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FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT (FEIAR)

LIMPOPO EAST CORRIDOR STRENGTHENING PROJECT

**PROPOSED CONSTRUCTION OF ±110KM 400KV POWER LINE FROM FOSKOR MTS TO SPENCER MTS WITHIN
MOPANI DISTRICT MUNICIPALITY, LIMPOPO PROVINCE**

DEA REF: 14/12/16/3/3/2/1076



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<p>This document presents the Final Environmental Impact Assessment Report for the Limpopo East Corridor Strengthening Project and the information and assessment presented is based on the information supplied by the 'applicant', Eskom Holdings SOC Limited, environmental baseline data collected during the field surveys, Specialist assessments/ studies conducted between October 2016 and September 2017 and stakeholder opinion.</p>	

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EXECUTIVE SUMMARY

1. BACKGROUND

Mining operations, residential, agricultural and industrial activities in some parts of Limpopo Province are supplied by the Polokwane Customer Load Network (PCLN) which is comprised of 4 substations with Spencer 275/132kV substation being one of them. Spencer substation is located approximately 37km south west of Giyani and is currently fed by 275kV power lines from Tabor and Witkop substations located approximately 86km and 136km respectively. In addition, the substation is equipped with 2x250MVA, 275/132kV transformers. There are 132kV power lines which link into distribution substations within the area and that also interconnect Spencer and Foskor MTS with the distribution substations. The load profile undertaken for the Province showed that Spencer substation will be having a peak demand of 318MVA by 2018. Eskom Transmission Grid Planning therefore initiated a study to investigate possible alternatives and solutions to address the transformation constraints at Spencer MTS, as well as 275kV transmission network constraints on the network supplying Spencer MTS supply zone. The activities identified to address these constraints entailed the following:

- i. Construct a 400kV power line from Foskor Substation to Spencer Substation with a length of approximately 110km.
- i. Establish 400/132kV transformation yard and install 1 x 500MVA, 400/132kV transformer at Spencer Substation; and
- ii. Establish 400/275kV transformation at Foskor substation.

A separate project to obtain the environmental authorization of the 400/275kV transformation at Foskor substation was completed on the 23rd of February 2018. This report will thus focus on the Environmental Impact Assessment for the proposed construction of the 400kV power line from Foskor substation to Spencer substation and the upgrade of Spencer substation. It should also be noted that this report forms part of a new application as the previous application (DEA Ref: 14/12/16/3/3/2/1023) was closed as per Section 45 of the EIA Regulations.

2. LEGISLATIVE REQUIREMENTS

2.1 First Application

According to Listing Notice 1, 2 and 3 of the EIA Regulations, Government Notice R982 as amended in April 2017, undertaking these activities will result in detrimental impacts to the environment. Eskom Holdings SOC Limited has therefore appointed DIGES Group to carry out the Environmental Impact Assessment for the proposed works in compliance with the EIA Regulations, Government Notice R982 as amended. As part of the Environmental Impact Assessment (EIA) application for the proposed

development, an application and draft scoping report were submitted on the 22nd of September 2017 and the project was assigned DEA Ref. No.: 14/12/16/3/3/2/1023. The final scoping report was accepted thereby initiating the EIA Phase. Activity 27 of Listing Notice 1 (Government Notice R983 as amended), 9 of Listing Notice 2 (Government Notice R984 as amended) and activity 12 e(ii) of Listing Notice 3 were applied for. It should be noted that at project inception, the Background Information Document and newspaper adverts only indicated that activities 14 and 27 of Listing Notice 1 and activity 9 of Listing Notice 2 were being applied for. After numerous discussions with the biodiversity specialist, it was also concluded that activity 12e(ii) of Listing Notice 3 as amended should also be applied for as more than 300m² of vegetation within CBA areas would be cleared during construction. In addition, taking into account the comments from the Competent Authority, activity 14 of Listing Notice 1 as amended was removed from the application as transformer oil is not classified as a dangerous good according to SANS 10234: supplement 2008 1.00.

The Final EIAR submitted on the 8th of May 2018 to DEA was not reviewed as the file had been closed due to the 1 day late submission. This was done in accordance with Section 45 of the EIA Regulations as amended. Reference is made to Appendix B-4 for the lapsing of timeframe letter from the Department. This has resulted in the reapplication of the proposed project. This reapplication entails the scope of work as detailed in the Background Section. Reference is made to the items being applied for in relation to the scope:

Relevant Government Notice	Activity No.	Description	Applicability
R983 (327)	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	The expansion of the transformation yard at Spencer substation requires ±9 ha.
R983 (R327)	30	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	Clearing of indigenous vegetation within the servitude and within CBA areas during construction.
R984	9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an	Construction of ±110km, 400kV power line from Foskop substation to Spencer substation.

		urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity.	
324	12e(ii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans	Clearing of indigenous vegetation at towers within CBA areas during construction
324	12e(iii)	On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	300m ² of indigenous vegetation will be cleared in areas zoned as conservation (nature reserves) surrounding Foskop substation

An application for the proposed project was resubmitted to DEA on the 12th of June 2018 with a draft Environmental Impact Assessment Report and a request for exemption to carry out activities as specified in sub-regulation 41(2)(a), (b), (c) and (d). Reference is made to Appendix B-1B for the acknowledgement letter received on the 26th of June 2018. DEA assigned the project, the following reference no. 14/12/3/3/2/1076.

3. OBJECTIVES OF THE EIA PHASE

The main objectives of this Environmental Impact Assessment report are thus:

- To ensure that all relevant environmental legal requirements will be met by Eskom Holdings SOC Ltd;
- To provide information on the proposed development by describing the nature and scale thereof;
- To define the reasonable and practical alternatives to the project;
- To identify the likely beneficial and detrimental consequences of the project;
- To ensure that all environmental consequences are recognized early on and taken into consideration in the design, construction, operation and maintenance of the activity; and

- To determine and recommend a set of environmental conditions and appropriate actions to mitigate any adverse effects on the physical, biological and human environment that will ensure that the study area is developed and operated in an environmentally sound management.

4. ASSUMPTIONS AND LIMITATIONS

A full list of the assumptions made during this EIA and the gaps in knowledge and information are given in the report. A summary of some of the assumptions made are listed below:

- It is assumed that, Eskom has provided adequate details with regards to the activities including construction and operation activities;
- The information with regards to land ownership is correct and that all the affected land-owners have been identified;
- It is assumed that the specialists' reports are factual and give a correct indication of the environment and how the project activities will impact on these resources; and
- It is also assumed that the public participation carried out is adequate and has identified all the Interested and Affected Parties.

5. PROJECT DESCRIPTION AND LOCATION

The proposed project addressed in this document, involves the construction and operation of the following infrastructure:

- ❑ ±110km, 400kV power line from Foskor MTS near Phalaborwa to Spencer MTS near Mohlabaneng village. Two alternative corridors and two deviations from these corridors have been identified and will be assessed. Though a 400kV power line requires 55m wide servitude, this study will assess a 3000m wide corridor to cater for constraints which might be posed by the location of physical features and the final engineering designs. The type of tower to be used can only be finalized after the power line has been designed. However, the following three towers are usually used for the 400kV power line: cross rope suspension, guyed suspension tower and self-supporting tower. It should be noted that the cross rope suspension tower requires 75m width at tower location;
- ❑ 400/132kV transformation yard and 1 x 500MVA, 400/132kV transformer which will cater for the proposed 400kV power line coming from Foskor MTS. This extension will require a footprint area of ±9 ha; and
- ❑ A transformer oil holding dam with a capacity of 120m³. The oil dam is required to contain any spillage from the 1 x500MVA, 400/132kV transformer and to prevent pollution to the environment thereby ensuring compliance with Environmental Legislation.

The proposed project is located within Mopani District Municipality and will span across four Local Municipalities; Ba-Phalaborwa, Greater Letaba, Greater Tzaneen and Maruleng. The District Municipality is in the north east of Limpopo Province and can be accessed via the R71 from Tzaneen, R40 from Lydenburg, R81 from Polokwane and various district roads. 86% of the project area is in a natural or near-natural state and this is largely due to the conservation and protected areas that are within the District Municipality. The land cover within the protected and conservation area is characterized of woodland, open bushland, thicket or dense bushland and grassland. Foskop substation is within Foskop Mine in Phalaborwa. Rural settlements (Mohlabaeng village being the closest) are in areas surrounding Spencer substation and subsistence agriculture and grazing also occurs close to the settlements. Commercial agriculture is also concentrated along the Groot Letaba River.

6. ALTERNATIVES

POWER LINE CORRIDORS

Corridor 1

The natural woodland in the study area between Spencer MTS and the R529 provincial road has been heavily disturbed and eradicated in places. Bush clearing and removal of trees is clearly visible in some areas, and evidence of grazing pressure is evident in the depleted state of the grass layer and dense bush encroachment in places, especially in the immediate vicinity of towns and settlements. Large sections of the study area have been completely transformed by human settlement and subsistence farming. Very little undisturbed woodland remains. The woodland areas are utilised mainly for live-stock grazing. The state of the woodland in the study area between the R529 and the Foskop MTS in Phalaborwa is markedly different and consists of mostly undisturbed, pristine savanna, utilised for game farming and eco-tourism. Large trees are plentiful and the grass layer is dense. The area is considered to have a moderately high to high ecological integrity and has a wide range of fauna within the nature and game reserves. According to the Limpopo Conservation Plan v2, the corridor is also characterised of Critical Biodiversity Areas (CBA1 and CBA2 and associated ecological corridors). In addition, the project area is dissected by Groot Letaba River where orchard farms are concentrated. The corridor also crosses Olifants and Ga-Selati river, drainage lines and intermittent streams. It should be noted that Corridor 1 follows a direct route from Foskop to Spencer substation also crossing farms that are utilised by the National Defence Forces for training. Corridor 1 is characterised of irregular plans with low ridges in areas surrounding Foskop substation and Selati Game Reserve whilst the areas surrounding Spencer substation area characterised of plains with low hill. Reference is made to the Locality Map overleaf.

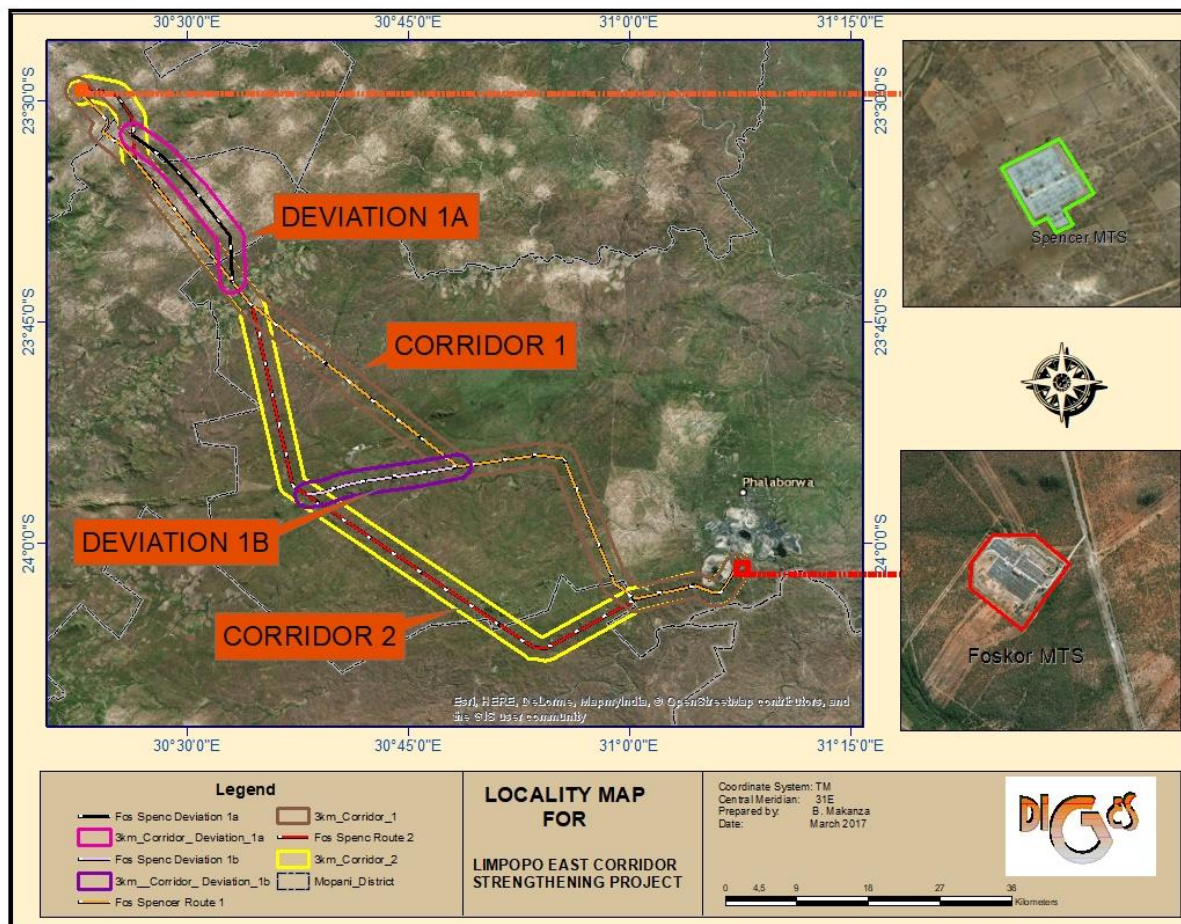
Alternative Corridor 2

This corridor is located on a similar landscape to that of Corridor 1. Certain portions of this corridor, especially north of the Groot Letaba River is the same as that which is proposed for corridor 1. Of significance is that this corridor transverses across section of Olifants North Game Reserve and landing strips. Thus, while the general area around the proposed corridor is disturbed, the area adjoining the Nature reserves is still intact. The area south of the river is also characterized of CBA1, CBA2 and associated ecological corridors. Of note is that the section of the corridor will run parallel R526, resulting in it being highly visible for tourists visiting Selati Game Reserve and Leopard Rock. Corridor 1 is characterised of irregular plains with low ridges in areas surrounding Foskor substation and Selati Game Reserve whilst the areas surrounding Gravelotte are characterised of high hills and level plains in some sections. At Spencer substation area characterised of plains with low hill. Reference is made to the Locality Map overleaf.

Alternative Deviation (s)

To cater for areas that are inaccessible, Deviation 1a and 1b were proposed. Deviation 1a is on an area which is under extreme residential sites, there is no large scale farming activities on this area, and family graves are expected in this area due to its high residential setting.

Deviation 1b is at the boundary of Selati Game Reserve, and is running parallel an existing 132kV power line and traverses undulating environment, this area is also characterised by isolated farmsteads. In terms of visual impact, these deviations whose current impacts include roads, fences, buildings as well as powerlines and telephone lines possesses a visual impact of low to moderate.



Locality Map for the proposed project

SPENCER SUBSTATION STRUCTURE

Substations are built to ESKOM's specific standards in terms of their structure and layout for operation and maintenance purposes. The proposed 400/132kV transformation yard and 1x500MVA, 400/132kV transformer at Spencer Substation is therefore expected to be generic with standard specification for such infrastructure.

OPERATION ALTERNATIVES

Operation alternatives were not considered because ESKOM has standards and regulations in place for the operation and maintenance of 400kV power lines and 400/132kV substations.

ACTIVITY ALTERNATIVES

Eskom ascertained that to strengthen the Limpopo East Corridor, power had to be transmitted from Foskor MTS to the existing Spencer MTS. Power can be transmitted by either overhead power lines or

underground power lines. The advantages and disadvantages for installing either the underground or the overhead power lines are discussed in the table below and these are mainly related to magnetic fields, engineering and costs.

Life cycle	Overhead line	Underground cable system
Capital costs	Lowest cost option Medium Voltage (6.6kV-33kV): R250k/km High Voltage (44-132kV): R3m/km Extra High Voltage (132-400kV): R8m/km	4 to 10 times cost of OHL Medium Voltage (6.6kV-33kV): R2,5m/km High Voltage (44-132kV): R12m/km (400MVA) Extra High Voltage (132-400kV):R30m/km (1600MVA)
Feeder route	Registered servitude required	Less space required (installation in road reserve)
Construction	Poles, pylons, foundations, stays and conductor (Pylon footprint dependant on tower design)	Fully trenched and re-instated route
Installation constraints	Trees, spanning and tension profiles, buildings, settlements	Open trenches, traffic considerations, theft (during installation – open trench prior to energising), jointing bays, river, road crossings
Protection	Auto reclosing to cater for temporary faults	No auto reclosing allowed
Life cycle	Overhead line	Underground cable system
Breakdown maintenance	Shorter repair times (hours), visual fault finding	Longer repair times, specialised fault finding methods (days), specialised skills
Maintenance constraints	Servitude cleaning (trees, etc.) Easy maintenance and reduced maintenance costs.	Specialised skills and high maintenance costs.
Operational constraints	Long lines, conductor jumper cutting theft, steel lattice support structure theft, pylon footing copper electrode theft, vandalism (shooting insulators), pollution	Prone to copper theft where exposed e.g. terminations to overhead lines and equipment, external contractor damage e.g. due to fibre optic expansion projects
Performance	Exposure to weather related faults (several intermittent faults)	Protected from weather related faults, increased reliability
Visual	Considerable visual impact	Minimal visual impact
Ground disturbance	Minimal ground disturbance therefore reduced impact on sensitive environments.	Increased ground disturbance therefore increased impact on sensitive environments

According to Eskom, the cost for constructing the Foskop-Spencer overhead power line using the 3 x IEC 315 conductors is R2 047 523.47 whilst the cost for 1200mm² Al conductor XLPE cable will be R26,5m split as follows:

- i. R12m/km for the cable;
- ii. R7.5m/km for the installation; and
- iii. R7m (once off) for after installation testing and commissioning.

Based on these aspects, underground cables were not considered as a viable option for strengthening the network.

NO-GO ALTERNATIVES

The 'no-go' alternative assumes that the activity does not go ahead implying that the current state does not change; power lines and substation upgrade will not be constructed. This option would entail not strengthening the existing network to test the robustness of the Spencer Network.

7. PUBLIC PARTICIPATION PROCESS (PPP)

The following PPP activities were carried out during the first application (14/12/16/3/3/2/1023) and there were undertaken in accordance to Section 39-44 of the EIA Regulations as amended:

Site Reconnaissance: A reconnaissance site visit was undertaken at the inception of the Scoping phase. This was done to develop the preliminary understanding of the social context (representative structures; language; communication media, etc.). The outcome of this site visit was that the information to the communities in the receiving environment would best be distributed via leadership structures that are available in these communities, namely traditional leadership and different Landowners Groupings. In addition, local officers were used to for communication purposes to mitigate the issue of language in meetings with the recognized leadership structures.

Stakeholder Identification: With the help of land-owners' database developed by Potlako Negotiators and Services (Pty) Ltd and through networking and advertising, I&APs were identified and these I&APs are currently registered on the database. Two separate databases are maintained viz. the database for landowners and the database for all other stakeholders (I&APs). The two databases of registered stakeholders submitted with this report includes stakeholders from:

- National, Provincial and Local Government;
- Landowners;
- Non-Governmental Organizations; and
- Business, Industry & Tourism.

Notification: To create awareness, use was made of Background Information Document (BID), emails; telephone calls; newspaper advertisements and site notices; visits to different Traditional

Authority offices and municipal offices. Visiting Traditional Authority offices and municipal offices also helped the PPP Team to establish the preferred consultation process in the area. Advertisements were also placed in national/provincial and local newspapers notifying them about project and the availability of Draft Scoping Report and to encourage them to comment as well as to attend public meetings that were planned in their area.

Meetings: Different groups of stakeholders were identified and registered as stakeholders. The different stakeholders were consulted separately as their perceptions of such projects differed, hence the need to be consulted with separately and sometimes individually. Proximity of locations of different stakeholders also made it difficult to get them to attend the same meetings. Meetings were held at project inception and at the draft scoping phase stage with the landowners, traditional authorities and stakeholder government departments.

Comments and Response Report: A full description of the comments and issues raised during this phase of the project are recorded in the Comment & Response Report and have also been incorporated into the EIAr. A summary of issues and concerns raised is given in the table below:

ISSUE/CONCERN	DESCRIPTION
Compensation:	compensation for the affected properties was one of the most commonly raised issues by land-owners. Most of the owners were not aware of how land would be valued and the rate which Eskom would pay
Construction Time-frame	Where hunting takes place, the owner’s concern was interference with hunting season during the construction phase.
Health	An issue was raised with regards to the health impacts associated with Electromagnetic Field emitted.
Knowledge of project	most agricultural landowners indicated that they had not received invitations to public forums.
Land-use	The first section of the alternative corridors from Foskop is characterized of nature and game reserves and landowners were concerned about the negative impact the power line would have on the pristine areas. Impacts cited include: loss of fauna habitat, habitat fragmentation and the impact on the sense of place which would result in a negative effect on eco-tourism.
Need and Desirability	an issue that was also raised was why Spencer MTS had to be strengthened by Foskop and not Medupi.
Safety and Security	Most farms with game concern was in terms of poaching and

	security against the contractor’s team. The owners needed to know who would be responsible for the contractor’s team.
Size of buffer	Landowners were concerned about the size of the buffer (3km), under assessment. A number of the owners thought that the entire 3km would be Eskom’s servitude. Owners of land under commercial agriculture (orchards) also needed clarity on what activities are allowed under the line and if pivotal irrigation would still possible.

Consultation at the EIA Phase: Consultation and/or communication with stakeholders and I&APs is ongoing throughout the study process up until an Environmental Authorization is issued. The draft Environmental Impact Assessment Report was submitted for a 30 day period for comments which ended on the 24th of April 2018. Focus Group meetings were then held from the 9th to the 18th of April 2018. The comments and issues raised during this period mainly revolved around habitat fragmentation and the need to keep the environment south of the Letaba intact for conservation and tourism processes. All comments received during the review of the Draft EIAR have been incorporated into this document. Registered stakeholders will be notified about the submission of the FEIAR to DEA.

Reapplication/ Resubmission Process

Due to the lapsing of time of the previous application, a new application was submitted to the Department with the draft EIAR and a letter for public participation exemption of activities indicated in sub-regulation 41(2)(a), (b), (c) and (d). In addition, the registered Interested and Affected Parties (IAP) were notified of the reapplication and the availability of the Draft Environmental Impact Assessment Report (DEIAR). The DEIAR was subjected to a 30 day comment period, from the 14th of June to the 16th of July 2018. Reference is made to Appendix F-8 and F-6G for the public participation exemption letter and notification to IAP. Comments received from stakeholder Departments were the same as those received during the previous application and comments received from IAP were mainly centered on discontent in having the power line traverse across private property. All comments received during the review period were responded to and summarized in the attached Comments and Response Report.

8. SPECIALISTS’ ASSESSMENT

The potential environmental impacts were identified through an internal process based on similar developments and site visits. These included the following:

- Biodiversity impacts;

- Soil/Land Impacts;
- Hydrological impacts;
- Waste impact;
- Air quality impact;
- Visual and noise impact;
- Heritage and archeological impacts;
- Tourism related impacts;
- Land use impacts; and
- Socio-economic Impacts

Based on the impacts anticipated, there was need to have an in depth understanding of the status quo of various aspects of the environment and how the development will have an impact on these environmental aspects. Specialists' studies were therefore required to inform the Environmental Impact Assessment Process by considering the specific nature of the environment within which the development is to be undertaken. The results of these studies serve as a basis to identify the potential impacts expected should the development be undertaken. Noise and air quality impacts while important are likely to be less significant hence they will not require a specialist assessment. This report includes the specialist impact assessment reports commissioned as part of the environmental process and a summary of the Avi-faunal, Ecological, Heritage, Palaeontology, Social, Soil and Land Capability, Tourism, Visual and Wetland Assessment is given below:

- a) **Avifauna:** The habitat through which the proposed Foskop-Spencer 400kV corridors traverse is **low to moderately sensitive** from a bird perspective with high sensitivity areas namely rivers, dams, and a vulture restaurant. Natural woodland habitat in the game farming and eco-tourism areas between Foskop and R529 is likely to attract a number of red data power line sensitive species. Between R529 and Spencer substation, the area is largely modified with fewer Red Data species expected to be attracted to this section of the study area. The construction of the proposed power line poses a **moderate** collision risk and habitat transformation associated with construction and decommissioning of the power line which can be reduced to **low** through the application of the mitigation measures. Based on the assessments undertaken, the preferred corridor is 2 and 1a followed by corridor 2;
- b) **Biodiversity:** The two corridors generally traverse a similar environment with the natural vegetation, north of Great Letaba River having a low ecological condition. This is mainly due to construction activities, grazing, wood collection as well as impacts associated with power lines. The corridors also cross various drainages, intermittent streams as well as rivers such as Groot Letaba River and the area in close proximity to the river is characterized of intensive cultivated

area whilst the area on the banks of the river is associated with a narrow band. It is however possible to get a clear route. The area south of the Groot Letaba River is characterized of game and natural reserves where historical practices have resulted in bush encroachment which lowers the ecological integrity of the area to **moderately high to high**. Based on the existing conditions within the area and the implementation of the mitigation measures, both corridors with the deviations are viable from an ecological integrity.

- c) **Eco-tourism:** The proposed area currently includes mining, settlements, wood harvesting, cultivation, cattle farming, game farming, ecotourism and other associated infrastructure. Tourism is an important activity in sectors of the total power line corridor and include travelling of visitors to local residents and visitors to a number of tourism destinations in the area. Some of the roads are tarred, but the majority of roads are not. A number 132kV powerlines are present in the area in close proximity to Spencer substation and there are telephone lines present and recently the cellphone communications masts are dotting the landscape. Taking into account the significance of the anticipated impacts, i.e., visual impact on tourism, land use changes, corporate demand and alteration of hunting seasons, the proposed construction of a 400kV transmission power line from Foskor Substation (Phalaborwa) to Spencer Substation (near Giyani) and Spencer MTS Upgrading is expected to have a **medium to high** negative significance in the vicinity of sensitive receptors and a **low negative** significance in the vicinity of less sensitive receptors.
- d) **Heritage:** The study area was investigated for sites of heritage significance that might be affected by the proposed construction. The only sign of sites of heritage potential were mostly graves (Especially on Corridor 2), and this can be avoided. 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, particularly within Nature Reserves. Taking all the above information into account, it can be recommended that Corridor One (1) is the preferred alternative from a heritage impact perspective. Two alternatives were investigated for the deviations. Option (s) 1a and 1b. The first option, 1a has the high level of heritage sensitivity. However, Option 1b showed minimal signs of heritage sites. It is therefore recommended that Option 1b can be used as a deviation from Corridor 1 to Corridor 2;
- e) **Paleontology:** The area is underlain by igneous and metamorphic rocks of Swazian to Vaalian aged igneous rocks (3.33 – 2.05 Ga). Due to the very low probability of fossils occurring in the study area it is recommended that the project should be exempted from further paleontological studies.

- f) **Social Impact Assessment:** The social baseline focuses on describing the *status quo* on the site and in the four municipalities, and includes regional contexts where relevant. Statistics South Africa Census 2011 and the district municipality's IDP for 2016/ 2017 were the main sources of data used for preparing the social baseline. Based on the impacts assessed, there will be no fatal flaws associated with the proposed development that can have grave social consequences. The proposed development will have varying negative/ positive impacts ranging from high to low in the area proposed for development. It is apparent that there is little differentiation between the proposed alternatives assessed, either-way, the area will be impacted upon during both the construction and operational phase of the project. The majority of the negative social impacts can respond to well-orchestrated mitigation measures, since they are general construction related problem, such as inflow of workers and jobseekers, possible impacts on farming and conservation activities, noise pollution, increased vehicle movement, as well as safety and security issues.
- g) **Soil and Land Capability:** By definition of parameters of land as stipulated by the Subdivision of Agricultural Land Act, No. 70 of 1970 and the Amended Regulation of Conservation of Agricultural Resources Act No. 43 of 1983 and Part 1 of the Regulation of Conservation of Agricultural Resources Act 43 of 1983), the land occurring under the two power line routes with deviations at the project sites:
- ❑ Consists predominantly of Mispah and Glenrosa soils which are of low potential for agriculture.
 - ❑ The two powerline corridors and the deviations traverse approximately similar landtypes, land capability, geology and vegetation within the study area.
 - ❑ On relative terms, Corridor 1 with Deviations 1b traverses less favourable landtype and hence will be the preferred route for the construction.
 - ❑ Regarding the location of the MTS, the Spencer substation is located on landtype Ae326 which is better soil for crop production agriculture relative the Foskor substation which occurs on landtype Fb180. This landtype is characterised by Mispah and Glenrosa soil forms.
- Based on the assessment, the recommended for the construction of the power line is Corridor 1, via Deviation 1b to merge with Corridor 2 and then proceed north to the Spencer Substation
- h) **Visual:** The proposed powerline corridor traverses through several diverse ecosystems which support many threatened fauna and flora. More than half of the Mopani District is covered by endemic and near endemic vegetation and 9 ecosystems. Having regard for the Mopani region, it is argued that the sense of place of the area is largely intact. As a result, the sense of place of the area is commonly associated with natural resources, which has strong linkages to the tourism sector, and subsistence agriculture. The landscape character of the area is therefore considered to be **moderate to high sensitive**. Due to the extensive nature of the

project, it is also contended that defined areas are of low sensitivity. The overall visual impact of the corridor alternatives is summarised as being of a **medium to high negative significance** in the vicinity of sensitive receptors and a low negative significance in the vicinity of less sensitive receptors. Overall, the sense of place and most other expected impacts of the proposed activity, will not alter to such an extent where users might experience the visual landscape in a less appealing or less positive light.

- i) **Wetlands:** The project footprint falls within the Olifants (WMA) and the area is dominated by sandy rivers and alluvial soils with most associated rivers being intermittent. The study area is comprised of a number of intermittent and perennial streams. River channels are in most cases associated with channeled valley bottom wetlands and floodplains, but are in some cases only associated with the riparian zones and do not have a wetland area nor any wetland indicators. Two floodplain HGM units were identified with the first floodplain wetland associated with the Groot Letaba River whilst the second floodplain wetland was associated with the Olifants River. These wetlands were largely modified with a PES score of D. The two wetlands were assessed to have moderate ecological functioning. In light of the above, alternative 2 is recommended as it cuts through less watercourses and wetlands.

Table 2: **Comparison of Alternatives**

	CORRIDOR 1	CORRIDOR 2	CORRIDOR 1+2+1A+1B
Avifauna			
Biodiversity	1	1	1
Eco-Tourism	1	1	1
Heritage	1	3	2
Paleontology	1	1	1
Social	1	1	1
Soil and Land	2	3	1
Visual	1	1	1
Wetlands	2	1	2

Rating: 1 being the most preferred and 3 being least Preferred

9. ENVIRONMENTAL IMPACT ASSESSMENT PHASE

Based on the outcome of this assessment, the EAP has to recommend to the Department of Environmental Affairs whether the project should be approved and the conditions and/ stipulations of such approval. The recommendations are based on:

- The information provided by the applicant with regards to the project activities;
- Legislative requirements;
- Assumptions and limitations during the assessment;
- The specialists input;
- Geographic Information Systems;
- The public input, i.e., stakeholders and Interested and affected parties; and
- The EAP's past experience.

In summary, the key findings identified in this assessment are detailed below:

The project area is within Mopani District Municipality traversing 4 Local Municipalities which are characterized by pristine areas which are rich in biodiversity of both flora and fauna species, and severely modified vegetation in the vicinity of Spencer substation. The proposed power line alternative corridors fall within the Kruger to Canyons Biosphere Reserve with landscapes of high scenic and conservation value. The first section of the power line south of Groot Letaba River is also within 10km of the Kruger National Park and characterised by informal and formal nature reserves. The natural vegetation in this area is in a fair to good condition with a moderately high to high ecological integrity with both corridors and deviation 1b traversing across Critical Biodiversity Areas. Ecologically, the area north of Groot Letaba River is severely modified for both corridors and substation area with a low ecological integrity. It should be noted that Corridor 1 traverses farm Begin 765LT and Volstruis 753LT and which are currently used by the National Defense Forces for training purposes. Corridor 2 traverses across landing strips at farms Archie 156KT and Lillie 148KT and it also has a larger area characterized of agriculturally productive land.

The area is also endowed with drainage lines, ephemeral and perennial streams/rivers such as Groot Letaba, Olifants and Ga-Selati which are also modified with a low ecological significance. The results of the Visual Impact Assessment for the proposed Limpopo East Corridor Strengthening Project consequently found that the overall visual impact of the route alternatives is summarised as being of a **medium to high** negative significance in the vicinity of sensitive receptors and a **low negative**

significance in the vicinity of less sensitive receptors. The sense of place, and most other expected impacts of the proposed activity, will not alter to such an extent where users might experience the visual landscape in a less appealing or less positive light. From an avi-fauna perspective, collision of birds and habitat transformation poses a **moderate** risk which can be reduced to low with mitigation measures whilst the eco-tourism assessment indicated that the proposed project poses a **medium to high** negative significance. Avi-fauna and wetland assessment preferred Corridor 2 whilst the soil and land capability preferred a combination of corridor 1,2 and 1b. All the other specialists studies indicated that all routes were viable.

Cognizance is taken that generally the project area is pristine, rich in biodiversity and has a booming eco-tourism industry. However there is also a need to strengthen the Limpopo East Corridor thereby indirectly boosting the regional economy. Most of the specialists undertaken have concluded that all the corridors assessed are viable however all the mitigations measures should be effectively implemented. The corridor recommended should be technically viable and should result in minimal residual negative impacts. Taking into account all stakeholder concerns, the specialists' recommendations and my professional experience on related projects, I as an EAP recommend that a combination of Corridor 1, 2 and deviation 1b be authorized where the power line will follow Corridor 1 from Foskor substation until the north eastern border of Selati Game reserve where it will deviate following Corridor 1b to Corridor 2 to Spencer Substation. This route:

- i. avoids a highly visually sensitive area next to R526, which traverses within the backdrop of Selati Game Reserve
- ii. Avoids the farms Begin 765LT and Volstruis 753LT used by the National Defense Forces for training. Military installations and training grounds where live ammunition is used poses a significant risk to power lines and security of supply of the Eskom network. In addition, acquiring this land from the Department of Defense and replacing it with another piece of land poses many challenges since this land has historically been used for this purpose and the neighbors are aware;
- iii. Avoids tourism related infrastructure such as the landing strips on farm Archie 156KT and Lillie 148KT;
- iv. Will traverse in close proximity to the boundaries of Selati Game Reserve thereby minimizing habitat fragmentation; and
- v. At deviation 1b, the corridor runs parallel an existing 132kV power line and towards Spencer Substation the route runs parallel to the existing power line infrastructure where the sense of place has already been modified.

It is further recommended that where there are fences and existing power lines, Eskom should follow these infrastructure to minimize further environmental modification. In addition, the graves observed in Corridor 2, the vulture restaurant in deviation 1b should be marked as 'no-go' areas. The extension of the substation is also recommended as it is within a modified environment and the substation is already existing.

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

An Environmental Management Programme (EMPr) is a plan that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled and monitored. An EMPr was compiled as per Appendix 4 of the EIA Regulations Government Notice R982 as amended and it discusses the impacts that are expected during the construction phase, operational phase and the mitigation measures that have been recommended to minimize the impacts. This document also identifies corrective actions if monitoring indicates that the performance requirements have not been met and notifies the responsible parties to undertake the actions required. Integrated Environmental Management (IEM) principles influenced the development of these measures, which are aimed at achieving broadly acceptable standards at minimum costs. These measures, procedures and monitoring guidelines are designed to ensure that the impacts anticipated as a result of the proposed development are limited to the acceptable significance predicted in this study. The EMPr is attached in Appendix G.

10. RECOMMENDATIONS

The following recommendations must be included within the authorization issued;

- ❑ The stipulations and provisions of the attached Environmental Management Programme on Appendix G be conveyed to and familiarized by the contractor and workers responsible for construction;
- ❑ The final powerline alignment must be inspected on foot by the avifaunal, biodiversity and heritage specialists prior to construction to ascertain if any Red Data species, avi-faunal nests, protected tree species and archaeological objects are present;
- ❑ Permits required by Eskom SOC Ltd from other competent authorities should be acquired before the commencement of the activity;
- ❑ An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with conditions of approval;

- ❑ Demarcate sensitive areas and no-go areas with danger tape to prevent disturbance during construction;
- ❑ Construction activity should be restricted to the immediate footprint of the infrastructure;
- ❑ The river, stream and associated buffers must be treated as sensitive environment areas: caution must be exercised near the watercourses;
- ❑ Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm-water discharge point(s);
- ❑ Only clear larger vegetation that will impact directly to the conductors. No total clearing of the basal layer" must be allowed in the Critical Biodiversity Areas;
- ❑ Plan construction times in such a manner to have the least impact on surrounding properties;
- ❑ Monitor land surface in the vicinity of the substation, access roads and pylons/towers to prevent loss of vegetation;
- ❑ Create a channel for runoff to avoid numerous runoff channels that erode the soil;
- ❑ Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity
- ❑ Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the power line and take immediate corrective action where invasive species are observed to establish;
- ❑ All towers must be placed at least 32m from any drainage line and streams;
- ❑ It must also be noted that, smaller towers or those with a more compact design (e.g. cross-rope suspension towers) should be used. By keeping the proposed lines as straight as possible, fewer strain towers will be required. This is preferable as strain towers are visually obtrusive compared to the suspension towers used when alignments are straight. The galvanising of the pylon should be allowed to weather a matt grey finish rather than be painted silver, as is often the case. This allows the structures to blend in with the existing environmental colours more readily than the silver that is highly reflective especially early morning and late afternoon. Should it be necessary to paint, it is recommended that a neutral matt finish be used; and
- ❑ In order to ensure that health impacts are minimised, structures are not permitted to be constructed underneath the conductors of a Transmission line (i.e. within the servitude). In addition, this fulfils safety requirements, ensuring that no person is able to have physical contact with a line conductor.

TABLE OF CONTENTS

1. INTRODUCTION.....	1
1.1 INTRODUCTION.....	1
1.2 DETAILS OF ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER (EAP).....	2
1.3 BACKGROUND TO EIA STUDY	3
1.3.1 SCREENING PHASE	5
1.3.2 SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT PHASE FOR THE PREVIOUS APPLICATION.....	5
1.3.3 ENVIRONMENTAL IMPACT PHASE	7
1.4 STRUCTURE AND CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT	8
1.4.1 STRUCTURE OF THE REPORT	8
1.4.2 CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR).....	9
1.5 ASSUMPTIONS AND LIMITATIONS	13
2. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS	15
2.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA.....	15
2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998).....	16
2.2.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS	16
2.3 OTHER RELEVANT LEGISLATION	18
3. PROJECT DESCRIPTION	27
3.1 NEED AND DESIRABILITY.....	27
3.1.1 ESKOM'S MANDATE	27
3.1.2 TRANSMISSION SYSTEM	27
3.2 PROJECT ACTIVITIES.....	30
3.3 LOCATION	32
3.3.1 REGIONAL CONTEXT OF THE PROJECT.....	32
3.3.2 SUBSTATION LOCATIONS	33
3.3.3 LAND OWNERSHIP	34
3.4 TECHNICAL DETAILS OF THE PROJECT	45
3.4.1 REQUIREMENTS FOR THE 400kV POWER LINE	45
3.4.2 POWER LINE INFRASTRUCTURE	46
3.4.3 ELECTRIC AND MAGNETIC FIELDS (EMF).....	48
3.4.4 OVERHEAD LINE CORONA, NOISE AND CORONA DISCHARGE	49
3.5 PRE-CONSTRUCTION AND CONSTRUCTION PHASE	49

3.5.1	PRE-CONSTRUCTION	49
3.5.2	CONSTRUCTION PHASE	50
3.5.3	SUBSTATION CONSTRUCTION	53
3.6	BULK SERVICES AND INFRASTRUCTURE	54
3.6.1	WATER	54
3.6.2	SEWERAGE	54
3.6.3	STORM WATER	54
3.6.4	SOLID WASTE	54
3.7	OPERATION AND MAINTENANCE OF THE POWER LINE.....	54
3.7.1	LAND USE AND POWER LINE OPERATION.....	55
3.8	DECOMMISSIONING PHASE	55
4.	<u>ALTERNATIVES</u>	<u>57</u>
4.1	LOCATION ALTERNATIVES	57
4.1.1	ROUTE/ CORRIDOR SELECTION CRITERIA	57
4.1.2	POWER LINE CORRIDOR 1.....	60
4.1.3	POWER LINE CORRIDOR ALTERNATIVE 2	61
4.1.4	FOSKOR-SPENCER DEVIATION 1A (CORRIDOR 1 AND 2)	64
4.1.5	FOSKOR-SPENCER DEVIATION 1B (COMBINATION OF CORRIDOR ALTERNATIVE 1 AND 2).....	65
4.1.6	PREFERRED CORRIDOR SELECTION.....	66
4.1.7	SUBSTATION EXTENSION	72
4.1.8	NO-GO ACTION ALTERNATIVES	72
4.1.9	ACCESS ROUTES	73
4.2	ACTIVITY ALTERNATIVES	73
4.3	SCHEDULING ALTERNATIVES	76
4.4	ADVANTAGES AND DISADVANTAGES OF THE PROPOSED PROJECT.....	76
5.	<u>THE RECEIVING ENVIRONMENT</u>	<u>78</u>
5.1	CLIMATE	78
5.2	SOILS.....	79
5.3	SURFACE WATER RESOURCES	79
5.4	GROUND WATER.....	81
5.5	GEOLOGICAL CONDITIONS	81
5.5.1	LITHOSTRATIGRAPHY	81
5.6	TOPOGRAPHY	82
5.7	FLORA & FAUNA.....	82
5.7.1	FLORA	82

5.7.2	FAUNA.....	86
5.7.3	AVI-FAUNA.....	87
5.8	CRITICAL BIODIVERSITY AREAS.....	87
5.8.1	PROTECTED AND NATURE RESERVES.....	89
5.9	LAND USE.....	91
5.10	ARCHAEOLOGICAL AND PALEONTOLOGICAL ATTRIBUTES.....	93
5.11	VISUAL ENVIRONMENT.....	93
5.12	AIR QUALITY.....	93
5.13	SOCIO-ECONOMIC ENVIRONMENT.....	94
5.13.1	POPULATION DEMOGRAPHICS.....	94
5.13.2	GENDER.....	95
5.13.3	LANGUAGE.....	95
5.13.4	LEVEL OF EDUCATION.....	95
5.13.5	EMPLOYMENT PROFILE.....	95
5.13.6	HOUSEHOLDS BY DWELLING TYPE.....	96
5.13.7	ACCESS TO SERVICES.....	96
5.13.8	ECONOMIC ACTIVITY.....	97
5.13.9	TOURISM.....	98
6.	<u>OVERVIEW OF SPECIALISTS SURVEY.....</u>	99
6.1	AVI-FAUNA IMPACT ASSESSMENT.....	99
6.1.1	ASSUMPTIONS AND LIMITATIONS.....	99
6.1.2	METHODOLOGY.....	100
6.1.3	IMPACT ASSESSMENT.....	100
6.1.4	CONCLUSIONS AND RECOMMENDATIONS.....	101
6.2	BIODIVERSITY IMPACT ASSESSMENT.....	103
6.2.1	ASSUMPTIONS AND LIMITATIONS.....	103
6.2.2	METHODOLOGY.....	103
6.2.3	SUMMARY OF ASSESSMENT.....	104
6.2.4	CONCLUSIONS AND RECOMMENDATION.....	106
6.3	ECO-TOURISM IMPACT ASSESSMENT.....	107
6.3.1	ASSUMPTIONS AND LIMITATIONS.....	107
6.3.2	METHODOLOGY.....	108
6.3.3	ASSESSMENT.....	108
6.3.4	CONCLUSIONS AND RECOMMENDATIONS.....	109
6.4	HERITAGE.....	110

6.4.1	ASSUMPTIONS AND LIMITATIONS	111
6.4.2	METHODOLOGY	111
6.4.3	IMPACT ASSESSMENT	112
6.4.4	CONCLUSION AND RECOMMENDATIONS	113
6.5	PALEONTOLOGY	114
6.5.1	METHODOLOGY.....	115
6.5.2	DESKTOP STUDY	115
6.5.3	RECOMMENDATIONS.....	115
6.6	SOCIAL IMPACT ASSESSMENT.....	115
6.6.1	ASSUMPTIONS AND LIMITATIONS	115
6.6.2	METHODOLOGY.....	116
6.6.3	ASSESSMENT.....	116
6.6.4	CONCLUSION AND RECOMMENDATIONS	117
6.7	SOIL AND LAND CAPABILITY ASSESSMENT	118
6.7.1	ASSUMPTIONS AND LIMITATIONS	118
6.7.2	METHODOLOGY.....	118
6.7.3	ASSESSMENT.....	119
6.7.4	CONCLUSION AND RECOMMENDATIONS	120
6.8	VISUAL IMPACT ASSESSMENT.....	121
6.8.1	ASSUMPTIONS AND LIMITATIONS	122
6.8.2	METHODOLOGY.....	122
6.8.3	ASSESSMENT.....	122
6.8.4	CONCLUSION AND RECOMMENDATIONS	124
6.9	WETLAND ASSESSMENT	126
6.9.1	ASSUMPTIONS AND LIMITATIONS	126
6.9.2	METHODOLOGY.....	127
6.9.3	ASSESSMENT.....	127
6.9.4	CONCLUSION AND RECOMMENDATIONS	128
6.10	COMPARISON OF ALTERNATIVES.....	128
7	PUBLIC PARTICIPATION PROCESS.....	130
7.1	INTRODUCTION.....	130
7.2	OBJECTIVES AND APPROACH TO THE PPP	130
7.3	PUBLIC PARTICIPATION TEAM	131
7.4	LIMITATIONS ASSOCIATED WITH PUBLIC PARTICIPATION PROCESS.....	132
7.5	METHODOLOGY ADOPTED	132

7.6	SUMMARY OF PP ACTIVITIES UNDERTAKEN DURING THE SCOPING PHASE OF THE PREVIOUS APPLICATION	133
7.6.1	SITE RECONNAISSANCE	133
7.6.2	STAKEHOLDER IDENTIFICATION	133
7.6.3	NOTIFICATION:.....	134
7.6.4	MEETINGS.....	134
7.7	PUBLIC PARTICIPATION AT EIA PHASE DURING THE PREVIOUS APPLICATION.....	136
7.7.1	BACKGROUND.....	136
7.7.2	METHODOLOGY.....	137
7.7.3	COMMENTS AND RESPONSE REPORT	138
7.8	PUBLIC PARTICPATION FOR THE NEW APPLICATION.....	139
7.9	CONCLUSION	139
7.10	WAY FORWARD	141
8	<u>POTENTIAL IMPACTS AND DETERMINATION OF SIGNIFICANCE.....</u>	<u>142</u>
8.1	CHARACTERISTICS OF ENVIRONMENTAL IMPACTS	144
8.1.1	CUMULATIVE IMPACTS.....	146
8.1.2	STATUS.....	147
8.1.3	SIGNIFICANCE.....	147
8.2	DETERMINATION OF IMPACT SIGNIFICANCE	148
8.2.1	BIODIVERSITY IMPACT ASSESSMENT	148
8.2.2	SOIL/LAND IMPACTS ASSESSMENT	156
8.2.3	HYDROLOGICAL IMPACTS.....	159
8.2.4	HERITAGE RESOURCES	162
8.2.5	VISUAL IMPACTS.....	164
8.2.6	SOCIAL IMPACT	167
8.2.7	IMPACT SUMMARY.....	175
9.	<u>CONCLUSION.....</u>	<u>176</u>
9.1	ENVIRONMENTAL IMPACT STATEMENT	176
9.2	ENVIRONMENTAL MANAGEMENT PROGRAMME.....	179
9.3	CONCLUSION.....	180
	<u>REFERENCES</u>	<u>191</u>

