style-type: none"> Choose optimum route for power line. Conduct avifaunal walk through to ground truth final alignment and identify any breeding SITES for sensitive species. If any found provide case specific management measures. 							
10.1.2.4 Avifauna Electrical faulting caused by birds							
Corridor 1	No	Negative	Local	Permanent	Low	Medium	Medium
	Yes	Negative	Local	Permanent	Low	Low	Low
Corridor 2	No	Negative	Local	Permanent	Low	Medium	Medium

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Permanent	Low	Low	Low
Corridor 3	No	Negative	Local	Permanent	Low	Medium	Medium
	Yes	Negative	Local	Permanent	Low	Low	Low
Mitigation Measures							
<ul style="list-style-type: none"> Choose optimum route for power line. Conduct avifaunal walk through to ground truth final alignment and identify towers requiring Bird Guards Install Bird Guards on relevant towers as per Eskom Transmission Guidelines 							

10.1.3 HERITAGE

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
10.1.3.1 Heritage impact							
Corridor 1	No	Negative	Local	Permanent	Low	Medium	Medium
	Yes	Negative	Site	Long term	Medium	Medium	Medium
Corridor 2	No	Negative	Local	Permanent	Medium	Medium	Medium
	Yes	Negative	Site	Long term	Medium	Low	Low

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Corridor 3	No	Negative	Local	Permanent	Medium	Medium	Medium
	Yes	Negative	Site	Long term	Medium	Low	Low
Mitigation Measures							
<ul style="list-style-type: none"> Choose optimum route for power line. Conduct avifaunal walk through to ground truth final alignment and identify towers requiring Bird Guards Install Bird Guards on relevant towers as per Eskom Transmission Guidelines 							

10.1.4 SOCIAL IMPACT

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Corridor 1	No	Negative	Local	Short term	High	High	Medium
	Yes	Negative	Local	Short term	Low	Medium	Low
Corridor 2	No	Negative	Local	Short term	Very High	Definite	High
	Yes	Negative	Local	Short term	Moderate	High	Medium
Corridor 3	No	Negative	Local	Short term	Very High	Definite	High
	Yes	Negative	Local	Short term	Moderate	High	Medium

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Mitigation Measures							
<ul style="list-style-type: none"> Residents must be kept abreast with the on-going activities. A Land owner liaison officer must be appointed to manage and address societal issues accordingly. Liaison with landowners prior to entering their properties; Access to the construction site should be controlled; Warning signs should be placed on site to make people aware of the dangers; No-go area should be clearly demarcated, marked and visible; Landowners must be kept abreast with movements in and around their properties; and Health and Safety standards and guidelines must be implemented. 							

10.1.5 SOCIAL IMPACT

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Social Impact							
Corridor 1	No	Negative	Local	Short term	High	High	Medium
	Yes	Negative	Local	Short term	Low	Medium	Low
Corridor 2	No	Negative	Local	Short term	Very High	Definite	High
	Yes	Negative	Local	Short term	Moderate	High	Medium

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Corridor 3	No	Negative	Local	Short term	Very High	Definite	High
	Yes	Negative	Local	Short term	Moderate	High	Medium
Mitigation Measures							
<ul style="list-style-type: none"> Residents must be kept abreast with the on-going activities. A Land owner liaison officer must be appointed to manage and address societal issues accordingly. Liaison with landowners prior to entering their properties; Access to the construction site should be controlled; Warning signs should be placed on site to make people aware of the dangers; No-go area should be clearly demarcated, marked and visible; Landowners must be kept abreast with movements in and around their properties; and Health and Safety standards and guidelines must be implemented. 							

10.1.6 AGRICULTURAL IMPACTS

Route Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Corridor 1	No	Negative	Site	Permanent	Moderate Definite	Medium	Medium
	Yes	Negative	Site	Long term	Low	High	Medium
Corridor 2	No	Negative	Site	Permanent	Moderate	Medium	Medium
	Yes	Negative	Site	Long term	Low	High	Medium
Corridor 3	No	Negative	Site	Permanent	Moderate	Medium	Medium
	Yes	Negative	Site	Long term	Low	High	Medium
Mitigation Measures							
<ul style="list-style-type: none"> • Rehabilitation of any bare soil areas caused by the construction process (including any access roads or tracks) • Wherever possible, the siting of pylons away from any cultivated lands, but rather to use servitudes and boundary lines. and • Special care should be given to areas with steeper topography and areas adjacent to water courses. • Sensitive areas such as wetland soils along the river courses must be avoided. 							