LIST OF TABLES

<i>Table 2-1: List of Activities for the Power line and Associated Spencer MTS works</i>	17
<i>Table 2-2: Legislative Framework</i>	19
<i>Table 3-1: Load Forecasts for Limpopo CLN</i>	29
<i>Table 3-2: Farm Details and ownership</i>	35
<i>Table 3-3: Technical Details</i>	45
<i>Table 4-1: Weighting and Site Scoring against Criteria</i>	67
<i>Table 4-2: Site Scores against Criteria</i>	69
<i>Table 4-3: Total Site Scorings for each alternatives</i>	71
<i>Table 4-4: Comparison between the Overhead line and the Underground cable system</i>	75
<i>Table 5-1: Average Monthly minimum temperature (°C)</i>	78
<i>Table 5-2: Average Annual Rainfall, 2014-2016</i>	79
<i>Table 5-3: Prominent Rivers within the Project Area</i>	79
<i>Table 5-4: CBA Categories</i>	88
<i>Table 5-5: Protected and Conservation Areas within and near the Project Area</i>	90
<i>Table 5-6: Population and Municipal Land Coverages</i>	94
<i>Table 6-1: Information of some of the archaeological/ heritage sites noted in the proposed area</i>	112
<i>Table 6-2: Comparison of Alternatives</i>	128
<i>Table 7-1: Roles and Experience of PP team</i>	131
<i>Table 7-2: Summary of PP Activities</i>	135
<i>Table 7-3: Location of the DEIAR for Review</i>	137
<i>Table 7-4: Summary of Issues and Concerns Raised</i>	139
<i>Table 8-1: Identification of significant impacts</i>	142
<i>Table 8-2: Characteristics of Environmental Impacts</i>	144
<i>Table 8-3: Categories for Cumulative Impact</i>	147
<i>Table 8-4: Categories for the Status of the Impact</i>	147
<i>Table 8-5: Significance Ratings of Impacts</i>	147
<i>Table 8-6: Flora Assessment</i>	148
<i>Table 8-6: Introduction and Proliferation of Alien Vegetation</i>	150
<i>Table 8-7: Destruction of Fauna Habitat</i>	151
<i>Table 8-8: Avi-fauna</i>	153
<i>Table 8-9: Loss of Agricultural Potential</i>	156
<i>Table 8-10: Soil Erosion</i>	157
<i>Table 8-11: Loss of Riparian Vegetation</i>	159

<i>Table 8-12: Sedimentation of rivers and streams</i>	160
<i>Table 8-13: Decrease in Water Quality</i>	161
<i>Table 8-14: Heritage</i>	162
<i>Table 8-15: Landscape Character</i>	164
<i>Table 8-16: Tourism Value</i>	165
<i>Table 8-17: Reflectivity and Glare of Structures</i>	166
<i>Table 8-18: Waged Labor</i>	167
<i>Table 8-19: Capacity and skills Development</i>	168
<i>Table 8-20: Gendered Division of Labor</i>	168
<i>Table 8-21: Displacement and relocation of households</i>	169
<i>Table 8-22: Influx of workers</i>	170
<i>Table 8-23: Game and Nature Reserves</i>	171
<i>Table 8-24: Land Use Change Impacts on Tourism</i>	172
<i>Table 8-25: Change or alteration of hunting calendars</i>	173
<i>Table 8-26: Impact Summary and Significance Ratings</i>	175
<i>Figure 9-1: Recommended Site</i>	181
<i>Table 9-1: Affected Farms</i>	182

TABLE OF FIGURES

<i>Figure 1-1: Locality Map</i>	1
<i>Figure 1-2: Scoping and EIA Phases</i>	4
<i>Figure 3-1: Electricity Provision in South Africa</i>	27
<i>Figure 3-2: Transmission Network</i>	28
<i>Figure 3-3: Regional Context of Project Area</i>	33
<i>Figure 3-4: Spencer Substation</i>	34
<i>Figure 3-5: Foskop Substation</i>	34
<i>Figure 3-6: Cross Rope Suspension Tower</i>	47
<i>Figure 3-7: Guyed Suspension Tower</i>	47
<i>Figure 3-8: Self-Supporting Tower</i>	48
<i>Figure 3-9: Example of Construction/Storage Camp</i>	51
<i>Figure 3-10: Example of clearing at tower sites</i>	51
<i>Figure 3-11: Example of excavated pits</i>	52
<i>Figure 3-12: Laydown Areas</i>	53
<i>Figure 4-1: Corridor Alternative 1</i>	60

<i>Figure 4-2: Corridor Alternative 2</i>	62
<i>Figure 4-3: The corridor will run parallel the 132kV line</i>	63
<i>Figure 4-4: Corridor 1 and 2 with deviation 1a</i>	64
<i>Figure 4-5: Combination of Alternative 1, 2 and Deviation 1b</i>	65
<i>Figure 4-6: Locality of Deviation 1b</i>	66
<i>Figure 4-2: Substation Layout</i>	72
<i>Figure 5-1: Merekome River</i>	80
<i>Figure 5-2: Dam near Xihoko</i>	80
<i>Figure 5-3: Olifants Water Management Area</i>	81
<i>Figure 5-4: Elevation of Project Area</i>	83
<i>Figure 5-5: Vegetation types within the project area</i>	84
<i>Figure 5-6: Vegetation in some areas near Selati Game Reserve</i>	85
<i>Figure 5-7: Vegetated areas near Spencer Substation</i>	86
<i>Figure 5-8: CBA Areas within Project Area</i>	89
<i>Figure 5-9: Protected areas and nature reserves within project area</i>	91
<i>Figure 5-10: Land cover within project area</i>	92
<i>Figure 6-1: Avi-fauna Sensitivity Map</i>	102
<i>Figure 6-2: Location of Archaeological and grave sites</i>	114
<i>Figure 7-1: Role Players in the PPP</i>	132
<i>Figure 7-2: Role Players</i>	133

LIST OF APPENDICES

Appendix A:	EAPs' CV
Appendix B:	DEA Correspondence
Appendix B-1A:	DEA- Application Acknowledgement Letter
Appendix B-1B:	DEA_Acknowledgement_Reapplication
Appendix B-2:	Scoping Acceptance Letter
Appendix B-3:	Request for Extension
Appendix B-4:	Lapsing of Time
Appendix C:	Layout
Appendix C-1:	Substation Layout
Appendix C-2:	Oil Holding Dam Layout
Appendix C-3:	MSDS Transformer Oil
Appendix C-4:	Power line bend Co-ordinates
Appendix C-5:	Site Photos
Appendix D:	Maps
Appendix D-1:	Locality Map
Appendix D-2:	CBA Map
Appendix D-3:	Sensitivity Map
Appendix E:	Specialists Report
Appendix E-1:	EMF Detailed Study
Appendix E-2:	Avi-fauna Report
Appendix E-3:	Biodiversity Report
Appendix E-4:	Eco-Tourism Report
Appendix E-5:	Heritage and Palaeontology Report
Appendix E-6:	Social Impact Assessment Report
Appendix E-7:	Soil and Land Capability Report
Appendix E-8:	Visual Report
Appendix E-9:	Wetland Delineation Report
Appendix F:	Public Participation
Appendix F-1:	I & AP Database
Appendix F-2:	List of Landowners
Appendix F-3:	Comments and Response Report
Appendix F-4:	Comments
Appendix F-4A:	IAP Comments at Scoping
Appendix F-4B:	IAP Comments at EIA

Appendix F-4C:	Stakeholder Comments at Scoping
Appendix F-4D:	Stakeholder Comments at EIA
Appendix F-4E:	IAP Comments_Reapplication
Appendix F-4F:	Stakeholders Comments_Reapplication
Appendix F-5:	Newspaper Adverts
Appendix F-5A:	At Inception
Appendix F-5B:	At Scoping
Appendix F-5C:	At EIA
Appendix F-6:	Notification
Appendix F-6A:	At Inception
Appendix F-6B:	At Scoping
Appendix F-6C:	At EIA
Appendix F-6D:	Reminder to comment at Scoping
Appendix F-6E:	Reminder to comment at EIAR
Appendix F-6F:	Proof of delivery of DEIAR
Appendix F-6G:	Proof of Notification-New application
Appendix F-6H:	Reminder to comment
Appendix F-7:	Minutes
Appendix F-7A:	Meeting invites at Scoping
Appendix F-7B:	Meeting invites at EIA
Appendix F-7C:	Minutes at Scoping
Appendix F-7D:	Minutes at EIA
Appendix F-8:	Letter for PP Exemption and Affidavit
Appendix G:	Draft EMPr
Appendix H:	Title Deeds

LIST OF ABBREVIATIONS

APNR	Associated Private Nature Reserves
CARA	Conservation of Agricultural Resources Act
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DSR	Draft Scoping Report
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
DME	Department of Minerals and Energy

EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
GDP	Gross Domestic Product
HA	Hectares
IAP	Interested and Affected Parties
IEM	Integrated Environmental Management
LED	Local Economic Development
MTS	Main Transmission Substation
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PNR	Private Nature Reserve
PP	Public Participation
PPP	Public Participation Process
ROW	Right of Way
SAHRA	South African Heritage and Resources Agency
SANDF	South African National Defense Forces
SANS	South African National Standards
TDP	Transmission Development Plan
V	Voltage
WMA	Water Management Area

DEFINITIONS

- 1 **Affected environment:** Those parts of the socio-economic and biophysical environment impacted on by the development.
- 2 **Alien Vegetation:** Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to; all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.
- 3 **Alternatives:** A possible course of action, in place of another that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative layouts or alternative designs, alternative processes and materials. In Integrated Environmental Management, the so-called "no action" alternative may also require investigation in certain circumstances;
- 4 **Assessment:** The process of collecting, organizing, analyzing, interpreting and communicating data that is relevant to some decision.
- 5 **Bio-regional plan:** inform land-use planning and decision-making by a range of sectors whose policies and decisions impact on biodiversity.
- 6 **Conservation Areas:** are areas of land not formally protected by law but informally protected by the current owners and users; and managed at least partly for biodiversity conservation.
- 7 **Critical Biodiversity Areas (CBA1):** are areas that are
 - Irreplaceable;
 - required to meet biodiversity pattern and/or sites that are required to meet each ecological process targets; and
 - natural and near-natural sites including some degraded areas.
- 8 **Critical Biodiversity Areas (CBA2):** these are:
 - Best design selected sites;
 - Areas selected to meet biodiversity pattern and/or sites that are required to meet each ecological process targets;
 - Alternative sites may be available to meet targets; and
 - natural and near-natural sites including some degraded areas, including areas modified by agriculture.
- 9 **Development:** The act of altering or modifying resources to obtain potential benefits.
- 10 **Ecological Support Areas (ESA1):** are areas that are natural, near natural and degraded areas supporting CBAs by maintaining the ecological processes on which CBAs depend.

- 11 **Ecological Support Areas (ESA2):** Areas with no natural habitat that is important for supporting ecological processes.
- 12 **Environment:** The external circumstances, conditions and objects that affect the existence and development of individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects.
- 13 **Environment Authorization:** A written statement from the Department of Environmental Affairs that records its approval of a planned undertaking and the conditions of such an approval.
- 14 **Environmental impact:** The degree of change in environmental components resulting from the effects of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organization's activities or may be indirectly caused by them.
- 15 **Environmental Impact Assessment:** A process of examining the environmental effects of a proposed development.
- 16 **Environmental issue:** A concern felt by one or more parties about some existing, potential or perceived environmental impact.
- 17 **Environmentally Sensitive Area:** An area designated in regional or local land use plans, or by a local, regional, provincial or national government body as being sensitive to disturbance or identified by an applicant as being sensitive for some reason.
- 18 **Erosion:** The process by which material, such as rock or soil, is worn away or removed by wind or water.
- 19 **Evaluation:** The process of weighing information, the act of making value judgments or ascribing values to data to reach a decision;
- 20 **Hazardous substance:** Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SANS 10228-B-The identification and Classification of Dangerous Goods and Substances'.
- 21 **Heritage Site:** A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc.
- 22 **Indigenous Vegetation:** refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years;
- 23 **Integrated environmental management (IEM):** is a process of integrating environmental, Socio-economic and cultural factors in decision making to promote sustainable development. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.

- 24 **Landowner:** The individual or company that owns the land through which the servitude crosses.
- 25 **Mitigation:** the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.
- 26 **Monitoring Programme:** The program for observing the potential environmental effects of a project, resolving specific outstanding environmental issues, and determining the action required based on the result of these activities.
- 27 **National protected area** means-
- a) a special nature reserve;
 - b) a national park; or
 - c) a nature reserve or protected environment-
 - (i) managed by a national organ of state; or (ii) which falls under the jurisdiction of the Minister for any other reason.
- 28 **Nature reserve** means-
- (a) an area declared, or regarded as having been declared, in terms of section 23 of the National Environmental Management: Protected Areas Act, 2003, as a nature reserve; or
 - (b) an area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 23(2) of the National Environmental Management: Protected Areas Act, 2003, be declared as a nature reserve.
- 29 **No Natural Areas Remaining:** are areas without intact habitat remaining.
- 30 **Other Natural Areas:** are areas that still contain natural habitat but that are not required to meet biodiversity targets.
- 31 **Power line:** An overhead line of whatever voltage, erected for the conducting of electricity.
- 32 **Protected Area:** Protected environment means -
- (a) an area declared, or regarded as having been declared, in terms of section 28 of the National Environmental Management: Protected Areas Act, 2003, as a protected environment;
 - (b) an area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 28(2) of the National Environmental Management: Protected Areas Act, 2003, be declared as a protected environment; or
 - (c) an area which was a lake area in terms of the Lake Areas Development Act, 1975 (Act No. 39 of 1975), immediately before the repeal of that Act by section 90(1) of the National Environmental Management: Protected Areas Act, 2003,

- 33 **Private nature reserve** means privately owned land declared as a nature reserve under section 23 of the National Environmental Management: Protected Areas Act, 2003.
- 34 **Right of Way (ROW):** The strip of land acquired for which ESKOM has obtained the rights for construction and operation of the distribution line.
- 35 **Scoping:** The process of determining the key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined;
- 36 **Stakeholder:** A stakeholder is any group or individual that may be potentially affected by a proposed project. Stakeholders typically include elected officials, government and non-government agencies, environmental and other special interest groups, developers, educators, landowners and members of the public.
- 37 **Study Area:** The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.
- 38 **Substation:** A network of switching, interrupting and voltage-transforming apparatus for transferring power from the electrical transmission system to the local electrical distribution system for utilization by electrical customers.
- 39 **Water body:** Means a body containing water and includes dams and wetlands, whether ephemeral or permanent.
- 40 **Water course:** Means any river, stream and natural drainage channel whether carrying water or not.

1. INTRODUCTION

1.1 INTRODUCTION

Eskom Holdings SOC Ltd (herein after referred to as Eskom) intends to construct ±110km 400kV power line from the existing Foskop Main Transmission Substation (MTS) near Phalaborwa to the existing Spencer MTS near Giyani within Mopani District, Limpopo Province. In addition, Spencer MTS will be upgraded by adding a 400/132kV transformation yard and 1 x500MVA, 400/132kV transformer. Reference is made to Figure 1-1 for locality of the project.

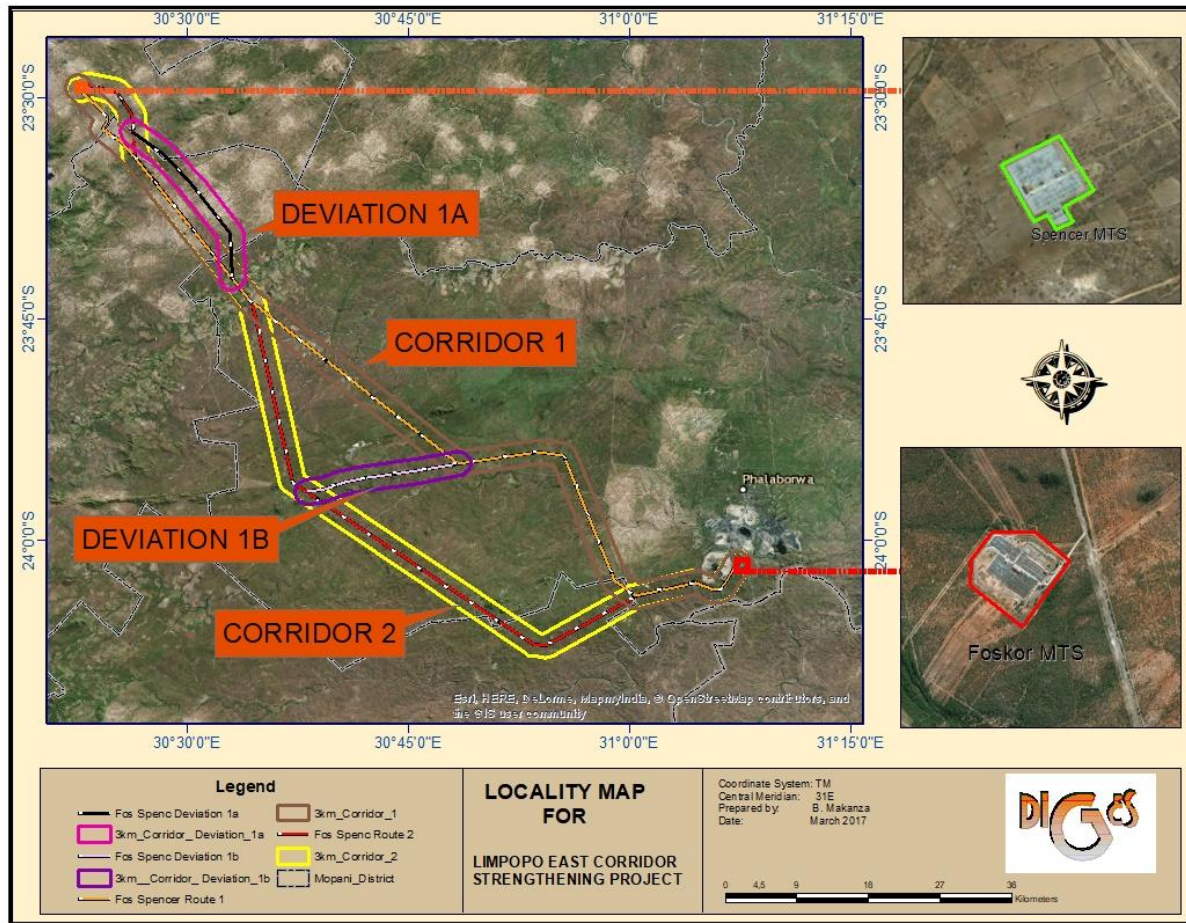


Figure 1-1: Locality Map

The proposed activities to be undertaken (together with the infrastructure to be provided) are listed as having detrimental impacts on the environment and as such requires that an Environmental Impact

Assessment be undertaken prior to the commencement of the project. Eskom has therefore appointed DIGES Group (herein after referred to as DIGES) to lodge an application with the Department of Environmental Affairs (DEA) for the proposed development in terms of Section 24 and 24D of the National Environmental Management Act (Act No.107 of 1998). The EIA will be undertaken to comply with the Environmental Impact Assessment Regulations (Government Notice R982) of December 2014 as amended on the 7th of April 2017.

1.2 DETAILS OF ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER (EAP)

Section 13 of EIA Regulations, Government Notice No. R982 as amended clearly indicates that an Environment Assessment Practitioner (EAP) should be independent and have expertise in conducting Environmental Impact Assessments, including knowledge of the Act, and any guidelines that have relevance to the proposed activity.

DIGES Group is a black owned BBB-EE consultancy company established in 2004 that offers services in the geo-environmental sector. The company has successfully completed many Environmental Impact Assessments for different developments.

Declaration of Independence

DIGES Group is an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act (Act No. 107 of 1998). In addition, remuneration for services provided by DIGES is not subjected to or based on the approval of the proposed development by the Competent Authority.

The details for the project EAP and compiler of this report are given below as per Section 3(1)(a) of Appendix 3 of the EIA Regulations R982 as amended.

Brenda Makanza (Pr. Sci. Nat)

- BSc (Hons) Environmental Science (NUST, 2004),
- Professional Diploma GIS (Universitat of Salzburg, 2015)
- Certificate GIS (University of Johannesburg, 2012)

A dedicated and passionate Environmentalist with valuable theoretical and experiential acumen in the areas of environmental conservation and administration. I have 12 years' experience gained through direct involvement in a number of conservation initiatives. Currently a Senior Environmental Consultant of DIGES Group responsible for leading, administering and completing assessments on Environmental Impact Assessments, as well as overseeing studies, interpreting technical reports and appendices regarding the same.

I leverage academic skills gained through an honours level degree in Environmental Science & Health and Post Graduate Certificates in Integral Water Management and Geo-informatics; alongside the proficient ability to actively and valuably participate in the development, design and implementation of environmental / conservation management policies and consultation initiatives; thereby supporting the highest standards of Environmental Management and Sustainable Development, in all undertakings. Reference is made to the CV attached in Appendix A.

1.3 BACKGROUND TO EIA STUDY

An Environmental Impact Assessment (EIA) is a proactive and systematic process where both positive and negative potential environmental impacts associated with certain activities are assessed. Every Environmental Impact Assessment project has two objectives namely, process and content objectives. The process objectives are to ensure that the process is open, transparent and inclusive, supplies stakeholders with sufficient information, affords them ample opportunity to contribute and makes them feel that their contributions are valued. The content objectives of the project are in the form of "hard" information: facts based on scientific and technical study, statistics or technical data.

Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, with respect to every application for environmental authorisation, ensure that the general objectives of Integrated Environmental Management (IEM) are considered. The EIA should include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity. Section 24(2) indicates that the Minister can publish a list of activities that may not commence without an environmental authorization. Three listing notices, Listing Notice 1, 2 and 3 were published in 2014 and amended on the 7th of April 2017 determine whether a Basic Assessment (Listing Notice 1 and 3) or Scoping and Environmental Impact Assessment (Listing Notice 2) should be undertaken. **Figure 1-2** overleaf shows the tasks to be performed during the scoping and EIA which are dictated by the Regulations published in Government Notice R982 as amended under Sections 24 (5) and 44 of the National Environmental Management Act (Act No. 107 of 1998).

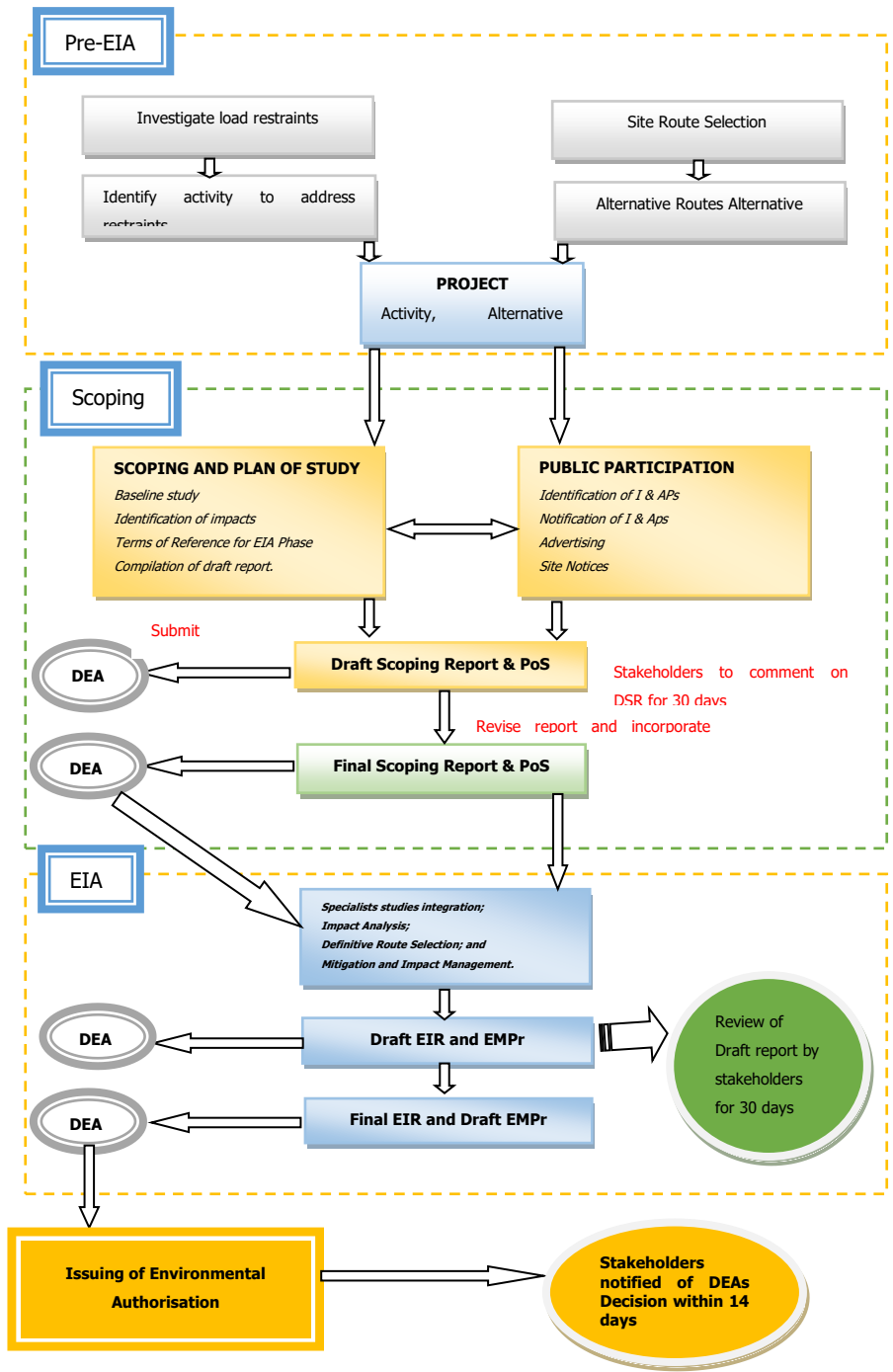


Figure 1-2: Scoping and EIA Phases

The following phases have been undertaken for this assessment:

1.3.1 SCREENING PHASE

Screening is the first stage in the EIA process whereby the EAP and the applicant determines if an EIA is required for the project in terms of the EIA Regulations Government Notice R982 and its associated Listings. The screening process was carried out and it determined that based on the project activities, a scoping and EIA process was required as the construction of the 400kV power lines is listed in Listing Notice 2 as amended in April 2017. In addition, the substation extension/upgrade is listed in Listing Notice 1 whilst clearing more than 300m² of indigenous vegetation in CBA areas is listed in Listing Notice 3.

1.3.2 SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT PHASE FOR THE PREVIOUS APPLICATION

The second stage of the EIA process is the scoping phase which entails a baseline study and preliminary site survey to ascertain the biophysical conditions of the site and identify the anticipated negative and positive impacts of the development in relation to the environment. This phase also includes public and stakeholder participation. Guidance in relation to the scoping phase is provided in Regulation 21 of the EIA Regulations, Government Notice R982 of 2014 as amended.

During the Scoping Phase of the first application (DEA Ref: 14/12/16/3/3/2/1023), the following general stages were followed as a basis for this assessment:

- a) ***Determination of the Current Environmental Baseline Conditions*** through review of existing information as well as field surveys to establish site specific issues and sensitivity. Literature relating to the project area was reviewed to comprehend the status quo of the project area and its surroundings. Topographic and thematic maps outlining the project area were also utilized. DIGES conducted several site inspections from November 2016 to February 2017. The first site inspection undertaken was sort of reconnaissance field survey where the different alternatives were briefly assessed. During the field surveys, most of the project area was covered with a vehicle where access routes existed. Photographs were taken to document the existing environmental conditions on site. Reference is made to **Appendix C-5** for the site photos;
- b) ***Determination of Policy, Legal and Administrative Framework and requirements*** through identification of relevant legal documents, guidelines and planning procedures. These

have been reviewed to ensure that necessary measures are included in the design and implementation of the project. In particular, those measures which could have an implication on environmental resources were identified. Reference is made to Section 2 of this report. At project inception, the Background Information Document and newspaper adverts only indicated that activities 14 and 27 of Listing Notice 1 and activity 9 of Listing Notice 2 were being applied for. After numerous discussions with the biodiversity specialist, it was also concluded that activity 12e(ii) of Listing Notice 3 as amended should also be applied for as more than 300m² of vegetation within CBA areas would be cleared during construction. In addition, taking into account the comments from the Department of Environmental Affairs (DEA), activity 14 of Listing Notice 1 as amended was removed from the application as transformer oil is not classified as a dangerous good according to SANS 10234: supplement 2008 1.00.

- c) **Public Participation:** An active approach was taken to identify potential Interested and Affected Parties. The proposed alternative corridors were mapped and the affected farms were identified and an on-site survey was carried out to identify the land owners and their contact details. Where land owners were not identified on site, Windeed and the Department of Rural Development and Land Reform were consulted. Stakeholder Government Departments and affected Municipalities were also contacted to get the contact details of the relevant officials. See **Appendix F-1 and F-2** for the list of stakeholders and land owners. Notification letters, Background Information Documents (BID) and newspaper adverts were written in English though the area is comprised of Tsonga, Northern Sotho, English and Afrikaans. All public meetings were then carried out using the native languages of the different areas.

The project was advertised in the Mopani, Letaba, Hoedspruit, Phalaborwa Heralds and The Citizen from the 20th to the 24th of January 2017. Public meetings were then held from the 8th of February to the 3rd of March 2017. See **Appendix F-3** for the Comments and Response report.

The Draft Scoping Report was submitted to IAPs for review for a period of 30 days from the 15th of May 2017 to the 15th of June 2017. Focus group meetings were then conducted from the 24th-25th of May 2017 to discuss the draft Scoping Report. Availability of the report and the dates of the meetings were advertised in the Mopani, Letaba, Hoedspruit, Phalaborwa Heralds and The Citizen on the 12th of May 2017. In addition, the revised scoping report referred to as the Final Scoping Report was also submitted to the registered Interested and Affected Parties where two public meetings were undertaken with the game reserve owners and farmers on the 22nd of August 2017 to discuss the revisions. Reference is made to Appendix F-7C for the

minutes of the meetings. Reference is also made to Section 7 of this report for the comprehensive details of the public participation process.

- d) Acceptance:** The final scoping report and Plan of Study submitted to DEA on the 22nd of September 2017 was accepted on the 3rd of November 2017. Reference is made to DEA acceptance letter attached in **Appendix B-2**.

1.3.3 ENVIRONMENTAL IMPACT PHASE

The third phase entails the undertaking of an EIA as outlined in the Plan of Study included in the Final Scoping Report. As a means of determining the significance of the various impacts that can or may be associated with the power line and Spencer substation upgrade, a series of assessment criteria are used for each impact. Based on the above description of the process, the main objectives of this EIA are thus:

- To ensure that all relevant environmental legal requirements will be met by Eskom;
- To provide information on the proposed development by describing the nature and scale thereof;
- To describe the affected environment;
- To inform the public about the proposal and identify the main stakeholders and their concerns and values;
- To define the reasonable and practical alternatives to the proposal;
- To identify the likely beneficial and detrimental consequences of the project;
- To ensure that all environmental consequences are recognized early on and taken into consideration in the design, construction, operation and maintenance of the activity; and
- To determine and recommend a set of environmental conditions and appropriate actions to mitigate any adverse effects on the physical, biological and human environment that will ensure that the study area is developed and operated in an environmentally sound management.

This report details the impact assessment that has been carried out and it has been guided by the following criteria:

- **Assessment Criteria for Impacts:** As a means of determining the significance of the various impacts that can or may be associated with the power line and substation, a series of assessment criteria were used for each impact. These criteria included an examination of the nature, extent, duration, intensity and probability of the impact occurring, and assessing

whether the impact will be positive or negative for the biophysical and social environments at the site and surrounding areas.

- **Environmental Sensitivity Map:** An environmental sensitivity map was used to indicate the impacts identified as a result of the proposed development.
- **Maximization of Positive Impacts:** The philosophy followed focused on maximizing the benefits to the local environment
- **Specialists Integration:** DIGES collated information from all specialists and summarized it in this report.
- **Identification of Mitigation Measures:** The mitigatory measures recommended describe possible actions for the reduction of the significant negative environmental impacts identified in the assessment. The philosophy of identifying mitigation measures for negative impacts was based on the reduction of the impact at source, the management of the impact through monitoring and control, and the involvement of the I&APs in consideration of mitigating measures, where appropriate.
- **Environmental Management Programme:** Based on the information collected during the EIA, a project specific Environmental Management Programme (EMPr) was developed. The plan provides guidelines for the planning, construction, operation, maintenance of the proposed development, as well as a holistic management and monitoring plan for the entire project. Recommendations were given with regards to the responsible parties for the implementation of the EMPr.

It should be noted that due to a lapse in time for the first application (DEA Ref: 14/12/16/3/3/2/1023), an application for the proposed project was resubmitted to DEA on the 12th of June 2018 with a draft Environmental Impact Assessment Report and a request for exemption to carry out activities as specified in sub-regulation 41(2)(a), (b), (c) and (d). Reference is made to Appendix B-1B for the acknowledgement letter received on the 26th of June 2018. DEA assigned the project, the following reference no. 14/12/3/3/2/1076. This Environmental Impact Assessment Report was subjected to a 30 day comment period and all comments received were incorporated into the Comments and Response Report and where feasible in this report.

1.4 STRUCTURE AND CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1.4.1 STRUCTURE OF THE REPORT

To address the information required as set in Appendix 3 and to present it in a clear manner, the following structure or layout outlined below was used:

Section 1: Background – deals with background of the project including the objectives of this EIA and the process.

Section 2: Administrative, Legal and Policy Requirements – To facilitate the Environmental Impact Assessment and understand the significance of the constructing and maintain the proposed development in the area, all relevant requirements from applicable laws, and provincial and local regulations are discussed and their relevance ascertained.

Section 3: Project description – locality, and technical details of the project, as well as need and desirability of the project.

Section 4: The receiving environment – a summary of the environment that will be potentially affected by the project activities.

Section 5: Public Consultation– a summary of the consultation process undertaken with stakeholders and Interested and Affected Parties (I&AP's), and the issues identified during this process.

Section 6: Alternatives evaluation – A description of the alternatives identified which are being assessed.

Section 7: Overview of specialist studies- a summary of the avifauna, air quality, heritage, ecological, tourism, soil and land capability, visual and wetland studies undertaken.

Section 8: Potential impacts and Determination of Significance – An assessment of residual socio-economic and bio-physical impacts, expected during construction and operation of the agreed upon route.

Section 9: Conclusions and recommendations

Section 10: References

Appendices: Appendices relating to Environmental Impact Assessment Phase are collated at the back of the document.

1.4.2 CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

The Environmental Impact Assessment Report was compiled as per the guidelines indicated in Appendix 3 of the EIA Regulations, Government Notice R982 as amended. **Table 1-1** summarizes the information required and identifies where in the report the information can be found:

Table 1-1: Environmental Impact Assessment Report

Information as Required in Appendix 3 of EIA Regulations R982 as amended	Relevant Section in the Report
3(1) (a)(iii) details of the EAP who prepared the report; and	Page i
3(1) (a) (iv) details of the expertise of the EAP, including a curriculum vitae;	Section 1.2, Appendix A
3(1)(b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report including: (i) the 21-digit Surveyor General code of each cadastral land parcel;	Section 3.2.3 and Appendix D-1
(ii) where available, the physical address and farm name;	Section 3.3
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
3(1) (c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is— (i) a linear activity, a description and co-ordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix D-1
3(1) (d) a description of the proposed activity, including (i) all listed and specified activities triggered and being applied for; (ii) a description of the associated structures and infrastructure related to the development;	Section 2.2.1
3(1)(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 2
3(1) (f) 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] development footprint within the approved site as contemplated in the accepted scoping report;	Section 3.1
3(1)(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 4
3(1) (h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including:	Section 4
(i) details of the development footprint alternatives considered;	

Information as Required in Appendix 3 of EIA Regulations R982 as amended	Relevant Section in the Report
(ii) details of the public participation process undertaken at each of the sites in terms of regulation 41 of these Regulations, including copies of the supporting documents and inputs;	Section 7
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 7 and Appendix F-3
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 5
(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.	Section 8.
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 8
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 4.1.8
(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 8.2
(ix) if no alternative development [location] footprints for the activity were investigated, the motivation for not considering such; and	Section 4.2
(x) a concluding statement indicating the location of the preferred alternative development [location] footprint within the approved site as contemplated in the accepted scoping report;	Section 4.1.6
3(1) (i) 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 development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including—	Section 8
(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Section 8
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8.1
3(1) (j) an assessment of each identified potentially significant impact and risk, including—	Section 8.2
(i) cumulative impacts;	Section 8.2

Information as Required in Appendix 3 of EIA Regulations R982 as amended	Relevant Section in the Report
(ii) the nature, significance and consequences of the impact and risk;	Section 8.2
(iii) the extent and duration of the impact and risk;	Section 8.2
(iv) the probability of the impact and risk occurring;	Section 8.2
(v) the degree to which the impact and risk can be reversed;	Section 8.2
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and	Section 8.2
(vii) the degree to which the impact and risk can be mitigated;	Section 8
3(1)(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Section 6
3(1)(l) an environmental impact statement which contains—	Section 9.1,
(i) a summary of the key findings of the environmental impact assessment:	
(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and	
(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
3(1)(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMP as well as for inclusion as conditions of authorisation;	Section 9.1,
3(1)(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 9.1,
3(1)(o) any 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;	Section 9.1,
3(1)(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.5
3(1)(q) 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;	Section 9.1
3(1)(r) where the proposed activity does not include operational aspects, 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;	
3(1)(s) an undertaking under oath or affirmation by the EAP in relation to	Section 9
(i) the correctness of the information provided in the reports;	

Information as Required in Appendix 3 of EIA Regulations R982 as amended	Relevant Section in the Report
(ii) the inclusion of comments and inputs from stakeholders and I&APs;	Appendix F-3 and F-4
(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and	
(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix F-3
3(1)(t) where applicable, details of any financial provision(s) for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	n/a
3(1)(u) an indication of any deviation from the approved scoping report, including the plan of study, including—	
(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	n/a
(ii) a motivation for the deviation;	n/a
3(1)(v) any specific information that may be required by the competent authority; and	
3(1)(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	

1.5 ASSUMPTIONS AND LIMITATIONS

The following assumptions have been made during this study:

- ✓ It is assumed that the Applicant has provided adequate details with regards to the activities to be carried out and the processes to be followed during the construction and operation phase;
- ✓ This study was carried out with the information available to the EAP at the time of executing the study, within the available timeframe and budget. The sources consulted are not exhaustive and additional information, which might strengthen arguments or contradict information in this report might exist;
- ✓ The study team obtained its data on affected farm owners on Windeed-Deeds office and on-site visits undertaken by Potlako. It is assumed that this information is correct and has identified all the affected land-owners;
- ✓ It is also assumed that where a land-owner has sold the property, they will notify the Public Participation team of the change in ownership;
- ✓ Some areas were not easily accessible due to private land ownership;
- ✓ Information used to inform the assessment was limited to data and GIS coverage's available at a local, regional and national level at the time of the assessment;
- ✓ The field assessment was carried out in the summer season hence it does not consider seasonal variations;

- ✓ It is assumed that the specialists' reports are factual and give a correct indication of the environment and how the project activities will impact on these resources;
- ✓ It is also assumed that the public participation carried out is adequate and has identified all the Interested and Affected Parties;
- ✓ An exact commencement date for the construction phase is unknown. It is assumed that construction will commence after public participation and an Environmental Authorization has been issued;
- ✓ The exact location of construction camps and material lay down areas have not yet been specified. It is therefore assumed that the camps will be located within the servitude and that the camp will consist of temporary structures, ablution facilities will be portable toilets and temporary shower facilities; and
- ✓ The exact location of the towers has not yet been determined hence visibility results are based from the anticipated alignment that may deviate from the approved route. The differences are considered omissible.

2. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

Environmental laws are formulated for realizing sustainable development strategy, preventing adverse impacts on the environment from implementation of plans and construction projects, and promoting coordinative development of the economy, society and environment. Most of South Africa's environmental law and principles are regulated by legislation with the Constitution of the Republic of South Africa and the National Environmental Management Act (NEMA) being the cornerstone of environmental law. The following laws, principles and regulations have also been formulated to promote environmental sustainability including the interaction of the living and non-living environment which also have relevance to this project are discussed below:

2.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

Section 24 of the Constitution of South Africa guarantees basic human rights and provides guiding principles for society. The environmental rights in the constitution states:

"Everyone has the right –

- a) to an environment that is not harmful to their health or well-being; and
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
 - (i) prevent pollution and ecological degradation;
 - (ii) promote conservation;
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Based on this section, there is need to ascertain if the construction and operation of the 400kV power line will result in harmful social, economic and biophysical environment after mitigation measures have been implemented.

The Bill of Rights in Chapter 2 of the Constitution entrenches the right to information, the right to freedom of expression, the right to participate in political activity, the right to administrative justice and fundamental science, cultural, legal, economic and environmental rights. In addition, the Constitution requires all legislature to facilitate public involvement in the legislative and other policy processes. Citizens have the right to engage in public initiatives and processes on an ongoing basis. On the basis of the Bill of Rights, the public will have access to all information developed and compiled during the Environmental Impact Assessment process.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998)

The National Environmental Management Act (NEMA) aims to improve the quality of environmental decision-making by setting out principles for environmental management that apply to all government departments and organisations that may affect the environment. NEMA also creates a framework for facilitating the role of civil society in environmental governance (see below).

The Principles of National Environmental Management state that - (DEAT 1998b)

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- Environmental justice must be pursued.
- Equitable Services Access to environmental resources to meet basic human needs and ensure human well-being must be pursued.
- Responsibility for the environmental health and safety consequences of a project or activity must exist throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted.
- Decisions must consider the interests; needs and values of all interested and affected parties.
- The social, economic and environmental impacts of activities, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and Services Access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of which environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects must be paid for by those responsible for harming the environment.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

2.2.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS

The Environmental Impact Assessment Regulations emanate from Section 24 (5) and 44 of NEMA and they set out the processes that must be followed to obtain an Environmental Authorization. Listing

Notice 1 and Listing Notice 2 provide lists of activities that require a Basic Assessment and EIA respectively whilst Listing Notice 3 lists activities that would require authorization if carried out in a specified geographical area. The EIA Regulations and listings have been amended as of the 7th of April 2017. The proposed activities that Eskom intend to undertake are listed in Listing Notice 1, 2 and 3 which are detailed below:

Table 2-1: List of Activities for the Power line and Associated Spencer MTS works

<i>Relevant Government Notice</i>	<i>Activity</i>	<i>Description</i>	<i>Applicability</i>
<i>R983 (R327)</i>	<i>27</i>	<i>The clearance of an area of 1 hectares or more, but less than 20hectares of indigenous vegetation.</i>	<i>The expansion of the transformation yard at Spencer substation requires ±9 ha and more than 1 ha of indigenous vegetation will be cleared during the construction phase.</i>
<i>R983 (R327)</i>	<i>30</i>	<i>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</i>	<i>Clearing of indigenous vegetation within the servitude and within CBA areas during construction</i>
<i>R984 (R325)</i>	<i>9</i>	<i>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity.</i>	<i>Construction of ±110km, 400kV power line from Foskop substation to Spencer substation.</i>
<i>R324</i>	<i>12e(ii)</i>	<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans</i>	<i>Clearing of indigenous vegetation within the servitude and within CBA areas during construction</i>
<i>R324</i>	<i>12e(iii)</i>	<i>On land, where, at the time of the coming into effect of this Notice or</i>	<i>300m2 of indigenous vegetation will be cleared</i>

thereafter such land was zoned open space, conservation or had an equivalent zoning.

in areas zoned as conservation (nature reserves) surrounding Foskor substation

It should be noted that at project inception, the Background Information Document and newspaper adverts only indicated that activities 14 and 27 of Listing Notice 1 and activity 9 of Listing Notice 2 were being applied for. After numerous discussions with the biodiversity specialist, it was also concluded that activity 12e(ii) of Listing Notice 3 as amended should also be applied for as more than 300m² of vegetation within CBA areas would be cleared during construction. Activity 30 of Listing 1 and Activity 12e(iii) has also been added since the areas where vegetation will be removed are also classified as CBA. In addition, taking into account the comments from the Competent Authority (DEA), activity 14 of Listing Notice 1 as amended was removed from the application as transformer oil is not classified as a dangerous good according to SANS 10234: supplement 2008 1.00. To verify the classification of the oil, the Material Safety Data Sheets (MSDS) for the transformer oil used by Eskom was used. Reference is made to Appendix C-3 for the MSDS.

The following series of IEM Guidelines were used during the entire EIA process:

- ❑ DEAT (2002), Scoping, Integrated Environmental Management, Information Series 2;
- ❑ DEAT (2002), Stakeholder Engagement, Integrated Environmental Management, Information Series 3;
- ❑ DEAT (2002), Specialists Studies, Integrated Environmental Management, Information Series 4;
- ❑ DEAT (2002), Impact Significance, Integrated Environmental Management, Information Series 5;
- ❑ DEAT (2002), Ecological Risk Assessment, Integrated Environmental Management, Information Series 6;
- ❑ DEAT (2004), Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7; and
- ❑ DEAT (2004), Criteria for determining alternatives, Integrated Environmental Management, Information Series 11.

2.3 OTHER RELEVANT LEGISLATION

In addition to the two laws indicated above, the following laws, regulations and documents in Table 2-2 also have relevance to the project:

Table 2-2: Legislative Framework

NAME	OVERVIEW	PERMITS/LICENSES
INTERNATIONAL		
Convention of Biological Diversity (CBD)	<p>South Africa is a signatory to the CBD, which requests countries to:</p> <ul style="list-style-type: none"> • Establish a system of protected areas to conserve biodiversity; • Develop guidelines for the selection, establishment and management of protected areas; and • Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species. <p>The proposed development traverses areas that are pristine and formally and informally designated as nature reserves. As such there is need to ensure that detrimental and irreversible impacts will be mitigated or avoided.</p>	
Biosphere reserves: The Seville Strategy and the Statutory Framework of the World Network. UNESCO, Paris (UNESCO, 1996)	<p>The primary objectives of biosphere reserves are the conservation of biological diversity; sustainable use and fair and equitable sharing of benefits arising from the utilization of genetic resources (in accordance with the Convention on Biological Diversity). The project area is within the Kruger to Canyon Biosphere hence there is need to ensure that negative impacts are avoided or reduced.</p>	
NATIONAL		
Environmental Conservation Act (Act No. 73 of 1989)	<p>This Act was superseded by NEMA as the primary environmental framework act. The purpose of the Act is to provide for effective protection and controlled utilisation of the environment.</p>	
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	<p>This Act controls the management and conservation of South African biodiversity within the framework of NEMA. The Act lists species that are threatened or require protection to ensure their survival in the wild, while regulating the activities, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. Tzaneen Sour Bushveld (SVI8) found within the study area has been listed as a vulnerable ecosystem as per Government Notice 1002 of 9 December 2011 and as such there is need to mitigate</p>	<p>A list has been published under Section 56 (1) of critically endangered, endangered, vulnerable and protected species and as such a permit is required prior to undertaking restricted activities in areas with the species.</p>

NAME	OVERVIEW	PERMITS/LICENSES
	<p>habitat fragmentation. The corridors traverse across CBA1, CBA2, ESA1 and ESA2 environment.</p>	
<p>National Spatial Biodiversity Assessment, 2004</p>	<p>The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.</p>	
<p>National Forest Act (Act No. 84 of 1998)</p>	<p>This Act provides for the management, utilisation and protection of forests through the enforcement of permitting requirements associated with the removal of protected tree species, as indicated in a list of protected trees. According to the Biodiversity Report, several protected trees were identified and are expected within the 3km buffer zone.</p>	<p>Protected and indigenous tree cutting permits in terms of the Section 15(1) of the Act. The protected trees that shall not be cut are listed in Schedule A of Notice No. 1602 of 23 December 2016.</p>
<p>National Environmental Management: Protected Areas Act (Act No.57 of 2003)</p>	<p>The Act makes provision for the protection and conservation of ecologically viable areas that show the country's biodiversity, natural landscapes. It also takes into account the declaration of the various categories of protected areas and envisages a national register of protected areas, with a simplified classification system of Special Nature Reserves, National Parks, Nature Reserves and Protected Environments. In addition, the Act brings in the concept of biological diversity protection and ecosystem management. Foskop substation is within 10km of Kruger National Park and sections of the alternative corridors traverse across formal and informal nature reserves.</p>	
<p>National Water Act (Act No 108 of 1997)</p>	<p>This Act aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. It is anticipated that some towers will be placed within 500m of a watercourse and as such it can result in the alteration of the banks of a watercourse. This activity is listed as a water use as per Section 21 (i) of the act.</p> <p>In addition, Section 19 of the Water Act requires the owner of the facility or person in control of land on which any activity, process is or was performed undertaken or</p>	<p>General Authorization is required from the Department of Water and Sanitation in terms of Section 39 of NWA for water use as defined in Section 21(c) and 21(i).</p>

NAME	OVERVIEW	PERMITS/LICENSES
	<p>any other situation exist which causes, has caused or is likely to cause pollution of water resources, take all reasonable measures to prevent any such pollution from occurring, continuing or recurring. Eskom as the applicant shall be responsible for ensuring that measures are taken to avoid and minimize the pollution of water resources during the construction and the operation of the power line will traverse.</p>	
<p>National Environmental Management: Waste Act (Act No. 59 of 2008)</p>	<p>In terms of the Waste Act; no person may commence, undertake or conduct a waste management activity except in accordance with:</p> <ul style="list-style-type: none"> ○ The requirements or standards determined in terms of the Waste Act for that activity; and ○ A waste management license issued in respect of that activity, if a license is required. 	<p>The waste produced during the construction and operation and storage thereof is below the minimum threshold specified in the listed activities Category A, B or C. However, the waste produced during construction should be disposed of at the registered municipality landfill.</p>
<p>The National Environmental Management: Air Quality Act (Act No.39 of 2004)</p>	<p>The main objective of the Air Quality Act (NEMAQA) is the protection of the environment and human health, in a sustainable (economic, social and ecological) development framework, through reasonable measures of air pollution control.</p>	<p>Schedule of activities that require an atmospheric emission license has been published. The proposed power line and substation extension are not listed as having detrimental impacts on air quality.</p>
<p>The Hazardous Substance Act (Act No. 15 of 1973)</p>	<p>The Hazardous Substances Act (HAS, No. 15 of 1973) was promulgated to provide for the control of substances which may cause injury, ill-health or death. Substances are defined as hazardous if their inherent nature is: toxic, corrosive, irritant; strongly sensitising, flammable and pressure generating (under certain circumstances) which may injure cause ill-health, or death in humans.</p>	<p>Minimum requirements of dealing with hazardous wastes should be followed when dealing with hazardous substances.</p>
<p>Conservation of Agricultural Resources Act (Act No. 43 of 1983)</p>	<p>The Conservation of Agricultural Resources Act ([CARA] Act 43, 1983) provides for the:</p> <ul style="list-style-type: none"> ○ Protection of wetlands; and ○ Requires the removal of listed alien invasive species. <p>This Act also requires that any declared invader species on Eskom land must be controlled according to their declared invader status.</p>	

NAME	OVERVIEW	PERMITS/LICENSES
The National Heritage Resources Act (Act No. 25 of 1999)	<p><i>Section 34 (1):</i> No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the South African Heritage Resources Agency (SAHRA), or the responsible provincial resources authority.</p> <p><i>Section 35 (4):</i> No person may, without a permit issued by the SAHRA or the responsible heritage resources authority, destroy or damage, excavate, alter or remove from its original position, or collect, any archaeological material or object.</p> <p><i>Section 36 (3)</i>No person may, without a permit issued by SAHRA or a provincial heritage authority, destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority.</p>	Permits are required for any development that may affect heritage resources such as graves and old buildings. The need for permits can only be ascertained when the Heritage specialists undertakes a final walk-down after the project has been authorized.
Tourism Act No.3 of 2014	<p>The main objectives of the Act are:</p> <ul style="list-style-type: none"> • Promotion of responsible tourism practices; • Provision for the effective marketing of South Africa, both domestically and internationally through South African Tourism (SAT); • Promotion of quality tourism products and development of sector; • Establishment of concrete intergovernmental relations to develop and manage tourism. <p>The project area is characterized of nature and game reserves that attract tourists due to its pristine nature. There is therefore a need to practice best practices during the construction and operation of the power line.</p>	
White Paper on the Development and Promotion of Tourism in South Africa, 1996	The paper provides a broad framework to guide the development, planning and management of tourism within the country. Some of the constraints identified that hinder the potential economic role of the tourism industry relate to inadequate funding, limited community integration,	

NAME	OVERVIEW	PERMITS/LICENSES
	<p>inadequate education and training, poor environmental management, lack of infrastructure, increased levels of crime and a lack of national, provincial and local tourism structures.</p> <p>To ensure that the project has a minimal impact on tourism potential, best environmental practices will be recommended for implementation.</p>	
Civil Aviation Act (Act No. 13 of 2009)	This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. All proposed developments or activities in South Africa that potentially could affect civil aviation must thus be assessed by SACAA in terms of the SA 71 CARs and South African Civil Aviation Technical Standards (SA CATS) to ensure aviation safety.	The Obstacle Evaluation Committee (OEC) which consists of members from both the SA CAA and South African Air Force (SAAF) fulfils the role of streamlining and coordinating the assessment and approvals of proposed developments or activities that have the potential to affect civil aviation, military aviation, or military areas of interest.
National Roads Act (Act No. 93 of 1996)	The Act provides for co-operative and coordinated strategic planning, regulation, facilitation and law enforcement in respect of road traffic matters by the national, provincial and local spheres of government. The act makes provision for regulating the transportation of dangerous goods and substances by road. Dangerous goods such as fuel will be transported on regional and local roads.	
National Appeal Regulations of 2014	The purpose of these Regulations is to regulate the procedure contemplated in section 43(4) of NEMA relating to the submission, processing and consideration of, a decision on an appeal.	
Promotion of Access to Information Act (Act No. 2 of 2000)	The Act maintains and protects South Africans' right to access any information held by the State and/or information held by another person that is needed to protect or exercise any rights. Access to information will be granted once certain requirements have been met. The Act also recognizes that the right of access to information may be limited if the limitations are reasonable in an	

NAME	OVERVIEW	PERMITS/LICENSES
	<p>open and democratic society.</p> <p>All project information will be availed to all registered stakeholders and Interested and Affected Parties.</p>	
<p>Promotion of Administrative Justice Act (Act No.3 Of 2000)</p>	<p>The Promotion of Administrative Justice Act (PAJA) aims to make the administration effective and accountable to people for its actions. It promotes South African citizens' right to just administration. Section 33 of the Constitution guarantees that administrative action will be reasonable, lawful and procedurally fair and it makes sure that people have the right to ask for written reasons when administrative action has a negative impact on them. The Department of Environmental Affairs' decision which details the steps undertaken to achieve the decision shall be made available to the public.</p>	
<p>Occupational Health and Safety Act 85 Of 1993</p>	<p>The act aims to provide for the health and safety of persons at work and for the health and safety of persons about the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or about the activities of persons at work. The construction workers should be inducted with regards to their health and safety and also of the communities around them. Eskom shall also ensure compliance to these standards during the operation of the power line and substations.</p>	
<p>National Energy Act Of 2008 & Electricity Regulation Act</p>	<p>The purpose of the act is to ensure that diverse energy resources are available, in sustainable quantities and at an affordable price and to provide for integrated energy planning, increased generation and consumption of renewable energies, contingency energy planning, holding of strategic fuel stocks and carriers, provide appropriate energy infrastructure, data on energy demand, supply and generation and establish institutions responsible for energy research.</p>	
<p>White Paper on Energy Policy 1998</p>	<p>The policy has five objectives for energy sector which are:</p> <ul style="list-style-type: none"> ○ increased access to affordable energy services; 	

NAME	OVERVIEW	PERMITS/LICENSES
	<ul style="list-style-type: none"> ○ improving energy governance; ○ stimulating economic development, managing energy related environmental impacts; ○ securing diversity through diversity; and ○ The need to provide alternative sources of energy including renewable. 	
Strategic Integrated Projects	<p>The South African Government adopted an Infrastructure Plan and from the spatial analysis of the country's needs carried out, 17 Strategic Integrated Projects (SIP) have been identified that cover a wide range of economic and social infrastructure. This project addresses one of the SIPs namely:</p> <p>SIP 10: Electricity transmission and distribution for all</p> <p>Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. The activities undertaken for the proposed project will contribute to SIP 10 being achieved.</p>	
Spatial Planning and Land Use Management Act (Act No. 16 of 2013)	<p>This act is a framework act for all spatial planning and land-use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. The spatial and land use management of the 4 local and the district municipalities will be taken into account when assessing the significance of the anticipated impacts.</p>	
Subdivision of agricultural Land Act, No. 70 of 1970 as amended	<p>Regulates the subdivision of all agricultural land. The purpose is to prevent the degradation of prime agricultural land. Sections of the corridor alternatives traverse across commercial agricultural land and as</p>	

NAME	OVERVIEW	PERMITS/LICENSES
	such are under the auspices of this act.	
Provincial, Local and District Municipalities Documents		
<p>The following provincial and district plans and guidelines are applicable to the proposed project and as such the requirements in these documents are considered in this report:</p>		
<ul style="list-style-type: none"> ✓ Limpopo Environmental Management Act (Act No. 7 of 2003); ✓ Limpopo Spatial Development Plan; ✓ Limpopo Conservation Plan; ✓ Mopani District Spatial Development Framework; ✓ Draft Mopani District Bioregional Plan; ✓ Integrated Development Plan (Mopani, Phalaborwa, Greater Letaba, Greater Tzaneen and Maruleng). 		
Eskom Standards and Guidelines		
<ul style="list-style-type: none"> ✓ Chemical Spillage Assessment and reporting; ✓ Waste Management; ✓ Water Strategy; ✓ Water Management Policy; ✓ Vegetation management and maintenance within Eskom land servitudes and Right of Way. 		

3. PROJECT DESCRIPTION

3.1 NEED AND DESIRABILITY

3.1.1 ESKOM'S MANDATE

ESKOM is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Electricity provision involves the following three phases shown in Figure 3-1:

- i. Generation is the process by which electricity is produced;
- ii. Transmission is the transportation of electricity that has been generated in power stations via high voltage, long distance power lines to local networks for distribution; and
- iii. Distribution is the actual delivery of electricity to end consumers.

The generation and transmission of electricity constitute electricity supply and this is largely the function of Eskom whilst the distribution function is shared between municipalities and Eskom.

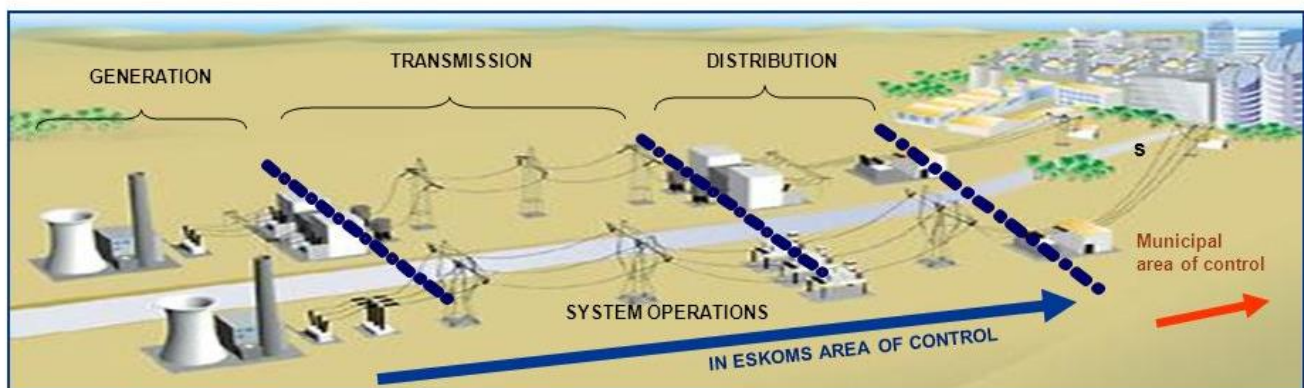


Figure 3-1: Electricity Provision in South Africa

3.1.2 TRANSMISSION SYSTEM

The transmission system plays a vital role in the delivery of reliable, high quality electricity throughout South Africa by delivering electricity in bulk to load centers and very large end-users. The Transmission Grid is divided into seven grid boundaries that operate and maintain 275kV, 400kV and 765kV power lines and associated transmission substations where the power lines terminate. Reference is made to Figure 3-2 overleaf for the transmission power lines and substations within the seven grids.

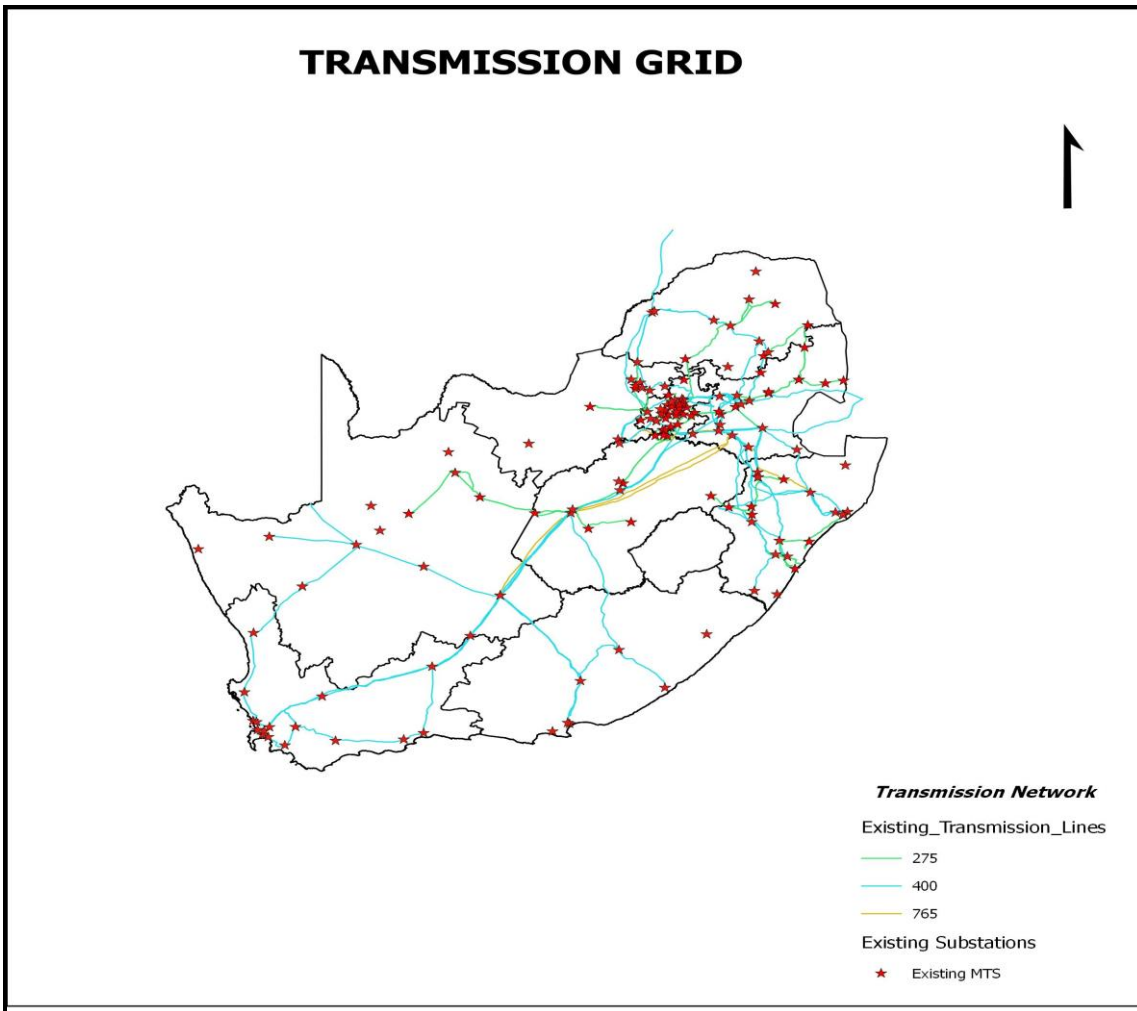


Figure 3-2: Transmission Network

3.1.2.1 LIMPOPO CUSTOMER LOAD NETWORK (POLOKWANE CLN)

As the transmission system has expanded over the years, surplus capacity available on transmission lines always seems to be consumed as the system grows or as transmission users find more economical ways of meeting system demands. Transmission congestion results when an electricity transmission path cannot accommodate increased power flow. Although the reasons for congestion vary, the common consequence is that increased power flow on a transmission path is not possible without risking system reliability. To ensure grid capacity and integrate the generation predicted in the IRP, Eskom compiles a 10-year Transmission Development Plan (TDP) that is modified on an annual basis to accommodate changes in both generation and load requirements. The load profile undertaken by

Eskom Holdings SOC Ltd in 2015 for the Limpopo Transmission Network indicated that there is an expected growth within Limpopo CLN as shown in Table 3-1 below:

Table 3-1: Load Forecasts for Limpopo CLN

Transmission Supply Areas (CLNs)	Percentage Growth	2016	2020	2025
Polokwane	3.13	1506	1556	1871
Lephalale	5.45	866	1240	1383
Phalaborwa	7.61	1889	2543	3390

Source: Transmission Development Plan 2016-2025 (Limpopo Province)

To reinforce the province’s transmission system and ensure reliable supply of electricity, several projects have been planned which consists of extending 400kV and 275kV power lines and installation of additional transformers at existing substations. This report will focus on one of the projects, i.e the Limpopo East Strengthening Project.

3.1.2.2 POLOKWANE CUSTOMER LOAD NETWORK

Mining operations, residential, agricultural and industrial activities in some parts of Limpopo Province are supplied by the Polokwane Customer Load Network (PCLN) which is comprised of 4 substations with Spencer 275/132kV substation being one of them. Spencer substation is located approximately 37km south west of Giyani and is currently fed by 275kV power lines from Tabor and Witkop substations located approximately 86km and 136km respectively. In addition, the substation is equipped with 2x250MVA, 275/132kV transformers. There are 132kV power lines which link into distribution substations within the area and that also interconnect Spencer and Foskor MTS with the distribution substations. The load profile undertaken for the Province showed that Spencer substation will be having a peak demand of 318MVA by 2018. Eskom Transmission Grid Planning therefore initiated a study to investigate possible alternatives and solutions to address the transformation constraints at Spencer MTS, as well as 275kV transmission network constraints on the network supplying Spencer MTS supply zone. The activities identified to address these constraints entailed the following:

- iv. Construct a 400kV power line from Foskor Substation to Spencer Substation with a length of approximately 110km.
- ii. Establish 400/132kV transformation yard and install 1 x 500MVA, 400/132kV transformer at Spencer Substation; and
- v. Establish 400/275kV transformation at Foskor substation.

A separate project to obtain the environmental authorization of the 400/275kV transformation at Foskor substation has been completed on the 23rd of February 2018. This report will thus focus on the proposed construction of the 400kV power line from Foskor substation to Spencer substation and the upgrade of Spencer substation.

3.2 PROJECT ACTIVITIES

The proposed project addressed in this document, involves the construction and operation of the following infrastructure:

- ❑ ±110km, 400kV power line from Foskor MTS near Phalaborwa to Spencer MTS near Mohlabaneng village. Two alternative corridors and two deviations from these corridors have been identified and will be assessed. Though a 400kV power line requires a 55m wide servitude, this study will assess a 3000m wide corridor to cater for constraints which might be posed by the location of physical features and the final engineering designs. Reference is made to the Locality Map attached in Appendix D-1;
- ❑ 400/132kV transformation yard and 1 x 500MVA, 400/132kV transformer which will cater for the proposed 400kV power line coming from Foskor MTS. This extension will require a footprint area of ±9 ha. The layout/configuration of the extension is yet to be finalised. A preliminary layout is attached in Appendix C-1;
- ❑ A transformer oil holding dam with a capacity of 120m³. The oil dam is required to contain any spillage from the 1 x500MVA, 400/132kV transformer and to prevent pollution to the environment thereby ensuring compliance with Environmental Legislation. Reference is made to the drawing in Appendix C-2.

The proposed activities are listed in Listing Notice 1, 2 and 3 as having a detrimental impact to the environment hence require an Environmental Impact Assessment to be undertaken. The proposed activity to be undertaken (together with the infrastructure to be provided) is listed as activity 27 and 30 of Listing Notice 1 (Government Notice R983), 9 of Listing Notice 2 (Government Notice R984) and Listing Notice 3 (Government Notice R324) as amended which reads as follows:

Listing 1

27 of R983 (as amended): The clearance of an area of 1 hectares or more, but less than 20hectares of indigenous vegetation.

Applicability

The extension of Spencer substation requires ±9 hectares of which more than 1 hectare of indigenous vegetation will be cleared during the construction phase. Reference is made to the Biodiversity Report attached in **Appendix E-3**.

30 of R983 (as amended): Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

Applicability

Based on activity 12(e) (ii) and (iii), vegetation will be cleared in Critical Biodiversity Areas which are termed threatened.

Listing 2

9 of R984 (as amended): The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity.

Applicability

In order to fulfill its mandate and ensure the supply of adequate electricity, Eskom intends to construct ±110km, 400kV power line from Foskor MTS to Spencer MTS traversing across areas that are largely classified as rural.

Listing 3

12e(ii) of R324: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans.

Applicability

According to the Draft Mopani Bioregional Plan and the Limpopo Conservation Plan v2, the proposed power line alternatives traverses across areas that have been classified as critical biodiversity areas, CBA1, CBA2, ESA1 and ESA2. A sum of vegetation to be removed per tower within these areas is more than 300m² indigenous vegetation.

12e(iii) of R324: On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

Applicability

300m² of indigenous vegetation will be cleared in conservation areas (nature reserves) surrounding Foskor substation.

3.3 LOCATION

3.3.1 REGIONAL CONTEXT OF THE PROJECT

The proposed project is within Mopani District Municipality located in the north-eastern part of the Limpopo Province and bordered by Ehlanzeni District Municipality in the south, Greater Sekhukhune District Municipality in the south west, Capricon District in the west and Vhembe District in the north west. The proposed power line alternatives will traverse across 4 local municipalities within the District Municipality namely Maruleng, Greater Tzaneen, Greater Letaba and Ba-Phalaborwa which are approximately 90km, 44km, 65km and 115km west of Polokwane respectively. The District can be accessed via R71, R81, R40, R526 and various district roads. Reference is made to Figure 3-3 for the regional context of the project:

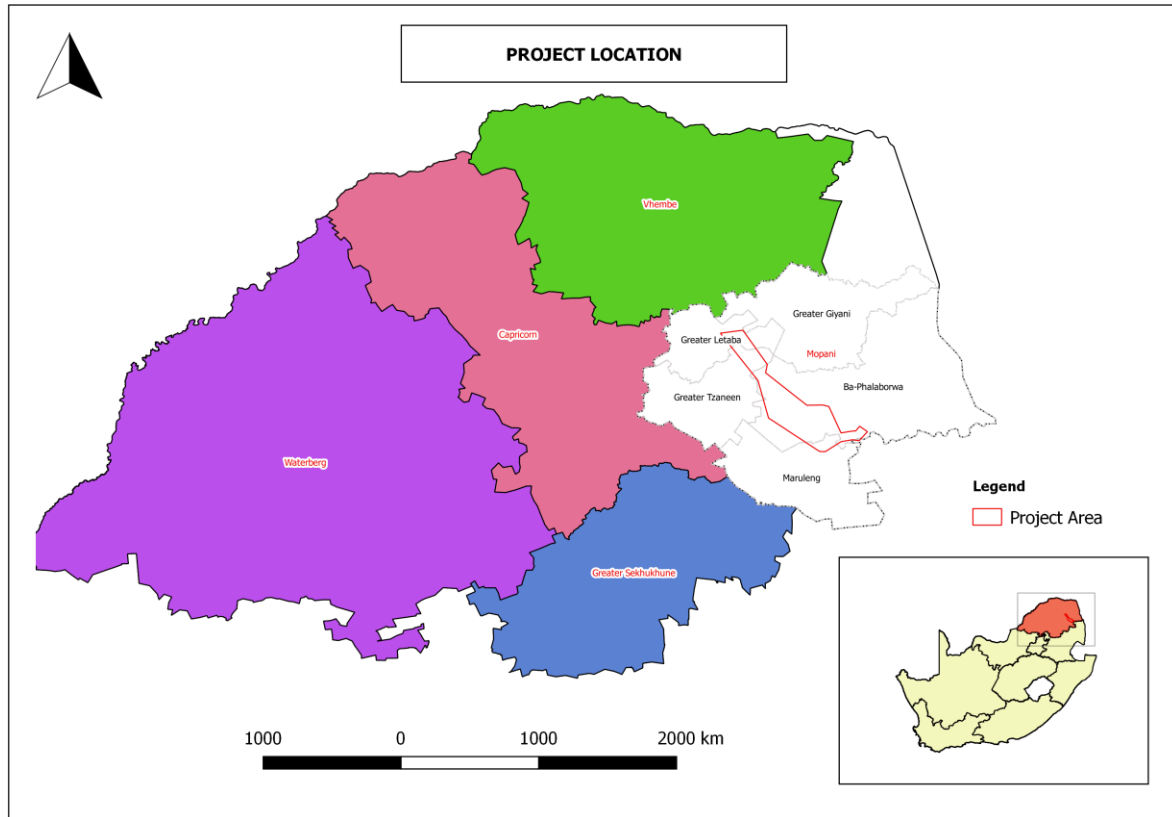


Figure 3-3: Regional Context of Project Area

3.3.2 SUBSTATION LOCATIONS

Foskor Main Transmission Substation is located on farm Loole 31LU at the following co-ordinates: **24°1'40.05"S, 31°07'37.41"E** within Foskor Mine which is approximately 9km south of Phalaborwa and 12km west of Kruger National Park. Foskor substation can be accessed via R40 and R71. Spencer substation is located 37km south west of Giyani, on farm Worcester 200LT at the following co-ordinates: **23°29'19.37"S, 30°22'51.58"E** and is near Mohlabaeng. The substation can be accessed via R81 road to Giyani. Reference is made to Figure 3-4 and 3-5 overleaf for the substations:



Figure 3-4: Spencer Substation



Figure 3-5: Foskor Substation

3.3.3 LAND OWNERSHIP

The land-use within the project area is largely comprised of nature reserves, residential, mining, commercial and subsistence farming. The farms are in private ownership and communal land owned by the Government and under the control of Traditional Authorities. Reference is made to Table 3-2 for the farm details and ownership:

Table 3-2: Farm Details and ownership

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Morelag 5KU	0	T0KU00000000000500000	Agricultural	Ba-Phalaborwa Ba Maseke CPA
Morelag 5KU	1/3	T0KU00000000000500001 T0KU00000000000500003	Agricultural Game Farm	Banakome CPA
Morelag 5KU	2	T0KU00000000000500002	Mining	Freddies Prop PTB Pty Ltd
Grietjie 6KU	107	T0KU00000000000600107	Private Reserve Nature	Burger, Pieter Andries
Grietjie 6KU	106	T0KU00000000000600106	Private Reserve Nature	Plast 1 Pty Ltd
Grietjie 6KU	105	T0KU00000000000600105	Private Reserve Nature	Brown, Trevor Anthony
Grietjie 6KU	104	T0KU00000000000600104	Private Reserve Nature	Lotter, Anita
Grietjie 6KU	118	T0KU00000000000600118	Private Reserve Nature	Olifants River Estate
Grietjie 6KU	96	T0KU00000000000600096	Private Reserve Nature	Arends, Richard
Grietjie 6KU	97	T0KU00000000000600097	Private Reserve Nature	Austin, Henry Struben
Grietjie 6KU	98	T0KU00000000000600098	Private Reserve Nature	Nieprins cc
Grietjie 6KU	95	T0KU00000000000600095	Private Reserve Nature	Mount Shilo Safari cc
Grietjie 6KU	94	T0KU00000000000600094	Private Reserve Nature	Mount Shilo Safari cc
Grietjie 6KU	93	T0KU00000000000600093	Private Reserve Nature	Kruger, Johannes Hendrik Trustees
Grietjie 6KU	81	T0KU00000000000600081	Private Reserve Nature	De Swardt, Guillaume
Grietjie 6KU	82	T0KU00000000000600082	Private Reserve Nature	Vroegop cc (Mupaya Lodge)
Grietjie 6KU	87	T0KU00000000000600087	Private Reserve Nature	Phalaborwa Hoedspruit Makelaar cc
Grietjie 6KU	86	T0KU00000000000600086	Private Reserve Nature	Schaap, Anna Sussanna
Grietjie 6KU	80	T0KU00000000000600080	Private Reserve Nature	Pretorius, Joachim Marthinus Wessel (Antonette Hays)
Grietjie 6KU	77	T0KU00000000000600077	Private Reserve Nature	37 Cherries-Glass Bead Studio & Guesthouse Pty Ltd
Grietjie 6KU	78	T0KU00000000000600078	Private Reserve Nature	Van Rooyen, Lindie
Grietjie 6KU	76	T0KU00000000000600079	Private Reserve Nature	Outbreak Beliggings 5 cc

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Grietjie 6KU	75	T0KU00000000000600075	Private Nature Reserve	Ackermann, Ester
Grietjie 6KU	74	T0KU00000000000600074	Private Nature Reserve	Citadel Prop Holdings cc
Grietjie 6KU	44	T0KU00000000000600044	Private Nature Reserve	Jankowitz, Johannes Daniel
Grietjie 6KU	41	T0KU00000000000600041	Private Nature Reserve	Micheleti, Guy Robert, George, Fredrick
Grietjie 6KU	40	T0KU00000000000600040	Private Nature Reserve	Dhooge, Andries Christiaan Lanke, Walter Marie
Paul 7KU	Rem	T0KU00000000000700000	Mining	National Government
Paul 7KU	1	T0KU00000000000700001	Public Service Infrastructure	Transnet Ltd
Doreen 8KU	Rem	T0KU00000000000800000	Mining	National Government
Doreen 8KU	1	T0KU00000000000800001	Public Service Infrastructure	Transnet Ltd
Doreen 8KU	2	T0KU00000000000800002	Public Service Infrastructure	Transnet Ltd
Doreen 8KU	3	T0KU00000000000800003	Public Service Infrastructure	Transnet Ltd
Rhoda 9KU	0	T0KU00000000000900000	Mining	National Government
Sheila 10LU	Rem	T0LU000000000001000000	Mining	National Government
Sheila 10LU	1	T0LU00000000000100001	Public Service Infrastructure	Eskom Holdings Ltd
Wegsteek 30LU	Rem	T0LU000000000003000000	Mining	National Government
Loole 31LU	0	T0LU000000000003100000	Mining	National Government
Thankerton 144KT	2	T0KT000000000014400002	Agricultural Game Farm	Verticure cc
Thankerton 144KT	RE/3	T0KT000000000014400003	Agricultural Game Farm	Overvaal eiendomme Pty Ltd
Thankerton 144KT	6	T0KT000000000014400006	Public Service Infrastructure	South African National Roads Agency Ltd
Transport 145KT	1	T0KT000000000017200001	Agricultural Game Farm	Overvaal Eiendomme Pty Ltd
Hoed 146KT	0	T0KT000000000014600000	Agricultural Game Farm	HL Hall & Sons Prop Pty Ltd
Lillie 148KT	Rem	T0KT000000000014800000	Agricultural Game Farm	Lillie Ranch Pty Ltd
Lillie 148KT	1	T0KT000000000014800001	Agricultural Game Farm	Scaterfield Game Ranch Pty Ltd

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Lillie 148KT	2	T0KT00000000014800002	Agricultural Game Farm	Twin City Letaba Ranch Pty Ltd
Lillie 148KT	3	T0KT00000000014800003	Agricultural Game Farm	Royal Square Inv. 448 cc
Punt 151KT	2/3/6/7/8	T0KT00000000015100002 T0KT00000000015100003 T0KT00000000015100007 T0KT00000000015100008	Agricultural Game Farm	Mashishimale CPA
Try 153KT (now Amsterdam)	0	T0KU00000000015300000	Communal	National Government (Ba-Phalaborwa Ba Maseke CPA)
Try 153KT (now Amsterdam)	1	T0KU00000000015300001	Game Farm	Jedven Plaas Cc
Magdalena 154KT	0	T0KU0000000000600086	Game	Malevelyn Holding Pty Ltd (Olifants North Game Reserve)
Parson 155KT	43	T0KU00000000015500043	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	44	T0KU00000000015500044	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	45	T0KU00000000015500045	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	46	T0KU00000000015500046	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	47	T0KU00000000015500047	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	48	T0KU00000000015500048	Agriculture (Vacant)	Grunert Inv Pty Ltd
Parson 155KT	49	T0KU00000000015500049	Agriculture (Vacant)	Loftell, Richard Patrick
Parson 155KT	50	T0KU00000000015500050	Agriculture (Vacant)	Loftell, Richard Patrick
Parson 155KT	79	T0KU00000000015500079	Agriculture (Vacant)	Loftell, Richard Patrick
Parson 155KT	80	T0KU00000000015500080	Agriculture (Vacant)	Loftell, Richard Patrick
Archie 156KT	Rem	T0KT00000000015600000	Lodge	Baphalaborwa Ba Maseke CPA
Excellence 157KT	Rem	T0KT00000000015700000	Agricultural	Excellence Farm Pty Ltd
Lekkergoed 158KT	9/23/29/50	T0KT00000000015800009 T0KT00000000015800023 T0KT00000000015800029 T0KT00000000015800050	Game	Limpopo Leopard Rock Nature Reserve
Lekkergoed 158KT	15	T0KT00000000015800015	Agricultural Game Farm	Troutwater Trust
Archie 169KT	Rem/1	T0KT00000000016900000	Agricultural Game Farm	Scaterfield Game Ranch Pty Ltd

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Archie 169KT	1	T0KT00000000016900001	Agricultural Game Farm	Royal Square Inv. 448 cc
Transport 172KT	0	T0KT00000000017200000	Agricultural Game Farm	Seriso 485 Pty Ltd
Worcester 200LT	0	T0LT00000000020000000	Communal Land	Modjadji Traditional Authority
Northampton 201LT	0	T0LT00000000020100000	Communal Land	Modjadji Traditional Authority
Seaphole			Communal Land	Modjadji Traditional Authority
Hoofpyn 269KT	3	T0KT00000000026900003	Agricultural Game Farm	Inyaku Game Farm Pty Ltd
Kromriviersfontein 360LT	0	T0LT00000000036000000	Communal	Modjadji Traditional Authority
Senobela 362LT	0	T0LT00000000036200000	Communal	Modjadji Traditional Authority
Makuba 425LT	0	T0LT00000000042500000	Communal	Modjadji Traditional Authority
Sirulurul 427LT	1/2	T0LT000000000742700001 T0LT000000000742700001	Communal	Modjadji Traditional Authority
Radoo 682LT	0	T0LT00000000068200000	Communal	Nyavana Traditional Authority
La Parisa 729 LT	Rem	T0KU00000000072900000	Agricultural	Gubitz Boerdery Pty Ltd
La Parisa 729LT	1	T0KU00000000072900001	Agricultural	Lompies Kwekerye Pty Ltd
Gunyula 730LT	Rem	T0LT00000000073000000	Agricultural	Grobler, Nicolaas
Gunyula 730LT	4	T0LT00000000073000004	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	13	T0LT00000000073000013	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	16	T0LT00000000073000016	Agricultural	Malle Mathoka Albert Mohalea
Gunyula 730LT	17	T0LT00000000073000017	Agricultural	Big Rock Construction 74 cc
Gunyula 730LT	18	T0LT00000000073000018	Agricultural	GK2N Projects Trust
Gunyula 730LT	19	T0LT00000000073000019	Agricultural	Last, Andre
Gunyula 730LT	20	T0LT00000000073000020	Agricultural	Last, Andre
Gunyula 730LT	21	T0LT00000000073000021	Agricultural	Last, Andre
Gunyula 730LT	22	T0LT00000000073000022	Agricultural	Last, Andre
Gunyula 730LT	23	T0LT00000000073000023	Agricultural	Last, Andre
Gunyula 730LT	24	T0LT00000000073000024	Agricultural	Last, Andre
Gunyula 730LT	26	T0LT00000000073000026	Agricultural	Mkhavele, Vukosi Autis
Gunyula 730LT	27	T0LT00000000073000027	Agricultural	Rikhotso, Jabulani Herold
Gunyula 730LT	28	T0LT00000000073000028	Agricultural	Rikhotso, Jabulani Herold
Gunyula 730LT	29	T0LT00000000073000029	Agricultural	Alfred Mashau

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Gunyula 730LT	30	TOLT00000000073000030	Agricultural	Alfred Mashau
Gunyula 730LT	31	TOLT00000000073000031	Agricultural	Mashaba, John
Gunyula 730LT	32	TOLT00000000073000032	Agricultural	Wright, Candice Rochelle
Gunyula 730LT	33	TOLT00000000073000033	Agricultural	Mbuyane Frank Jesaya
Gunyula 730LT	34	TOLT00000000073000034	Agricultural	Williams, James Ronald
Gunyula 730LT	35	TOLT00000000073000035	Agricultural	Nxumalo, Mackekwa Edwell
Gunyula 730LT	36	TOLT00000000073000036	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	37	TOLT00000000073000037	Agricultural	Manabe, Nkateko Loraine
Gunyula 730LT	38	TOLT00000000073000038	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	39	TOLT00000000073000039	Agricultural	Mashao, Malesela Alfred
Gunyula 730LT	40	TOLT00000000073000040	Agricultural	Mkhvele, Vukosi Autis
Gunyula 730LT	41	TOLT00000000073000041	Agricultural	Fasen, Coenraad Hendrik
Gunyula 730LT	42	TOLT00000000073000042	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	43	TOLT00000000073000043	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	44	TOLT00000000073000044	Agricultural	Smith, Coenraad Jacobus
Gunyula 730LT	45	TOLT00000000073000045	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	46	TOLT00000000073000046	Agricultural	Jooste, Charlotte Catharina
Gunyula 730LT	47	TOLT00000000073000047	Agricultural	Bill, Godfrey Morgan
Gunyula 730LT	48	TOLT00000000073000048	Agricultural	Potgieter, Stephanus Johannes
Gunyula 730LT	49	TOLT00000000073000049	Agricultural	Mbiza, Tinyiko Nicolas
Gunyula 730LT	50	TOLT00000000073000050	Agricultural	Smith, Coenraad Jacobus
Gunyula 730LT	51	TOLT00000000073000051	Agricultural	Phosa, Sanny
Gunyula 730LT	52	TOLT00000000073000052	Agricultural	Phosa, Sanny
Gunyula 730LT	53	TOLT00000000073000053	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	54	TOLT00000000073000054	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	55	TOLT00000000073000055	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	56	TOLT00000000073000056	Agricultural	Risaba, Ernest

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
				Mkansi
Gunyula 730LT	57	T0LT00000000073000057	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	58	T0LT00000000073000058	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	59	T0LT00000000073000059	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	60	T0LT00000000073000060	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	61	T0LT00000000073000061	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	62	T0LT00000000073000062	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	63	T0LT00000000073000063	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	65	T0LT00000000073000065	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	66	T0LT00000000073000066	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	67	T0LT00000000073000067	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	68	T0LT00000000073000068	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	69	T0LT00000000073000069	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	70	T0LT00000000073000070	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	71	T0LT00000000073000071	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	72	T0LT00000000073000072	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	73	T0LT00000000073000073	Agricultural	Wolvaardt, Jurie Francois
Henley 734LT	2	T0LT00000000073400002	Agricultural	Kidson, Dina Johanna
Henley 734LT	5	T0LT00000000073400005	Agricultural	Labuschagne, Pieter Willem
Henley 734LT	7	T0LT00000000073400007	Agricultural	Last, Andre
Henley 734LT	8	T0LT00000000073400008	Agricultural	David Maswanganyi Family Trust
Henley 734LT	9	T0LT00000000073400009	Agricultural	David Maswanganyi Family Trust
Henley 734LT	10	T0LT00000000073400010	Agricultural	Alida & Basie Jacobs Family Trust
Henley 734LT	11	T0LT00000000073400011	Agricultural	Ntimbane, Gaza Edney
Henley 734LT	12	T0LT00000000073400012	Agricultural	Mathebula, Mishell
Henley 734LT	13	T0LT00000000073400013	Agricultural	National Government
Henley 734LT	14	T0LT00000000073400014	Agricultural	National

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
				Government
Henley 734LT	15	TOLT0000000073400015	Agricultural	Dos Santos, Antonio Sardinha
Henley 734LT	16	TOLT0000000073400016	Agricultural	Zeni, Robert
Henley 734LT	17	TOLT0000000073400017	Agricultural	Zeni, Robert
Henley 734LT	18	TOLT0000000073400018	Agricultural	Heydenrych, Alida Cornelia
Henley 734LT	19	TOLT0000000073400019	Agricultural	Alcro Trust
Henley 734LT	20	TOLT0000000073400020	Agricultural	Alcro Trust
Henley 734LT	21	TOLT0000000073400021	Agricultural	Alcro Trust
Henley 734LT	22	TOLT0000000073400022	Agricultural	Jacques Burger Family Trust
Henley 734LT	23	TOLT0000000073400023	Agricultural	Jacques Burger Family Trust
Henley 734LT	24	TOLT0000000073400024	Agricultural	Jacques Burger Family Trust
Henley 734LT	25	TOLT0000000073400025	Agricultural	Jacques Burger Family Trust
Henley 734LT	26	TOLT0000000073400026	Agricultural	Labuschagne, Saskia Jean
Henley 734LT	27	TOLT0000000073400027	Agricultural	Jacques Burger Family Trust
Henley 734LT	28	TOLT0000000073400028	Agricultural	Jacques Burger
Henley 734LT	30	TOLT0000000073400030	Agricultural	Strathearn Mervyn Gerrity Dubaj
Henley 734LT	34	TOLT0000000073400034	Agricultural	Van Heerden Family Trust
Henley 734LT	35	TOLT0000000073400035	Agricultural	Botha, Antonie Johannes Carolus
Matuma 735LT	0/4/5/8/9 11	TOLT0000000073500000 TOLT0000000073500004 TOLT0000000073500005 TOLT0000000073500008 TOLT0000000073500009 TOLT0000000073500011	Agricultural	Xcelsior Letsitele Prop Pty Ltd
Matuma 735LT	1/2/6/10	TOLT0000000073500001 TOLT0000000073500002 TOLT0000000073500006 TOLT0000000073500010	Agricultural	Matuma Citrus Eiendomme Pty Ltd
Matuma 735LT	3/7	TOLT0000000073500003 TOLT0000000073500007	Agricultural	Dreanco Pty Ltd
Matuma 735LT	12	TOLT0000000073500012	Agricultural	Merite Pakkers Pty Ltd
La Cotte 736LT	Rem	TOLT0000000073600000	Agricultural	Xcelsior Letsitele Prop Pty Ltd
La Cotte 736LT	1	TOLT0000000073600001	Agricultural	Nouvelle-Lacott Pty Ltd
La Cotte 736LT	2	TOLT0000000073600002	Agricultural	R Pretorius & Kinders Pty Ltd
La Cotte 736LT	3	TOLT0000000073600003	Agricultural	R Pretorius &

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
				Kinders Pty Ltd
La Cotte 736LT	4	TOLT00000000073600004	Agricultural	R Pretorius & Kinders Pty Ltd
La Cotte 736LT	5	TOLT00000000073600005	Agricultural	CLB La Cotte Trust
Black Hill 740LT	Rem	TOLT00000000074000000	Agricultural Game Farm	Balepye CPA
Josephine 749LT	1	TOLT00000000074900001	Agricultural Game Farm	Piet Warren Plase Pty Ltd
Square 750KT	Rem	TOLT00000000075000000	Communal	Big Rock Ranch Pty Ltd
Square 750KT	1	TOLT00000000075000001	Communal	Archie Beesplaas cc
Volstruis 753LT	Rem/2/3	TOLT00000000075300000 TOLT00000000075300002 TOLT00000000075300003	Agricultural Game Farm	SANDF (Government of RSA)
Chester 754LT	Rem	TOLT00000000075400000	Agricultural Game Farm	Farm Chester cc
Chester 754LT	1	TOLT00000000075400001	Agricultural Game Farm	Morgenstern Familie Trust
Chester 754LT	2	TOLT00000000075400002	Agricultural Game Farm	Balepye CPA
Riverhead 755LT	Rem	TOLT00000000075500000	Agricultural Game Farm	Balepye CPA
Eden 757LT	Rem/2	TOLT00000000075700000 TOLT00000000075700002	Agricultural Game Farm	Balapye CPA
Quagga 759LT	Rem/2	TOLT00000000075900000 TOLT00000000075900002	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
Solomons Mine 762LT	Rem/3/4	TOLT00000000076200000 TOLT00000000076200003 TOLT00000000076200004	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
Free State 763LT	Rem/2	TOLT00000000076300000 TOLT00000000076300002	Agricultural Game Farm	SANDF(Government of RSA)
Malati 764LT	0	TOLT00000000076400000	Agricultural Game Farm	LE Thom Pty Ltd
Begin 765LT	Rem	TOLT00000000076500000	Agricultural Game Farm	Sebakwe Trust
Begin 765LT	1	TOLT00000000076500001	Agricultural Game Farm	SANDF
Begin 765LT	3	TOLT00000000076500003	Agricultural Game Farm	Balepye CPA
The Beacon 769LT	0	TOLT00000000076900000	Agricultural Game Farm	Balapye CPA
Ziek 771LT	1	TOLT00000000077100001	Communal	National Government
Brook 772LT	Rem/1	TOLT00000000077200000 TOLT00000000077200001	Agricultural Game Farm	Mashishimale Traditional Council
Breakfast 773LT	Rem	TOLT00000000077300000	Communal Land	Mashishimale CPA
Breakfast 773LT	1	TOLT00000000077300001	Agricultural Game Farm	Majeje Traditional Authority
Landraad 774LT	Rem	TOLT00000000077400000	Agricultural Game Farm	Majeje Traditional Authority

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Landraad 774LT	1	TOLT00000000077400000	Agricultural Game Farm	Mashishimale CPA
Voster 775LT	1	TOLT000000000775000001	Agricultural Game Farm	Selatirus Pty Ltd
Voster 775LT	3	TOLT000000000775000003	Agricultural Game Farm	Gedeelte 3 van die plaas Voster Pty Ltd
B.V.B Ranch 776LT	7	TOLT00000000077600007	Agricultural Game Farm	Ryk Nagel Selati Familie Trust
B.V.B Ranch 776LT	9	TOLT00000000077600009	Agricultural Game Ranch	Joubert Phillip Joseph
B.V.B Ranch 776LT	10	TOLT00000000077600010	Agricultural Game Ranch	Joubert Phillip Joseph
B.V.B Ranch 776LT	12	TOLT00000000077600012	Agricultural Game Ranch	Lepelle Industrial & Mining Supplies cc
B.V.B Ranch 776LT	13	TOLT00000000077600013	Agricultural Game Ranch	
B.V.B Ranch 776LT	18	TOLT00000000077600018	Agricultural Game Ranch	J & L Fourie Trust
B.V.B Ranch 776LT	19	TOLT00000000077600019	Agricultural Game Ranch	J & L Fourie Trust
B.V.B Ranch 776LT	20	TOLT00000000077600020	Agricultural Game Ranch	Bezuidenhout Frederik Johannes
B.V.B Ranch 776LT	21	TOLT00000000077600021	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	22	TOLT00000000077600022	Agricultural Game Ranch	Noord Transvaalse Akediemiese Trust
B.V.B Ranch 776LT	23	TOLT00000000077600023	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	24	TOLT00000000077600024	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	25	TOLT00000000077600025	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	26	TOLT00000000077600026	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	27	TOLT00000000077600027	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	28	TOLT00000000077600028	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	29	TOLT00000000077600029	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	29	TOLT00000000077600030	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	31	TOLT00000000077600031	Agricultural Game Ranch	Antenna eiendomme pty ltd
B.V.B Ranch 776LT	32	TOLT00000000077600032	Agricultural Game Ranch	Bezuidenhout phillipus lourens
Claimland 780LT	Rem/1	TOLT00000000078000000 TOLT00000000078000001	Agricultural	PP Mare Boerdery Pty Ltd
Claimland 780LT	2	TOLT00000000078000002	Mining	National Government

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
Claimland 780LT	4	TOLT00000000078000004	Agricultural	Piet Warren Plase Pty Ltd
Claimland 780LT	5	TOLT00000000078000005	Mining	Consolidated Murchison Ltd
Farrell 781LT	1	TOLT00000000078100001	Mining	Northern District Council
Farrell 781LT	Rem/5	TOLT00000000078100005	Gravelotte Town	Northern District Council
Farrell 781LT	6	TOLT00000000078100006	Agricultural Game Farm	Piet Warren Plase
Farrell 781LT	7	TOLT00000000078100007	Mining	Modjadji Manufacturing Pty Ltd
Farrell 781LT	8	TOLT00000000078100008	Agricultural Game Farm	PP Mare Boerdery Pty Ltd
Farrell 781LT	9	TOLT00000000078100009	Agricultural Game Farm	Provincial Government of Limpopo
Farrell 781LT	10	TOLT00000000078100010	Agricultural Game Farm	Northern District Council
Mon Desir 782LT	Rem/1	TOLT00000000078200000 TOLT00000000078200001	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
Mon Desir 782LT	2	TOLT00000000078200002	Agricultural	Pieter Oosthuizen Landgoed Pty Ltd
Willie 787LT	Rem/5	TOLT00000000078700000 TOLT00000000078700005	Agricultural Game Farm	Dunn, Henry Brown
Willie 787LT	2	TOLT00000000078700002	Agricultural Game Farm	Angetu Prop Pty Ltd
Willie 787LT	3	TOLT00000000078700003	Agricultural Game Farm	Osmers, Charles Nicolaas Joubert
Willie 787LT	6	TOLT00000000078700006	Agricultural Game Farm	Klipspringer Lodge cc
Willie 787LT	10	TOLT00000000078700010	Agricultural Game Farm	Elphinstone, Rachel Johanna Emmarentia
Arundel 788LT	Rem	TOLT00000000078800000	Agricultural Game Farm	HL Hall & Sons Prop Pty Ltd
Arundel 788LT	3	TOLT00000000078800003	Agricultural Game Farm	Pieter Ernst Familie Trust
Arundel 788LT	4	TOLT00000000078800004	Agricultural Game Farm	Nyala Lodge Share Block Pty Ltd
Arundel 788LT	7	TOLT00000000078800007	Agricultural Game Farm	Big Five Game Co Pty Ltd
Danie 789LT	1	TOLT00000000078900001	Agricultural Game Farm	Pedal Trading 168 Pty Ltd
Mashisimale 800LT	0	TOLT00000000080000000	Communal Land	Mashisimale Traditional Council
Croc-Ranch 835LT	0/1/2/7/9//11/13/14/15/16	TOLT00000000835000000 TOLT00000000835000000 TOLT00000000835000010	Communal Land	Mashishimale Traditional Council

FARM NAME	PTN	SG 21 DIGITS	LAND-USE	OWNER
		TOLT0000000835000090 TOLT0000000835000011 TOLT0000000835000012 TOLT0000000835000013 TOLT0000000835000014 TOLT0000000835000015 TOLT0000000835000016		

3.4 TECHNICAL DETAILS OF THE PROJECT

3.4.1 REQUIREMENTS FOR THE 400KV POWER LINE

The technical requirements for a 400kV power line are given in the Table below and are further discussed in Sections 3.4.1.1 to 3.4.2.1.