10.2 CUMULATIVE IMPACTS

Cumulative impacts in relation to an activity, means the past, present and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations).

This section provide cumulative impacts ratings associated with the proposed project which include the waste generation, traffic, socio-economic and visual impacts. It also outlines the mitigation measures of each rated cumulative impacts as follows:

10.2.1.1 Waste generation

During the construction phase of the proposed powerline there will be a variety of waste material produced within the study area. The waste generation impact rating and the proposed mitigation measures are provided in table below as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	Local	Short term	High	Definite	Medium
	Yes	Negative	Site	Short Term	Low	High	Low
Corrective Actions	<ul style="list-style-type: none"> No waste will be buried on site or incorporated into the foundation trenches; The work force must be encouraged to sort waste into recyclable and non-recyclable waste; No burning of waste will be allowed on site; and Waste must be regularly removed from site and disposed of at a registered waste disposal facility. 						

10.2.1.2 Socio-economic impact

The proposed development will result in a positive socio-economic impact as the demand for equipment, building material and labour will increase. Secondary service provision such as food supply, toilet hire, equipment maintenance and many more items would also stimulate the local economy especially during

the construction phase. The impacts of socio-economic impacts associated with the proposed development are rated as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Socio-economic	No	Positive	Regional	Short Term	High	Definite	Medium
Corrective Actions	<ul style="list-style-type: none"> Contractors must by all means practice the localisation matrix while seeking for construction equipment or building materials. For minimal jobs, the appointed contractor should by all means consider the local residents for jobs that do not need any skill transfer. Property owners or occupiers must be treated with respect and courtesy at all times; The culture and lifestyles of the communities living in close proximity to the proposed development must be respected; A register must be maintained of all complaints or queries received as well as action taken. 						

10.2.1.3 Visual Impact

The proposed activity will change the visual character of the area particularly considering that the proposed site is located next to regional roads (R37, R555 and R518). Given the undulating topography of the site and the proximity to these routes, the impact can be considered definite and long term. Cumulative impact will be higher than anticipated due to existing power lines and substations. A visual impact study will be conducted during the EIA phase. The visual cumulative impacts and mitigation measures within the proposed study area are provided as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Visual	No	Negative	Local	Long Term	High	Definite	High
	Yes	Negative	Local	Long Term	Moderate	medium	Medium

Corrective Actions	<ul style="list-style-type: none"> Keep the construction sites and camps neat, clean and organized in order to portray a tidy appearance; and Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height.
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10.2.1.4 Traffic Impact

During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. The traffic impacts ratings and mitigation measures associated with the proposed project presented in the table below as follows.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Traffic	No	Negative	Regional	Short Term	High	Medium	Medium
	Yes	Negative	Local	Short Term	Moderate	Low	Low
Corrective Actions	<ul style="list-style-type: none"> The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads; Access roads must be clearly marked; and Delivery vehicles must comply with all traffic laws and bylaws. 						

10.3 PLAN OF STUDY FOR EIA

The Scoping phase is fundamental as it allows for the identification of potential impacts on the environment, as well as facilitation of the process of compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews as well as previous environmental studies conducted in the area; it therefore, provides a comprehensive baseline of the environment at the proposed site.

This Scoping Process has followed the appropriate standards and procedure for the EIA application, as set out in the NEMA and the EIA Regulations of April 2017. The study includes a description of the various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment of the EIA process. Impact significance of the proposed activity on the environment will be assessed in the EIA phase with the assistance of the various specialist studies.

The purpose of this section is to outline how the EIA for the proposed development will proceed during EIA phase. The detailed assessment phase of the EIA process entails the integration of the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMP. This section provides specific terms of reference and impact assessment methodology for utilisation by the specialist team and EAP.