Table 3-3: Technical Details

Component	Description/dimensions
Power line capacity	400kV
Pylon type	Cross rope suspension Guyed suspension tower Self-supporting tower
Height of pylon	30m-45m
Span Length	300m-400m
Minimum Ground Clearance	8.1m
Length	±110km
Servitude	55m (cross rope suspension towers require 75m at tower position)
Area occupied by laydown areas	To be determined during construction by the contractor in consultation with the ECO
Width of access road	Servitude to be used for access. Where there is need, a 4m wide road will be used.
Length of access road	The servitude will be used as access route.
Height of fencing	2.1m
Type of fencing	Palisade

3.4.1.1 LINE HEIGHT AND SERVITUDE WIDTH

The statutory minimum ground clearance for a 400kV overhead line is 8.1m. The line must be designed to afford this clearance in ALL circumstances. The overall height of the line is also dependent on several criteria, including geographical location, topography, height above sea level, span length and conductor type. Though a 3km buffer is being assessed, the required servitude width for a 400kV power line is 55m.

3.4.1.2 SPAN LENGTH

The span length also depends on the same criteria as line height. The distance between supports (span length) will vary from 300 to 400m, with an average span of 350m between supports.

3.4.1.3 SERVICE ACCESS ROADS

Temporary access routes capable of accommodating construction plant, material and workers are required for the construction of each tower and the installation of conductors. These roads with a width of 4m are constructed within the transmission corridor/ servitude. In consultation with the land owners, gates are installed where they intersect with roads, other property boundaries and where access roads cross agricultural land containing livestock.

3.4.2 POWER LINE INFRASTRUCTURE

An overhead power line is comprised of tower structures and conductors with associated hardware discussed below:

3.4.2.1 TOWER STRUCTURES AND CONDUCTORS

Transmission towers are utilized to suspend high voltage overhead power lines and each transmission tower must be constructed to support the level imposed on it by conductors. Although the power line towers that will be utilized for this project have not been decided, three tower structures below are generally used for 400kV power lines.

- ❑ **Cross Rope Suspension Tower**

The towers are supported by stays or guys to stabilize the towers. This tower is easy to assemble and the structure requires less galvanized steel than the guyed V tower making it lighter. Forces from the earth-wires, tower guys, and conductors are transferred only to the two mast peaks, thus eliminating direct bending moments in the structure and resulting in cost savings in the order of 50% per tower. The tower has an average height of 40m and requires a servitude of 55m. However, 75m is required at tower location. See Figure 3-6 for the tower structure.

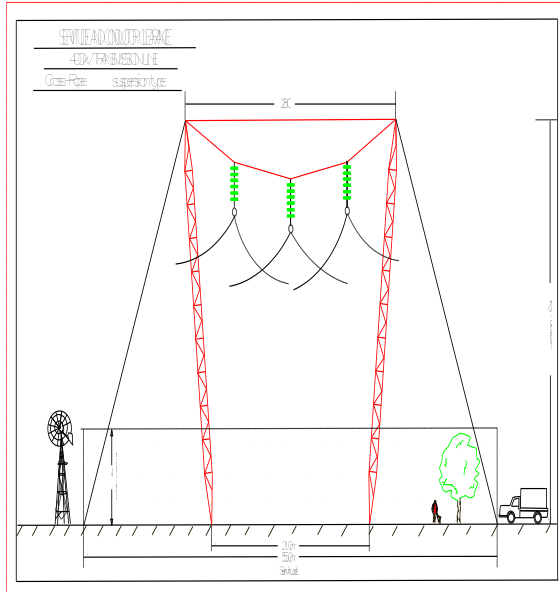


Figure 3-6: Cross Rope Suspension Tower

□ **Guyed Suspension Tower**

The tower has one large foundation and four guys therefore four smaller foundations. They provide the best protection from lightning impulses due to ground wire and cross arm configuration. Tower cross bar helps with the live maintenance. The towers have an average height of 33m. See Figure 3-7:

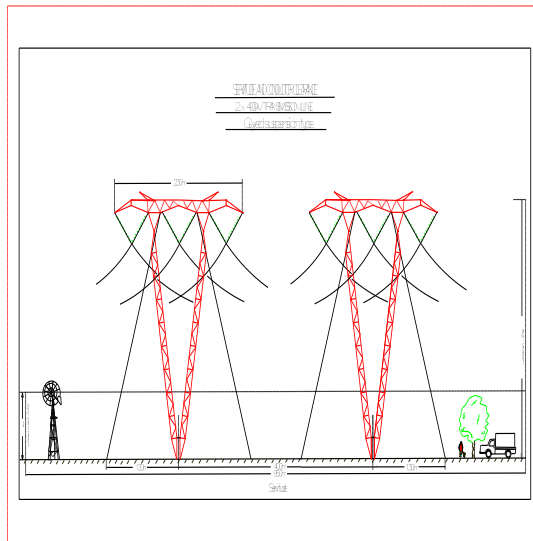
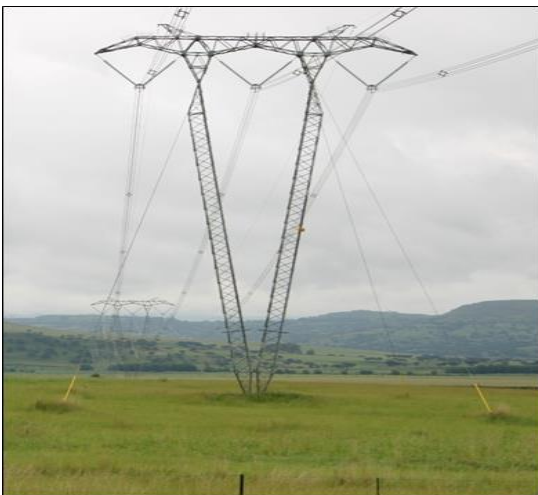


Figure 3-7: Guyed Suspension Tower

□ **Self-Supporting Tower**

This is a typical Eskom designed self-supporting tower and utilizes a V assembly to allow for compaction of the phases. The structure is optimized to carry 190KN glass insulators which support

quad zebra conductors. Commonly used before the cheaper guyed and cross rope structures were designed. Reference is made to Figure 3-8 below for the tower.

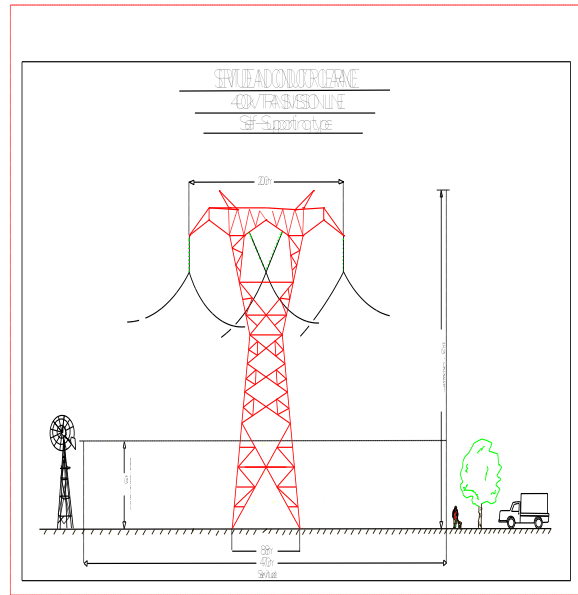


Figure 3-8: Self-Supporting Tower

3.4.3 ELECTRIC AND MAGNETIC FIELDS (EMF)

3.4.3.1 ELECTRIC FIELDS

Power line electric fields are produced by the presence of electric charges and therefore the Voltage (V) applied to a conductor of a power line. Generally, the voltage on a system is stable and therefore the electric field under the line remains relatively constant. Tower geometry and conductor height affects the electric field at ground level. Electric fields decrease with an increase in distance from the conductor and overhead power lines are designed to meet a maximum electric field level of 10 kV/m within the servitude and directly below the line. This level falls to lower levels and must meet the level of 5 kV/m allowed for public exposure at the servitude boundary.

3.4.3.2 MAGNETIC FIELDS

Magnetic fields are produced by the current flowing on the conductor of a power line. The current on a system may vary depending on the load supplied by the system. As the load changes, the magnetic field will change. Tower geometry and conductor height affects the magnetic field at ground level. Magnetic fields decrease with an increase in distance from the conductor. Overhead power lines are designed to meet a maximum magnetic field level of 200 μ T allowed for public exposure at the servitude boundary. Reference is made to **Appendix E-1** for a detailed study carried out by Empetus

CC and peer reviewed by Optimum Engineers with regards to the effects of EMF on humans, plants and animals.

3.4.4 OVERHEAD LINE CORONA, NOISE AND CORONA DISCHARGE

Corona noise is found on transmission lines where higher voltages exist and it is more active during the increased humidity conditions provided by light rain. A large number of corona discharges are caused by water drops collecting on the conductors. In dry conditions, the conductors usually operate below the corona inception level, and less corona sources are present. Corona noise comprises of two sound components: one is random crackling noise and the other is hum noise of buzzing. The random sound has a wide frequency band because the sounds caused by corona discharge occur randomly and the corona hum noise results from the electric field surrounding the conductors. The level of operational noise from overhead lines will vary depending upon the environmental conditions, the locality and several other factors including the distance to ground and voltage.

3.5 PRE-CONSTRUCTION AND CONSTRUCTION PHASE

The construction phase of the project is expected to take up to 24 months with a project lifespan of 40 years or more. The main works for the construction of the 400kV power lines and substation include the following:

3.5.1 PRE-CONSTRUCTION

3.5.1.1 LAND NEGOTIATION

400kV power lines are constructed and operated within a 55m wide that is established along the entire length of the line. Within this servitude, Eskom Transmission have certain rights and controls that support the safe and effective operation of the line. Eskom is responsible for the servitude negotiation process which is undertaken after a route has been environmentally authorized by DEA and this process must be completed with the relevant landowner before construction starts on that property. The negotiation involves the following steps:

- Once the route is confirmed, the servitude agreement will be finalized with the individual landowners. This agreement will set out the conditions for the establishment and operation of the servitude, exact location of the towers, access arrangements and will be site-specific as different landowners may have different requirements;
- Compensation payments are made when the servitude is registered at the Deeds office;
- Once construction is complete and the land rehabilitated to the landowners satisfaction, the landowner signs a "Final Release" certificate. Until the "Final Release" certificate has been

signed, Eskom Transmission remains liable for the condition of the land. Once the clearance certificate is signed, the responsibility for the line and servitude is handed over to the regional Eskom Transmission office.

3.5.1.2 RIGHT OF WAY SURVEYING

Prior to construction of the overhead power line, a precise ground survey is carried out to determine the ground profile along the centre of the power line route and for 27.5m on either side where the ground profile slopes across the power line route. This is to ensure that the location selected for towers and stays and their relationship with each other comply with the technical limits laid down for maximum span lengths, maximum sums of adjacent spans and safe clearance to live conductors in the final siting of pole. Further consideration is given to detailed environmental effects. Where the route of the line passes over or near trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned prior to the construction of the line.

3.5.1.3 SOIL SAMPLING

Geotechnical investigations will be carried out at substation and tower positions to determine the type of foundation required. The holes will be filled in after soil sampling is completed.

3.5.1.4 STRUCTURE STACKING

A survey crew will peg the substation location and the power line corridor.

3.5.2 CONSTRUCTION PHASE

The following is a process that will be adopted for the entire route, beginning at the starting point of the new line. Each activity will follow the previous one, such that at any one point an observer will see a chain of events, with different teams involved over time. At any one time some or all of the different teams may be working at different points along the line. There may be days of no activity in the process.

3.5.2.1 CONSTRUCTION CAMP

The establishment of the construction camp will involve the clearing of vegetation, fencing of camp and the construction of workshops and store rooms as well as temporary site offices. The location is selected by the contractor who will take into account such aspects as access to the construction site, access to services, access to materials, etc. The contractor will then enter into an agreement with a

landowner for the establishment of the construction camp. The site moves continuously with the progression of the line, so the teams will perhaps travel a different distance to the site each time.

All materials are stored at the construction camp with the exception of the steel towers and concrete. There is usually one construction camp per 100km of transmission line. It is therefore anticipated that there will be one construction camp along the route. Reference is made to Figure 3-9:



Figure 3-9: Example of Construction/Storage Camp

3.5.2.2 CLEARING

The Right of Way (ROW) must be cleared to allow for construction and operation activities of substation and power line. The land-owner and the local community will be notified prior to construction clearing. Reference is made to Figure 3-10 below for an example of servitude clearance.



Figure 3-10: Example of clearing at tower sites

3.5.2.2 ACCESS ROAD CONSTRUCTION

Where construction of a new road has been agreed, the road width shall be determined by need, such as equipment size, and shall be no wider than 6m. The proposed servitude will also be used to access each tower. In consultation with the land owners, gates are installed where they intersect with roads, other property boundaries and where access roads cross agricultural land containing livestock. It should also be noted that no bridges will be constructed as the contractor will use the existing river/stream crossings.

3.5.2.3 FOUNDATION INSTALLATION

A work crew will excavate the foundations for the towers. See Figure 3-11. The foundation is influenced by the terrain encountered as well as the underlying geotechnical condition. The actual size and type of foundation to be installed will depend on the soil bearing capacity and can be excavated manually or by using machines. The foundations will be back filled, stabilized through compaction and capped with concrete.



Figure 3-11: Example of excavated pits

3.5.2.4 ERECTING STRUCTURES AND STRINGING CONDUCTORS

The Right of Way corridor may be used as an area for temporary storage and handling for equipment and materials related to construction. See Figure 3-12. Steel components of structures may be delivered and placed on the ground near foundation sites. Once foundations are in place, the following work will be carried out:

- (i) Erection of the structures within the Right of Way;
- (ii) The steel components of the tower will be assembled using a crane and then lifted onto the foundations;

- (iii) Insulators and attachment hardware will be installed and stringing sheaves attached to the insulators; and
- (iv) The conductors will be strung by attaching the conductor to a steel line and pulled through each structure's stringing sheaves under tension to keep the conductors well off the ground.



Figure 3-12: Laydown Areas

3.5.3 SUBSTATION CONSTRUCTION

To cater for the proposed 400kV power line, Spencer substation needs to be extended/ upgraded to establish the 400/132kV transformation yard and the 1x500MVA, 400/132kV transformer. In addition, a transformer oil holding dam with a capacity of 120m³ will also be constructed. The area required for this extension is approximately ±9 hectares and the preliminary layout for the substation extension is appended to the Report. The proposed upgrade/ extension works will entail the following activities:

- Cut and fill grading;
- Placement and compaction of structure fill to serve as a foundation for equipment;
- Grading to maintain drainage patterns;
- Installation of equipment and structure foundations;
- Construction of bund walls, oil drainage pipes and oil holding dam;
- Construction of formal drainage and storm-water control measures;
- Installation of structures and equipment;
- Connection of the new infrastructure to the existing network; and
- Erect a fence around the perimeter of the substation.

3.6 BULK SERVICES AND INFRASTRUCTURE

The supply of the following basic services forms part of the contract between Eskom and the contractor hence the agreements will be acquired by the contractor.

3.6.1 WATER

This report has not quantified an expected volume of water required for the construction and operational phases of this project. Should water from nearby surface water sources be required, then a formal application for a water use license is needed. More background information and analysis on surrounding water resources is included in the wetland report attached in **Appendix E-9**.

3.6.2 SEWERAGE

Sewerage generation is anticipated during the construction phase due to the presence of the workforce contracted for the project. Consequently, the use of portable chemical toilets is suggested, which will be serviced periodically. During the operational phase, negligible amount of sewerage will be generated at Spencer substation for which a septic tank will be provided. However, such a mechanism requires adequate maintenance to prevent leakages.

3.6.3 STORM WATER

Storm-water measures will be implemented to suite the terrain. The measures to be implemented are detailed in the Environmental Management Programme attached in **Appendix G**.

3.6.4 SOLID WASTE

It is anticipated that solid waste will be produced mostly in the construction phase such as litter, packaging materials such as plastics, carton boxes, paper, beverages and stockpiles. This type of waste will not pose any threat to the proposed project and will not require a Waste Management License.

3.7 OPERATION AND MAINTENANCE OF THE POWER LINE

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

- Eskom Transmission will be responsible for the tower structures, access roads, watercourse crossings, and gates and fences relating to servitude access.

Exceptions to the above may arise where dual use is made of the access roads and gates and specific land use limitations are set by Eskom Transmission within the servitude which directly affect the landowner.

3.7.1 LAND USE AND POWER LINE OPERATION

Literature studies have shown that farming and associated infrastructure such as irrigation systems and support structures can be practiced under 400kv power lines provided that all the safe working clearances, crop height restrictions and building restrictions are properly followed. However, there is also a need for the land-owner to have an agreement with Eskom with regards to the activities that can be carried out underneath the servitude. Various research undertaken has also concluded that the Electric Magnetic Field (EMF) associated with the power line has little or no impact on the farming activities. Reference is made to Appendix B-4 for the EMF report. The following activities are generally allowed:

- **Livestock grazing:** Bush clearing in the servitude will have little impact on the grazing potential of the land because most of the vegetation can be re-established under servitude. Overhead power lines do not affect the behavior of livestock health, therefore, they can continue to feed underneath power line once the cleared vegetation become re-vegetated; and
- Overhead power lines do not affect the growth of any crops and other low-growing vegetation. Tree height should not exceed the minimum height restriction.

3.8 DECOMMISSIONING PHASE

During the decommissioning phase, the removal of the power lines and substation will be the reversal of the construction phase and rehabilitation of the ROW. The process of dismantling and removal of the line includes:

- Lowering the overhead conductors and earth wires to the ground and removing them from the site and selling them as scrap;
- Removing insulators and line hardware from structures at the site and disposing them at a registered local authority waste facility;
- Dismantling the towers and cutting them into pieces small enough to be handled and transported from the site;

- Demolition of foundations and disposing the concrete at a registered landfill site; and
- Backfilling and compaction of the excavation with suitable material.

4. ALTERNATIVES

This chapter identifies and describes the alternative infrastructure options and motivation for site selection for the proposed project. In terms of the NEMA EIA Regulations GNR982, one of the criteria to be considered by the Competent Authority when considering an application is “*any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment*”. Alternatives are defined in the Regulations as “*different means of meeting the general purpose and requirements of the activity*”. It is therefore necessary to provide a description of the need and desirability of the proposed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community, that may be affected by the activity.

The “*feasibility*” and “*reasonability*” of an alternative will therefore be measured against the general purpose, requirements and need of the activity and how it impacts on the environment and on the community that may be affected by the activity. It is therefore vital that the identification, investigation and assessment of alternatives address the issues/impacts of a proposed development.

4.1 LOCATION ALTERNATIVES

‘These are considered for the entire proposal or for a component of a proposal with the latter sometimes being considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate and alternative locations that are in close proximity. Alternative locations in the same geographic area are often referred to as alternative sites.’
DEAT, 2004.

4.1.1 ROUTE/ CORRIDOR SELECTION CRITERIA

Prior to identifying the power line alternatives, the applicant undertook a desktop evaluation to assess and note the key challenges within the proposed area. To construct and operate a 400kV power line from Foskor MTS to Spencer MTS, Eskom identified and evaluated two corridor alternatives at a broader scale to identify the preferred corridor. Criteria were selected from the biophysical, technical and social aspects to ensure representation of the different project proponents. Though these two corridors **may** be suitable for a transmission power line, it should be noted that they will be thoroughly assessed in the next sections of this report. The identified corridors represent opportunities to rule in

and out other possible transmission line corridors that require further evaluation when they are presented to the public for discussion and input. Corridors that are not identified at this phase may still be added later.

The three aspects considered by Eskom to identify their preferred corridor are discussed below:

4.1.1.1 BIOPHYSICAL CRITERIA

- ❑ **Biodiversity:** The construction and maintenance of transmission line through intact environments may result in alteration and disruption to the habitat including impacts to fauna and avian species and an increased risk of forest fires. The avoidance of the corridor passing through sensitive environmental resource areas such as nature reserves and intact environments is desired hence this criterion was weighted of high significance;
- ❑ **Land Capability:** This was considered in the context of agricultural potential, i.e. the loss of agricultural area due to the Right of Way. This was given a moderate weighting since some agricultural activities are allowed within the ROW if the minimum vertical and horizontal distances set out by Eskom are kept.
- ❑ **River Crossings:** the spanning of power lines across rivers may result in sedimentation and water pollution hence crossing of rivers should be minimised.
- ❑ **Current Land-use:** the intensity of the current site use and the associated value of that use was considered especially in a conservation and agricultural context as the area is largely comprised of game reserves and agricultural farms. This also included an indication of the possible economic losses and the likelihood of land owner objection should the power line traverse across their properties.

4.1.1.2 TECHNICAL CRITERIA

- ❑ **Existing Right of Way (ROW):** The potential location of the 400kV corridor along existing ROWs where linear uses are already established such as transmission and distribution lines, roads and railroads is a primary routing consideration. The co- location of linear services within existing corridors is strongly desired;
- ❑ **Engineering:** the terrain and location of the transmission line corridor and constructability issues must be considered for new and existing ROW since both may have a significant bearing on cost and effects on environmental resources. Among the constructability factors considered is the ability to avoid or minimize the location of structures along steep slopes or embankments, in areas of rock outcroppings, or within environmentally sensitive areas such as wetlands. This aspect was given a moderate significance.

- ❑ **Length of the Corridor:** The distances of the corridors between the two MTS was also considered as longer distances imply greater capital, larger areas of surface disturbance and greater likelihood of nature reserves, roads and river crossings.
- ❑ **Future expansion of Network:** The future expansion of the transmission network was considered at a regional level. The distances between the line and the future network was considered as it would have a bearing on costs.

4.1.1.3 SOCIAL CRITERIA

- ❑ **Visibility:** the visibility of the power line to local receptors and tourists was considered in the context of the current visual environment and in relation to the receptors. This aspect was weighted as being of high significance as a larger percentage of the area is in pristine condition;
- ❑ **Proximity to Receptors:** The proximity of the site to the nearest receptor population defined in terms of the likely extent of impacts such as noise, visual and air quality impacts. The proximity was estimated as the approximate distance to the closest average receptor. A single structure was not considered as an average receptor.
- ❑ **Heritage:** this entails the existence of archaeological objects that may be impacted by the construction of the power lines which may result in increasing the time frame and costs of the project.

To ascertain the preferred corridors an assessment of the identified routes was done as per Table 4-1. Reference is made to Section 4.1.6.

The following two alternatives with the deviations identified are discussed in the next sub-sections:

4.1.2 POWER LINE CORRIDOR 1

Start: 24°01'40.05" S, 31°07'37.41" E

Mid-point: 23°51'31.28" S, 30°44'11.68" E

End: 23°29'19.37" S, 30°22'51.58" E

The bend co-ordinates are attached in Appendix C-4.

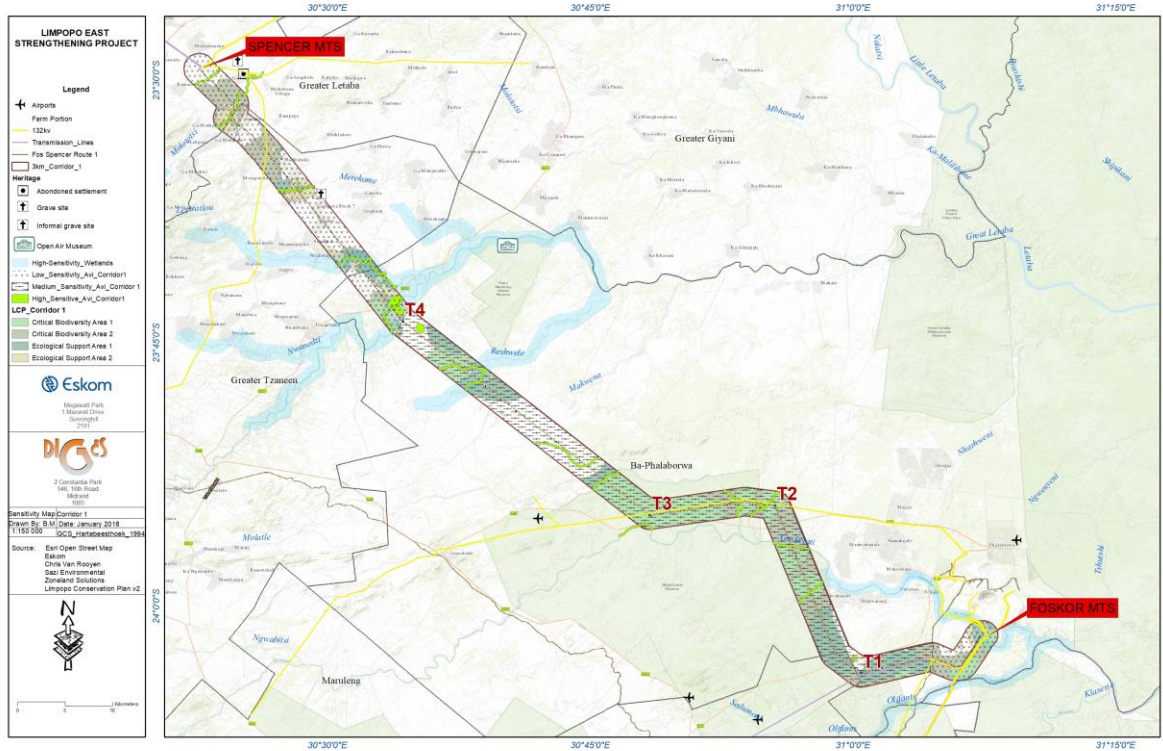


Figure 4-1: Corridor Alternative 1

The corridor will traverse across four Local Municipalities within Mopani District Municipality namely: Maruleng, Ba-Phalaborwa, Greater Tzaneen and Greater Letaba. Corridor alternative 1 is 112km within a 3 000m wide corridor. Reference is made to Figure 4-1 for corridor alternative 1. For ease of reference T1, T2, T3 and T4 will be used to refer to the turn points:

- The corridor starts at Foskor Main Transmission Substation on farm Loole 31LU within Foskor mine running in a south westerly direction parallel to the existing 275kV power line towards T1. This area is predominantly characterized of mining activities, nature reserves and game farming. The vegetation is mainly comprised of woodland and grassland and the capability of

the land is non-arable. According to the Limpopo Conservation Plan (LCP v2), the area is classified as CBA1, CBA2, ESA1 and ESA2;

- At turn point T1, the corridor will swing to the north-west crossing R40/R530, Selati Game Reserve, Tribal Lands, i.e., at the outskirts of settlements, Ga-Mashishimale and Makwareng, Ga-Selati River and R71 to turn point T2. The area is characterized of woodland and grassland and classified as a Critical Biodiversity Area with the following classifications: CBA1, CBA2 and ESA1;
- At turn point T2, the corridor will turn and traverse in a westerly direction crossing Molatle River and running parallel to the existing Gravelotte-Foskor 132kV power line for 10.5km to turn point T3. A larger section of the corridor is within a Critical Biodiversity Area (CBA1) that has several drainage lines and is comprised of woodland and grassland;
- The corridor swings to the north-west from T3 to T4 traversing across woodland, grassland, Ndzalama Wildlife Reserve, R71 road, Molatle and Reshwele Rivers. The corridor will traverse across Portion 1 of Begin 765LT, Remainder, Portion 1 and 2 of Volstruis 753LT, remainder and portion 2 of Free State 763LT which is currently under the custodianship of the South African National Defense Forces (SANDF). These farms are currently being used for training purposes by SANDF; and
- At turn point T4, the corridor will run in a north-westerly direction towards Spencer Substation traversing across commercial agricultural holdings that are concentrated around the Greater Letaba River and settlements practicing subsistence cultivation. The corridor will traverse across two non-perennial and a perennial river: Lerwatlou, Merekome and Molototsi respectively. Sections of the corridors fall within built up areas, i.e., in Xihoko, Ga-Mawa, Senakwe, Polaseng and Ga-Moloko. The area surrounding Spencer substation is predominantly characterized of open bushland, subsistence farming and residential areas.

4.1.3 POWER LINE CORRIDOR ALTERNATIVE 2

Start: 24°01'40.05" S, 31°07'37.41" E

Mid-point: 23°56'56.52" S, 30°38'31.67" E

End: 23°29'19.37" S, 30°22'51.58" E

The bend co-ordinates are attached in Appendix C-4.

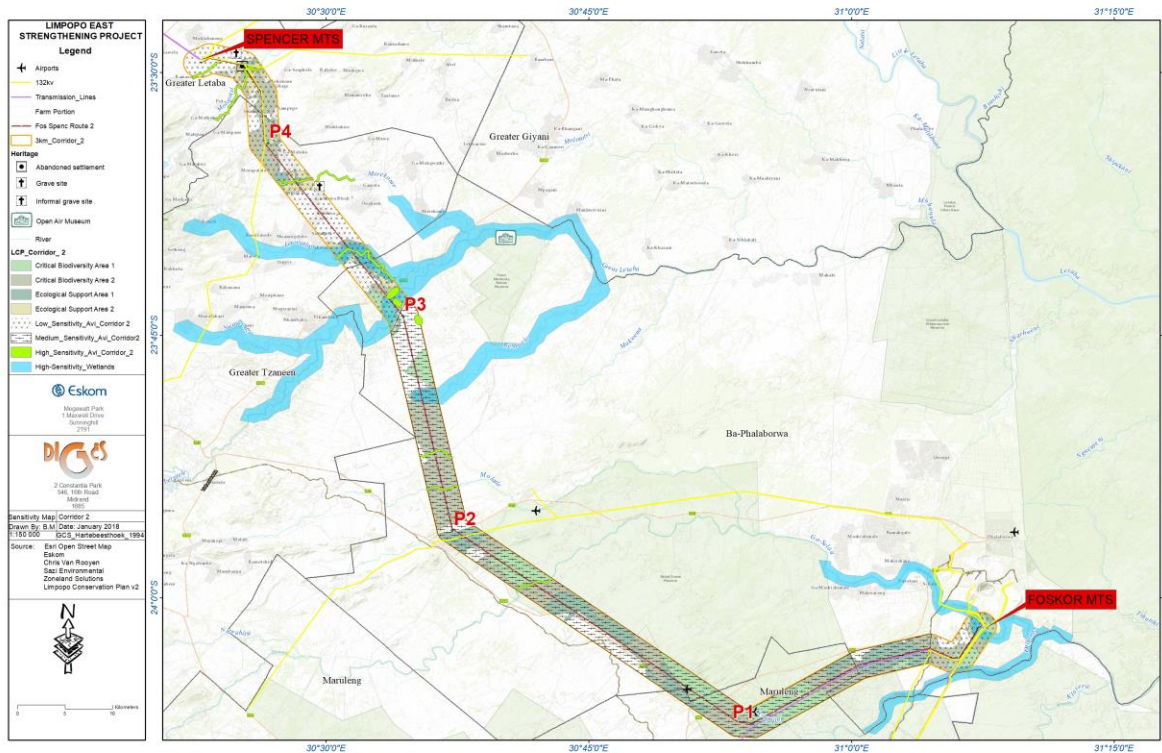


Figure 4-2: Corridor Alternative 2

- This alternative was referred to as Alternative 3 during the initial phase of public participation. Due to suggestions made during the meetings, the alternative is now being referred to as alternative 2. The proposed corridor alternative traverse areas that are similar to Alternative 1 and in some sections, will follow the same route. Reference is made to Figure 4-2 for the locality of the corridor. Corridor alternative 2 is 121km in length within a 3000m width corridor. Where corridor alternative 1 turns at T1 to run in a northerly direction, corridor alternative 2 will continue to run parallel to the 275kV for a further 12km cutting across Balule Nature Reserve towards P2. The area traversed is largely natural with mining occurring near the substation;
- At P1, the corridor crosses R40 cutting across Archie farm 156KT and Lillie 148KT and landing strips located within the farm, traversing in the southern-south east border of Selati Game Reserve. The corridor will run parallel to R526, traversing across Ga-Selati River, irregular plains, intact vegetation and R71 towards P2. Rocky outcrops and low hills can also be observed within the corridor;
- At P2, the corridor turns in a northerly direction traversing at the outskirts of Gravelotte with Consolidated Murchison Mine and the airport in the north east. The corridor will traverse across

Reshwele River and intact woodland towards P3 where it joins the corridor for Alternative 1 until P4 at Ga-Moloko; and

- At Ga-Moloko the corridor will swing to the north-east running parallel to an existing 132kV power line until Spencer substation. Reference is made to Figure 4-3. This section of the corridor will traverse at the outskirts and through villages, cultivated fields and cross the perennial Molototsi river running parallel to its tributary.



Figure 4-3: The corridor will run parallel the 132kV line

4.1.4 FOSKOR-SPENCER DEVIATION 1A (CORRIDOR 1 AND 2)

Start: 23°42'13.36" S, 30°33'04.21" E

Mid-point: 23°36'38.60" S, 30°30'54.98" E

End: 23°32'19.77" S, 30°26'22.41" E

The bend co-ordinates are attached in Appendix C-4.

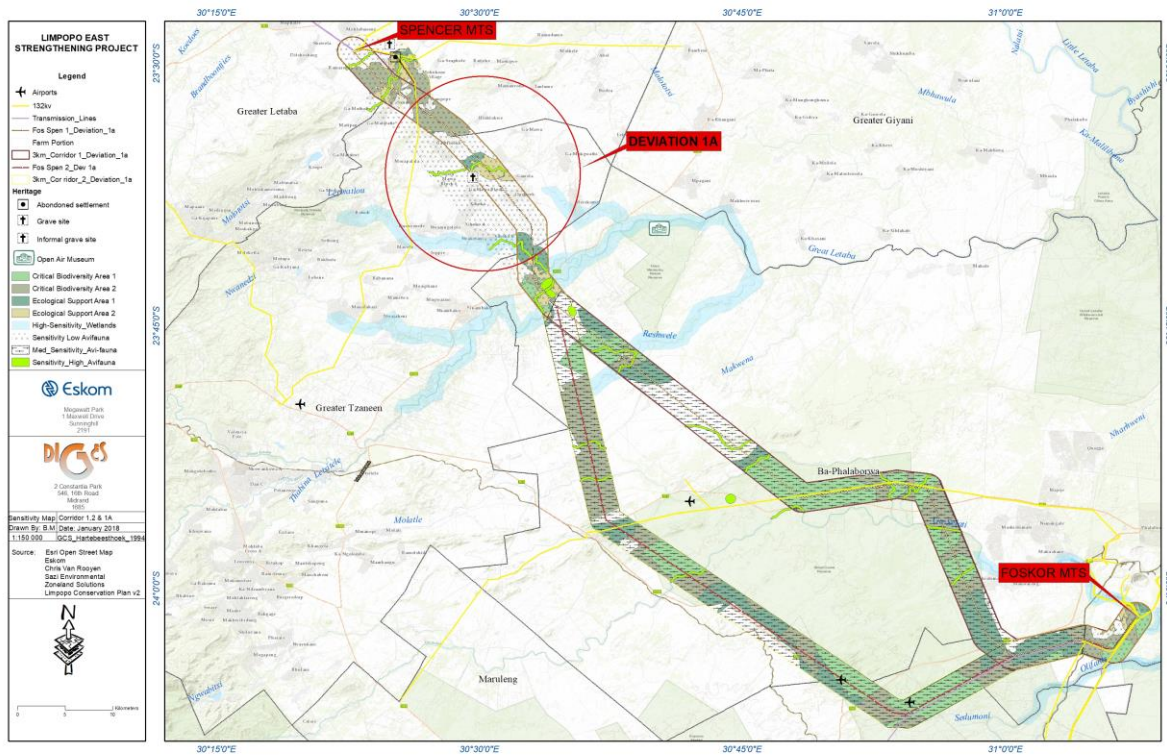


Figure 4-4: Corridor 1 and 2 with deviation 1a

The deviation was previously referred to as alternative 2 but due to suggestions given during the meetings, it is now referred to as a deviation from the two alternatives. To avoid some inaccessible areas within the built up areas, deviation 1a was proposed. Reference is made to Figure 4-4 for where deviation 1a joins either alternative 1 or 2. The deviation is 23km with a 3000m corridor starting from corridor alternative 1 and 2 at the agricultural plots north of Groot-Letaba River and running for 5.6km in a north-easterly direction.

This part of the deviation corridor will cross the Lerwatlou River and traverse across the open woodland and bushland. The corridor will then swing to the north- west traversing through and at the outskirts of villages such as Ga-Mawa, Ooghoek, Gamela, Rampede for 17km towards corridor alternatives 1 and 2. It will also cross shrubland, cultivated fields, Merekome River and its tributaries.

4.1.5 FOSKOR-SPENCER DEVIATION 1B (COMBINATION OF CORRIDOR ALTERNATIVE 1 AND 2)

Start: 24°01'40.05" S, 31°07'37.41" E

Mid-point: 23°56'21.25" S, 30°39'54.11" E

End: 23°29'19.37" S, 30°22'51.58" E

The bend co-ordinates are attached in Appendix C-4.

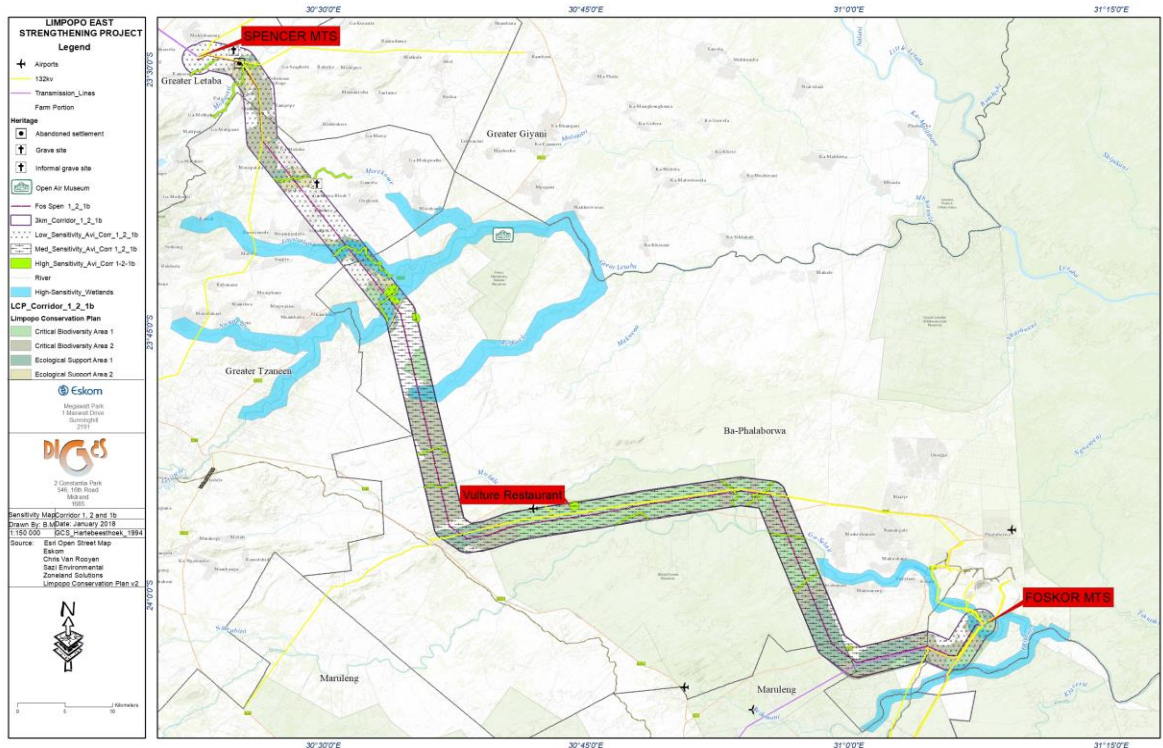


Figure 4-5: Combination of Alternative 1, 2 and Deviation 1b

This deviation was proposed as an option during the public participation meetings to avoid the area being utilised by Department of Defence. The use of this deviation combines both Corridor Alternatives 1 and 2 and the length of the corridor is 125.2km. Reference is made to Figure 4-5 for the route.

Instead of Corridor Alternative 1 proceeding to T4 as described in the section 4.1.2, the corridor will deviate at T3 (BVB Ranch) running westwards parallel to the existing 132kV power line towards corridor alternative 2. The deviation will cross the north-western border of Selati Game Reserve in an area that is characterised of plains with open low hills and ridges whilst the area towards corridor alternative 2 is generally denuded due to its proximity to Gravelotte. At Gravelotte the corridor will follow Corridor Alternative 2 towards Reshwele River where it will join Corridor Alternative 1 and continue to follow Corridor Alternative 2.