The Plan of Study for EIA is intended to provide a summary of the key findings of the Scoping Phase and to describe the activities to be undertaken during impact assessment. The Plan of Study must provide the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- A description of the aspects to be assessed as part of the environmental impact assessment process;
- Aspects to be assessed by specialists;
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- A description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- Particulars of the public participation process that will be conducted during the EIA process;
- A description of the tasks that will be undertaken as part of the environmental impact assessment process; and
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The EAP will ensure that the entire process is undertaken as dictated by the Regulations.

10.3.1 A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY

The scoping phase assessed technical, route and structural alternatives. These alternatives will be assessed further during the EIA. The preferred route alternative will be the route with least environmental impacts as well as providing most benefits to the socio-economy.

10.3.1.1 Route alternatives

The alignments to be assessed further during the EIA are Corridors 1, 2, 3 and the No-Go Alternative.

10.3.1.2 Technical

The technical alternatives that were considered included above ground power lines as well as underground. Following which the option of constructing an underground cable was assessed and dismissed during the scoping phase of the project. The dismissal was based on the technical non-feasibility due to the geology and topography of the proposed routes as well as consideration of advantages and disadvantages as indicated in Table 16 below.

Table 17: Advantages and Disadvantages of Underground and Aboveground

	Advantages	Disadvantages
Underground 400 kV power line	<ul style="list-style-type: none"> Minimal Visual Impact 	<ul style="list-style-type: none"> Increased ground disturbance, therefore increased impact on sensitive environments. High maintenance cost High construction costs; underground costs 4 times more than the above ground cables
Above Ground 400kV power line	<ul style="list-style-type: none"> Minimal ground disturbance therefore reduced impact on sensitive environments. Economically feasible as it offers a cost saving Easy maintenance and reduced maintenance cost 	<ul style="list-style-type: none"> Considerable Visual Impact

It is therefore evident that the merits of the underground option are minimal, given the nature of the terrain as well as other technical requirements the underground option is not feasible. Subsequently this alternative will not be assessed any further during the EIA. The aboveground (overhead option) is the remaining option which will be assessed further

10.3.1.3 Structural

Structural design alternatives include the following:

- Cross-Rope suspension type;
- Self-supporting type; and
- Guyed V towers.

10.3.2 A DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The following are aspects to be assessed further as part of the EIA:

- Agriculture;
- Avifauna;
- Biodiversity (flora and fauna);
- Heritage and archaeology;
- Hydrology;
- Visual;
- Noise;
- Waste management;
- Ecotourism;
- Traffic; and
- Social.

10.3.3 ASPECTS TO BE ASSESSED BY THE SPECIALISTS

During the draft scoping phase, five specialist studies were undertaken and these include Biodiversity, Heritage, Avifauna, Social Impact Assessment and Agricultural Studies and their reports are attached herein as Appendices C. The studies undertaken during the scoping phase assessed all the alternative

corridors and will continue with all three corridors as well as the No-go option during the EIA phase. Additional studies that may become necessary during the EIA phase include:

- Visual Impact Assessment; and
- Ecotourism Assessment

Table 18: Aspects to be assessed by the specialist

Specialist Study	Specialist	Aspects
Biodiversity	Simon Todd	Flora and fauna
Heritage	Munyadziwa Magoma of Vhubvo Archaeo-Heritage Consultants	Heritage and Palaeontology
Avifauna	Jon Smallie	Avifauna
Agriculture	Garry Peterson of ARC	Soils and Agricultural potential
Social	Neville Bews	Hydrology and Wetland
Visual	Young	Young

10.3.4 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS

The description of the proposed method of assessing the duration and significance is included in Section 7.6, Table 17 above.

10.3.4.1 An indication of the stages at which the competent authority will be consulted

Figure 16 below indicates the different stages at which the Competent Authority will be consulted.