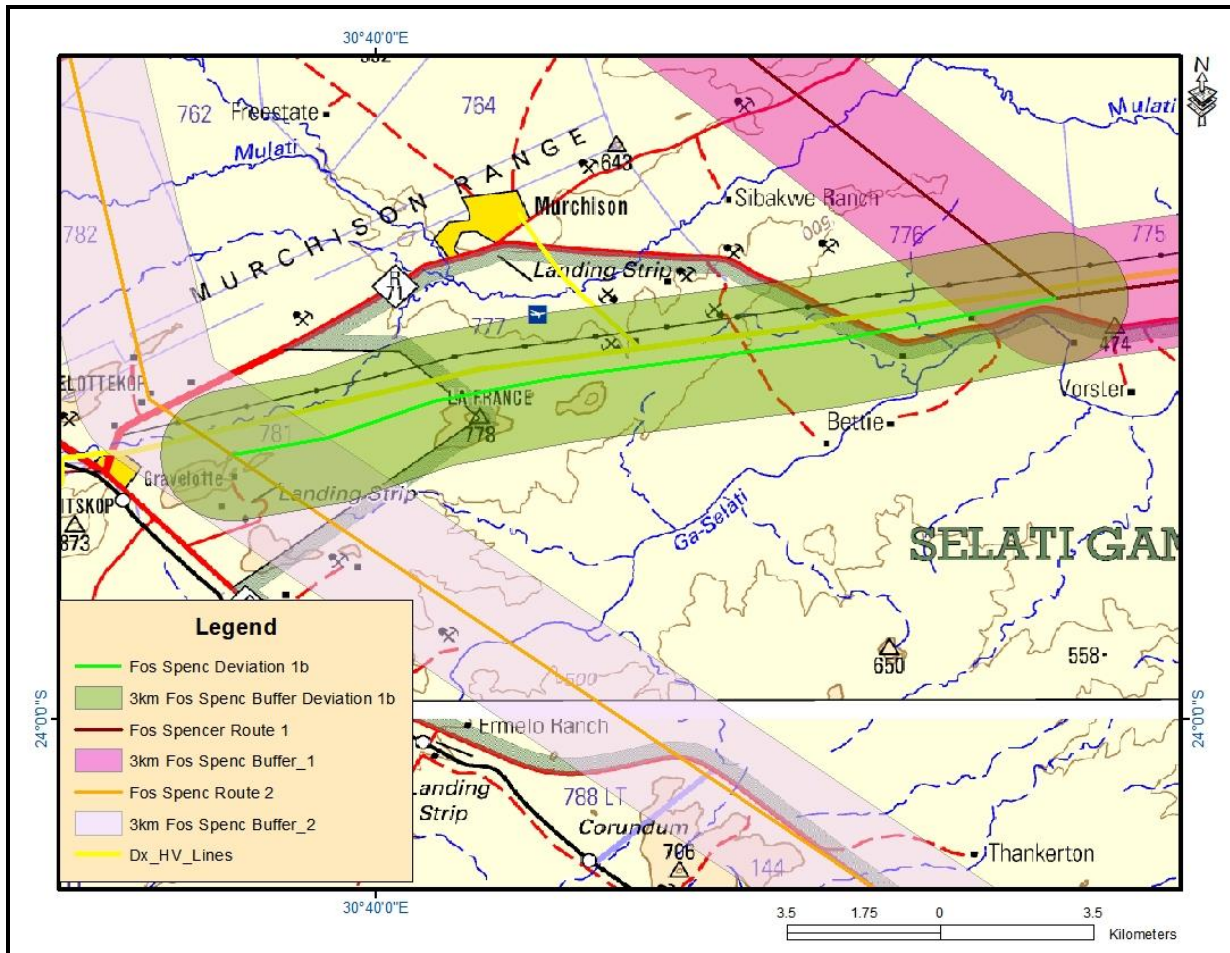


Figure 4-6: Locality of Deviation 1b

4.1.6 PREFERRED CORRIDOR SELECTION

During the screening and scoping phase, to determine the preferred alternative with regards to the two alternatives and factoring in the inclusion of the deviations, the criteria discussed in Section 4.1.1.1 to 4.1.1.3 were assigned weights from 1-3 in terms of environmental importance and the anticipated impacts where 1 was assigned to criteria of low significance and 3 for a criteria with high significance. For example, due to the pristine nature of the environment near Foskor substation and the nature reserves, biodiversity was deemed as a highly significant criteria whilst river crossings are assigned a weight of 1 since the impacts expected when power lines span across rivers are low. The table below shows how the site scores and the weights were assigned for each criterion:

Table 4-1: Weighting and Site Scoring against Criteria

Site Selection Criteria	Site Scoring Against Criteria			Weight
	<i>Low (1)</i>	<i>Medium (2)</i>	<i>High (3)</i>	
Bio-physical				
Biodiversity	Impacted Area	Area of Low sensitivity	Area of conservation importance	3
Land Capability	No potential	Low potential for Agriculture	Agricultural areas/high agricultural potential	2
River Crossing	No		Yes	1
Current Land-Use	No use	Moderate use	Intensively used	2
Technical				
Existing ROW	>40% of corridor runs parallel existing corridor	<40% of corridor runs parallel existing corridor	No	1
Engineering	No constraints	With constraints that can be addressed	Not suitable	2
Future Expansion of Network	Close Proximity (Within 50km radius)		Far (>50km radius)	1
Social				
Visibility	Low visibility in project area	Low visibility in natural areas and high visibility in project area	High visibility in natural areas	3
Proximity to receptors	Within 5000m-2500m	Within 2500-500m	500m	3
Heritage	-	-	-	

To compute the total score of each corridor, the site score of each criterion was multiplied by the criterion weighting to get a weighted site score. All weighted site scores for a corridor were added to get the total score per corridor. The corridor with the lowest total site score was the most preferred.

Based on the above table, environmental datasets were overlaid to get the areas the power line will traverse across. The length of the power line traversing across the different datasets or environment was measured and expressed as a percentage of the overall power line route. For example, the length of power line route alternative 1 traversing across nature reserves was measured and expressed as a percentage of the total length of alternative power line 1. Table 4-2 assigns site scores based on the percentages calculated and the implications of such on the identified criteria. The following datasets were used to make a comparison of the alternative corridors/routes:

- i. Limpopo Conservation Plan version 2. The source of data is Limpopo Department of Economic Development Environment and Tourism;
- ii. Land capability;

- iii. Protected and Conservation Areas. The source of data is DEA: South Africa Protected Areas Database_2017_Q2; and
- iv. Existing power lines. The source of data is Eskom.

It should be noted that deviation 1a was not included in the selection of the preferred route, as this deviation has relatively the same environment with alternative 1, 2 and a combination of 1,2 and deviation 1b and as such the implications posed by assessing the alternative are the same respectively.

Table 4-2: Site Scores against Criteria

Site Criteria	Site Score		
	Alternative 1	Alternative 2	Deviation 1b in combination with Alternative 1 and 2
Biodiversity	High (3)	High (3)	High (3)
Comments	45% of the power line route traverses across nature reserves whilst 76% traverses across Critical Biodiversity areas (CBA1, CBA2, ESA1, ESA2)	48% of the power line route traverses across nature reserves whilst 86% traverses across Critical Biodiversity areas (CBA1, CBA2, ESA1, ESA2)	39% of the power line route traverses across nature reserves whilst 86% traverses across Critical Biodiversity areas (CBA1, CBA2, ESA1, ESA2)
Land capability	Medium (2)	Medium (2)	Medium (2)
Comments	Sections of the power line traverse across commercial and subsistence farms.	Sections of the power line traverse across commercial and subsistence farms.	Sections of the power line traverse across commercial and subsistence farms.
River Crossings	Medium (2)	Medium (2)	Medium (2)
Comments	The power line crosses several ephemeral and perennial rivers. However, linear projects are regarded to have less impacts when it comes to wetland degradation.	The power line crosses several ephemeral and perennial rivers. However, linear projects are regarded to have less impacts when it comes to wetland degradation.	The power line crosses several ephemeral and perennial rivers. However, linear projects are regarded to have less impacts when it comes to wetland degradation.
Current Land-use	Medium (2)	High (3)	Medium (2)
Comments	Based on the activities carried out within the area and surrounding environment indicate that the power line construction and operation will have an impact on tourism. This will result in objections from land owners.	Based on the activities carried out within the area and surrounding environment indicate that the power line construction and operation will have an impact on tourism. This will result in objections from land owners. In addition, there are landing strips within the corridor.	This alternative has the same implications as Alternative 1 and 2. However, it avoids the farms utilised for training activities by the Department of Defence.
Existing Right Of Way	Medium (2)	Medium (2)	Low (1)
Comments	24% of the power line route runs parallel to the existing 132kV and	32% of the power line route runs parallel to the existing 132kV and 275kV power	46% of the power line route runs parallel to existing 132kV and 275kV power lines.

	275kV power lines.	lines.	
Engineering	Low (1)	Low (1)	Low (1)
Comments	Some sections of the route are characterised by ridges which can be addressed during the final power line design.	Some sections of the route are characterised by ridges which can be addressed during the power line design.	Some sections of the route are characterised by ridges which can be addressed which can be addressed during the power line design.
Future Expansion of Network	Low (1)	Low (1)	Low (1)
Comments	The power line route is within 50km radius from Tzaneen.	The power line route is within 44km radius from Tzaneen.	The power line route is within 50km radius from Tzaneen.
Visibility	Medium (2)	High (3)	Medium (2)
Comments	Due to the pristine nature of most of the project and surrounding area. The height of the towers will render them visible.	Due to the pristine nature of most of the project and surrounding area. The height of the towers will render them visible.	Due to the pristine nature of most of the project and surrounding area. The height of the towers will render them visible.
Proximity of receptors	High (3)	High (3)	High (3)
Comments	The power line will traverse across natural areas where tourism activities are undertaken. It will also cross within 500m of built up areas near Spencer Substation.	The power line will traverse across natural areas where tourism activities are undertaken. It will also cross within 500m of built up areas near Spencer Substation.	The power line will traverse across natural areas where tourism activities are undertaken. It will also cross within 500m of built up areas near Spencer Substation.

Table 4-3: Total Site Scorings for each alternatives

Site Selection Criteria	Corridor Alternative 1			Corridor Alternative 2		Deviation 1b (Combination of Corridor 1 and 2)	
	Weight	Site Score	Total	Site Score	Total	Site Score	Total
Biodiversity	3	3	9	3	9	3	9
Land Capability	2	2	4	2	4	2	4
River Crossing	1	2	2	2	2	2	2
Current Land-Use	2	2	4	3	6	2	4
Existing ROW	1	2	2	2	2	1	1
Engineering	2	1	2	1	2	1	2
Future Expansion of Network	1	1	1	1	1	1	1
Visibility	3	2	6	3	6	2	6
Proximity to receptors	3	3	9	3	9	3	9
Heritage	-	-				-	
Total			39		41		38

Prior to the inclusion of deviation 1b, corridor alternative 1 was the preferred alternative. Assessing deviation 1b and how it would connect to the two alternatives resulted in having a combination of alternative 1, 2 and deviation 1b as the preferred route.

4.1.7 SUBSTATION EXTENSION

Spencer substation is located within Greater Letaba Local Municipality near Mohlabaneng at the following co-ordinates: **23°29'19.37"S, 30°22'51.58"E**. The substation can be accessed via the D3180 which branches from R81 road to Giyani. The site is relatively flat characterised of scattered vegetation in the north east, cultivated areas various villages surround the substation. Drainage lines are located 500-675m north west and south of the substation. In addition, transmission and distribution power lines come in and out of the substation. The layout of the extension which will cater for the 400/132kV transformation yard, 1x500MVA, 400/132kV transformer and the oil holding dam will be finalised during the Environmental Impact Assessment Phase. Due to the nature of the proposed activities, no alternative sites will be assessed since it is an existing substation. Reference is made to the figure below for the preliminary layout.

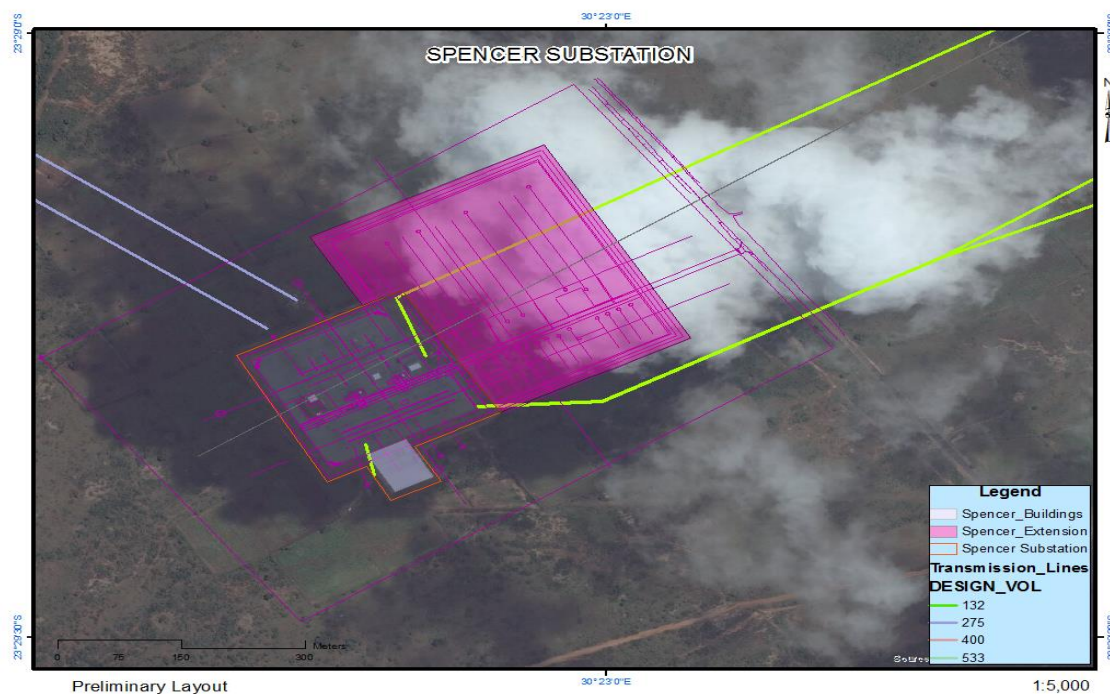


Figure 4-2: Substation Layout

4.1.8 NO-GO ACTION ALTERNATIVES

The description of the baseline or existing environment or status quo is essential to all environmental assessments, and should be focussed on the key characteristics of, and values or importance attached to the environment. The baseline, or 'no-go' option, as well as all other relevant alternatives must be

described, assessed and evaluated at the same scale and level of detail that enables adequate comparison with the proposed project. DEAT, 2004

This option would entail not strengthening the existing network in order to test the robustness of the Network. This option will entail the following network restraints:

- Risk of load shedding from 2018 onwards; and
- Further constraint on the Spencer 275/132kV transformation.

The no-go alternative also means that the environment does not change, i.e., the land upon which the power line would traverse would primarily be used for agriculture, mining, conservation and residential unless a different development is undertaken. The impacts identified in Section 8 both positive and negative would not occur.

4.1.9 ACCESS ROUTES

Temporary access routes capable of accommodating construction plant, material and workers are required for the construction of each tower and the installation of conductors. These roads with an average width of 4m are constructed within the transmission corridor/ servitude. In consultation with the land owners, gates are installed where they intersect with roads, other property boundaries and where access roads cross agricultural land containing livestock.

4.2 ACTIVITY ALTERNATIVES

According to DEAT, 2004, consideration of activity alternatives entails the change in nature of the proposed activity to meet the same need. No go alternative can also be assessed under these alternatives. These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans, and programmes as well projects. Consideration of such alternatives requires a change in the nature of the proposed activity. (DEAT: 2004d)

Eskom ascertained that to strengthen the Limpopo East Corridor, power had to be transmitted from Foskop MTS to the existing Spencer MTS. Power can be transmitted by either overhead power lines or underground power lines. The advantages and disadvantages for installing either the underground or the overhead power lines are discussed below and these are mainly related to magnetic fields, engineering and costs.

I. Magnetic field levels

- ❑ Underground cables produce no external electric field due to the shielding effect of the ground / covering above and to the sides of the cable;
- ❑ Due to the smaller distance to the buried cable they can have a much higher maximum magnetic field levels directly above the cable compared to overhead power lines;
- ❑ The magnetic field of the cable is also more localized compared to that of an overhead power line; and
- ❑ Where cables are buried in a tunnel, the magnetic field at the surface is much reduced and may be lower than an equivalent overhead line and often lower than background fields from other sources.

II. Engineering

- ❑ 400 kV cables present inherently huge capacitances. This behavior cause voltage deviations which limits manageable application to relatively short distances. The integration of these characteristics in the existing electricity network may lead to transient over-voltages and resonance effects, jeopardising system reliability;
- ❑ Fault rate is lower for underground cables than overhead power lines but cable fault location is more challenging;
- ❑ Repair time for underground cables is more than 20 times longer compared to overhead lines. This causes longer outage periods; and
- ❑ Decommissioning of underground cables systems is more challenging and expensive.

III. Costing

- ❑ Costing is dependent on the site characteristics and the system constraints. However, underground cables are 4 to 10 times more costly solution than the overhead power line (i.e R30million/km as compared to R8 million/km for the 400kV overhead power line. According to recent studies undertaken, a major element of this cost differential is accounted by the cable itself as the underground conductor has to be bigger than the overhead conductors as to reduce its electrical resistance and hence the heat produced. According to Eskom, the cost for constructing the Foskop-Spencer overhead power line using the 3 x IEC 315 conductors is R2 047 523.47 whilst the cost for 1200mm² mm² Al conductor XLPE cable will be R26,5m split as follows:
 - i. R12m/km for the cable;
 - ii. R7.5m/km for the installation; and
 - iii. R7m (once off) for after installation testing and commissioning.

The Table below gives a summary of the comparison between the two alternatives:

Table 4-4: Comparison between the Overhead line and the Underground cable system

Life cycle	Overhead line	Underground cable system
Capital costs	Lowest cost option Medium Voltage (6.6kV-33kV): R250k/km High Voltage (44-132kV): R3m/km Extra High Voltage (132-400kV): R8m/km	4 to 10 times cost of OHL Medium Voltage (6.6kV-33kV): R2,5m/km High Voltage (44-132kV): R12m/km (400MVA) Extra High Voltage (132-400kV):R30m/km (1600MVA)
Feeder route	Registered servitude required	Less space required (installation in road reserve)
Construction	Poles, pylons, foundations, stays and conductor (Pylon footprint dependant on tower design)	Fully trenched and re-instated route
Installation constraints	Trees, spanning and tension profiles, buildings, settlements	Open trenches, traffic considerations, theft (during installation – open trench prior to energising), jointing bays, river, road crossings
Protection	Auto reclosing to cater for temporary faults	No auto reclosing allowed
Life cycle	Overhead line	Underground cable system
Breakdown maintenance	Shorter repair times (hours), visual fault finding	Longer repair times, specialised fault finding methods (days), specialised skills
Maintenance constraints	Servitude cleaning (trees, etc.) Easy maintenance and reduced maintenance costs.	Specialised skills and high maintenance costs.
Operational constraints	Long lines, conductor jumper cutting theft, steel lattice support structure theft, pylon footing copper electrode theft, vandalism (shooting insulators), pollution	Prone to copper theft where exposed e.g. terminations to overhead lines and equipment, external contractor damage e.g. due to fibre optic expansion projects
Performance	Exposure to weather related faults (several intermittent faults)	Protected from weather related faults, increased reliability
Visual	Considerable visual impact	Minimal visual impact
Ground disturbance	Minimal ground disturbance therefore reduced impact on sensitive environments.	Increased ground disturbance therefore increased impact on sensitive environments

Data Source: Eskom Engineering Department 2017

Based on these aspects, underground cables were not considered as a viable option for strengthening the network.

4.3 SCHEDULING ALTERNATIVES

'These are sometimes known as sequencing or phasing alternatives. In this case, an activity may comprise a number of components, which can be scheduled in a different order or at different times and as such produce different impacts.' DEAT, 2004'

Each activity will follow the previous one, such that at any one point an observer will see a chain of events, with different teams involved over time. At any one time some or all of the different teams may be working at different points along the line. There may be days of no activity in the process.

4.4 ADVANTAGES AND DISADVANTAGES OF THE PROPOSED PROJECT

The load profile undertaken for the Province showed that Spencer substation will be having a peak demand of 318MVA by 2018 and to reinforce the province's transmission system and ensure the reliable supply of electricity, there is need to implement this project. Some of the advantages of implementing this project are notably:

- i. Access to electricity within the project area will catalyze economic development thereby creating more jobs, the generation of disposable income and other benefits which ultimately leads to poverty reduction;
- ii. The availability of electricity to many more people in rural areas will also decrease the reliance on wood and biomass for cooking and heating thereby decreasing both indoor and outdoor air pollution. This will have a positive impact on health and the environment; and
- iii. Improvement and better community security due to lighting.

The following negative ecological and socio-economic impacts are expected if the proposed project is implemented:

The proposed development will have a negative impacts on game farms, nature reserves and conservation areas. With the presence of construction teams and the movement of heavy vehicles, game will be negatively affected. During construction, game could be disturbed due to noise vehicle movement, it is possible that some game could even collide with fences when shocked by the above resulting in injury or death of the animals. Safety and security risks especially theft of game, birds and plant species, as well as the increased risk of veld fires are also a serious concern. Furthermore during operational phase, the development can have severe visual and subsequent economic impacts on the affected nature reserves and conservation areas.

Some of the negative cumulative impacts includes a loss of use of agricultural land, damage to habitat and fauna, the displacement of wildlife, erosion due to loss of ground cover and the transformation of sensitive areas such as rivers, wetlands and streams.

5. THE RECEIVING ENVIRONMENT

5.1 CLIMATE

The project area falls within the summer rainfall area, receiving most of its rainfall in the summer months. Average minimum temperatures range from approximately 7.9-15.3°C in summer to 5.5-10.4°C in winter. Reference is made to Table 5-1 and 5-2 for the minimum temperatures and average annual rainfall. Table 5-1 shows that the average minimum temperature between the years are similar whilst average yearly rainfall range from 291 to 575mm from 2014 to 2016 with a 49% decrease recorded in 2015. Relative humidity is lowest during winter and spring and highest during summer and autumn.

Table 5-1: Average Monthly minimum temperature (°C)

Months	Average Monthly Temperature (°C)	
	2015	2016
January	14.8	14.3
February	15.1	14.0
March	15.3	12.3
April	11.4	11.5
May	7.8	10.4
June	7.8	4.7
July	5.5	6.2
August	5.9	6.0
September	10.6	7.8
October	7.9	12.1
November	14.2	10.8
December	14.8	15.7

Source: rp5.co.za (Hoedspruit Airport Station)

Table 5-2: Average Annual Rainfall, 2014-2016

Year	Average annual rainfall (mm)
2016	401
2015	291
2014	575

Source: rp5.co.za (Hoedspruit Airport station)

The predominant wind direction recorded at the airport is from the East North-East (ENE). Wind speeds are generally slow to moderate with wind speeds exceeding 5m/s recorded infrequently.

5.2 SOILS

Areas are classified into land types based on their slope, soil type and depth and underlying geology. The project area is characterized with slopes ranging from 0-9% and there are red yellow apedal and glen rosa and/ mispah soils dominated by swelling clays. The clay content in this area is between 15% and 35%. The detailed soil profile and the land capability in the area is detailed in the report attached in **Appendix E-7**.

5.3 SURFACE WATER RESOURCES

The proposed project area is located in the Olifants Water Management Area (WMA 2) which includes the Olifants, Letaba and Shingwedzi systems. The spatial extent of the area includes tertiary drainage regions B72 and B81. In addition to the numerous seasonal tributaries and wetlands traversed across by the power lines, three prominent rivers will also be traversed, i.e., Olifants, Groot Letaba and Ga-Selati Rivers. Table 5-3 below shows the rivers crossed by the proposed power line corridors.

Table 5-3: Prominent Rivers within the Project Area

Name	Class
Olifants River	Perennial
Ga-Selati River	Perennial
Great Letaba/ Groot Letaba	Perennial
Molototsi	Perennial
Sedumoni	Non-Perennial
Molatlé	Non-Perennial
Reshwele	Non-Perennial
Lerwatlou	Non-Perennial

Name	Class
Merekome	Non-Perennial



Figure 5-1: Merekome River



Figure 5-2: Dam near Xihoko

The Letaba River catchment is drained by the Groot Letaba River and its major tributaries are the Klein-Letaba, Middle Letaba, Letsitele and Molototsi River whilst the Olifants River catchment is a sub catchment of the Limpopo Basin and is the largest tributary of the Limpopo River. According to the Department of Water Affairs (2013), Olifants WMA is a highly utilised and regulated catchment and like many other WMAs in South Africa, its water resources are becoming more stressed due to an

accelerated rate of development and the scarcity of water resources. The map below shows the Olifants WMA as well as the area affected by the proposed development.

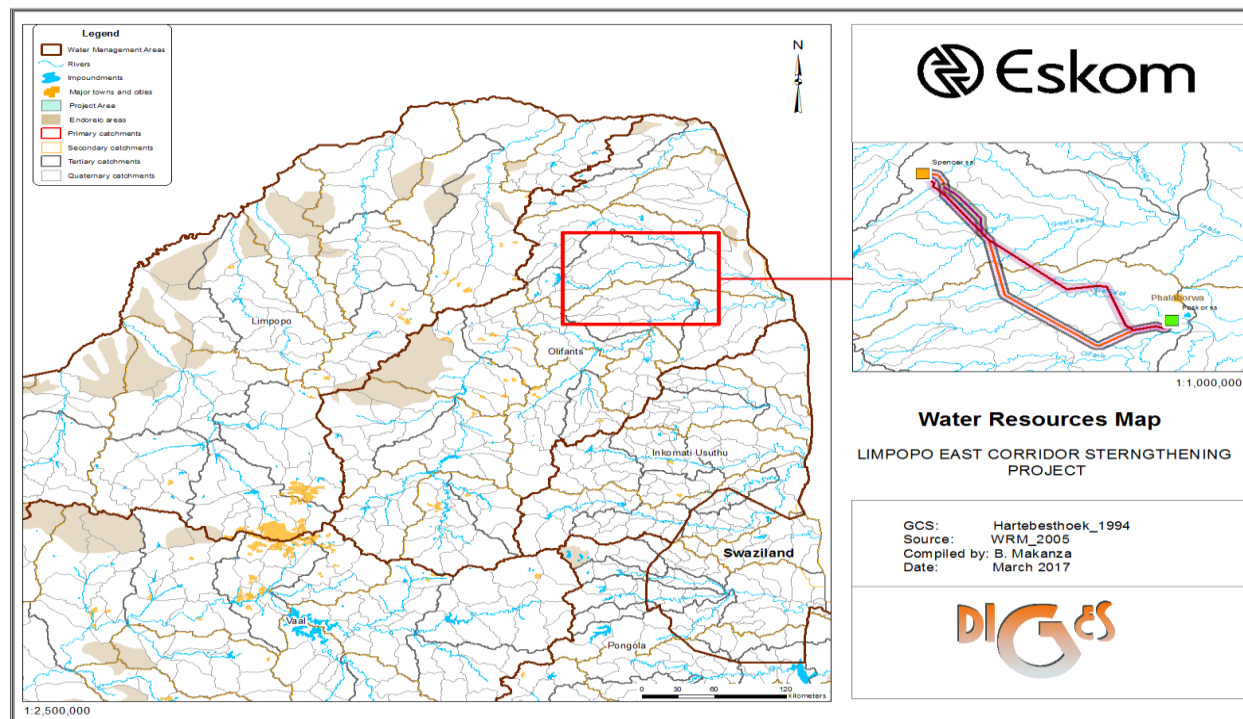


Figure 5-3: Olifants Water Management Area

A Wetland Report is attached in **Appendix E-9**.

5.4 GROUND WATER

Groundwater forms part of the four sources of water available within the Local Municipalities. Some villages and mining industries make use of ground water as their water source. The project area is characterized of a minor aquifer with a depth of approximately 20-30m. The groundwater zone is low to moderate yielding formation except where fractured. The water bearing fractures are principally restricted to a shallow zone below groundwater level.

5.5 GEOLOGICAL CONDITIONS

5.5.1 LITHOSTRATIGRAPHY

The Goudplaats Gneiss and Makhutswi Gneiss underlie most of the project area, with a smaller contribution from the ultramafic metavolcanics (rocks rich in chlorite, amphibole, talc and serpentine) and meta-sediments of the Giyani Greenstone Belt. Soils are red-yellow apedal, freely drained, but also

shallow. Gravelotte and surrounding areas is underlain by varied geology which is largely composed of schist and amphibolite of the Gravelotte and Giyani Groups, with a few quartzitic and granitic hills. Miscellaneous, often shallow, soils with Glenrosa and Mispah forms common. Land types are mainly Ib, Fa, Ae and Fb.

5.6 TOPOGRAPHY

Due to the length of the proposed power line corridors, the terrain the alternative power line corridors traverse across differ and they are characterised by:

- i. Irregular plains with low ridges: this terrain was observed in areas surrounding Foskor and Selati Game Reserve;
- ii. Plains with open low hills: this terrain was observed in areas surrounding Spencer substation;
- iii. Open low mountains;
- iv. High hills; in areas surrounding Murchison and Gravelotte near Alternative 2;
- v. Level plains with some relief in in areas surrounding Murchison and Gravelotte near Alternative 2; and
- vi. Plains with open high hills in areas surrounding Spencer Substation

Surrounding elevations range from approximately 200-1000 metres above mean sea level with the proposed sites situated at approximately 330- 720 metres above sea level. Reference is made to Figure 5-4 overleaf for the elevation of the project area.

5.7 FLORA & FAUNA

5.7.1 FLORA

The threat of an ecosystem status defines the degree to which an ecosystem is still intact or has lost some of its vital aspects of its structure, function or composition. The proposed power line traverses across five vegetation types of the savanna type, two of which have been listed as threatened in terms of the Environmental Management Act (NEM:BA). A detailed Biodiversity Report is attached in **Appendix E-3**.

The vegetation within the project area is discussed below. Reference is also made to the Vegetation Map attached on page 82:

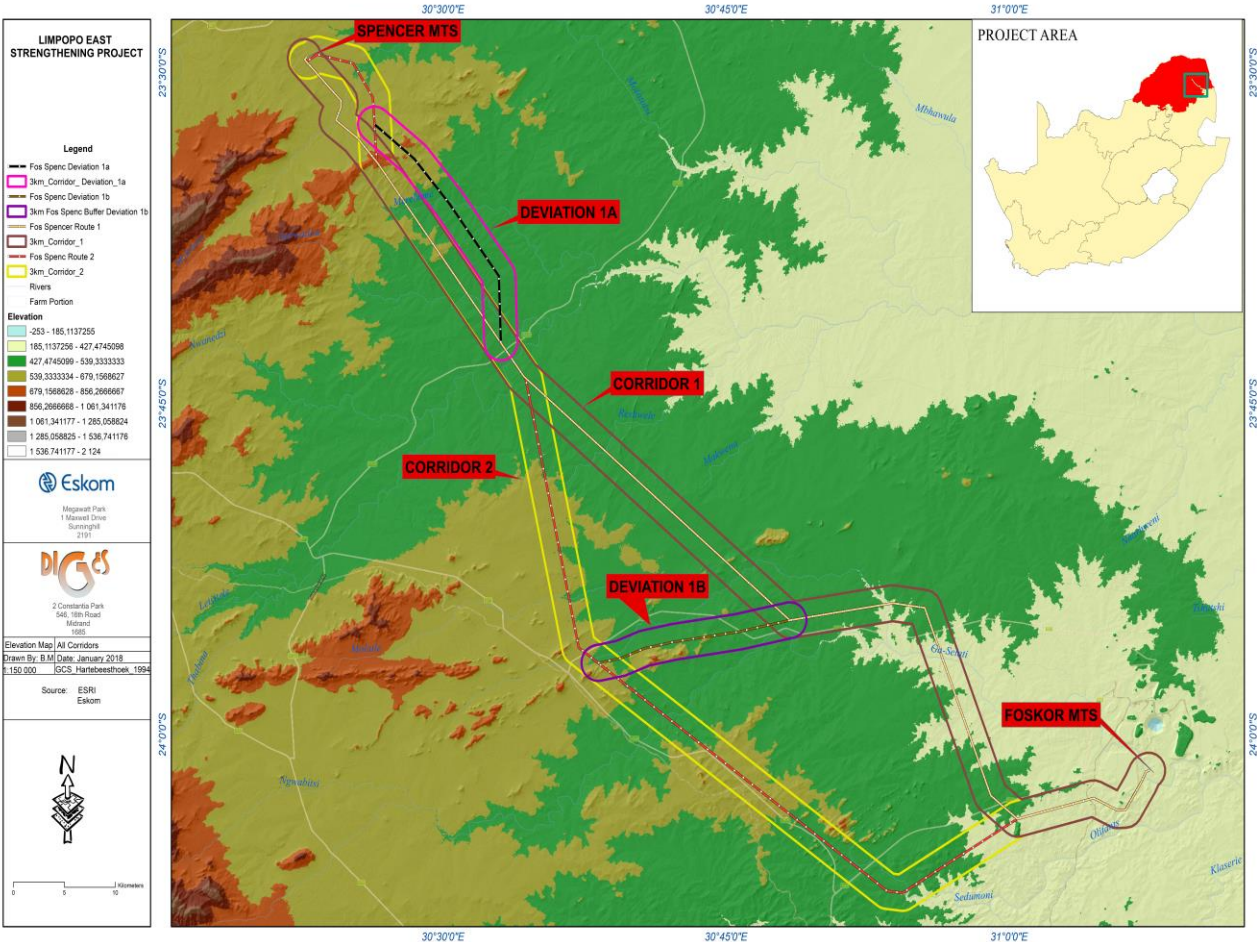


Figure 5-4: Elevation of Project Area

A. Tsende Mopaneveld (SVmp5)

This vegetation type is distributed around the Hans Merensky Nature Reserve in the west to the vicinity of Letaba Rest Camp in the east. The vegetation is classified as least threatened characterized of a medium to high shrub dominated savanna with scattered trees and a dense field layer. Tree and shrub species include *Acacia nigrescens* and *Sclerocarya birrea* subsp. *caffra*; *Colophospermum mopane*, *Combretum apiculatum*, *Combretum hereroense*, *Dichrostachys cinerea*, *Euclea divinorum* and *Grewia bicolor* (tall shrubs), amongst others. The field layer comprises *Clerodendrum ternatum*, *Indigofera schimperi*, *Bothriochloa radicans*, *Digitaria eriantha* subsp. *pentzii*, *Heteropogon contortus* and *Panicum maximum* (grasses). The vegetation type is endemic and well protected.

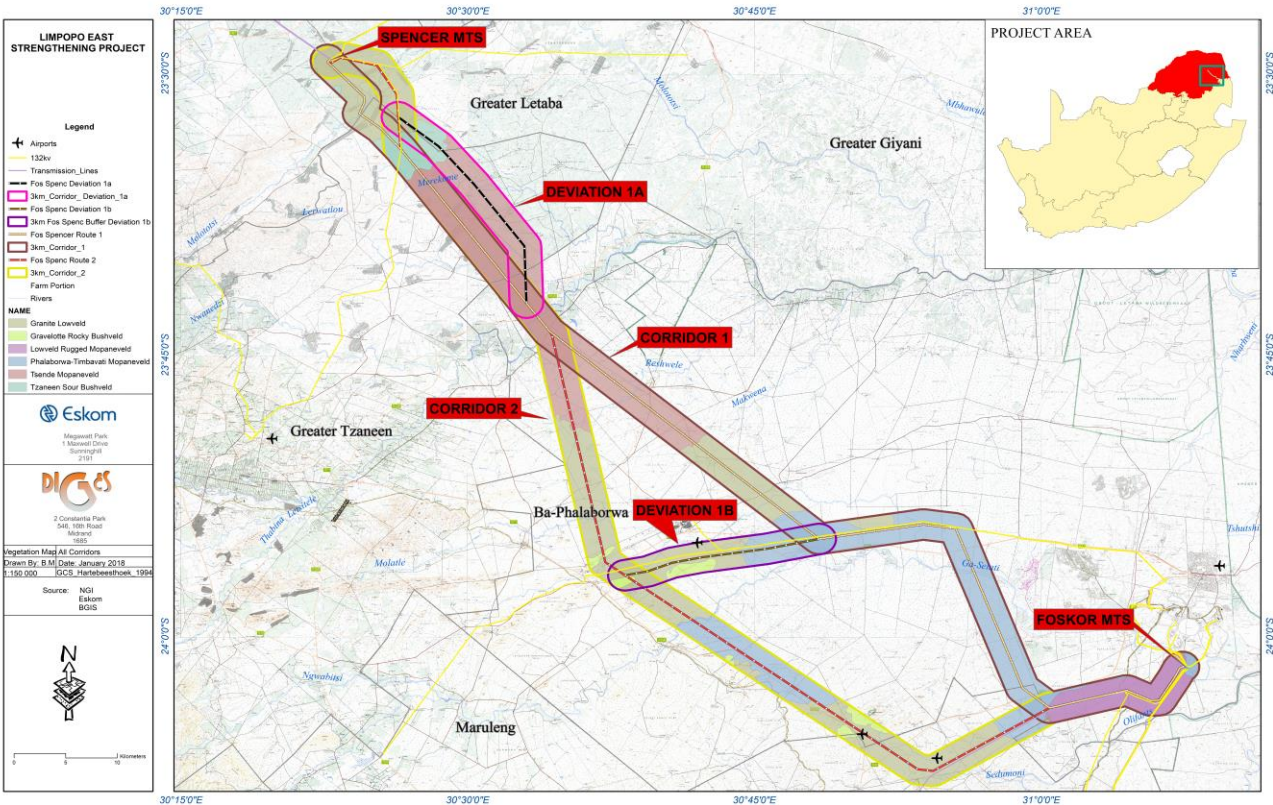


Figure 5-5: Vegetation types within the project area

B. Lowveld Rugged Mopaneveld (SVmp6)

This vegetation type is distributed in the Limpopo and Mpumalanga Provinces. In the project area, it is distributed around the Foskop substation, parts of Balule Private Nature and Selati Game Reserve. The vegetation is usually characterized of dense shrubs with occasional trees and a sparse ground layer. Woody plants can become particularly dense where fire is excluded by very rocky terrain, such as in the vicinity of the Olifants River. Trees and shrubs found in this vegetation type include: *Acacia nigrescens*, *Sclerocarya birrea* subsp. *Caffra*, *Colophospermum mopane*, *Combretum apiculatum*, *Terminalia prunioides*, *Acacia exuvialis*, *A. nilotica* and *Boscia albitrunca*. It is classified as least threatened with a target conservation status of 19%. 34% is statutorily conserved in the Kruger National Park whilst an additional 5% conserved in private reserves such as Klaserie, Letaba Ranch and Selati Game Reserve. Approximately 20% is already transformed mainly by cultivation and some urban and built-up areas.

C. Phalaborwa-Timbavati Mopaneveld (SVmp7)

This vegetation is distributed in Limpopo and Mpumalanga Provinces and occurs south of the Olifants River between Amalgated Private Nature Reserves and Kruger National Park at an altitude between

300-600m. The vegetation is characterized of open tree savanna on undulating plains with the sandy uplands dominated by *Combretum apiculatum*, *Terminalia sericea* and *Colophospermum mopane* trees, with *T. sericea*. This type is classified as least threatened with a target for conservation set at 19%. Vegetation type is largely protected in Kruger National Park and the Private Nature Reserves. Approximately 5% has been transformed, mainly by development of human settlements as well as by mining. Reference is made to Figure 5-6 below for the vegetation near Selati Game Reserve.



Figure 5-6: Vegetation in some areas near Selati Game Reserve

D. Granite Lowveld (SVI3)

The vegetation type is distributed in Limpopo and Mpumalanga Provinces, Swaziland and marginally also KwaZulu-Natal. In the project area, it can be found in areas surrounding Murchison and Spencer Substation. Vegetation is characterized of dense thicket to open savanna with *Acacia nigrescens*, *Dichrostachys cinerea*, *Grewia bicolor* in the woody layer. The dense herbaceous layer contains the dominant *Digitaria eriantha*, *Panicum maximum* and *Aristida congesta*. The vegetation type is classified as vulnerable with a target for conservation set at 19%. 17% is statutorily conserved in the Kruger National Park. Approximately the same amount conserved in private reserves mainly the Selati, Klaserie, Timbavati, Mala Mala, Sabi Sand and Manyeleti Reserves. More than 20% is already transformed, mainly by cultivation and by settlement development.

E. Gravelotte Rocky Bushveld (SVI7)

The vegetation is found in Limpopo Province around the Murchison Range in the Gravelotte area including surrounding mountains and hills including Ga-Mashishimale. It is characterized of open deciduous to semideciduous woodland on rocky slopes and inselbergs, contrasting strongly with the

surrounding plains. *Encephlartos dyerianus* is endemic to this area. The vegetation type is least threatened with a target for conservation at 19%. 7% is conserved in a small proportion of the area in the northern part of the Selati Game Reserve. Approximately 15% is transformed due to cultivation and some development of settlements.



Figure 5-7: Vegetated areas near Spencer Substation

F. Tzaneen Sour Bushveld (SVI8)

The vegetation type is found near the Spencer substation and is characterized of deciduous, tall open bushveld with a well-developed, tall grass layer, occurring on low to high mountains with undulating plains mainly at the base of and on the lower to middle slopes of the northeastern escarpment. Scattered alien plants associated with this type include *Solanum mauritianum*, *Melia azedarach* and *Caesalpinia decapetala*. The conservation status is endangered with a target for conservation set at 19%. The vegetation on site has been transformed mainly by settlements and cultivation.

5.7.2 FAUNA

Various nature reserves are scattered across the project area and these are characterized of natural and near natural habitats for fauna species. More than 55 mammal species have been recorded including lion, rhino, elephant and sable. The mammal species of conservation concern will be listed in the Biodiversity Report is attached in **Appendix E-3**.

5.7.3 AVI-FAUNA

The proposed project area is characterised by natural and near natural environment consisting of open woodland, shrub land and grassland habitat potential for hosting a variety of avi-faunal species. The presence of rivers, drainage lines and dams also offers habitat for breeding and foraging wetland associated species. According to Van Rooyen, 2017, SABAP 2 reporting rates for large power line sensitive Red Data vultures and eagles occurring in the study area are generally high, which is a strong indicator of a healthy ecosystem, which is certainly the case with the areas utilised for game farming and eco-tourism. Red Data species that could potentially occur in undisturbed woodland in the study area are Lanner Falcon, Verreaux's Eagle (around koppies), European Roller, Marabou Stork, Bateleur, Tawny Eagle, Cape Vulture, Martial Eagle, Lappet-faced Vulture, Southern Ground-Hornbill, Bat Hawk, White-backed Vulture, Hooded Vulture and White-headed Vulture. The disturbed woodland in the subsistence farming areas is unlikely to regularly support the same rich complement of raptors, but vultures also forage in those areas. A detailed Avi-fauna Impact assessment is attached in **Appendix E-2**.

5.8 CRITICAL BIODIVERSITY AREAS

The current Systematic Biodiversity Plan for the province is the Limpopo Conservation Plan (version 2) whose purpose is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBA's) and Ecological Support Areas (ESA's) which are classified into different categories based on biodiversity characteristics, spatial configuration and requirement for meeting targets for biodiversity pattern and ecological processes. Table 5-4 describes the different classes and their coverages thereof within the District Municipality. Figure 5-8 shows the different classes traversed by the proposed corridors:

Table 5-4: CBA Categories

CBA MAP CATEGORY	DESCRIPTION	% COVERAGE
Protected Areas	Declared and formally protected areas under the Protected Areas Act, such as National Parks, legally declared Nature Reserves, World Heritage Sites and Protected Environments	30.8
Critical Biodiversity Area (CBA1)	are sites that are required to meet each ecosystem's biodiversity targets	18.7
Critical Biodiversity Area (CBA2)	The selected sites are the ones that best achieve targets of the systematic biodiversity plan though their areas that might achieve these targets.	13.6
Ecological Support Area (ESA1)	Areas that are important for maintaining the ecological processes on which CBAs depend. These are largely natural areas.	9.50
Ecological Support Area (ESA2)	These areas are no longer intact but potentially retain significant importance from a process perspective.	8.40
Other Natural Areas	Areas that still contain natural habitat but that are not required to meet biodiversity targets.	11.9
No Natural Areas	These are areas without intact habitat remaining.	7.3

The table above shows that protected areas and CBA1 areas constitute a larger percentage of the area in the District Municipality. The Nature Reserves traversed by the power line corridors are classified as CBA1 areas whilst the areas near the Spencer substation are classified as Other Natural Areas and No Natural Areas. This is largely due to the human activities such as settlements and subsistence farming.

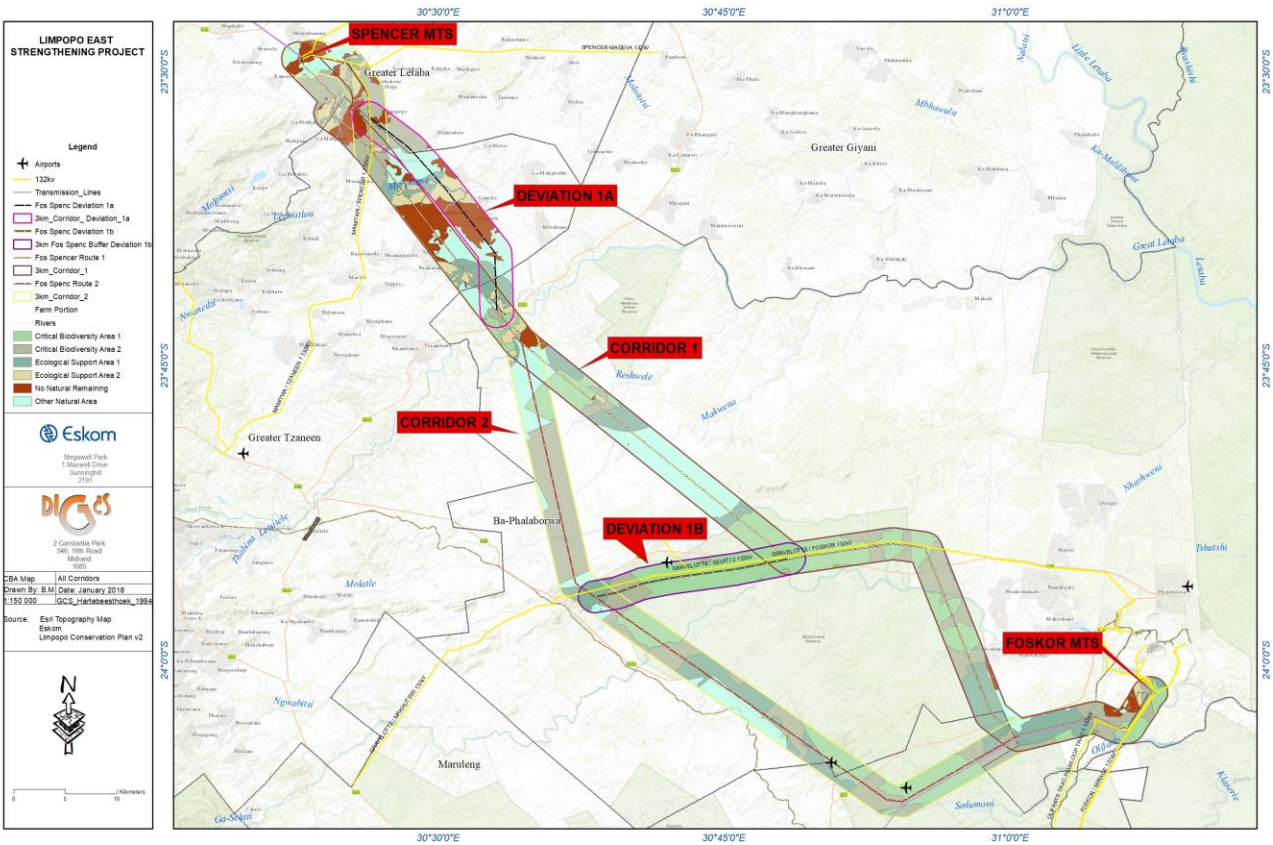


Figure 5-8: CBA Areas within Project Area

5.8.1 PROTECTED AND NATURE RESERVES

According to the Draft Mopani Bioregional Plan, protected areas including a portion of the Kruger National Park (KNP) cover 31.7% of Mopani District and private reserves cover an additional 10.2%. The Associated Private Nature Reserves (APNR) represents the bulk of the Private Nature Reserves (PNR) that are within the project area. The APNR is comprised of:

- a) Timbavati Private Nature Reserve;
- b) Umbabat Private Nature Reserve;
- c) Klaserie Private Nature Reserve; and
- d) Balule Private Nature Reserve

These areas are not formally protected by law but are considered to be conservation areas which also represent part of the Kruger to Canyons Biosphere Region. The proposed project area traverses across the Balule Private Nature Reserve and other nature reserves. The table overleaf and the Figure 5-8 lists and shows the Nature Reserves within and in close proximity to the corridors.

Table 5-5: Protected and Conservation Areas within and near the Project Area

Name	Management Authority	Distance from Corridors
Protected Areas		
Kruger National Park	SANParks	- 7.5km east of corridors
Letaba Ranch Nature Reserve	LEDET	- 9km north east of Alternative 1; - 14km north east of Alternative 2.
Hans Merensky Nature Reserve	LEDET	- 2km north east of Alternative 1; - 8km north east of Alternative 2.
Conservation Areas		
Amalgated Private Nature Reserves	Private	- Corridor will traverse across some portions of Grietjie.
Selati Game Ranch	Private	- Corridors will traverse across the nature reserves.
Solomon Private Nature Reserve	Private	- Alternative 1 traverses across it; - 9km North East of Alternative 2
J.S.A. Macdonald Private Nature Reserve	Private	- < 5km from both corridors
Marbadane Nature Reserve	Private	- 2.8km North East of Alternative 1; - 23.6km North East of Alternative 2.
Thankerton Private Nature Reserve	Private	- 10km South West of Alternative 1; - Alternative 2 crosses the reserve.
Mazunga Private Nature Reserve	Private	- 15.6km South West of Alternative 1; - < 2km from Alternative 2.
Andeon Private Nature Reserve	Private	- 13km South West of Alternative 1; - < 1km from Alternative 2
Sannie Private Nature Reserve	Private	-
Volstruis Nature Reserve	Private	- Alternative 1 traverses across it; - 10km North East of Alternative 2
Parks Ranches Nature Reserve	Private	- Alternative 1 crosses at the border
John Roux Nature Reserve	Private	- 6.5km North East of Alternative 1
Chester Nature Reserve	Private	- Both corridors traverse across the reserve.
Ndzalama Private Nature Reserve	Private	- Alternative 1 traverses across the reserve; - <500m North East of reserve.
Vyeboom Private Nature Reserve	Private	- 4.5km North East of Alternative 1; - 12km North East of Alternative 2.
Platveld Private Nature Reserve	Private	- <500m from Alternative 1; - 14km from Alternative 2.

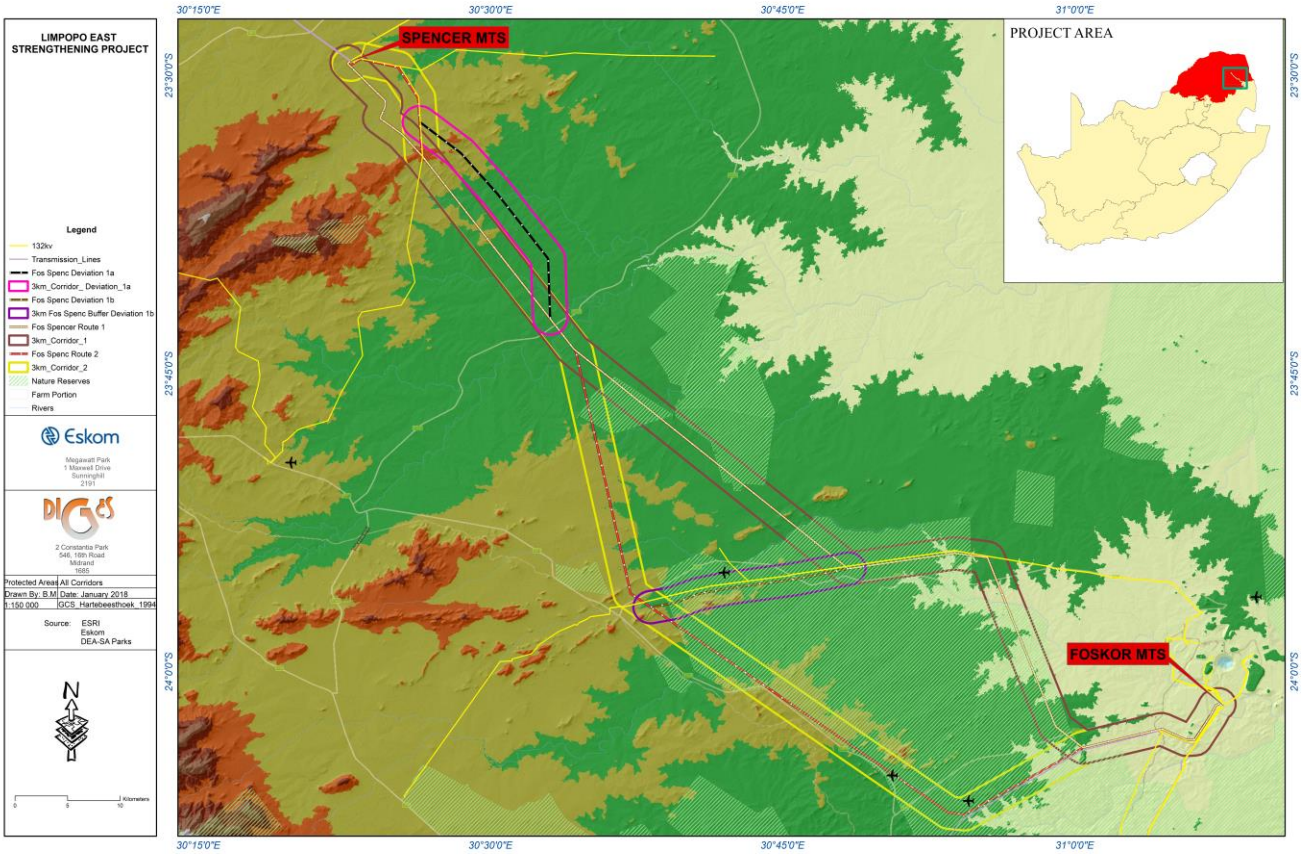


Figure 5-9: Protected areas and nature reserves within project area

5.9 LAND USE

Land cover data indicates that 86% of the Mopani District is in a natural or near-natural state and this is largely due to the conservation and protected areas that are within the District Municipality. (Draft Mopani District Bioregional Plan, 2016) The alternative power line corridors will traverse these areas as shown in Figure 5-10. The land cover within the protected and conservation area is characterized of woodland, open bushland, thicket or dense bushland and grassland. Foskor substation and some sections of the power line corridors traverse across mining areas in Phalaborwa and Gravelotte.

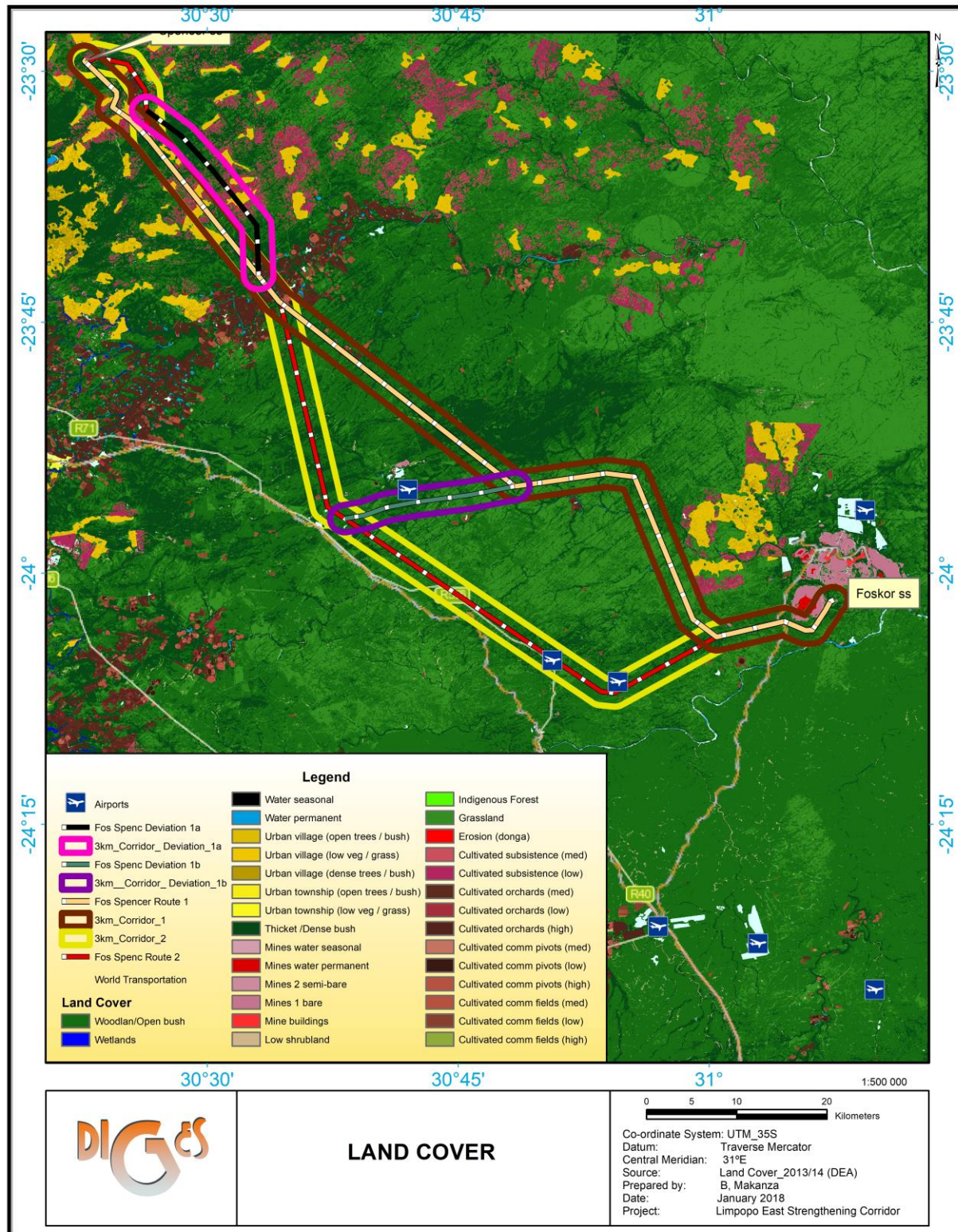


Figure 5-10: Land cover within project area

The following rural settlements are located in areas surrounding Spencer substation:

- Ga-Femane;
- Gamela;
- Ga-Mawa Block 6 and 7;
- Ga-Maloko;
- Mawa;
- Nyakelani;
- Ooghoek;
- Polaseng;
- Senakwe; and
- Xihoko.

Subsistence agriculture and grazing also occurs close to these settlements. Commercial agriculture, citrus farming is concentrated along the Groot Letaba River.

5.10 ARCHAEOLOGICAL AND PALEONTOLOGICAL ATTRIBUTES

According to the National Heritage Resources Act, 1999 (Act No.2 of 1999) objects that may be affected include the burial sites, buildings of more than 60 years of age, special geological features (fossil prints and bushman rock art) and paleontological objects. Clearing the area may result in the discovery of such objects. Construction of the service access roads, the proposed substation extension and power lines could potentially impact on heritage sites. A detailed heritage study is attached in **Appendix E-5**.

5.11 VISUAL ENVIRONMENT

The visual character of the environments through which the corridor alternatives would pass is quite varied, characterised by rural settlements, cultivated, mining and conservation areas. Areas close to the two substations, Foskor and Spencer are characterised of power lines of different voltages. These power lines traverse the area for distances between 5- 10km. A visual impact report is attached in Appendix E-8.

5.12 AIR QUALITY

Several activities associated with transmission line construction can cause particulate matter and gases to enter the atmosphere and degrade air quality. Particulate matter originates from smoke from open burning of waste vegetation as well as from dust generated by construction activities. Gaseous

hydrocarbons and oxides of sulfur and nitrogen are emitted from vehicle exhaust and open burning. The impact that these air pollutants have on sensitive persons or crops depends on topographic and meteorological factors, as well as the amount of each pollutant emitted. The air quality in areas surrounding Foskor substation is generally poor due to the mining activities undertaken in the area. The topography of the area also contributes to poor air quality by trapping air pollutants in the atmosphere under stable atmospheric conditions. The main impacts on air quality result from pollution and dust emissions from mining, agricultural, domestic and industrial activities.

5.13 SOCIO-ECONOMIC ENVIRONMENT

According to Tony Barbour, 2007, there is a need to understand the social environment and communities affected by the proposed development in order to ensure that positive benefits associated with the project are enhanced and the negative impacts are avoided or mitigated. There is therefore a need to collect baseline data on the current social environment and historical social trends. This section therefore covers the socio-economic profile of the area at a local and regional level. Desktop review of the Mopani District Municipality, Greater Letaba, Greater Tzaneen, Ba-Phalaborwa and Maurelmg Local Municipalities Integrated Development Plans and documents pertaining to the project area were consulted.

5.13.1 POPULATION DEMOGRAPHICS

According to Census 2011, Mopani District's population accounts for 20.1% of the Province's population whilst Greater Tzaneen Local Municipality has the highest population within the district accounting for 35.7%. Table 5-6 show the total land area and population per municipality within the District Municipality.

Table 5-6: Population and Municipal Land Coverages

Municipalities	Population	% of District Population	Land Area	% of District Land Area
Greater Tzaneen	390 095	35.7	3 242.6km ²	16.2
*Greater Giyani	244 217	22.4	4 171.6km ²	20.8
Greater Letaba	212 701	19.5	1 890.9km ²	9.4
Ba-Phalaborwa	150 637	13.8	7 461.6km ²	37.3
Maruleng	94 857	8.7	3 244.3km ²	16.3
Mopani District	1 092 507	100	20 011 km²	100

Source: Mopani District IDP (2016/17 version 1)

*Local Municipality is not within the project area

Ba-Phalaborwa accounts for 13.8% of the District's population though it occupies the largest area within the District. This can be attributed to the nature reserves that are within the Local Municipality which occupy large tracts of land. Greater Letaba Local Municipality is largely rural accounting for 94.3% respectively per the Local Municipality's population whilst Ba-Phalaborwa has the highest urban and farming population accounting for 51% and 12.8% respectively. *(Source: Mopani District Municipality IDP 2016/17 version 1)*

The percentage growth of population for Ba-Phalaborwa has increased immensely by 14.9% from 2001 to 2011. This growth is higher than the District Municipality and it can be attributed to the mining and conservation activities being undertaken in Phalaborwa and Gravelotte. Greater Letaba Local Municipality population decreased by 3.4% and this can be attributed to out-migration.

5.13.2 GENDER

In almost all local municipalities there are more females than males. This is significant in Greater Letaba Municipality which is primarily rural in nature. This could be attributed to low levels of education intensified by the out migration by men seeking jobs elsewhere. Ba-Phalaborwa has comparable balance in numbers between females and males, however with more males than females work within the economically active age group.

5.13.3 LANGUAGE

According to Mopani District Municipality 2016/17 IDP, the most dominant languages are Northern Sotho and Tsonga accounting for 46% and 44% respectively of the total district's population. Afrikaans and English account for 2% and 1.3% respectively.

5.13.4 LEVEL OF EDUCATION

Education is very important in one's life. It creates a range of options which a person can choose from and it also opens doors to better opportunities and great achievements. The District Municipality has a low level of education accounting for 40% of the adult population being regarded as functionally illiterate. Approximately 13,7% have only completed some form of primary education whilst 6.5% has completed some form of higher education. (Mopani District IDP version 1)

5.13.5 EMPLOYMENT PROFILE

The farming sector is the second largest employer within the District Municipality employing 25.9% of the District population. In Ba-Phalaborwa, mining is the second largest employer accounting for 19.5% of the population. 39% of the economically active population in the District are unemployed, 60% of

which are women. The unemployment rate is higher in Greater Tzaneen accounting for 42% of the district's unemployed population.

5.13.6 HOUSEHOLDS BY DWELLING TYPE

There are four broad types of settlements within the District Municipality which are distinguished primarily by the availability of services and the security of tenure. The settlements are described as follows:

i. Formal Urban Settlements

These have a formal layout, are serviced with a full range of municipal services and the settlement households can obtain security of tenure. These include areas such as Phalaborwa, Gravelotte,

ii. Tribal Settlements

Large areas of land in the District, mainly Greater Letaba Municipality are owned by the National Government of South Africa and former Lebowa and Gazankulu Government with tribal and community authorities as custodians. These traditional authorities play a very important role in terms of their traditional culture and therefore also have a major influence in the manner in which land is made available to individuals for settlement, as well as the use for economic purposes.

iii. Rural Settlements

These are settlements that are similar in nature to the tribal settlements regarding the residential densities and functions, but they are not located on tribal land.

5.13.7 ACCESS TO SERVICES

Access to social and economic services enables people to participate fully in the economy and their communities. When services such as water, energy and transport are available to people, they can spend more time doing profitable work, and communication establishes a vital link between people and the outside world.

▪ Energy

Eskom provides electricity for lighting to most of the communities within the Mopani District Municipalities. The most frequent use of electricity in Ba-Phalaborwa Local Municipality and Greater Letaba Local Municipality is lighting accounting for 90.8 % electricity for lighting.

▪ Water

Mopani District Municipality is the Water Service Authority (WSA) and is responsible for bulk water supply and sanitation facilities within the local municipalities. The municipalities are responsible for water reticulation in agreement with the district municipality.

- *Toilet facilities*

The towns and their extensions have well developed sanitation systems whilst most rural areas do not due to their dispersed nature which makes it difficult to provide services. Most dwellings in the rural areas use pit latrines or have no sanitation facilities at all.

- ***Refuse removal and Waste Disposal***

Most of waste management services by municipalities are prioritized in urban areas (townships & towns) and most of rural communities in the Mopani District Municipality do not have access to waste removal services by their local municipalities. This results to residents in rural areas dispose waste on their own, often to illegal dumping occurring. According to Census 2011, Ba-Phalaborwa Municipality has the highest percentage (48.8%) of refuse removal per week whilst Maruleng Local Municipality only accounts for 5.9% of refuse removal per week.

There are only two local Municipalities, Greater Tzaneen and Maruleng with legal landfill sites whilst Greater Letaba transports its waste to Greater Tzaneen.

5.13.8 ECONOMIC ACTIVITY

The mining sector is the largest contributor of the Mopani District Municipality's Gross Domestic Product (GDP) constituting 30% whilst agriculture is the most important sector in Greater Tzaneen, Greater Letaba and Maruleng Local Municipalities. Mining is concentrated in Ba-Phalaborwa Local Municipality where it contributes approximately 80% of the Local Municipality's GDP and employs more than 2 000 people and an additional 450 contractors. The major mining activities in the region are concentrated in Phalaborwa in the Phalaborwa Mineral complex which has been declared a Spatial Development Initiative (SDI). The objectives of the SDI is to exploit the unutilized and underutilized potentials of the area by combining private and public sector resources in a sustainable manner. Other significant mineral zones in the region are the Murchison Greenstone Belt (Gravelotte towards Leewkop in the Kruger National Park [KNP]), Giyani Greenbelt-from KNP in the south Western direction to the town of Giyani, and Rooiwater Complex Northern flank of Murchison.

Agriculture is predominant in Tzaneen, Maruleng and Letaba where ZZ2 dominates the industry in terms of output and the major focus is on sub-tropical fruit. These two industries focus is to produce for exportation. According to Mopani District Municipality's IDP, Greater Letaba currently makes the least contribution to the District's GDP.

5.13.9 TOURISM

Tourism is deemed to be an engine that drives growth and development in areas and is often seen as a mechanism for local communities to capitalize on assets such as the natural environment and cultural heritage. In Mopani District Municipality, it also plays an important role. The indigenous forests, biospheres, nature reserves, wetlands, endangered species as well as Kruger National Park offer several opportunities for tourism. These include opportunities for eco-tourism, as well as tourism associated with the variety of historical and cultural interests found within the district. Mopani District is also considered the home of the big five due to abundance of such animals in Kruger National Park and surrounding private game farms and nature reserves. The numerous nature reserves within the district include: Selati Game reserve, Chester Reserve, Ndzalama Wildlife Reserve, Klaserie, Thorny Bush and Timbavati, Westfalia Estates, Merensky Reserve, Letaba Ranch, Geothermal springs in Hans merensky Nature Reserve and Soutini Baleni, Manotsa and Madrid and Shiluvane. Tourism related activities offered in these areas include: hiking, white water rafting, abseiling, hot air ballooning, rock climbing and bird watching. A Tourism Impact Assessment will be carried out during the EIA and the report detailing the impacts of constructing the power line in the area will be attached to the Environmental Impact Report.

Airports

There are several landing strips within the area which play a significant role in increasing tourist traffic and establishing the area as a gateway to the Kruger National Park and the surrounding areas. There are two airports within the 3000m corridor located on Archie 156KT and Lillie 148KT with the landing strip having a length of 1.1km. These airports cater for visitors to the Boulders Game Ranch. Two other airports are also near the corridors, namely Hendrick Van Eick Airport and Gravelotte Airports which are approximately 9km and 4km south west of the corridors.

6. OVERVIEW OF SPECIALISTS SURVEY

The first site inspection undertaken by both Consultants and applicant was sort of reconnaissance field survey where different components of the environment that are likely to be affected by the proposed development were briefly assessed. Based on the environment observed and the nature of the development, there was a need to have an in depth understanding of the status quo of various aspects of the environment and how the development will have an impact on these environmental aspects. Specialists' studies were therefore required to inform the Environmental Impact Assessment Process by considering the specific nature of the environment within which the development is to be undertaken. The results of these studies will serve as a basis to identify the potential impacts expected should the development be undertaken. Noise and air quality impacts while important are likely to be less significant hence they will not require a specialist assessment. This report includes the specialist impact assessment reports commissioned as part of the environmental process and a summary of the Avi-faunal, Biodiversity, Heritage, Palaeontology, Social, Soil and Land Capability, Tourism, Visual and Wetland Assessment is given in the sections below. The detailed reports are attached in **Appendix E-2 to E-9** respectively.

6.1 AVI-FAUNA IMPACT ASSESSMENT

The Avi-fauna Impact study was carried out by Chris Van Rooyen Consulting and the full report is attached in **APPENDIX E-2**.

The Terms of Reference were as follows:

- ✓ Describe the affected environment;
- ✓ Indicate how birdlife will be affected;
- ✓ Discuss gaps in baseline data;
- ✓ Describe and assess the expected impacts;
- ✓ Indicate sensitive and possible no-go areas; and
- ✓ Provide recommendations for mitigating measures.

6.1.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made:

- SABAP2 is regarded as fairly comprehensive as there have been significant studies undertaken; and
- Though conclusions are based on experience and similar species in different parts of South Africa, power line impacts were predicted with a fair amount of certainty due to the published research carried out over a long period of time.

6.1.2 METHODOLOGY

The following sources were consulted:

- South African Bird Atlas 2 (SABAP2) for the bird distribution data;
- Important Bird Areas (IBA) for an overview of the important bird areas and species diversity within and surrounding the project area;
- Endangered wildlife Trust for the species that may be impacted upon by the power line;
- Vegetation Map of South Africa for the vegetation types within the project area;
- South African Red Data for birds and the latest IUCN Red list for the conservation status of all species likely to occur in the area;
- Kerri Wolter at Vulpro and Selati Game Reserve for the location of Cape Vulture colonies and restaurants; and
- South Africa Protected and Conservation Areas data from DEA for protected areas within and around the project area.

In addition, a field visit was undertaken by the specialist on the 1st- 2nd of February 2017. Personal observations based on previous studies/assessments undertaken was used to supplement the data from the field surveys and desk top study.

6.1.3 IMPACT ASSESSMENT

'Excerpt from the Avi-fauna Report'

The habitat through which the proposed Foskop – Spencer 400kV corridors run is **low to moderately** sensitive from a potential bird powerline impact perspective, with a few areas of high sensitivity, namely rivers, dams and a vulture restaurant. The natural woodland habitat in the game farming and eco-tourism areas between Foskop substation and the R529 is likely to attract a number of Red Data power line sensitive species, mostly eagles and vultures, while the rivers are attractive to several Red Data powerline sensitive stork species, as well as vultures and eagles. Between the R529 and the Spencer substation the main economic activity is subsistence farming, with evidence of anthropogenic impacts, which is visible in the disturbed state of the majority of the woodland. This has had a negative

impact on avifaunal diversity and abundance, with fewer Red Data species expected to be attracted to this section of the study area.

The construction of the proposed power line will result in various potential impacts on the birds occurring in the vicinity of the new infrastructure, with impacts ranging from low to moderate. The proposed power line poses a **moderate** collision risk which can be reduced to **low** through the application of mitigation measures. The habitat transformation and disturbance associated with the construction and decommissioning of the power line should have a **moderate** displacement impact, which could be reduced to **low** with appropriate mitigation. No electrocution risk is foreseen.

6.1.4 CONCLUSIONS AND RECOMMENDATIONS

Based on the potential negative impacts expected on Red Data species, the study area was delineated into high, medium and low sensitivity and the total surface area per each category was calculated for each proposed corridor with the least amount of highly sensitive habitat was selected as the preferred corridor (Reference is made to Appendix 6-1 for the sensitivity map).

- ❑ Based on the methodology used in terms of sensitivity, Corridor 2 and Deviation 1a is the preferred route. However, the other corridor options are viable provided that the proposed mitigation measures are implemented. Reference is made to the map overleaf:

Mitigation for displacement:

- ✓ The primary means of mitigating this impact is through the selection of the optimal route for the line. This will ensure that high sensitivity habitats (e.g. rivers, dams and vulture restaurants) are avoided as far as possible;
- ✓ Construction activity should be restricted to the immediate footprint of the infrastructure;
- ✓ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species;
- ✓ Measures to control noise should be applied according to current best practice in the industry;
- ✓ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- ✓ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.



Figure 6-1: Avi-fauna Sensitivity Map

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

Mitigation for collisions:

- ✓ High risk sections of power line must be identified by a qualified avifaunal specialist during the walk-through phase of the project, once the alignment has been finalized.
- ✓ Where power line marking is required (i.e. in areas that contain rivers, dams or is situated near a vulture restaurant) bird flight diverters must be installed on the full

span length on each earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated so as to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung.

6.2 BIODIVERSITY IMPACT ASSESSMENT

The Biodiversity Impact Study was carried out by BioAssets (Dr. Wyland Vlok) and the full report is attached in **Appendix E-3**.

The Terms of Reference were:

- ✓ Undertake baseline survey and describe affected environment within the project footprint;
- ✓ Take into consideration the Limpopo Conservation Plan;
- ✓ Assess the current ecological status and the conservation priority within the project footprint;
- ✓ Undertake sensitivity study to identify protected species, Red Data species, alien species and fauna within the servitude;
- ✓ Compile a plant rescue and protection plan which allows for the maximum transplant of conservation of important species from areas to be transformed;
- ✓ Prepare maps that indicate critical biodiversity areas and ecological support areas; critical and endangered vegetation areas; and
- ✓ Recommend the preferred alternative and mitigation measures.

6.2.1 ASSUMPTIONS AND LIMITATIONS

- Prevailing weather conditions: during the survey it was hot with light wind blowing and the region had received rainfall prior to the site visit and there was standing water present. These conditions will have implications on biodiversity likely to occur in the area. However, the weather conditions during the survey were ideal;
- Due to time constraint, a full survey of plants was not undertaken; and
- The study area is large and access to all areas was not always feasible.

6.2.2 METHODOLOGY

A desktop study was undertaken to determine the possible impacts and concerns associated with the study area in relation to the biodiversity and protected fauna and flora. Field surveys were conducted

and were targeted to identify the different habitat types, threatened species, animal activity and the potential impacts that the proposed development will have on biodiversity.

6.2.3 SUMMARY OF ASSESSMENT

'Excerpt from the Biodiversity Report'

The findings from this report can be summarised as:

Substation

It must be noted that more than 1 hectare of indigenous vegetation will be cleared at the Spencer Substation (9ha is required).

General vegetation clearing for the project – in addition, it must be noted that more than 300m² of indigenous vegetation will be removed in the CBA areas.

Alternative 1

The natural vegetation, north of Groot Letaba River is modified and many activities have had a negative impact on the habitat namely subsistence agriculture, urbanization and overgrazing. The area on the banks of the river is associated with the narrow band of intensive agricultural activities which are mostly orchards but it is possible to get a clear corridor of the power line. The riparian vegetation along the Groot Letaba River is modified and it is possible to get a corridor to cross the river without needing to remove large riparian trees.

South of Groot Letaba River, the vegetation is modified but still in a fair to good condition due to previous land-uses such as overgrazing which has led to the encroachment of the shrub and small tree layer. This has resulted in a modified ecological integrity which is lower than what would be expected in the well managed area. According to Limpopo Conservation Plan version 2, the area to the south of Groot Letaba River is characterized of CBA1 and CBA2 zones with associated supported zones. In these areas, only the corridor for the new power line should be cleared and the grass and small shrub layer must not be cleared (minimum 300mm) as this will lower the risk of erosion and the establishment of alien invasive species in the corridor. Though, protected plant species such as *Sclerocarya birrea* and *Combretum Imberbe* were observed, no red data species were found. This should be confirmed prior to construction. In addition, various exotics were also present within the corridor namely include *Jacaranda mimosifolia*, *Melia azedarach* and *Psidium guajava*.

Alternative 2

The first section of Alternative 2 differs from Alternative 1 but the main section is the same to the crossing of Groot Letaba River. The small deviation from Spencer Substation to the east of Alternative 1 crosses similar terrain and vegetation and therefore the impacts and low ecological value is similar to Alternative 1. According to Limpopo Conservation Plan version 2, the area affected in the north of Groot Letaba River is classified as CBA2 and ESA2. In these areas the proposed corridor for the power line must be only cleared from larger vegetation that will impact directly on conductors. The ecological importance is low. The construction of the power line in this section will therefore have a low impact on the ecosystem.

South of Groot Letaba River, the vegetation is modified but still in a fair to good condition due to previous land-uses such as overgrazing which has led to the encroachment of the shrub and small tree layer. This impact on the basal layer has resulted in poorer grass cover than would be in pristine areas which has lowered the ecological integrity of the area. In this section of the corridor, there is a small section of the corridor traversing across CBA1, CBA2 and associated support areas. In these areas, total clearing of basal layer is prohibited which will ensure that the grass and small shrub layer will lower the risk of erosion and the establishment of alien invasive plants in the corridor.

From an ecological perspective, this route is also viable. It is noted that historic land use practices have resulted in modifications to the landscape and associated floral composition. A combination of the routes will lower the impact on the existing natural vegetation, private reserves and military training *areas*.

Deviation 1a and Deviation 1b

Deviation 1a is viable and the area is similar to the route for Alternative 1 whilst Deviation 1b is a better option as it follows R71 road, open corridors next to fences and the corridor for the existing power and telephone lines. The ease of access and the use of existing roads will lower the impact on natural vegetation.

Fauna

The faunal component along the full corridors of the power line vary considerably. In the northern section (north of the Groot Letaba River) game was not observed and very little evidence of activity was noted. Some spoor and droppings of *Sylvicapra grimmia*, *Aepyceros melampus*, *Tragelaphus strepsiceros*, *Hystrix africaeaustralis* and some smaller rodents were seen. The power line will have very limited impact on these with some possible disturbance of the rodents if burrows are impacted during construction.

To the south, the diversity of the animals increased mostly where the game farms are present. In the cattle areas more *Sylvicapra grimmia*, *Aepyceros melampus*, *Tragelaphus strepsiceros* and *Raphicerus campestris* activity were noted due to higher protection and better habitat. Larger species and rare game are present and include *Loxodonta africana*, *Syncerus caffer*, *Panthera pardus*, *Pantherus leo*, *Crocuta crocuta*, *Equus quagga*, *Connochaetes taurinus*, *Giraffa camelopardalis*, *Hippotragus niger*, *Hippotragus equinus* and *Damaliscus lunatus*.

6.2.4 CONCLUSIONS AND RECOMMENDATION

- ❑ During construction it will be important to liaise with the landowners with regards to the game present on the different farms (once the final route is selected). Where dangerous animals are present, it will be important to ensure that game is moved to other camps where possible. A ranger from the farm must be present during construction to ensure the safety of man and animals. A concern will be the areas where *Loxodonta africana* and *Giraffa camelopardalis* are present as the former can damage pylons and get electrocuted if conductors are too low and the latter is exposed to electrocution as well;
- ❑ With regards to the visual impacts, it is obvious that some structures will be seen from roads and other infrastructure (houses and camps). The best solution is to follow existing fences and roads where power lines and telephone lines are present. This will ensure that the power line is on the boundary of the property and that a minimal visual impact can be achieved.
- ❑ The corridor for the new proposed power line must be only cleared from larger vegetation that will impact directly to the conductors. This entails that trimming of larger trees must be done and it is important that “no total clearing of the basal layer” must be allowed. This will ensure that the grass and small shrub layer will lower the risk of erosion and the establishment of alien invasive plants in the corridor. No buffer around the corridor is needed, as only the narrow strip must be cleared for the proposed power line. The corridor will further act as the access route during construction. In addition, limited traffic must be allowed in the area and smaller construction vehicles must be used to transport the materials;
- ❑ A walk down survey consisting of the surveyor, the engineer and botanist must then be undertaken to see if it will be necessary to move pylons to lower the need of trimming or cutting of protected trees. This information is needed for the permit applications to DAFF. No clearing of the corridor can commence before the permits are issued;
- ❑ The route must follow existing roads, fences or servitudes, as this will lower the need of cutting and trimming of trees; and

- ❑ A formal induction and monitoring of clearing must be done by the botanist to ensure that the permit regulations are carried out.

6.3 ECO-TOURISM IMPACT ASSESSMENT

The Eco-Tourism Impact Assessment for the project area was carried out by Engwe Scoping Consulting and the full report is attached in **APPENDIX E-4**.

The Terms of Reference were as follows:

- ✓ Provide status of tourism within and in close proximity to the study area;
- ✓ Identify conservation/protected areas in conjunction with tourism worthy areas;
- ✓ Identify provincial, regional and local tourism trends;
- ✓ Identify existing tourism products in surrounding region;
- ✓ Undertake an impact assessment of the proposed development on existing tourism industry; and
- ✓ Identify mitigation measures of the proposed infrastructure on the ecotourism industry.

6.3.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

- The length and width of the alignment, as well as the time frames made it almost impossible to identify and visit every facility along the respective corridors and in the surrounding areas. As such, the area was researched in a more broad approach with the main focus on desktop studies;
- Tourism is very diverse, as a result, certain aspects of ecotourism experience, specifically “sense of place” is subjective by nature and could be viewed in a very different light by different stakeholders;
- Given the precinct of some of the area, it is possible that some of the area could have been used for/ and or earmarked for tourism activities such as mountain biking, hiking and fishing;
- Of note is that ecological assessment would take into consideration the impacts on sensitive habitats/ ecological features which may attract visitors; and
- This study was largely desktop, and the actual tourism trends of the area are difficult to estimate since they are not readily available, and will require in-depth interviews with product owners.

6.3.2 METHODOLOGY

Firstly, a desktop study was undertaken, this was followed by a field survey and then analysis of findings. Below is the detailed explanation of activities conducted:

- ✚ **A desktop study** entailing observing the South African tourism industry from both a Provincial and National perspective, taking into consideration trends and potentials, as well as evaluation of tourists' destinations found in the area such as nature reserves, private game reserves, private game farms and lodges, as well as eco-tourism attractions;
- ✚ **A site inspection** of the area was undertaken with an aim of verifying tourist's destinations and locating any new ones which could have been missed during desktop study. In addition, the desktop visual impact assessments were undertaken using Google Earth View-shed tools.

6.3.3 ASSESSMENT

'Excerpt from the Eco-Tourism Report'

Below are some of the major tourists' destination known to exist in the area proposed for development:

- i. **Hans Merensky Nature Game Reserve:** is a protected area which was proclaimed a nature reserve in 1953. This approximately 5200 hectares and lies approximately 70km northeast of Tzaneen toward the Kruger National Park. The terrain also provides an ideal habitat for hundreds of interesting bird species, including the White-breasted Cuckoo shrike, Brown-headed Parrot, Raptors and Wood Sandpipers;
- ii. **Selati Game Reserve:** the game reserve has 30500 hectares of privately owned Lowveld Bushveld situated north of the Olifants River between Mica, Gravelotte and Phalaborwa;
- iii. **Ndzalama Wildlife Reserve:** with animals including four of the Big Five and klipspringer antelopes roaming its 80-plus km²;
- iv. **Lekkersmaak Game Reserve:** conserves different kinds of wildlife and is privately owned;
- v. **Leopard rock Cap:** is in close proximity to the Kruger National Park with towering boulders and lush vegetation. Wildlife such as Saddleback Impala, Sable Antelope, Black Impala, Cape Buffalo, Nyala, Kudu Golden Wildebeest, and Livingstone Eland can be found there.
- vi. **Jeune Elephant:** It offers unique intimate hands-on educational elephant interactions, elephant-back safaris, swims on elephants as well as tailor-made events such as weddings.
- vii. **Grietjie Private Nature Reserve:** is 30km south of Phalaborwa, and encompasses approximately 2 800ha including 6km of impressive river frontage on the perennial Olifants River; and
- viii. **Inyanga Safari Lodge:** a small Bush Lodge, located in the Greater Kruger Park, It is only 20 minutes' drive from Phalaborwa.

Anticipated eco-tourism impacts include:

The four major impacts likely to result from the transmission line include the following:

- A. Visual and Cultural Impacts of the project on Tourism:** The first section of the project area from Foskor substation is largely natural. Leisure tourism is practiced in these areas and these areas are more likely to be visually affected by power lines and this could affect negatively on tourism as some tourists visit these areas just to enjoy the beautiful views.
- B. Change in land-use:** Introducing power lines would be viewed as a change in land use or a change in natural character. This would therefore spoil the scenic value of these areas and potentially affect tourism activities. Conversely the proposed power lines are not perceived as a change in land use in already visually degraded areas such as Phalaborwa and other parts of Mohlabaeng due to the presence of other linear structures such as roads, other power lines and buildings.
- C. Corporate demand:** In general, the impact of the proposed transmission lines on corporate demand for tourism facilities is anticipated to be huge as the power lines will ensure many other development projects in future that will increase the need for tourism. It is however very debatable whether this positive impact on tourism demand in the area would offset possible losses to the existing eco-tourism or possible development opportunities in this regard.
- D. Change or alteration of hunting calendars:** During the Public participation meetings held, some villagers from the Mashishimale CPA raised concerns about the disruption of the hunting seasons due to the fact that seasonal professional hunters will not be able to hunt during the construction phase. They raised concern over the issues of poaching and also the safety of the developers against dangerous wild animals during the construction phase. This would mean that their usual hunting calendar of May to September will have to be altered in the event that construction is in their territory during this period. However, expectations of economic benefits from tourism may be positively impacted with the coming of a better and improved electricity supply after the construction phase. The construction phase of the project may also disturb wildlife by altering their eating habits and feeding patterns. Feeding patterns are altered directly by the construction of utility towers on grazing/feeding lands, and indirectly by littering caused by construction workers on site, which encourages wildlife to scrounge for food.

6.3.4 CONCLUSIONS AND RECOMMENDATIONS

Most impacts associated with transmission lines on the eco-tourism products relate to visual impacts hence the eco-tourism study takes into account the impacts and mitigation measures detailed in the

Visual Impact Assessment Report. The following mitigation measures for the anticipated impacts are detailed in Section 8 of this report and the attached EMPr in Appendix G.

- Eskom should try and avoid placing towers on areas of scenic natural beauty;
- The flood-line needs to be determined, and structures should be avoided below the 1:50 years flood line;
- Eskom should ensure that their construction should not contradict with the hunting season;
- Placing the towers on the backdrop of the reserve, such should be discussed with the landowners.
- Eskom must screen construction activity to reduce the impact on tourism, and utilise existing screening features such as dense vegetation stands or topographical features;;
- Construction sites must be kept tidy and litter free to reduce the potential visual impact.
- Where new access roads are required, disturbance should be minimized by keeping roads narrow and using two-track dirt roads wherever possible;
- It must also be noted that, smaller towers or those with a more compact design (e.g. cross-rope suspension towers) should be used.
- By keeping the proposed lines as straight as possible, fewer strain towers will be required. This is preferable as strain towers are visually obtrusive compared to the suspension towers used when alignments are straight. Should it be necessary to paint, it is recommended that a neutral matt finish be used.

From a tourism point of view, the proposed construction of a 400kV transmission power line from Foskor Substation (Phalaborwa) to Spencer Substation (near Giyani) and Spencer MTS Upgrading, Limpopo Province is expected to a **medium risk** on tourism in between Mohlabaeng (Spencer) and Phalaborwa (Foskor) after the implementation of the recommended mitigation measures.

6.4 HERITAGE

The Heritage Impact study was carried out by Vhubvo Archaeo-Heritage Consultants and the full report is attached as **APPENDIX E-5**.

The Terms of Reference were as follows:

- ✓ Undertake a Phase 1 Heritage and Paleontology Impact Assessment in accordance with the South African Heritage Resources Act (Act No. 25 of 1999);
- ✓ Undertake baseline study indicating the location of heritage and paleontology resources, the nature and degree of significance and the present physical condition;

- ✓ Prepare a heritage and paleontology sensitivity map, based on the findings of the study;
- ✓ Identify the resources to be monitored; and
- ✓ Recommend the preferred corridor with mitigations measures to be implemented.

6.4.1 ASSUMPTIONS AND LIMITATIONS

- Most of the area proposed for development is encroached by bush which make it almost impossible to access. It is thus possible that some materials could have been overlooked due to that the area was investigated only in a broad, overview approach as access to the different properties was not possible;
- Several houses located on the proposed area (s) were noted, and will have to be relocated. Most of the people in the area proposed for development bury their loved ones at home. The relocation of people will have a negative effect on grave sites;
- It is assumed that the Social Impact Assessment and Public Participation Process might also result in the identification of sites, features and objects, including sites of intangible heritage potential in the corridors and that these will also have to be considered in the selection of the preferred corridor; and
- It is also assumed that a Visual Impact Assessment will be done to determine the impact of development on any identified heritage sites.

6.4.2 METHODOLOGY

The Heritage Impact was conducted by the means of the following:

- i. **Literature Review:** To understand the background archaeology of the area, a background study was undertaken and relevant institutions were consulted. These studies entailed review of archaeological and heritage impact assessment studies that have been conducted around the proposed area thorough SAHRIS. In addition, E-journal platforms such as J-stor, Google scholars and History Resource Centre were searched. The University of Pretoria's Library collection was also consulted;
- ii. **The field survey** was conducted from the 1st to the 9th of February 2017, this also included public consultations and oral interviews;
- iii. The final step involved the recording and documentation of relevant archaeological resources, as well as the assessment of resources in terms of the heritage impact assessment criteria and report writing, as well as mapping and constructive recommendations.

The applicable maps, tables and figures, are included as stipulated in the NHRA (no 25 of 1999), the National Environmental Management Act (NEMA) (no 107 of 1998) and the Minerals and Petroleum Resources Development Act (MPRDA) (28 of 2002).

6.4.3 IMPACT ASSESSMENT

'Excerpt from the Heritage Impact Assessment'

Corridor 1

The first corridor stretches on an unused land and sections of nature reserves, these areas are ideal for isolated archaeological materials, or historic settlement such as stone walling which are known to spread across the area. 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 in their place of dwelling. Making this an ideal place for finding either known or unknown burial.

Corridor 2

This corridor is located on a similar landscape to that of Corridor 1. However, this one also transverses over airports and several main roads as well as perennial streams and watercourse, of significance is that this corridor transverses across sections of Olifants North Game Reserve which is one of the reserve which is still intact. Archaeologically, Nature Reserves are considered sensitive since they have not had many disturbances due to that they are a protected landscape. This area thus remains sensitive form an archaeological point of view.

Deviation (s)

Furthermore, to these two corridors, two deviations are proposed and are referred to as 1a and 1b. Deviation 1a is on an area which is under extreme residential sites. There is no large-scale farming activities on this area and family graves are expected in this area due to its high residential setting. The second deviation referred to as 1b is at the boundary of Selati Game Reserve, running parallel an existing 132kV power line and traverses undulating environment, this area is also characterised by isolated farmsteads.

The significance of the loss of archaeological and grave sites for all alternative corridor is **low** whilst the magnitude is classified as medium. The graves observed within the corridors are given in the Table 6-1 and Map 6-2:

Table 6-1: Information of some of the archaeological/ heritage sites noted in the proposed area

Site	Coordinates	Description	Significance
Spe001	23.48158°S 30.42467°E	Informal grave site (s) with marked and unmarked graves was noted on the area proposed for Corridor 2.	High if a grave site
Spe002	23.49391°S 30.41997°E	An abandoned settlement was noted on the area proposed Corridor 2.	High
Spe003	23.60836°S 30.49391°E	Grave site was noted in Ga-Mawa which consists of marked and unmarked graves. These graves are located within the project servitude on the area of deviation route 1a.	High
Spe004	23.65713°S 30.67114°E	Muti wa Vatsonga Open Museum approximately 10.9km and 13km east of Deviation 1a and Corridors 1 and 2 respectively.	Medium

The only sign of sites of heritage potential were mostly graves (Especially on Corridor 2), and this can be avoided. Nonetheless, there is also a high chance of finding archaeological sites and this will be difficult to avoid since most of these are trifling and often hidden underground, only exposed once construction begins.

6.4.4 CONCLUSION AND RECOMMENDATIONS

- ❑ 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, particularly within Nature Reserves.
- ❑ Taking all the above information into account, it can be recommended that **Corridor One (1)** is the preferred alternative from a heritage impact perspective. Noteworthy that all grave sites should be avoided in the best way possible.