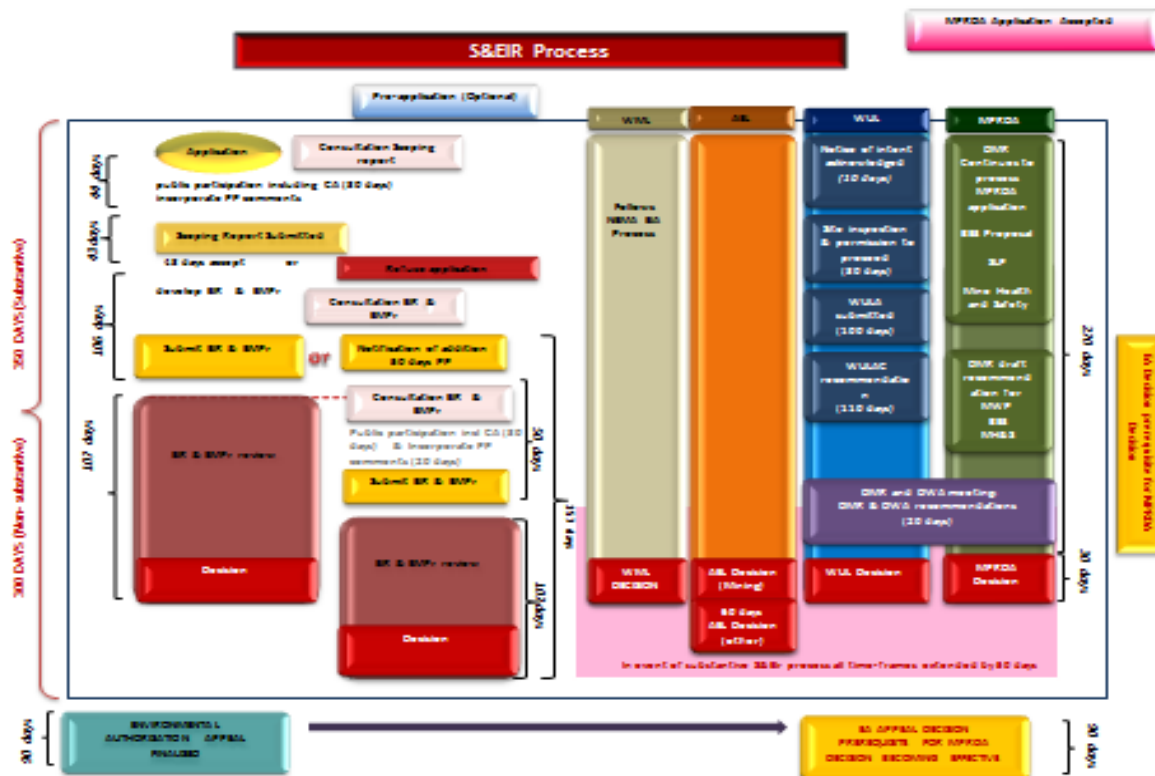


Figure 17: Stages for submitting the reports to the Competent Authority

10.3.4.2 Scoping Phase

The draft Scoping Report together with the Application will be submitted to DEA for review and comment. The EAP will consider the comments and prepare responses. In addition, the report will be sent to all stakeholders to review and comment for a period of 30 days, of which any comments or issues raised will be addressed appropriately. The final Scoping Report will be submitted to the DEA for consideration.

10.3.4.3 Environmental Impact Assessment Phase

The draft Environmental Impact Assessment Report will be prepared and distributed for public review and comments. Further, copies of the draft EIA will be submitted to the DEA and other stakeholders as well. The final EIR which includes all comments received, specialist reports and recommendations will be submitted to DEA for decision making.

The extensive database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The

database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIA Report for review and will be given 30 days to provide their comments.

The comments received will be incorporated into an updated Comments & Response Report (CRR). Additional public consultation will take place in the form of public meetings and focus group meetings as appropriate.

The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development.

In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made to the report. The Final EIA Report will be submitted to the DEA, subsequent to the second phase of public consultation

10.3.5 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The extensive database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the Draft EIA Report for review and will be given 30 days to provide their comment.

The comments received during the review period will be incorporated into an updated Comments & Response Report. Further public consultation will take place in the form of public meetings and focus group meetings as appropriate.

The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist

input, and also to provide the stakeholders with the opportunity to further comment on the proposed development.

In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made and the final EIA Report will be compiled and submitted to the DEA.