Two alternatives were investigated for the deviations. Option (s) 1a and 1b. The first option, 1a has the high level of heritage sensitivity. However, Option 1b showed minimal signs of heritage sites. It is therefore recommended that **Option 1b can be used as a deviation from Corridor 1 to Corridor 2**. It should still be noted that no site (s) can be found within 1a can be of such high significance such that construction may not be possible. As the exact coordinates for the power line and the individual tower structures are not yet available, it is difficult to determine what the final impact of the proposed development would be like.

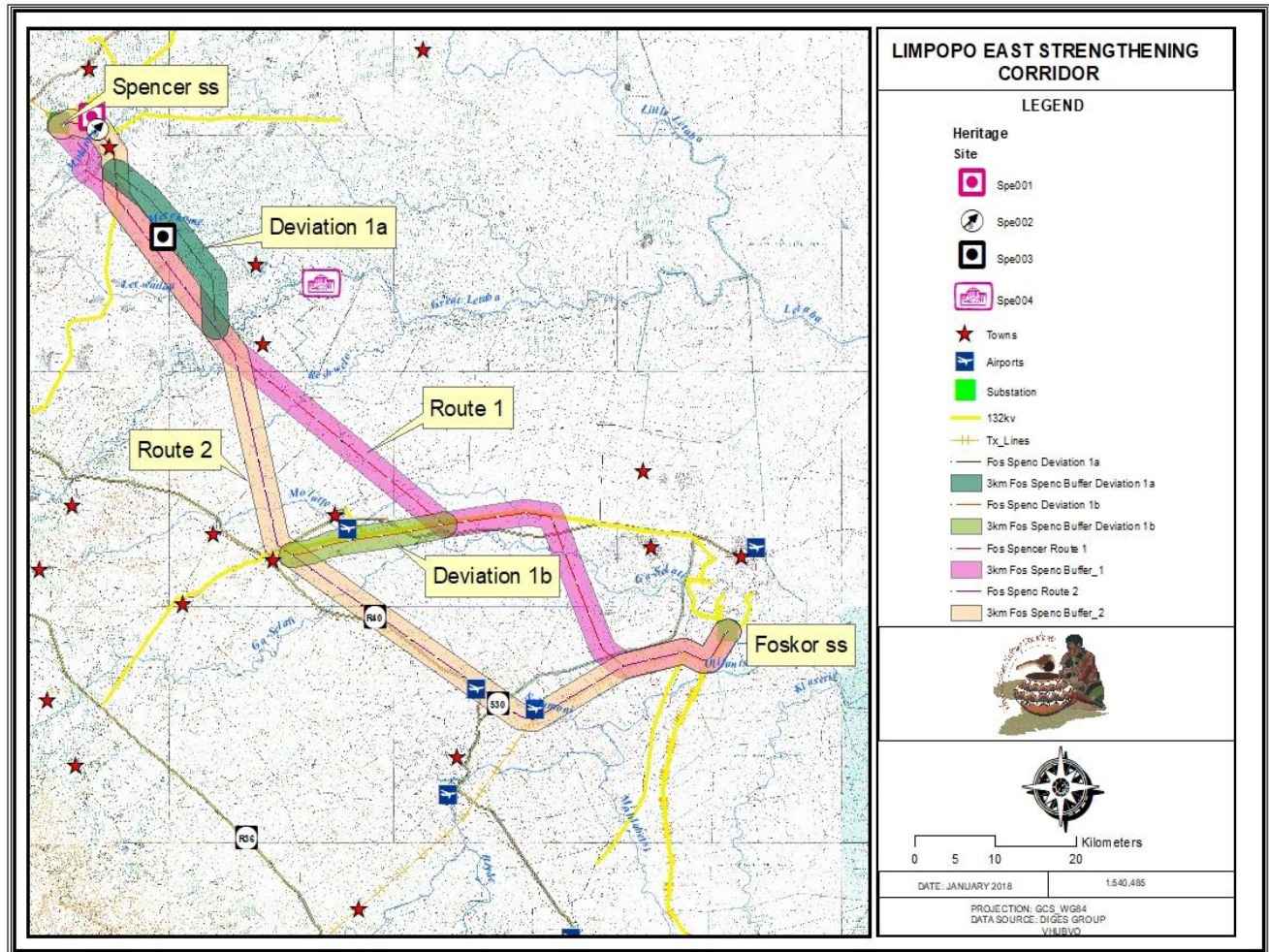


Figure 6-2: Location of Archaeological and grave sites

Henceforth, for the project to continue the archaeologist recommended the following:

- i. A heritage practitioner should complete a “walk down” of the final selected power line servitudes, the chosen deviation location and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible.

6.5 PALEONTOLOGY

The Paleontology Study was carried out by Dr J.F. Durand and the full report is attached as **APPENDIX E-5**.

The Terms of Reference were as follows:

- To detail the probability of finding fossils in the study area which may be impacted by the proposed development.

6.5.1 METHODOLOGY

Relevant literature and geological maps were studied.

6.5.2 DESKTOP STUDY

Several mines occur in this mineral-rich region the largest of which is in Phalaborwa. The study area varies from No to Low Paleontological Sensitivity according to SAHRA. The relevant literature and geological maps have been studied for a Desk Top Study. The rocks of the study consist of igneous and metamorphic rocks of between 3333 and 2060 Ma. These rocks are of no palaeontological concern.

The fossil record of the overlying Quaternary-aged sands is sparse, occurs sporadically and is low in diversity. Although no fossils have been reported for the study area, fossils such as root casts, burrows, termitaria, ostrich egg shells, mollusc shells and isolated bones have been discovered in the Quaternary sands elsewhere (Almond & Pether 2008).

6.5.3 RECOMMENDATIONS

The area is underlain by igneous and metamorphic rocks of Swazian to Vaalian aged igneous rocks (3.33 – 2.05 Ga). Due to the very low probability of fossils occurring in the study area it is recommended that the project should be exempted from further palaeontological studies.

6.6 SOCIAL IMPACT ASSESSMENT

The Social Impact Assessment for the project area was carried out by Afro Conserva Intergration and the full report is attached in **APPENDIX E-7**.

The Terms of Reference were as follows:

- i. To describe the social characteristics of the affected population as well as the cultural and socio-political dynamics in the broader project area;
- ii. To identify relevant social aspects and the anticipated impacts associated with the proposed project; and
- iii. To identify viable mitigation measures and project related benefits.

6.6.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

- This study was carried out with the information available to the specialist at the time of executing the study, within the available timeframe and budget. The sources consulted are not

exhaustive and additional information, which might strengthen arguments or contradict information in this report might exist;

- The specialists did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment;
- It was assumed that the motivation for, and the ensuing planning and feasibility studies of the project were done with integrity, and that the information provided to date by the project proponent, the independent environmental assessment practitioner and the public participation consultant was accurate;
- The information contained in this report has been compiled with the utmost care and accuracy within the parameters specified in this document. Any decision based on the contents of this report is, however, the sole responsibility of the decision maker.

6.6.2 METHODOLOGY

A social baseline study was undertaken and it made use of the following information:

- existing data;
- comments received during the public participation process;
- Published reports including the Integrated Development Plans; and
- Statistical data obtained from Statistics South Africa; and
- Social Impact Assessment literature.

6.6.3 ASSESSMENT

In order to assess the potential impact of the proposed project, it was important to consider Limpopo Province, District Municipalities and Local Municipalities as well as nearby towns in a holistic way. The baseline study therefore included a brief over-view of the socio-economic factors in these areas with a thorough investigation into the affected 4 Local Municipalities, Ba-Phalaborwa, Greater Letaba, Greater Tzaneen and Maruleng. The following detailed information is documented in the Social Impact Assessment attached in **Appendix E-7:**

- Demographic Profile which includes population and household, population group, age and education profile; and
- Economic Profile which includes employment and labor, services and infrastructure, housing, energy use, water, roads and transport.

The anticipated socio-economic impacts expected include the following:

- i. Waged labour;

- ii. Capacity Building and Skills Development;
- iii. Influx of construction workers;
- iv. Inflow of workers;
- v. Gendered division of labor;
- vi. Accommodation of workers;
- vii. Local economic contribution;
- viii. Socio-economic Processes;
- ix. Conversion: Geographic;
- x. Increase in demands for service
- xi. Property value;
- xii. Displacement and Relocation of households;
- xiii. Property Value;
- xiv. Displacement and Relocation;
- xv. Existing Residential;
- xvi. Game farms and nature reserves; and
- xvii. Tourism and visual.

6.6.4 CONCLUSION AND RECOMMENDATIONS

'Excerpt from the Social Impact Assessment Report'

From a social perspective based on the initial assessment of the receiving environment, there will be no fatal flaws associated with the proposed development that can have grave social consequences. The proposed development will have varying negative/ positive impacts ranging from high to low in the area proposed for development. It is apparent that there is little differentiation between the proposed alternatives assessed, either-way, the area will be impacted upon during both the construction and operational phase of the project.

The majority of the negative social impacts can respond to well-orchestrated mitigation measures, since they are general construction related problem, such as inflow of workers and jobseekers, possible impacts on farming and conservation activities, noise pollution, increased vehicle movement, as well as safety and security issues. The following recommendations should be implemented:

- In areas or on properties with existing power lines, Eskom should at all times aim to place the new transmission line away from the residential dwellings and sensitive activities taking place on those properties;

- Where possible, towers must be placed along the boundary of the properties to limit the incursion on property value, as well as on the residents' daily living and movement patterns; and
- Failure to adopt recommendation made in the Visual Impact Assessment, can have a negative impact on the project since some landowners might feel that the future of tourism activities and the "sense of place" would be compromised by the proposed project, and this could lead to select mobilization against the project.

6.7 SOIL AND LAND CAPABILITY ASSESSMENT

The Soil and Land Capability Assessment for the project area was carried out by FNR Lesedi Organic Farming Development and the full report is attached in **APPENDIX E-8:**

The Terms of Reference were as follows:

- Define parameters of land as stipulated by the Subdivision of Agricultural Land Act No. 70 of 1970 and the Amended Regulation of Conservation of Agricultural Resources Act No. 43 of 1983;
- Classify high potential agricultural land in South Africa compiled by the Agricultural Research Council for the National Department of Agriculture;
- Identify the current land-use on the farms and that of the neighbourhood;
- Identify other Agro-ecological factors prevailing in the area;
- Identify the agricultural potential of the area and possible crop types;
- Undertake an economic analysis; and
- Provide a recommendation and mitigation measures to reduce the identified impacts.

6.7.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions were made:

- ❑ The soil physical properties will not be altered in future as a result of human activities and the current land-use will not change significantly in future; and
- ❑ Agricultural activities will not encroach the demarcated buffer zone.

6.7.2 METHODOLOGY

- I. Assessment of soil potential and land capability of the proposed routes was based on a combination of desktop studies to amass general information and then through site visits for status quo assessment. Relevant information on the study area was obtained through a

combination of background information review, public database and literature as well as GIS information.

- II. Site Visit: The project site was traversed largely by a vehicle in January and February 2017 to document the following:
- Current land-use of the project site; and
 - Soil characteristics, vegetation profile, water resources and infrastructural profile.

The classification of soils at the project site was based on Land type description and the Binomial System for South Africa.

6.7.3 ASSESSMENT

The studies revealed the following:

- a) **Land-use:** The two powerline routes and deviations traverse conservation areas, natural vegetation areas, cultivated farms, subsistence areas and settlement areas and hence could impact agricultural activities. However, on relative terms, Route 2 was found to traverse slightly more the peripheries of the conservation and subsistence farm land;
- b) **Land type:** The proposed route will cross several land types with the following map units, namely: Ae; Ea; Eb; Fa; Fb and Ib. The dominant one is Fb followed by Ea and then Ae. Fb and Ea are largely Glenrosa and Mispah soil forms characterised by rocky layers or shallow depth limited by hard rock. Their potential for agricultural development is minimal and hence, construction of the powerline on these soils will have a minimal impact. In relative terms, route 2 traverse better agricultural soils and hence, not the preferred route for the construction of the power line. Regarding the substations, Foskop occurs on the Glenrosa and Mispah soil which are of low agricultural potential. The land type Ae326 which occurs around the Spencer MTS has relatively favourable soils for agriculture;
- c) **Land capability:** The proposed power line route 1 and route 2 traverse fairly similar land capability class which is the low to moderate class. In terms of land capability, these two routes can be considered for the construction of the power lines. There are however localised pockets of permanently transformed in the path of the two routes and deviations. Considering the extent of impact on agriculture following the construction, the proposed routes of the power line appear similar. Approximately 29 km of the two routes traversing towards Spencer substation will traverse moderate land capability and hence, have a greater impact on agriculture. Moderate to high land capability however occurs at Spencer MTS;

- d) **Geology:** The two proposed power line routes with deviations experience relatively similar geology to a large extent with Gneiss and Granite dominating.
- e) **Precipitation:** The two power line routes with deviations will be affected by annual precipitation to the same extent. The precipitation received at the study area is relatively low to medium and supplementary water supply through irrigation could enhance crop productivity.
- f) **Water resource:** The water resources in the study area do not differ among the two routes and deviations and there is a potential for the development of irrigations systems for each of the routes. This renders the routes high agriculture potential areas according to the classification of potential agricultural land.
- g) **Agro-enterprise:** The proposed project routes traverse an area that is generally not conducive for rain-fed arable farming but has existing irrigated farming systems and also areas with the potential for irrigated farming.

Impact Assessment

- ❑ During construction, the significance of the disturbance of the natural landscape for the two corridors is **low** whilst for the deviations the significance for the deviations is **low-medium**;
- ❑ The significance for the presence of foreign material in the natural landscape during the operation phase for the two corridors t is **low** whilst for the two deviations the significance is **low-medium**.

6.7.4 CONCLUSION AND RECOMMENDATIONS

By definition of parameters of land as stipulated by the Subdivision of Agricultural Land Act, No. 70 of 1970 and the Amended Regulation of Conservation of Agricultural Resources Act No. 43 of 1983 and Part 1 of the Regulation of Conservation of Agricultural Resources Act 43 of 1983), the land occurring under the two power line routes with deviations at the project sites:

- ❑ Consists predominantly of Mispah and Glenrosa soils which are of low potential for agriculture.
- ❑ The two powerline routes and the deviations traverse approximately similar landtypes, land capability, geology and vegetation within the study area.
- ❑ On relative terms, Route 1 with Deviations 1b traverses less favourable landtype and hence will be the preferred route for the construction.
- ❑ Regarding the location of the MTS, the Spencer substation is located on landtype Ae326 which is better soil for crop production agriculture relative the Foskor substation which occurs on landtype Fb180. This landtype is characterised by Mispah and Glenrosa soil forms.

- ❑ The water resources in the study area do not differ among the two routes and deviations and there is a potential for the development of irrigations systems for each of the routes. This renders the routes high agriculture potential area according to the classification of potential agricultural land.

Mitigation measures:

- ✓ All forms of cultivation within, and preferably a significant distance away from the buffer zones must be avoided. Land cultivation from soil tillage causes all forms of soil disturbances which initiate erosion processes.
- ✓ Construction activity should be restricted to the immediate footprint of the infrastructure. Existing farming activities in close proximity to the buffer zone should be based on sustainable principles to prevent unintended infringement into the project area.
- ✓ Other construction activities such as access roads should be kept to a minimum.

The two power line routes with deviations traverse similar land types and other geographical features. All things being equal and based on the findings and information gathered from the study area, the recommended for the construction of the power line is Route 1, via Deviation 1b to merge with Route 2 and then proceed north to the Spencer Substation

6.8 VISUAL IMPACT ASSESSMENT

According to the Final Scoping Report and Plan of Study submitted to DEA, the Visual Impact Assessment for the project area was to be carried out by Axis Landscape Architects cc but due to the short timeframe, the report could not be submitted on time. Zoneland Solutions was therefore appointed to carry out the assessment. The full report is attached in **APPENDIX E-9**.

The Terms of Reference were as follows:

- Determine of the extent of the study area;
- Identify and describe the landscape character of the study area;
- Identify of the elements of visual value and -quality that could be affected by the proposed project;
- Identify the landscape and visual receptors in the study area that will be affected by the proposed project and assess their sensitivity;
- Indicate the potential landscape and visual impacts;
- Assess the significance of the landscape and visual impacts; and
- Recommendations of mitigation measures to reduce and/or alleviate the potential adverse landscape and visual impacts.

6.8.1 ASSUMPTIONS AND LIMITATIONS

Assessments of this nature generally suffer from a number of defects that must be acknowledged:

- ❑ **Limited time:** A comprehensive assessment requires a systematic assessment of the environment at different times of the day. Such luxury is not always possible and therefore most assessments are based on observations made at a specific time of day. Educated estimates are made, where applicable, based on the knowledge of the area.
- ❑ **Availability of literature:** A thorough assessment requires that all relevant literature on the subject matter is studied, acknowledged and incorporated in the report. Due to a range of factors, forward planning documents are not always available for all spheres of government.

6.8.2 METHODOLOGY

The assessment was based on information from the following sources:

- i. Literature review;
- ii. Topographic maps and GIS data;
- iii. Observations and photographs were taken on site during the field survey; and
- iv. Technical information that was received from DIGES.

6.8.3 ASSESSMENT

'Excerpt from the Visual Impact Assessment Report

6.8.3.1 LANDSCAPE CHARACTER

Landscape Character Assessment (LCA) is concerned primarily with the observable elements, components or features within a landscape that individually and collectively define the landscape characteristics whilst landscape impacts are alterations to the fabric, character, visual quality and/or visual value which will either positively or negatively affect the landscape character. The proposed powerline route traverses through several diverse ecosystems which support many threatened fauna and flora. These ecosystems mostly include savanna and grasslands. More than half of the Mopani District is covered by endemic and near endemic vegetation and 9 ecosystems. Having regard for the Mopani region, it is argued that the sense of place of the area is largely intact. As a result, the sense of place of the area is commonly associated with natural resources, which has strong linkages to the tourism sector, and subsistence agriculture. The landscape character of the area is therefore considered to be **moderate to high sensitivity**. Due to the extensive nature of the project, it is also contended that defined areas are of low sensitivity.

6.8.3.2 KEY ISSUES

'Trigger' is a characteristic of either the receiving environment or the proposed project which indicates that visibility and aesthetics are likely to be key issues and may require further specialist involvement (DEA&DP, 2005). The 'triggers', as it relates to the proposed project refer to the following:

- ✓ Nature of the receiving environment; and
- ✓ Nature of the project.

Based upon the 'triggers' and key issues, the proposed activity is categorised as a **Category 5 Development**: *e.g. high density township/residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agriculture land and commercial tree plantations. Quarrying and mining activities with related processing plants.*

Based upon the this categorisation and the assessment criteria provided in the Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes it is expected that a '**moderate to very high visual impact**' could be expected as a result of the proposed activity.

Based on the above, a survey was undertaken to determine the existence of significant view corridors associated with the project site. A view corridor is defined as 'a linear geographic area, usually along movement routes, that is visible to users of the route' (DEA&DP, 2005) The following dominant view corridors were identified in the immediate vicinity of the proposed powerline, namely:

- a. R71 The main movement corridor between Tzaneen in the west and Phalaborwa in the east.
- b. R40 The R40 is a regional tourist route between Phalaborwa in the north and Nelspruit in the south, passing through the towns of Hazyview and Hoedspruit R319. The R40 eventually crosses into Swaziland south of Baberton.
- c. R526 The regional road between Gravelotte in the west and the R40 in the east.
- d. R529 Another main movement corridor that connects with the R36 at Manchabeni in the south and follows a northern alignment past the Hans Merensky Nature Reserve and connects with the R81 south of Giyani.

Another key aspect affecting the potential visual impact of any proposed activity is the topography of the project site and the surrounding environment and the existence of prominent biophysical features from where the project site is visible. The route of the proposed powerline is located on generally flat to undulating terrain. The DEM also shows depressions in the landscape associated with the major river corridors as it drains in an eastern direction. It is also evident that there are not prominent ridges or

topographical manifestations within the immediate vicinity of the powerline, from where the latter could potentially be visible.

6.8.3.3 IMPACT ASSESSMENT

In order to quantify and assess the visibility and potential impact of the proposed activity and to provide a basis for selecting appropriate observation points outside of the project site, a photographic study and analysis was undertaken in the vicinity of the project site. The analysis identified several observation points with similar characteristics and assessments outcomes. A selection of Key Observation Points is therefore included in the Visual Impact Assessment Report. Based on the above-mentioned aspects the following impacts were identified and rated:

- ✚ **Landscape Character:** The significance of the activities in relation to the landscape character is deemed to have a **Medium** significance before mitigation which can be reduced to **Low** with mitigation measures;
- ✚ **Tourist value:** Tourists are regarded as visual receptors of exceptional high sensitivity. Their attention is focused towards the landscape which they essentially utilise for enjoyment purposes and appreciation of the quality of the landscape. The significance of the activities in relation to the tourist values in the area is deemed to have a **Medium** significance before mitigation which can be reduced to **Low** with mitigation measures. Only those receptors in the immediate vicinity of the proposed powerline will be visually impacted upon by the new infrastructure. Receptors situated further away tend not to be impacted by the proposed activity due to the visual absorption capacity of the landscape within which the project site is located;
- ✚ **Glare:** The impact of glare source depends on the nature of the receptor, the size of the source relative to the visual field, the position of the source within the visual field and intensity of the source. Glare can pose, at minimum, a nuisance and in other cases can create a safety risk. The significance of visual impact of reflectivity and glare of structures is deemed to have a **Medium** significance before mitigation which can be reduced to **Low** with mitigation measures.

6.8.4 CONCLUSION AND RECOMMENDATIONS

6.8.4.1 CONCLUSION

The on-site verification from the selected Key Observation Points (KOP) and the viewsheds generated from the points indicated that the proposed powerline and substation will be clearly visible from most observation points in the foreground of the project. This is primarily due to the undulating landscape

and natural bushveld vegetation, which provides a natural high visual absorption capacity and, hence, prevents long-distance views onto the project installation. The following conclusions can be made:

- i. Visual impact is not equal along the length of the powerline. The impact of the respective alternatives is more pronounced near tourist facilities, roads and residential areas.
- ii. Similarly, the impact is less severe in rural areas, industrial complexes and areas where the proposed powerline will be erected in the same route corridor as similar large overhead powerline infrastructure.
- iii. The overall visual impact of the route alternatives is summarised as being of a medium to high negative significance in the vicinity of sensitive receptors and a low negative significance in the vicinity of less sensitive receptors.
- iv. The proposed powerline will, in parts, add to the existing infrastructure in the area which might have an additive cumulative effect. Similarly, the additive cumulative impact will still be less than a new impact on virgin soil.
- v. Although the proposed powerline will be developed on a relatively flat (undulating) terrain, the height of the structures might result in a potential impact on the skyline.
- vi. The proposed powerline will traverse landscapes of high scenic and conservation value. The powerline will, however, in places be located relatively far from the scenic routes and not have a direct impact on all sensitive receptors.
- vii. All forward planning documents reference the importance of services infrastructure to supply in the needs of the greater community. The documents also do not specifically note that such installations could not be considered in the area; and

Overall, the sense of place and most other expected impacts of the proposed activity, will not alter to such an extent where users might experience the visual landscape in a less appealing or less positive light.

6.8.4.2 RECOMMENDATIONS

The following mitigation measures should be implemented:

- ✓ Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape;
- ✓ Keep disturbed areas to a minimum;
- ✓ No clearing of land to take place outside the demarcated footprints;
- ✓ The contractor should maintain good housekeeping on site to avoid litter and minimise waste;
- ✓ Erosion risks should be assessed and minimised;
- ✓ The steel components should not be painted but be galvanised and allowed to oxidise naturally over time. The grey colour produced in this process will help to reduce the visual impact;

- ✓ New road construction must be kept to a minimum. Where new roads are required, they should be two-track gravel roads, maintained to prevent dust plumes and erosion. Utilise existing roads and tracks to the extent possible;
- ✓ Those parts of the substation that require the protection of paint should be painted in colours chosen from a palette that is matched to the natural colours found in the surrounding landscape;
- ✓ Create storm-water channels alongside access roads and divert storm-water in the natural veld at regular intervals along the road; and
- ✓ All contractors to adhere to a construction phase Environmental Management Plan.

6.9 WETLAND ASSESSMENT

The Wetland Assessment for the project area was carried out by SAZI Environmental Consulting and the full report is attached in **APPENDIX E-9**.

The Terms of Reference were as follows:

- ✓ Identify the relevant legislature and guidelines pertaining to water resources;
- ✓ Delineate all wetlands as per the guideline by DWAF 2005;
- ✓ Provide suitable mitigation measures to protect watercourses during project life-cycle;
- ✓ Recommend monitoring programme and measures to protect hydrological features and other sensitive features from construction impacts including spillages; and
- ✓ Prepare a map as per National Freshwater Priority Areas including buffer zones.

6.9.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made or encountered during the assessment:

- It is assumed that the current information received from the client and existing data is correct;
- It is also assumed that the maps available are still relevant and can be used as representation of site conditions.
- Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies, due to the use of handheld GPS instrumentation, may occur. If more accurate assessments are required the wetlands will need to be surveyed and pegged according to surveying principles.
- Aquatic, wetland and riparian ecosystems are dynamic and complex. The effects of natural seasonal and long-term variation in the ecological conditions are therefore largely unknown.
- Fauna and flora assessments undertaken were mainly for the purposes of supporting the Present Ecological Status and Ecological Importance and Sensitivity that is required as part of

the wetland assessment. Extensive fauna and flora assessment outside of the wetland system did not form part of this report.

6.9.2 METHODOLOGY

The assessment was based on information from the following sources:

- a) Desktop assessment of the site;
- b) A site visit to confirm the presence or absence of wetland areas within the proposed project site area as well as verification of wetland boundaries;
- c) Assessment of the catchment;
- d) Assessment of the Present Ecological Status of wetlands on site (Level 1, Wet-Health);
- e) Assessment of Ecological Importance and Sensitivity of wetlands on site; and
- f) Impact assessment of the proposed activities on the wetlands.

6.9.3 ASSESSMENT

The project footprint falls within the Olifants (WMA) and the area is dominated by sandy rivers and alluvial soils with most associated rivers being intermittent. The study area comprised of a number of intermittent and perennial streams. River channels are in most cases associated with channeled valley bottom wetlands and floodplains, but are in some cases only associated with the riparian zones and do not have a wetland area nor any wetland indicators. During the field assessment, some of the streams and their tributaries comprised of wetland indicators such as soil wetness, terrain, vegetation and hydrology. Two floodplain HGM units were identified with the first floodplain wetland associated with the Groot Letaba River whilst the second floodplain wetland was associated with the Olifants River.

The impacts that were observed on site largely informed the hydrological, geomorphological and vegetation impact scores. In the summary of impact scores, the wetlands were explained individually due to their geographic location and vegetation cover. The two assessed wetlands were largely modified with a PES score of D. The two wetlands were assessed to have moderate ecological functioning. The EIS scores

Impact Assessment

Linear projects are regarded to have less impacts when it comes to wetland degradation. Impacts anticipated that will be caused by the construction activities include;

- Loss and disturbance of wetland habitat;
- Increased sediment transport into wetlands;
- Altered flow characteristics within wetlands; and

- Water quality deterioration within wetlands.

6.9.4 CONCLUSION AND RECOMMENDATIONS

The proposed power line from Foskop and Spencer and its associated substations crossed watercourses (rivers, wetlands). Based on the PES and EIS and site assessment undertaken for the identified wetlands, the proposed activity will not pose detrimental impacts on wetlands. The wetlands have already experienced natural impacts that have degraded the wetlands integrity. Furthermore, none of the wetlands were regarded as those of natural importance. In light of the above, the proposed power line activities should be conducted with all mitigation measures put in place. Reference is made to Section 8 and Appendix G.

The current study approved the proposed construction of the Foskop-Spencer power line. All alternatives cross watercourses, however alternative 2 cuts through less watercourses and wetlands, therefore, is the recommended alternative.

6.10 COMPARISON OF ALTERNATIVES

The table below summarizes the specialists' comparison of alternatives. It indicates that from an biodiversity, eco-tourism, paleontology, social and soil and visual all alternatives are viable where as in terms of wetlands alternative 2 is preferred whilst Alternative 1 and deviation 1b is preferred from an heritage and land capability perspective and alternative 1 is preferred from a heritage perspective.

Table 6-2: **Comparison of Alternatives**

	CORRIDOR 1	CORRIDOR 2	CORRIDOR 1+2+1B
Avifauna	3	1	2
Biodiversity	1	1	1
Eco-Tourism	1	1	1
Heritage	1	3	2
Paleontology	1	1	1
Social	1	1	1
Soil and Land	2	3	1
Visual	1	1	1

Wetlands	2	1	2
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Rating: 1 being the most preferred and 3 being least Preferred

7 PUBLIC PARTICIPATION PROCESS

7.1 INTRODUCTION

Public Participation Process (PPP) is viewed as a process of empowering communities and stakeholders in their efforts to safeguard the resource-base in more efficient ways and to use the resources sustainably. It also enables people to play lead roles in identifying, designing, directing and implementing any development activity which has an impact on their immediate environment, and therefore on their way of life. When undertaking an EIA project, public participation process is undertaken in terms of the Regulations set out in Chapter 6 of the EIA Regulations, Government Notice R982 of December 2014 as amended. The activities carried out as part of the process are as follows:

- *Section 40 – all registered Interested and Affected Parties (I&APs) are given 30 days to submit comments on generated reports;*
- *Section 41 – the person conducting a PPP must give notice to all I&APs by fixing notice boards, giving written notice and placing advertisements in local newspapers and provincial/national newspapers;*
- *Section 42 – open and continuously maintain a register of Interested and Affected Parties (I&APs);*
- *Section 43 – all registered I&APs are entitled to comment on all reports and the person conducting the PPP must ensure that comments raised are brought to the attention of the proponent or applicant; and*
- *Section 44 – the person conducting the PPP must ensure that comments of I&APs and records of meetings are recorded and responded to. The comments and responses report must be attached to the reports that are submitted to the competent authority.*

7.2 OBJECTIVES AND APPROACH TO THE PPP

The objectives of the PPP are:

- ❑ To gather input from Interested and Affected Parties (I&APs) regarding the level and nature of their interest to better plan public participation activities related to the EIA;
- ❑ To obtain local knowledge from the public to enhance our understanding of the environmental, cultural and socio-economic setting of the proposed project for use in the EIA;
- ❑ To understand the reasons behind the views of the public regarding the potential environmental impacts;
- ❑ To solicit public input or views regarding potential alternatives and mitigation measures to reduce environmental impacts;

- ❑ To work with the public to resolve a topic specific issue;
- ❑ To obtain public comments on all project documentation to verify whether information in the report is accurate, representative and adequate;
- ❑ To provide feedback to Interested and Affected Parties about how their input, views, issues and concerns have been considered in the process; and
- ❑ To inform the public about the Competent Authority's (Department of Environmental Affairs) decision and next steps to follow.

7.3 PUBLIC PARTICIPATION TEAM

During the previous application, a team of Public Participation Practitioners was assembled to undertake the PPP taking into consideration the geographic nature/area of the receiving environment, process needs of I&APs (language; organizational structures etc.) and the technical nature of the project. Reference is made to the table below for the roles and experience of the PP team:

Table 7-1: Roles and Experience of PP team

Name	Position	Experience
Moses Mahlangu	PP Team Manager:	<ul style="list-style-type: none"> • Involved in more than 20 EIA projects for Eskom power lines and substations; • Handled consultations with municipality councillors, traditional leaders in different regions in South Africa using six different languages; • Has been involved in 8 Eskom construction projects as an ECO; and • Previously worked as a teacher and school inspector for 12 years
Vicus Coetser	Facilitator for Public Meetings	<ul style="list-style-type: none"> • Mr Vicus Coetser commands a vast experience of facilitating public meetings which involve farming communities; and • Currently involved in the handling of negotiations for Eskom servitude for different power lines in Limpopo Province. He is thus familiar with the farming community in the study area.
Calvin Netshaulu	PPP Officer	More than 10 Eskom (Transmission & Distribution) projects since 2010. Mr. Netshaulu is responsible for continuous database management. Database management is internally considered as a backbone of public participation process since an accurate record

		keeping of participating stakeholders is needed for the flow of information between stakeholders, the study team and the proponent.
Khazamula Daniel Chauke	Local PP Officer	<ul style="list-style-type: none"> Mr. Chauke is a local person who speaks both xiTsonga and Northern Sotho; and He has worked in Tzaneen-Phalaborwa-Giyani as an agricultural extension officer working in villages. Mr. Chauke brings the skill of communicating with the villagers and good knowledge of the affected villages.

7.4 LIMITATIONS ASSOCIATED WITH PUBLIC PARTICIPATION PROCESS

Certain limitations are found with any public participation process. The most important are:

- I&APs not registering and therefore not partaking in public events and the public participation process;
- I&AP not attending public events relating to the proposed project;
- I&AP not receiving information timeously and commenting timeously;
- Lengthy time associated with identifying and contacting all I&AP in a study area; and
- I&APs focusing on issues that do not relate to the proposed project.

7.5 METHODOLOGY ADOPTED

Public Participation Process entails that all stakeholders that might be affected or have interest in the proposed project be afforded an opportunity to participate in the impact assessment of the project and they must each realize that they have responsibilities. See Figure 7-1 and 7-2 for the role of the Interested and Affected Parties (I&APs), the EAP and the Competent Authority (CA):

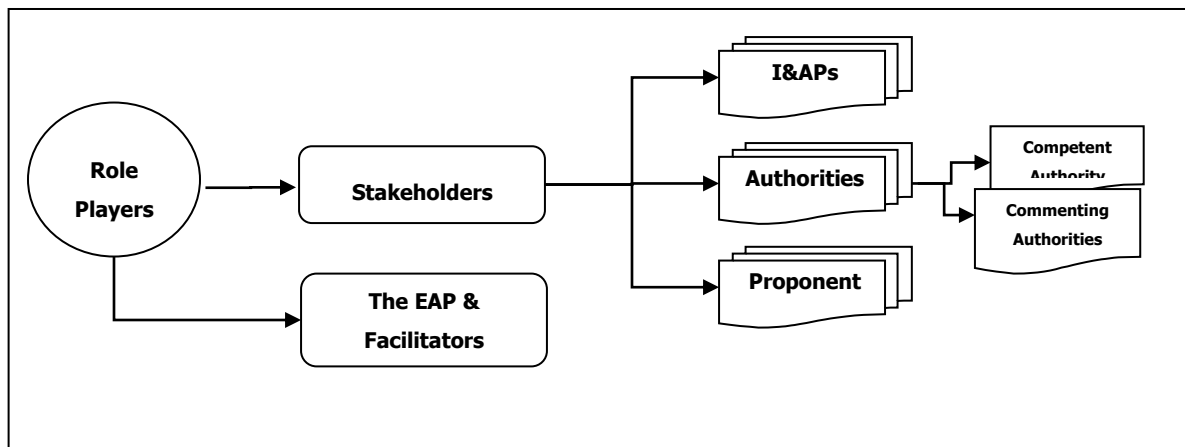


Figure 7-1: Role Players in the PPP

The Proponent:

- Provide adequate information to the Authorities, the EAP and to I&APs
- Adopt an open and transparent attitude during the interaction with I&APs
- Understand that the EAP acts independently and objectively in order to improve communication between I&APs and the Proponent
- Have empathy and patience with I&APs who do not possess the relevant background knowledge
- Avoid raising unrealistic expectations

I&APs:

- Register as an I&AP and advise the EAP about other I&APs who should be consulted
- Engage according to the agreed procedures and time frames
- Representatives of landowners and other organizations must ensure that their views are of their members and not their own
 - Avoid making unrealistic demands and provide appropriate information
 - Assist in identifying and prioritizing issues that need to be investigated and verify that issues have been recorded and considered

The EAP/PP Team:

- Communicate with all I&APs in order to provide them with information to enable them to participate in a meaningful way
- Organize all the required PPP activities
- Record and process the inputs, comments and issues received from I&APs
- Ensure that I&APs inputs are integrated into the reports which are communicated to the competent authority
- Avoid raising unrealistic expectations and undue fears



Competent Authority:

- Ensure that the requirements for decision-making do not limit the rights of stakeholders to engage adequately in the process
 - Where appropriate, ensure that the Proponent appointed an independent EAP
- Allow adequate time for stakeholder engagement
- Provide a decision on the application
- Allow for stakeholders to appeal against the decision

Figure 7-2: Role Players

7.6 SUMMARY OF PP ACTIVITIES UNDERTAKEN DURING THE SCOPING PHASE OF THE PREVIOUS APPLICATION

The following PPP activities were carried out in accordance to Section 39-44 of the EIA Regulations as amended:

7.6.1 SITE RECONNAISSANCE

Due to the larger area traversed by the proposed power line, there was need to have a diversified team who understood the cultures and languages of the different groups of people. A reconnaissance site visit was undertaken at the inception of the Scoping phase. This was done to develop the preliminary understanding of the social context (representative structures; language; communication media, etc.). The outcome of this site visit was that information to the communities in the receiving environment would best be distributed via leadership structures that are available in these communities, namely traditional leadership and different Landowners Groupings. In addition, local officers were used to mitigate the issue of language in meetings with the recognized leadership structures that are used for communication.

7.6.2 STAKEHOLDER IDENTIFICATION

With the help of land-owners' database developed by Potlako Negotiators and Services (Pty) Ltd, Windeed and through networking and advertising, I&APs were identified and these I&APs are currently

registered on the database. Two separate databases are maintained viz. the database for landowners and the database for all other stakeholders (I&APs). The two databases of registered stakeholders include stakeholders from:

- National, Provincial and Local Government;
- Landowners;
- Non-Governmental Organizations; and
- Business, Industry & Tourism.

7.6.3 NOTIFICATION:

To create awareness, use was made of Background Information Document (BID), emails; telephone calls; newspaper advertisements and site notices; visits to different Traditional Authority offices and municipal offices. Visiting Traditional Authority offices and municipal offices also helped the PPP Team to establish the preferred consultation process in the area. Advertisements were also placed in national/provincial and local newspapers notifying them about project and the availability of Draft Scoping Report and to encourage them to comment as well as to attend public meetings that were planned in their area. Reference is made to Table 7-2 for the dates of advertising and **Appendix F-5A** and **F-5B** for the newspapers.

7.6.4 MEETINGS

Different groups of stakeholders were identified and registered. The different stakeholders were consulted separately as their perceptions of such projects differed, hence the need to be consulted with separately and sometimes individually. Proximity of locations of different stakeholders also made it difficult to get them to attend the same meetings. Meetings were held at project inception and at the draft scoping phase stage with the landowners, traditional authorities and stakeholder government departments. Reference is made to the attached Comments and Response Report and the minutes of the meetings in Appendix F-3 and F-7C.

The activities undertaken and proposed during the Pre-Application and Scoping Phases of the assessment are outlined in Table 7-2 overleaf:

Table 7-2: Summary of PP Activities

DATE	ACTIVITY	PARTICIPANTS	PRODUCTS
26/09/2016	Identified Interested and Affected Parties and listed them in the database	Consultants and the public	I&AP Database
13/01/2017	Placed posters in the study area	PP Consultant	Posters
19/01/2017	Distribution of PP documents (BID, Reply Sheet, Study Area Map and list of properties owners)	Consultants and the Public	Information documents distributed See Appendix F-6
20/01/2017 and 24/01/2017	Officially announced the project through the newspapers advertisements (One regional and four different local newspapers)	Project Proponent (Eskom), Consultants and general public	Newspapers adverts See Appendix F-5A
08/02/2017	Focus Group meeting (Majeje Traditional Authority)	Project Proponent (Eskom), Consultants and Majeje Traditional Authority)	Minutes See Appendix F-7C
08/02/2017	Focus Group meeting (Mashishimale CPA)	Project Proponent (Eskom), Consultants and Mashishimale CPA	Minutes See Appendix F-7C
09/02/2017	Focus Group meeting (Selati Game Reserve)	Consultants and Selati Game Reserve	Minutes See Appendix F-7C
10/02/2017	Focus Group meeting (Grietjie Community Members)	Consultants and Grietjie Community Members	Minutes See Appendix F-7C
10/02/2017	Focus Group meeting (The Local Governments and Key Stakeholders)	Project Proponent (Eskom), Consultants, the Local Government and Key Stakeholders.	Minutes See Appendix F-7C
02/03/2017	Focus Group meeting (Modjadji Traditional Authority)	Project Proponent (Eskom), Consultants and Modjadji Traditional Authority	Minutes See Appendix F-7C
02/03/2017	Focus Group meeting (Olifants North Game Reserve)	Project Proponent (Eskom), Consultants and Olifants Game Reserve Representatives	Minutes See Appendix F-7C
ACTIVITIES UNDERTAKEN DURING THE AVAILABILITY OF DRAFT SCOPING REPORT			
12/05/2017	Advertise the availability of DSR and the dates of public meeting in the Citizen and Local Newspapers	PP team	Newspapers Adverts See Appendix F-5B
15/05/2017	Notify I&APs about the availability of DSR and the dates of the public meetings	PP team	Letter
24/05/2017	Public Meeting	Project Proponent (Eskom), Consultants and the General Public in Phalaborwa	Minutes
24/05/2017	Focus Group Meeting	Project Proponent (Eskom), Consultants and the Agri-Letaba Farmers Association	Minutes

DATE	ACTIVITY	PARTICIPANTS	PRODUCTS
24/05/2017	Public Meeting	Project Proponent (Eskom), Consultants and Nyavana Traditional Authority	Minutes
25/05/2017	Focus Group Meeting	Project Proponent (Eskom), Consultants and Selati Game Reserve	Minutes
25/05/2017	Public Meeting	Project Proponent (Eskom), Consultants and the General Public in Gravelotte	Minutes
09/06/2017	Reminder to comment on DSR	Registered Stakeholders	Email's proof
19/06/2017	Circulation of Minutes	PP Consultant	Email's proof
24/07-01/08/2017	Notification of availability of revised (final) scoping report	Registered Stakeholders	E-mail proof and notification letter
22/08/2017	Public Meeting	Project Proponent (Eskom), Consultants and stakeholders	Minutes
ACTIVITIES UNDERTAKEN FOR THE NEW APPLICATION (14/12/16/3/3/2/1076)			
11/06/2018	Notification of reapplication and availability of the DEIAR	Registered stakeholders	E-mail proof and notification letter Appendix F-6G
27/06/2018	Notification of DEA Reference no.	Registered Stakeholders	E-mail proof Appendix F-6G
10/07/2018	Reminder to comment	Registered stakeholders	E-mail proof Appendix F-6H

7.7 PUBLIC PARTICIPATION AT EIA PHASE DURING THE PREVIOUS APPLICATION

The purpose of the public participation process during the EIA Phase is to:

- ✓ inform stakeholders about the findings of the specialists reports and the recommendation by the EAP;
- ✓ gather comments and concerns regarding the potential impacts and the recommendations made by the EAP;
- ✓ identify gaps in terms of the potential mitigation measures that might have been overlooked; and
- ✓ Further strengthen relationships with the stakeholders.

7.7.1 BACKGROUND

According to the EIA Regulations of 2014 as amended, it is required that all registered Interested and Affected Parties should be informed about the process. After the acceptance of FSR the stakeholders

were notified about the acceptance and the commencement of Environmental Impact Assessment Phase (see **Appendix F-6C**).

7.7.2 METHODOLOGY

Registered I&APs were advised about the availability of DEIAR and EMPr and the duration for comment period. Details of how to access the reports for commenting and venues where the reports were placed were made known to the public by a letter and advertisement. (Reference is made to **Appendix F-6C and F-5C**) The public participation process for the EIA Phase involved the following steps:

7.7.2.1 ANNOUNCEMENT OF THE AVAILABILITY AND PUBLIC REVIEW OF THE DRAFT EIR AND EMPR

A letter was circulated to all registered I&APs, informing them about the progress made with the study and that the DEIAR and EMPr were available for public comment. The reports were distributed to public places mentioned in the table below (**Local libraries within the study area**) as well as different sections in the affected Local Municipalities and Mopani District Municipality and identified commenting authorities on the 19th March 2018. Advertisements were placed in the national newspaper, the Citizen and four local newspapers within the study area on the 15th and 16th of March 2018 (see **Appendix F-5C**).

Table 7-3: Location of the DEIAR for Review

Name of the Library	Contact details
Phalaborwa Public Library	Mr Steve Mkhlabuki - (015) 318 6311
Tzaneen Public Library	Ms Christine Nel - (015) 307 8050
Hoedspruit Public Library	Ms Nelly Sekgobela - (015) 793 2409
Giyani Public Library	Ms Relinah Shingane - (015) 811 5500
Modjadji Public Library	Ms Rebecca Nkgapele – (015) 309 8609

7.7.2.2 PUBLIC REVIEW OF DEIAR AND EMPR

As part of the process to review the DEIAR and EMPr, registered I&APs were given 30 days to comment on the DEIAR and EMPr. The commenting period commenced on the 19th March 2018 and ended on the 24th April 2018. The proof of delivery of the draft report and notification letters is attached in **Appendix F-6C and F-6F**). The written comments received during and after this period have been recorded in the attached Comments and Response Report and also attached in **Appendix F-4D**.

7.7.2.3 MEETINGS

As per the Scoping Phase, the Public Participation Team considered it necessary to consult with the different groups of Interested and Affected Parties separately as their perceptions of such projects differed e.g. villagers usually consider such project as bringing development and job opportunities whilst stakeholders that are involved in ecotourism and game farming consider power lines as being destructive to their industry. Proximity of locations of different stakeholders also made it difficult to get them to attend the same meetings. Invitations to the meetings were sent out, reference is made to **Appendix F-7B** for proof of invitations.

Meetings with Landowners

The landowners of Agri-Letaba, Selati Game Reserve, Selati River Lodge and Olifants North Game Reserve were met to discuss the draft Environmental Impact Assessment Report. Minutes and of this meeting can be read under **Appendix F-7D**. Based on these meetings, it can be concluded that the landowners are not in favour of the proposed power lines on their properties, citing issues of concern such as:

- The infrastructure reduces the productivity of their orchards because conducting agricultural activities under the power lines is difficult and has some safety risks;
- Power lines poses visual impact which affect eco-tourism; and
- The presence of power lines on game farms increases poaching.

General Public Meeting

Meeting with the general public was held in Gravelotte on the 10th of April as advertised. Minutes and attendance register of this meeting can be read under **Appendix F-7D**. This meeting was mainly attended by commercial property owners and their concerns are the same as those mentioned above.

Meetings with Traditional Authorities (or Community Property Association)

Four traditional authorities have been met (Majeje, Mashishimale, Nyavana and Modjadji) and the minutes of these meetings and attendance registers are included under **Appendix F-7D**. Traditional authorities are more welcoming to the construction of power lines in the area as they perceive the proposed development as having the potential of creating jobs and boosting economic activities in the region.

7.7.3 COMMENTS AND RESPONSE REPORT

A full description of the comments and issues raised during the Scoping and EIA phases of the project are recorded in the Comment & Response Report attached in **Appendix F-3** and have also been incorporated into this document. It should be noted that no comments were received from the general public which can be recorded as resulting from the placement of the reports in public places (Libraries).