10.3.5.1 Advertising

The commencement of the EIA process i.e. the Scoping Phase was advertised in a local newspaper in English. The proposed project was further announced publicly through the following forms of information sharing:

- Newspaper adverts providing a description of the proposed development and location, as well as contact details of where more information can be obtained and announcing the availability of the draft Report for review and comment;
- A2 and A3 notices in English and sepedi were placed at conspicuous locations along the study area. Notices were also placed at the route alternative sites as well as at the Local Municipalities offices within the proposed study area;
- A5 notices were distributed in the immediate vicinity of the development; and
- Letters were submitted to key stakeholders.

Further advertising will take place during the EIA phase and will relate to the availability of the reports for public review and announcement of public meetings that will be held at strategically located sites, which will allow for maximum attendance.

10.3.5.2 Interaction with DEA and Provincial Departments

Interaction with DEA and the other provincial authorities with jurisdiction on the proposed development undertaken during the Scoping Phase will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the final Scoping Report to DEA;

- A consultation meeting with various stakeholders and I&APs as appropriate, to discuss the findings of the Draft EIA;
- Submission of the Draft final EIA report following a public review period; and
- Notification of registered I&APs of the EA once it is issued.

The draft EIR will be reviewed by I&AP's, authorities and key stakeholders. Furthermore, Report will also be published and the made available on Nsovo website for public review and also submitted to the following authorities:

Table 19 : I&AP's, authorities and key stakeholders to review draft EIR

I&AP's, Authorities and key stakeholders to review draft EIR	
Departments	Municipalities
National Department of Environmental Affairs;	Capricorn District Municipality
Limpopo Department of Economic Development, Environment and Tourism;	Sekhukhune District Municipality
National Department of Water and Sanitation;	Polokwane Local Municipality;
Limpopo Department of Transport and Public Works	Lepelle-Nkumpi Local Municipality;
Limpopo Department of Water and Sanitation	Makhuduthamaga Local Municipality
Limpopo Heritage Resource Agency	Fetakgomo Greater Tubatse Local Municipality

10.3.5.3 Developing a Strategy and Resolving Key Issues

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out;
- Use of the Public Participation Meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- Openly and honestly relating both positive and negative impacts of the proposed development during the Public Meetings; and
- Allowing the public to understand the consequences of the proposed development on the area.

10.4 A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The section below indicates the tasks that will be undertaken as part of the EIA process.

10.4.1.1 Preparation of the draft EIA Report and EMPr

The draft EIA Report and EMPr will be prepared as per Appendices 3 and 4 of the 2017 EIA Regulations and will include input from the specialist studies as indicated in Section 7.7.3 above.

Contents of the draft EIR (Appendix 3) will include the following:

- Details and expertise of the EAP;
- Location of the Activity;
- A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity;
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity;
- An assessment of each identified potentially significant impact and risk including (i) and (vii) as per the Regulations;
- A summary of the findings and recommendations of specialist reports;
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations;

- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
- The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;
- A description of any assumption, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- The period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;
- The undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations;

An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations;

Contents of the EMPr (Appendix 4) will include the following:

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including (i) to (v) of the 2014 EIA Regulations as amended;

- A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated on (i) to (iv) of the EIA 2017 Regulations.
- The method of monitoring the implementation of the impact management actions contemplated above;
- The frequency of monitoring the implementation of the impact management actions contemplated above;
- An indication of the persons who will be responsible for the implementation of the impact management actions;
- The time periods within which the impact management actions contemplated above must be implemented;
- The mechanism for monitoring compliance with the impact management actions contemplated above;
- A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;
- An environmental awareness plan describing the manner in which-
 - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- Any specific information that may be required by the competent authority.

10.4.1.2 Public Participation Process

The draft EIA Report will be distributed to I&APs as well as the Organs of State for a 30 days review and comments period. Various means of notifying the I&APs of the availability of the draft EIA Report will be used and this include newspaper advert, e-mails, letters etc. The public participation process will be undertaken as indicated on Section 7.7.7 above.

10.4.1.3 Preparation of the final EIA Report and EMPr

The final EIA Report and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations as amended, further, it will be submitted to DEA in hard copy and electronic version (CD) and will include the following:

10.4.2 IDENTIFY SUITABLE MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED

The aspects that will be assessed have been identified and their potential impacts and mitigation measures are indicated on Sections 7.5.1 and 7.7.2. The proposed method of assessing environmental aspects is included on Section 7.6, Table 17 above.

11. UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

In undertaking the draft and final Scoping phases of the project the EAP has taken into consideration the requirements stipulated in the EIA Regulation of April 2017 as amended, as well as other relevant Acts and Regulations. The EAP hereby confirm that with the information available at the time of preparing the Scoping Report and the reports prepared by the specialists, the following has been taken into account in preparing this report:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties; and
- Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to **Appendix E3** for the Declaration of the EAP.

12. AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT

The draft Plan of Study for EIA is part of the draft Scoping Report which will be made available to I&APs and Organs of State for a 30 days review and comment period. Comments/issues raised will be addressed and included in the Issues and Response Report (**Appendix D4**).

No agreement between the EAP and I&APs is in place.

13. WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information required by the authority; should it be required it will be included accordingly.

14. ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT.

This Report has been prepared in terms of NEMA, its respective 2014 EIA Regulations as well as other various Acts. Information that is required by the NEMA has been included in the Scoping Report and will also be included in the EIA phase.

15. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

15.1 ASSUMPTIONS

- It is assumed that technical data supplied by the client was correct and valid at the time of compilation of specialist studies and the final EIA report.
- It is furthermore assumed that the alternatives presented by the client are feasible.

15.2 LIMITATIONS

15.2.1 PUBLIC PARTICIPATION PROCESS

Given the magnitude of the project and the various extent and portions of farms in the area of which some are private and not easily accessible, it is likely that some I&APs were not reached. However, efforts were made as part of the process to advertise on local media as well as placing of notices at noticeable places within the communities.

15.2.2 LITERATURE REVIEWS IS VIEWED AS CORRECT

The compilation of the reports was based on various literature reviews which were viewed as correct at the time. However, it is acknowledged that there might be some gaps in knowledge with regards to the literature reviewed although concerted efforts were made to attain as much information as possible.

15.2.3 HERITAGE STUDY

It is possible that the Phase 1 HIA may have missed heritage resources in the project area, as some heritage sites may occur in thick clumps of vegetation while others may lie below the surface of the earth and may only be exposed once development commence. Some of the sections of the corridors were not assessed due to access challenges. Hence, a walk-down is recommended prior to commencement of construction activities.

15.2.4 VEGETATION ASSESSMENT

Vegetation studies should be conducted during the growing season of all plant species that may potentially occur. In the absence of guidance documents for biodiversity assessment in Limpopo, the Mpumalanga guidelines were used as best practise. According to the Mpumalanga Minimum Requirements for Biodiversity Assessment (Mpumalanga Tourism and Parks Agency, 2008):

“A floristic (plant) survey must be conducted during the growing season of all species that may potentially occur (this may require more than one season’s survey in order to identify flowering species) with two (2) visits undertaken (November & February). Visits during other seasons will be determined by the flowering and fruiting times of species that do not occur during the summer.”

However, only one season survey was undertaken in October 2017.

16. CONCLUSION

The Draft Scoping study was undertaken in accordance with the requirements of the NEMA and the EIA Regulations as well as associated Legislations. The corridor alternatives have been proposed and the primary objective was to assess the suitability of each corridor for the intended use as well as to assess the impacts of the proposed 400kV Maphutha-Witkop power-line. 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.

16.1 FATAL FLAWS

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 recommended mitigation measures and a summary of site suitability and residual impacts will further be assessed in detail during the EIA phase. Such potential impacts include the following:

- Impacts on flora and fauna;
- Impacts on avifauna;
- Impacts on water resources (Hydrology);
- Impacts on heritage and archaeology;
- Impact on visual;

- Impact on noise;
- Traffic impact; and
- Impact on agriculture.

The subsequent EIA phase will provide a detailed assessment of the identified aspect, rate the significance accordingly and propose mitigation measures as applicable. Based on all the findings and assessment of impacts by the EAP, all route alternatives (Corridors 1, 2 and 3) are feasible for the proposed development and will therefore be assessed further in the EIA phase. Therefore, the three route alternative as well as the No-Go option will be assessed comprehensively taking into consideration specialist studies that have been recommended as part of the PPP; following which the preferred corridor will be selected.

17. REFERENCES

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