A summary of issues and concerns raised are given in the table below:

Table 7-4: Summary of Issues and Concerns Raised

ISSUE/CONCERN	DESCRIPTION
Compensation	compensation for the affected properties was one of the most commonly raised issues by land-owners. Most of the owners were not aware of how land would be valued and the rate which Eskom would pay.
Construction Time-frame	Where hunting takes place, the owner's concern was interference with hunting season during the construction phase.
Health	An issue was raised with regards to the health impacts associated with Electromagnetic Field emitted.
Knowledge of project	most agricultural landowners indicated that they had not received invitations to public forums
Land-use	The first section of the alternative corridors from Foskor is characterized of nature and game reserves and landowners were concerned about the negative impact the power line would have on the pristine areas. Impacts cited include: loss of fauna habitat, habitat fragmentation and the impact on the sense of place which would result in a negative effect on eco-tourism
Need and Desirability	an issue that was also raised was why Spencer MTS had to be strengthened by Foskor and not Medupi
Safety and Security	Most farms with game concern was in terms of poaching and security against the contractor's team. The owners needed to know who would be responsible for the contractor's team
Size of buffer Size of buffer	Landowners were concerned about the size of the buffer (3km), under assessment. A number of the owners thought that the entire 3km would be Eskom's servitude. Owners of land under commercial agriculture (orchards) also needed clarity on what activities are allowed under the line and if pivotal irrigation would still possible.

7.8 PUBLIC PARTICIPATION FOR THE NEW APPLICATION

Due to the lapsing of time of the previous application, a new application was submitted to the Department with the draft EIAR and a letter for public participation exemption of activities indicated in sub-regulation 41(2)(a), (b), (c) and (d). In addition, the registered Interested and Affected Parties

(IAP) were notified of the reapplication and the availability of the Draft Environmental Impact Assessment Report (DEIAR) on the 11th of June 2017. The DEIAR was subjected to a 30 day comment period, from the 14th of June to the 16th of July 2018. Reference is made to Appendix F-8 and F-6G for the public participation exemption letter and notification to IAP. Comments received from stakeholder Departments were the same as those received during the previous application and comments received from IAP were mainly centered on discontent in having the power line traverse across private property. All comments received during the review period were responded to and summarized in the attached Comments and Response Report in Appendix F-3.

7.9 CONCLUSION

Based on the inputs received during the previous and current Public Participation Process, the PPP team is confident that all reasonable efforts were made to inform the public in the study area about the proposed project. The consultation process is considered to have managed to give the public, especially the landowner's ample opportunity to raise issues of concern, which they might have regarding the proposed transmission powerlines and substation upgrade. The following conclusions can be made:

- i. Traditional Authorities/Councils are generally considered to be representing the villagers and in most cases are considered to be the link between the population of a particular village and the outsider who is coming to use their land. Traditional leaders view the power line project in their area as having the potential for job/economic opportunities and compensation for the use of their land;
- ii. Community Property Associations form land management arms of the Traditional Authorities/Councils and are usually considered to be the structure that will consult on behalf of land claimants with any person/organization that wants to use their land. CPA generally accept the power in the area but they want to be compensated adequately for the use of their properties;
- iii. Game Farmers and Nature Reserves owners have been consulted as organized structures that represent different property owners in the area that will be traversed by the proposed power line. These property owners are not happy with the power line in their farms but have indicated that they will accept the preferred routes; and
- iv. Commercial farmers who are mainly citrus growers not happy with the power line dissecting their orchards. They indicated that since a 3km corridor was studied Eskom is advised to consult with each property owner to agree on where to place the power line such that minimal negative impact is done.

It should be noted that the consultation and/or communication with stakeholders and I&APs is ongoing throughout the study process up until the Department's decision. In addition, information regarding to

the project, Environmental Impact Assessment process and the Department's decision will be communicated to all I&APs.

7.10 WAY FORWARD

Registered stakeholders will be notified about the submission of the final EIAR and they will be advised that the full copy of the report will be posted on DIGES website. All registered stakeholders will also be informed of the Department's decision and the appeal process to be followed.

8 POTENTIAL IMPACTS AND DETERMINATION OF SIGNIFICANCE

This section of the report evaluates the possible negative and positive impacts which may occur because of going ahead with the proposed project. Potential environmental impacts have been identified based on the following:

- A review of the proposed activity; and
- The nature of the receiving environment.

Risks and key issues were identified through an internal process based on similar developments and site visits. Reference is made to the Table below for the environmental aspects used to identify the significant impacts:

Table 8-1: Identification of significant impacts

Environmental Feature	Component	Possible Construction effect envisaged?	Possible Post construction effect envisaged	Main effect?	Likely Significant Effect?	Comments/reason for inclusion or exclusion from further consideration
BIODIVERSITY (Flora and Fauna)	Habitat types	Y	Y	Y	Y	Loss of habitats
	Plant communities	Y	Y	Y	Y	Clearing of vegetation including protected/species of conservation concern
	Animal communities	Y	Y	Y	Y	Habitat transformation can cause displacement of animal/avi-fauna species.
	Conservation	Y	Y	Y	Y	Potential effects on the conservation/ protected species.
SOIL/LAND	Erosion	Y	Y	Y	?	Earthworks to be carried out
	Ground contamination	Y	Y	Y	?	Mainly caused by spillage of hazardous substances.
	Soils /agricultural land quality	Y	Y	Y	Y	Loss of agricultural land and movement of soils.
LAND-USE	Agriculture	Y	N	Y	Y	Loss of agricultural land
	Conservation Areas	Y	Y	Y	Y	Construction and operation will occur in conservation areas
WATER ENVIRONMENT	Surface water quality	Y	Y	Y	Y	Pollution during construction and run-off from cleared areas
	Groundwater quality	Y	Y	Y	Y	Pollution during construction and run-off from cleared areas
WASTE	Waste management	Y	N	N	N	Waste generated during construction will need to be managed

Environmental Feature	Component	Possible Construction effect envisaged?	Possible Post construction effect envisaged	Main effect?	Likely Significant Effect?	Comments/reason for inclusion or exclusion from further consideration
	Waste characteristics	Y	N	N	N	Waste generated changes from agricultural in some areas to construction waste.
AIR	Local air quality	Y	N	N	N	Increased emission of NO ₂ and PM ₁₀ on the local road network.
	Particulates and dust	Y	N	N	N	Dust generated during earthworks.
	Odor	Y	N	N	N	Odor expected from waste and sanitation systems during construction.
ARCHAEOLOGY	Burial areas	Y	Y	Y	Y	There are cemeteries within the corridors
	Objects/buildings more than 60 years old	Y	Y	Y	Y	Potential for buildings/ objects within corridor.
VISUAL	Landscape character	Y	Y	Y	Y	Introduction of towers in highly sensitive landscape resulting in negative impacts on its character.
	Landscape quality	Y	Y	Y	Y	Eroding of landscape quality by inappropriate developments.
	Sensitive views	Y	Y	Y	Y	Sensitive receptors in the vicinity of tourism related activities will result in a negative impact
	Land-cover	Y	Y	N	N	Removal of vegetation
NOISE	Noise	Y	N	N	N	Noise will be generated during earthworks and construction. Corona expected during operation.
	Vibration	Y	N	N	N	Potential for vibration.
SOCIO-ECONOMIC	Employment	Y	N	Y	Y	The development will create jobs within the local and regional areas.
	Public health and safety	Y	N	Y	N	Influx of workers may introduce diseases and the construction activities will result in accidents and thefts.
	Tourism	Y	Y	Y	Y	Can have both a negative and positive impact on the industry.
	Local environment amenity	Y	Y	Y	Y	The influx of construction workers may cause minimal constraints on local amenities
	Standard of living	Y	N	Y	Y	Standard of living within the area may improve during the

Environmental Feature	Component	Possible Construction effect envisaged?	Possible Post construction effect envisaged	Main effect?	Likely Significant Effect?	Comments/reason for inclusion or exclusion from further consideration
						construction phase.

Key: Y=Yes N=No ?=Uncertain

8.1 CHARACTERISTICS OF ENVIRONMENTAL IMPACTS

The significance of an impact is an expression of the cost or value of an impact to society. Impacts are divided according to phases: pre-construction, construction, operation and decommissioning phase. The following parameters will be used to assess the identified environmental impacts. It should be noted that the Tables as stated in the accepted Plan of Study have been combined to form one table with the exception of cumulative impacts, status and significance:

Table 8-2: Characteristics of Environmental Impacts

ASPECT	CATEGORY	DESCRIPTION	SCORE
INTENSITY	This refers to the degree to which the project area is affected by an impact. The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys impacted environment, alters its functioning, or slightly alters the environment itself.		
	Minor (MI)	The impact alters the affected environment in such a way that the natural processes or functions are not affected.	2
	Low (LO)	The affected environment is altered, but functions and processes continue, albeit in a modified way.	4
	Medium (ME)	The impact alters the affected environment in such a way that the natural processes or functions are modified to a great extent.	6
	High (HI)	Function or process of the affected environment is disturbed to the extent where it temporarily or ceases.	8
	Very High (VH)	Function or process of the affected environment is disturbed to the extent where it permanently ceases.	10
EXTENT	These are geographic boundaries that reflect the physical area in which an impact occurs.		
	Footprint (F)	The impacted area extends only as far as the activity, including the total footprint occurring within the total site area.	1
	Site (S)	The impact could affect the whole, or a significant portion of the site.	2
	Regional (R)	The impact could affect the area including the neighboring properties, the transport routes and the adjoining towns or suburbs.	3
	National (N)	The impact could have an effect that expands throughout the country (South Africa).	4
	International (IN)	Where the impact has international ramifications that extend beyond the boundaries of South Africa.	5

ASPECT	CATEGORY	DESCRIPTION	SCORE
DURATION	Duration pertains to the length of time that the environmental impact will be felt by the affected entities.		
	Short term (ST)	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.	1
	Short to Medium Term (SMT)	The impact will be relevant through to the end of a construction phase.	2
	Medium term (MT)	The impact will last up to the end of the development phases, where after it will be entirely negated.	3
	Long term (LT)	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.	4
	Permanent (P)	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.	5
PROBABILITY	This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.		
	Improbable (IM)	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).	1
	Possible (PO)	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.	2
	Likely (L)	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.	3
	Highly Likely (HL)	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.	4
	Definite (D)	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.	5
REVERSIBILITY	This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
	Completely Reversible (CR)	The impact can be completely reversed with the implementation of the correct mitigation and rehabilitation measures as stipulated in the Environmental Management Programme.	90-100%
	Partly reversible (PR)	The impact can be partly reversed providing that mitigation measures as stipulated in the Environmental Management	6-89%

ASPECT	CATEGORY	DESCRIPTION	SCORE
		Programme are implemented and rehabilitation measures are undertaken.	
	Irreversible (IR)	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place	0-5%
RESOURCE LOSS	This describes the degree to which environmental resources will be irreplaceably lost as a result of proposed activity		
	Resource will not be lost (RL)	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the Environmental Management Programme are implemented.	90-100%
	Resource may be partly destroyed (RPD)	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the Environmental Management Programme are implemented.	1-89%
	Resource cannot be replaced (RR)	The resource cannot be replaced no matter which management or mitigation measures are implemented.	0%
MITIGATIBLE	This refers to the degree to which impacts can be mitigated.		
	Completely Mitigatable (CM)	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the Environmental Management Programme are implemented	90-100%
	Partly mitigatable (PM)	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the Environmental Management Programme are implemented. Implementation of these measures will provide a measure of mitigatability.	1-89%
	Un-mitigatable (UN)	The impact cannot be mitigated no matter which management or mitigation measures are implemented.	0%

8.1.1 CUMULATIVE IMPACTS

According to DEAT 2002, cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time.

Table 8-3: Categories for Cumulative Impact

CATEGORY	DESCRIPTION
Marginal	Insignificant
Compounding	Increased impact

8.1.2 STATUS

Table 8-4: Categories for the Status of the Impact

CATEGORY	DESCRIPTION
Positive	Impacts have a positive socio-economic and environmental benefits.
Negative	There are negative socio-economic and environment impacts.

8.1.3 SIGNIFICANCE

The potential impacts are assigned a significance rating (S), based on the information in the tables above. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. (S) is formulated by adding the sum of numbers assigned to Extent (E), Duration (D), and Intensity (I) and multiplying the sum by the Probability.

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

Table 8-5: Significance Ratings of Impacts

CATEGORY	DESCRIPTION	SCORE
Zero Impact	No impact	0
Low	Mitigation of impacts is easily achieved where this impact would not have a direct influence on the decision to develop in the area.	<30
Medium	Mitigation of impact is both feasible and fairly easy. The impact could influence the decision to develop in the area unless it is effectively mitigated.	30-60
High	Significant impacts where there is difficult. The impact must have an influence on the decision process to develop in the area.	>60

8.2 DETERMINATION OF IMPACT SIGNIFICANCE

ISO 2001:2004 defines an impact as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspect whilst an environmental aspect is defined as an element of an organization's activities or products or services that can interact with the environment. The project related impacts have been identified as detailed in Section 8.1 and will be assessed as per the criteria specified in Section 8.1 and Table 8.1 to 8.4 above. The assessment of the identified impacts takes into account the specialists assessments and the EAP's professional experience with regards to the proposed development. The significance of the impacts are defined in consideration of legislation in the context of the environmental aspect and issues identified through public/stakeholder consultation. Section 8.2.1 to 8.2.7 therefore discusses impacts that are deemed to be of med-high significance whilst Section 8.2.7 summarizes all impacts anticipated during the project life cycle, including those deemed less significant. Of note is that there is little differentiation between the proposed alternatives assessed, as they traverse across similar environment. The table below therefore gives an assessment of the project area. It should also be noted that mitigations measures given in the tables below are not exhaustive as they are fully discussed in the EMPr attached in Appendix G.

8.2.1 BIODIVERSITY IMPACT ASSESSMENT

Table 8-6: Flora Assessment

Phase	Construction	
Impact	Destruction of pristine environment	
Description of Impact	Loss of habitat and biodiversity especially in nature and game reserves during vegetation clearance. Activity 27 and 30 of Listing 1, Activity 9 of Listing 2 and Activity 12(e) (ii)(iii) of Listing 3.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	F(1)
Duration	P (5)	P (5)
Intensity	LO-ME (4-6)	LO (4)
Probability	HL (4)	HL (4)
Significance	Medium-High (48-72)	Medium (40)

Reversibility	PR	
Resource Loss	RPD	
Mitigatable	PM	
Cumulative Impact	Compounding. Should Eskom intend to construct another power line parallel to the proposed, additional indigenous and protected trees will be cleared.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ A specialist should undertake a site walkthrough during the design of the power line and recommend site specific measures that should be implemented; ✓ Areas of high ecological sensitivity should be demarcated as 'no-go' areas; ✓ Existing roads should be used where possible; ✓ Limited plants need to be removed when clearing the servitude for the new power line; ✓ Exposed areas should be rehabilitated with a grass mix that blends in with surrounding vegetation . The grass mix should consist of indigenous grasses adapted to the local environmental conditions; and ✓ The power line should be designed to avoid fragmentation of the environmentally sensitive areas. 	
Phase		
Phase	Construction and Operation	
Impact	Destruction of threatened and protected flora species	
Description of Impact	<p>During the construction phase, the tower positions, substation extension development area and site camp are cleared of vegetation prior to assembly. Threatened and protected species can be found in the informal and formal reserves where vegetation clearance should be undertaken. Clearing of indigenous vegetation will result in impacts associated with Activity 27 and 30 of Listing 1, Activity 9 of Listing 2 and Activity 12(e) (ii)(iii) of Listing 3.</p> <p>During the operational phase, vegetation, especially taller tree species, are periodically removed directly below the line positions to avoid faults or damage inflicted on the line due to brush fires. Vegetation may also be routinely removed to maintain road servitudes, necessary for maintenance of the system.</p>	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	P (5)	P (5)
Intensity	LO(4)	MI(1)
Probability	HL (4)	L (3)
Significance	Medium (40)	Low (21)

Reversibility	CR
Resource Loss	RL
Mitigatable	CM
Cumulative Impact	Marginal. However if the maintenance is poor, the impact will have a compounding result on the environment.
Mitigation Measures	<ul style="list-style-type: none"> ✓ Eskom must according to the National Forest Act, apply for removal permits for all protected trees found within the servitude; ✓ A tree marking walk down must be carried out in order to quantify the type and quantity of protected trees within the line corridor. DAFF will also require that Eskom complete an offset for the trees cut; ✓ The ECO should be present in an advisory capacity during tree removal; ✓ Limited plants need to be removed when clearing the servitude for the new power line. Clear guidelines and proper plans must be given to the contractor and inspections should be cleared out daily during the clearing activities; ✓ Where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp, the vegetation occurring in the area to be disturbed must be salvaged and kept in a controlled environment such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation; ✓ Provide prior notice to land-owners about operation and maintenance work being carried out in their areas. ✓ Regular maintenance, inspections and removal of alien plants should be undertaken; ✓ Firewood is not to be removed from the line corridor; and ✓ Also refer to the EMPr.

Table 8-6: Introduction and Proliferation of Alien Vegetation

Phase	Construction and Operation	
Impact	Introduction and Proliferation of alien vegetation	
Description of Impact	A change in floristic species due to the clearing of vegetation for servitude clearing, line stringing and maintenance. This can result in the introduction of alien invasive species during the construction and operation phase.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	F(1)
Duration	LT (4)	ST (1)
Intensity	VH (10)	LO-ME (4-6)

Probability	D (5)	HL (4)
Significance	High (85)	Low-Medium (24-36)
Reversibility	CR	
Resource Loss	N/A	
Mitigatable	CM	
Cumulative Impact	Marginal. However, it can be compounding if no maintenance is done	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Alien vegetation should be removed from all sites on a regular basis; ✓ An alien vegetation monitoring and control plan should be compiled and implemented during the operational phase of the project. 	

Table 8-7: Destruction of Fauna Habitat

Phase	Construction and Operation	
Impact	Destruction of faunal habitats	
Description of Impact	The proposed power line alternatives traverse across nature reserves, i.e., Selati and Olifants North Game reserves and other Private Nature reserves. These reserves being continuous provide a good habitat for a variety of species within the project area. The construction of the power line will result in a permanent habitat loss, however it will be minor in a regional and national context.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S(2)	S(2)
Duration	P (5)	P (5)
Intensity	LO (4)	LO (4)
Probability	D (5)	HL (4)
Significance	Medium (55)	Medium (44)
Reversibility	PR	
Resource Loss	RPD	
Mitigatable	PM	
Cumulative Impact	Marginal. However it can be compounding should the mitigations not implemented and should another line be constructed.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Regular monitoring of the construction process, especially in identified sensitive habitats should be carried out by the ECO all through the construction phase; 	

	✓ Low trees, shrubs and ground vegetation should be left to grow back which will provide cover for most wildlife that need to move through the Right of Way.	
Phase	Construction	
Impact	Interaction of the construction crew and the fauna species	
Description of Impact	Increased access to faunal habitats during the construction phase may increase the incidence of poaching practices.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	F (1)
Duration	P (5)	P (5)
Intensity	ME-HI (6-8)	LO (4)
Probability	HL (4)	PO (2)
Significance	Medium(56)- High (64)	Low (20)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Compounding. If not controlled the cumulative impact will have a compounding effect on animal and bird populations in the area. This must be well managed by conservation authorities.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Eskom and the contractor should establish a "Zero Tolerance" approach to poaching; ✓ The contractor's EO should carry out regular awareness raising of existing laws, rules and penalties against poaching; ✓ Strict monitoring of construction and maintenance crew activities by the ECO; ✓ No workers stay on site and must be limited to the construction site as far as possible. 	
Phase	Construction	
Impact	Interruption of animal breeding	
Description of Impact	Interruption of animal breeding due to inappropriate timing of construction activities.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	S (2)
Duration	SMT (2)	SMT (2)

Intensity	ME (6)	LO (4)
Probability	HL (4)	IM (2)
Significance	Medium (40)	Low (16)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Compounding. If not controlled the cumulative impact will have a compounding effect on animal and bird populations in the area. This must be well managed by conservation authorities.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Construction activities must not coincide with mating; ✓ Activates must be carried out in appropriate months so as to avoid potential claims from landowners; and ✓ The ECO and contractor's EO should ensure that there is minimum interference with wildlife and domestic animals. 	

Table 8-8: Avi-fauna

Phase	Construction	
Impact	Temporary displacement of Red Data species	
Description of Impact	Temporary displacement of Red Data species may occur during the construction phase of the power line and extension of Spencer substation, and may be caused by the noise and movement associated with the construction activities.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	S (2)
Duration	SMT (2)	SMT (2)
Intensity	ME (6)	LO (4)
Probability	HL (4)	IM (2)
Significance	Medium (40)	Low (16)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Although each power line probably affects a relatively small proportion of the landscape, there are already several existing activities and infrastructure in some parts of the study area that has resulted in habitat transformation, and	

	additional infrastructure in the form of an additional power line will add further cumulative impact. It is important therefore to try to limit the effects of this new power line as much as possible, by applying the mitigations described above.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Construction activity should be restricted to the immediate footprint of the infrastructure. ✓ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species; ✓ Measures to control noise should be applied according to current best practice in the industry; ✓ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum; ✓ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned; ✓ The final powerline alignment must be inspected on foot by the avifaunal specialist prior to construction to ascertain if any Red Data species nests are present. All relevant detail must be recorded i.e. species, coordinates and nest status. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer; ✓ An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain when and where such breeding Red Data species could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active. 	
Phase	Operation	
Impact	Collision of birds with the earthwire	
Description of Impact	Red Data species mortality due to collisions with the earth-wire of the power line.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	R(3)
Duration	LT (4)	LT (4)
Intensity	LO (4)	MI (2)
Probability	HL (4)	L (3)

Significance	Medium (44)	Low (27)
Reversibility	PR	
Resource Loss	RPD	
Mitigatable	PM	
Cumulative Impact	The cumulative impacts of power lines on several Red Data species, through collision are significant nationally. Specific concern exists for vultures because, while they are more vulnerable to electrocutions than collisions, they are also vulnerable to collisions, especially in high risk areas such as in close proximity to vulture restaurants. With mitigation, this could be reduced to low. The cumulative impact, if properly mitigated, is therefore regarded to be low, and provided the proposed mitigation is implemented. The broader study area already has several existing power lines. No effort should be spared to ensure that the new power lines are built bird friendly and results in no additional impact on birds in the area.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ High risk sections of power line must be identified by a qualified avifaunal specialist during the walk-through phase of the project, once the alignment has been finalized; and ✓ Where power line marking is required (i.e. in areas that contain rivers, dams or is situated near a vulture restaurant) bird flight diverters must be installed on the full span length on each earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated so as to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung. 	
Phase		
Decommissioning		
Impact	Displacement of Red Data Species	
Description of Impact	Displacement of Red Data species may occur during the decommissioning phase of the power line and may be caused by the noise and movement associated with the dismantling activities.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	S (2)
Duration	SMT (2)	SMT (2)
Intensity	LO (4)	LO (4)
Probability	L (3)	IM (2)
Significance	Low (24)	Low (12)
Reversibility	CR	
Resource Loss	RL	

Mitigatable	CM
Cumulative Impact	Marginal
Mitigation Measures	<ul style="list-style-type: none"> ✓ Decommissioning activity should be restricted to the immediate footprint of the infrastructure. ✓ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ✓ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. ✓ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as rehabilitation of disturbed areas is concerned.

8.2.2 SOIL/LAND IMPACTS ASSESSMENT

Table 8-9: Loss of Agricultural Potential

Phase	Construction and Operation	
Impact	Loss of agricultural potential	
Description of Impact	<p>The area in close proximity to Groot Letaba River is characterized of farms where commercial farming is being undertaken with citrus farming being dominant. Though citrus trees can be planted underneath the power line and the direct loss of productivity may be low, there is a possibility that the presence of the power line would interfere with aerial insecticide spraying which would result in indirect citrus loss.</p> <p>In addition, there are farms where chickens houses are within the corridor. In general, buildings cannot be placed underneath the line, this would result in loss of infrastructure and can result in the decline in income generation. Should there be chicken houses within the servitude they would have to be relocated.</p> <p>No impacts on agricultural potential are anticipated as a result of the proposed extension of Spencer Substation as the area is not utilised for agricultural purposes.</p>	
Status	Negative	

	Without Mitigation	With Mitigation
Extent	S (2)	S (2)
Duration	P (5)	P (5)
Intensity	ME(6)	ME (6)
Probability	HL (4)	L (3)
Significance	Medium (52)	Medium (39)
Reversibility	PR	
Resource Loss	RPD	
Mitigatable	PM	
Cumulative Impact	Compounding. Should other power lines be introduced in the area, more land will be lost.	
Mitigation Measures	<p>Due to the short duration of construction and the small footprint of the towers, it is anticipated that there will be minimal residual impacts on land use. A very small area of land will be disturbed during construction for structure installation, i.e. tower foot print.</p> <p>In areas where cultivation is practised, the owners will be permitted to continue with the agricultural activities that do not interfere with the safe operation of the power lines. Possible avoidance of citrus farms and chicken houses can be addressed during the negotiations for the final line placement. The farmers in this area have recommended a route that will minimize the number of farms that will be affected. See Appendix F-4B.</p>	

Table 8-10: Soil Erosion

Phase	Construction and Operation	
Impact	Soil Erosion	
Description of Impact	Erosion and sedimentation are naturally occurring processes that are unnaturally accelerated by land development. Erosion is primarily influenced by four factors, i.e., climate, soil type, topography and vegetation. The risks of erosion is highest in areas with fine soils, on steep slopes, and areas undergoing active construction activities. Soils denuded of vegetation and the resultant increased imperviousness are two potential effects of development that contribute to greater peak flows, longer duration of high flows, and other factors that increase erosion. During construction of substation structures and towers, unstable soils, any form of vegetation clearing and excavations presents a risk of a negative impact.	
Status	Negative	

	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	SMT (2)	ST (1)
Intensity	LO(4)	MI (2)
Probability	HL (4)	HL (4)
Significance	Medium (36)	Low (16)
Reversibility		CR
Resource Loss		RL
Mitigatable		CM
Cumulative Impact	Compounding if another development takes place in the area then a cumulative impact on erosion will be experienced.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ The gravel access roads are particularly at risk during the wet weather due to heavy construction vehicles gaining access. In the event that they are damaged, they must be repaired by the contractor to the written satisfaction of the ECO and the landowner. <p>Spoil Sites</p> <ul style="list-style-type: none"> ✓ The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site used during the contract period. This shall include existing spoil sites that are being re-entered; ✓ Before spoil sites may be used, proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the Engineer for approval; ✓ A photographic record shall be kept of all spoil sites for monitoring purposes, and must include photographs of before the site is used, as well as after re-vegetation; ✓ The affected landowner must be consulted and must provide consent for the location of these spoils sites on his property; ✓ No spoil site shall be located within 500 m of any watercourse; <p>Stockpiles</p> <ul style="list-style-type: none"> ✓ Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level; ✓ Ensure that all topsoil is stored in such a way and in a place that it will not cause the damming up of water, erosion gullies, or wash away itself; ✓ Do not stockpile topsoil in heaps exceeding 2m in height; <p>Erosion and Sediment Control</p>	

	<ul style="list-style-type: none"> ✓ The following methods should be used for control; a) Sediment Fences <ul style="list-style-type: none"> ✓ These fences should be used where temporary sediment control is required. The fences will dissipate storm-water velocity collecting moving solids ; ✓ The temporary sediment fences will need to be positioned where erosion is most severe, i.e., near the non-perennial river; and ✓ Sediment fences will be placed downstream of stockpiles and disturbed areas. Prior to construction, the ECO and engineer will provide a map indicating these areas. b) Fencing <ul style="list-style-type: none"> ✓ Areas selected for protection will be fenced and protected throughout the duration of the construction period; ✓ Orange mesh fencing should be used to fence any other area susceptible to being disturbed during construction. c) Gabions and Reno mattress; d) Where there are gullies, gabions and reno mattresses should be used to prevent erosion. <p>Rehabilitation</p> <ul style="list-style-type: none"> ✓ On completion of construction, temporary structures such as sediment traps should be removed by removing all silt material from the base of the trap, removing the trap wall and filling the trap with compacted fill; ✓ The temporary structures shall only be removed following stabilization of disturbed areas not when top soiling or grassing; ✓ Maintenance of rehabilitated areas shall continue until vegetation is well established.
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8.2.3 HYDROLOGICAL IMPACTS

Table 8-11: Loss of Riparian Vegetation

Phase		Construction and Operation
Impact		Loss of Riparian Vegetation
Description of Impact		Surface water features are a very important component of the natural environment, as they are typically characterised by

	high levels of biodiversity and are critical for the sustaining of human livelihoods through the provision of water for drinking and other human uses. They are sensitive features of the natural environment and pollution or degradation of rivers/streams can result in a loss of biodiversity	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	SMT (2)	ST (1)
Intensity	ME(6)	MI (2)
Probability	HL (4)	L (3)
Significance	Medium (40)	Low (12)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Compounding if another development takes place in the area then a cumulative impact on erosion will be experienced.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Avoid driving on watercourses during construction of power line to prevent the potential for channel initiation. Where this is unavoidable crossing structures should be in place across affected wetlands and other watercourses along with a relevant Water Use License (WULA); ✓ No hard surface infrastructure , construction camps or quarries should be constructed within buffered watercourses, apart from unavoidable road crossings, which should be minimized and be approved by the relevant regulatory authorities; ✓ Watercourses affected by unavoidable construction activities should be re-sloped to a stable gradient (e.g. at least a slope of 1:3), revegetated with suitable indigenous plant species to help facilitate revegetation soon after construction. 	

Table 8-12: Sedimentation of rivers and streams

Phase	Pre-Construction, Construction and Operation	
Impact	Sedimentation of rivers and streams	
Description of Impact	The impact of excavation at tower sites is small such that it is not expected to cause large quantities of soil to be washed into the river or stream during the rainy season. In addition, tower sites are dispersed and spaced at least 350m away from each other and only a small amount of soil is generated per tower thus there will be no large stockpiles of soil that	

	could result in dredging of soil that could cause major point source of sedimentation. The dredging of soil in rivers is expected to be less than 5m ³ .	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	SMT (2)	ST (1)
Intensity	LO(4)	MI (2)
Probability	HL (4)	L (3)
Significance	Medium (36)	Low (16)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Compounding if another development takes place in the area then a cumulative impact on the sedimentation of water resources will be experienced.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Locate all tower at a safe distance of 32m from water sources so that excavation work does not cause large quantities of soil to be washed in streams; ✓ Construction and maintenance tracks and roads should also be located outside of buffered watercourses; ✓ All unavoidable overlap between infrastructure, such as access roads and towers in demarcated watercourses will require a Water Use License (WUL); ✓ Adequate storm water drainage system must be designed and maintained to adequately control the volume, speed, location of runoff, to avoid soil erosion and siltation of water courses; ✓ No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase; ✓ Re-profiling of the banks of disturbed wetland areas should be done; and ✓ Monitor all systems for erosion and incision. 	

Table 8-13: Decrease in Water Quality

Phase	Construction and Operation	
Impact	Decrease in water quality	
Description of Impact	Decrease in water quality as a result of re-fueling vehicles and machinery near water courses. The effect of this impact are bio-accumulation of toxic compounds in biota and oxygen depletion.	

Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	MT (3)	ST (1)
Intensity	LO(4)	MI (2)
Probability	L (3)	L (3)
Significance	Medium (27)	Low (12)
Reversibility	CR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	Compounding if another development takes place in the area then a cumulative impact on erosion will be experienced.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ No refueling of construction vehicles should occur within 32m of demarcated watercourses; ✓ Hydrocarbons should not be stored within 32m of buffered watercourses; ✓ A storm-water management plan should be developed so as to reduce the risk of water quality deterioration associated with storm-water release 	

8.2.4 HERITAGE RESOURCES

Table 8-14: Heritage

Phase	Construction and Operation	
Impact	Damage to graves	
Description of Impact	Damage to graves may occur during excavation at tower sites and during line stringing.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	F (1)	F (1)
Duration	LT (2)	ST (1)
Intensity	ME(6)	MI (2)
Probability	PO(2)	IM (1)
Significance	Medium (18)	Low(4)
Reversibility	IR	

Resource Loss	RR
Mitigatable	CM
Cumulative Impact	Compounding if another development takes place in the area then a cumulative impact on erosion will be experienced.
Mitigation Measures	<ul style="list-style-type: none"> ✓ Familiarise all staff and contractors with procedures for dealing with heritage objects/sites; ✓ Care should be taken to conserve exposed archaeological objects in gullies; ✓ Any graves shall be clearly marked and treated as no go areas. Marked and unmarked graves were observed at the following co-ordinates; <ul style="list-style-type: none"> 23.48158°S, 30.42467°E; 23.49391°S, 30.41997°E; and 23.60836°S, 30.49391°E ✓ No destruction of any site shall be allowed. Should it be necessary to remove any graves, the necessary procedures shall be followed and permits obtained; ✓ Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. The permit must be obtained from the SAHRA Burial Ground and Graves (BGG) Unit.) in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and Limpopo Provincial Heritage Regulations No. 103 of 2003; ✓ If the building is a designated historic structure, very close to such a structure, or located in a designated historic area, notification shall be made and approvals/permits be obtained from SAHRA and all construction activities planned and carried out in line with local and national legislation; ✓ It shall be ensured that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted and Eskom's, responsible officials contacted, and works activities delayed or modified to account for such finds; ✓ The Chance Palaeontological Finds procedure must be implemented by the ECOA heritage practitioner should complete a "walk down" of the final selected power line servitudes, the chosen deviation location and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible.

8.2.5 VISUAL IMPACTS

Table 8-15: Landscape Character

Phase	Construction	
Impact	Landscape Character	
Description of Impact	The sense of place of the area is largely intact. As a result, the sense of place of the area is commonly associated with natural resources, which has strong linkages to the tourism sector, and subsistence agriculture.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	L (2)
Duration	LT (4)	LT (4)
Intensity	ME (6)	ME (6)
Probability	LI (3)	PO (2)
Significance	Medium (39)	Low (24)
Reversibility	IR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	It is expected that the cumulative effect of the proposed activity would be indirect/secondary as the impact would be experienced over time. The cumulative effect would also be synergistic (e.g. incremental development resulting in a loss of character of the area). In areas where the powerline will run parallel to existing powerline, the cumulative impact is expected to be additive (e.g. the sum of all the effects).	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape. ✓ Keep disturbed areas to a minimum. ✓ No clearing of land to take place outside the demarcated footprints; and ✓ The contractor should maintain good housekeeping on site to avoid litter and minimise waste. 	

Table 8-16: Tourism Value

Phase	Construction	
Impact	Tourism value of the area	
Description of Impact	Specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed activity. Tourists are regarded as visual receptors of exceptional high sensitivity. Their attention is focused towards the landscape which they essentially utilise for enjoyment purposes and appreciation of the quality of the landscape.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	L (2)
Duration	LT (4)	LT (4)
Intensity	ME (6)	ME (6)
Probability	LI (3)	PO (2)
Significance	Medium (39)	Low (24)
Reversibility	IR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	It is expected that the cumulative effect of the proposed activity would be indirect/secondary as the impact would be experienced over time. The cumulative effect would also be synergistic (e.g. incremental development resulting in a loss of character of the area). In areas where the powerline will run parallel to existing powerline, the cumulative impact is expected to be additive (e.g. the sum of all the effects).	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape. ✓ Keep disturbed areas to a minimum. ✓ No clearing of land to take place outside the demarcated footprints; and ✓ The contractor should maintain good housekeeping on site to avoid litter and minimise waste. 	

Table 8-17: Reflectivity and Glare of Structures

Phase	Operation	
Impact	Reflectivity and glare of structures	
Description of Impact	The impact of glare source depends on the nature of the receptor, the size of the source relative to the visual field, the position of the source within the visual field and intensity of the source. Glare can pose, at minimum, a nuisance and in other cases can create a safety risk. Areas of particular sensitivity include roads, airports and rail as individuals are guiding vehicles and are required to visually scan their environment without averting their gaze.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	L (2)
Duration	LT (4)	LT (4)
Intensity	ME (6)	ME (6)
Probability	LI (3)	PO (2)
Significance	Medium (39)	Low (24)
Reversibility	IR	
Resource Loss	RL	
Mitigatable	CM	
Cumulative Impact	It is expected that the cumulative effect of the proposed activity would be direct as the effects would occur at the same time and in the same space as the activity. The cumulative effect would also be synergistic (the incremental addition of the substation to the area already improved with large powerlines).	
Mitigation Measures	<ul style="list-style-type: none"> ✓ The steel components should not be painted but be galvanised and allowed to oxidise naturally over time. The grey colour produced in this process will help to reduce the visual impact; and ✓ Those parts of the substation that require the protection of paint should be painted in colours chosen from a palette that is matched to the natural colours found in the surrounding landscape. 	

8.2.6 SOCIAL IMPACT

Table 8-18: Waged Labor

Phase	Construction	
Impact	Waged labor	
Description of Impact	This project will thus result in few local employment, and there will thus be limited short-term positive impacts to the communities. These will mostly be of low skill such as clearance of the servitude, stringing of transmission cables and excavation of foundations.	
Status	Positive	
	Without Mitigation	With Mitigation
Extent	R (3)	R (3)
Duration	ST (1)	ST (1)
Intensity	LO (4)	HI (8)
Probability	HP (4)	D (5)
Significance	Medium (36)	High (60)
Reversibility		
Resource Loss		
Mitigatable	CM	
Cumulative Impact	It is expected that the cumulative effect should there be more projects of the same nature as they would aide in decreasing unemployment.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Representatives from the various local municipalities could assist in determining local sub-contractors and labourers that should be considered for possible employment. ✓ The tender document should specify the use of local labourers or enterprises (where possible). It should be stipulated in the tender documentation that contractors use local labourers for manual and low skilled activities such as fencing and bush clearing. Where possible, on-site training should be undertaken to ensure long term benefits to the members of the community. 	

Table 8-19: Capacity and skills Development

Phase	Construction and Operation	
Impact	Capacity and skills development	
Description of Impact	It is predicted that the construction of the proposed project will lead to capacity building in the community, as this project may open opportunities for local residents through training, coaching and skills transfer. It is suggested that all employees be trained in the function of their job and that such training should also incorporate health, safety, security and environmental aspects.	
Status	Positive	
	Without Mitigation	With Mitigation
Extent	R (3)	R (3)
Duration	ST (1)	ST (1)
Intensity	LO (4)	ME (6)
Probability	P (2)	HL (4)
Significance	Low (16)	Medium (40)
Mitigatable	CM	
Cumulative Impact	Compounding	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used. 	

Table 8-20: Gendered Division of Labor

Phase	Pre-construction and Construction	
Impact	Gendered division of labor	
Description of Impact	South Africa has seen a strong push for gender equality in policy and decision making in both the public and private	

	sectors. In 2015, the JSE introduced listing requirements compelling companies to have a policy for the promotion of gender diversity. If this project is seen favouring men over women, such will create social conflict.	
Status	Positive	
	Without Mitigation	With Mitigation
Extent	R (3)	R (3)
Duration	ST (1)	LT (4)
Intensity	ME (6)	ME (6)
Probability	PO(2)	L (3)
Significance	Low (30)	Medium (39)
Mitigatable	PM	
Cumulative Impact	Compounding	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Eskom’s own internal policies and procedures should be used to ensure a fair and transparent recruitment process; ✓ Salaries of women should be equal to that of men when undertaking the same work; ✓ Training and skills development should take place for women; and ✓ Institute a well-designed gender equality strategy, if not available. 	

Table 8-21: Displacement and relocation of households

Phase	Construction and Operation	
Impact	Displacement and relocation of households	
Description of Impact	The displacement and relocation of households causes social and psychological disruption to those involved. The need for relocation implies a certain degree of responsibility on the side of the project proponent (Eskom) to ensure that the affected individuals and/or families do not endure the most of a project that will benefit others. This means that the affected individuals should enjoy the same standard of living that they have enjoyed before the project	
Status	Negative	
	Without Mitigation	With Mitigation

Extent	F (1)	F (1)
Duration	P (5)	P (4)
Intensity	HI (8)	ME (6)
Probability	D (5)	D (5)
Significance	High (70)	Medium (55)
Reversibility	IR	
Mitigatable	PM	
Cumulative Impact	Compounding	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Negotiations should be approached with the necessary cultural sensitivity; ✓ Sufficient compensation and assistance with the relocation process; ✓ A Land Acquisition Process and Compensation Assessment and Action Plan must be developed. 	

Table 8-22: Influx of workers

Phase	Construction and Operation	
Impact	Influx of workers	
Description of Impact	<p>The development will transverse mostly on rural area and farmland, as such, the influx of jobseekers is rated as moderate as some local jobseekers might be unsuccessful in securing job opportunities, which could result in conflict between locals and some outsiders looking for employment. If construction workers are not sourced locally, but housed in the hosts' communities, this may further lead to conflict with locals. Conversely the presence of temporary workers could provide a small stimulus to the local economy if accommodation for such workers could be procured locally, this would provide local economy through rentals paid. The influx may also increase anxiety in the area, especially in villages, as they may be seen as responsible for any criminal activities that take place during the construction phase.</p>	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	R (3)
Duration	ST (1)	ST (1)
Intensity	ME (6)	LO (4)
Probability	HL (4)	HL (4)

Significance	Medium (40)	Medium (32)
Reversibility	CR	
Mitigatable	PM	
Cumulative Impact	Marginal	
Mitigation Measures	✓ Employment should be made through local community structures. No jobs will be created during the operational phase of the project, and thus there will be no inflow of jobseekers.	

Table 8-23: Game and Nature Reserves

Phase	Construction	
Impact	Game and Nature Reserves	
Description of Impact	The proposed development will have a negative impacts on game farms, nature reserves and conservation areas. With the presence of construction teams and the movement of heavy vehicles, game will be negatively affected. During construction, game could be disturbed due to noise vehicle movement, it is possible that some game could even collide with fences when shocked by the above resulting in injury or death of the animals. Safety and security risks especially theft of game, birds and plant species, as well as the increased risk of veld fires are also a serious concern.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	R (3)	S (2)
Duration	ST (2)	ST (2)
Intensity	ME(6)	LO (4)
Probability	HL (4)	HL (4)
Significance	Medium (44)	Medium (32)
Reversibility	PR	
Mitigatable	PM	
Cumulative Impact	Compounding	
Mitigation Measures	The placement of a power line through the conservation areas or nature reserves is thus not preferable from a social perspective. However, if such is not possible and the line would traverse such areas, the following measures should be	

	<p>adhered to:</p> <ul style="list-style-type: none"> ✓ Construction activities should be done via helicopter where possible to avoid any damage to the sensitive vegetation, but should not be used in areas where sensitive game species could be disturbed by the noise; ✓ Contractors should be supervised at all times while working in these areas, utilization of bulldozers should be minimized, access routes should be minimized; ✓ Eskom should develop an emergency management plan to specifically deal with the increased risk of fires; and ✓ The contractor should submit a method statement for accessing private land and the conduct of these workers within the farms
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8.2.7 TOURISM IMPACT

Table 8-24: Land Use Change Impacts on Tourism

Phase	Construction and Operation	
Impact	Land Use Changes Impacts on Tourism	
Description of Impact	The power lines routes and the servitude cuts across natural undisturbed wildlife reserves where the scenic beauty plays tremendous role in attracting leisure tourists. These areas are undisturbed to a large extent, introducing power lines would be viewed as a change in land use or a change in natural character. This would therefore spoil the scenic value of these areas and potentially affect tourism activities. Conversely the proposed power lines are not perceived as a change in land use in already visually degraded areas like Gravelote, Phalaborwa and other parts of Mohlabaeng due to the presence of other linear structures such as roads, other power lines and buildings.	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	P (5)	P (5)
Intensity	LO(4)	MI(2)
Probability	HL (4)	HL (4)

Significance	Medium (44)	Medium (32)
Reversibility	IRR	
Mitigatable	PM	
Cumulative Impact	Compounding. The impact would result cumulative effects should additional electrical infrastructure be introduced.	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Eskom should try and avoid placing towers on areas of scenic natural beauty; ✓ Avoid placing the transmission line in close view of restaurants and accommodation facilities where the visual beauty of the area is the main attraction; ✓ Avoid placing the transmission line across properties used for eco-tourism and leisure. Should avoidance not be possible, the alignment should avoid the main activity areas and preferably be placed on the border of the properties; ✓ Avoid placing the transmission line across nature reserves at all costs. Thus, placement of a new transmission line away from numerous tourism establishments, could limit the negative impacts on the tourism industry rather than placing the new proposed transmission line in close proximity to these tourism establishments. This could be considered as an option in the central section of the study area. 	

Table 8-25: Change or alteration of hunting calendars

Phase	Construction and Operation	
Impact	Change or alteration of hunting calendars	
Description of Impact	The construction phase of the project may also disturb wildlife by altering their eating habits and feeding patterns. Feeding patterns are altered directly by the construction of utility towers on grazing/feeding lands, and indirectly by littering caused by construction workers on site, which encourages wildlife to scrounge for food	
Status	Negative	
	Without Mitigation	With Mitigation
Extent	S (2)	F (1)
Duration	ST-MT (2)	ST (1)
Intensity	LO(4)	LO(4)
Probability	HL (4)	HL (4)

Significance	Medium (32)	Low (24)
Reversibility	CR	
Mitigatable	CM	
Cumulative Impact	Marginal	
Mitigation Measures	<ul style="list-style-type: none"> ✓ Eskom should ensure that construction does not contradict with the hunting season. There should also be communication between Eskom and game reserves owners in relation to working hours during construction phase so as to avoid disturbing animal feeding times, and curb poaching concerns raised during public participation meetings. 	

8.2.7 IMPACT SUMMARY

The table below shows the summary of the impacts assessed and the impacts that were deemed to be of low significance such as noise and air with mitigation measures.

Table 8-26: Impact Summary and Significance Ratings

ISSUE/IMPACT	Extent	Duration	Intensity	Probability	Significance	Status
Destruction of Pristine Environment	F	P	LO	HL	M	-
Destruction of threatened and protected flora species	F	P	MI	L	L	-
Introduction and proliferation of alien species	F	ST	LO-ME	HL	L-M	-
Destruction of fauna habitat	S	P	LO	HL	M	-
Interaction of the construction crew and fauna species	F	P	LO	PO	L	-
Interruption of animal breeding	S	SMT	LO	IM	L	-
Temporary displacement of Red Data Species	S	SMT	LO	IM	L	-
Collision risk of birds	R	LT	MI	L	L	-
Displacement of red data species (decommissioning)	S	SMT	LO	IM	L	-
Loss of agricultural potential	S	P	ME	L	M	-
Soil erosion	F	ST	MI	HL	L	--
Loss of riparian vegetation	F	ST	MI	L	L	-
Sedimentation of rivers and streams	F	ST	MI	L	L	-
Decrease in Water Quality	F	ST	MI	L	L	-
Heritage	F	ST	MI	IM	L	-
Landscape character	L	LT	ME	PO	L	-
Tourism Value of the area	L	LT	ME	PO	L	-
Reflectivity and glare of structures	L	LT	ME	PO	L	-
Waged Labor	R	ST	HI	D	H	+
Capacity and skills development	R	ST	ME	HL	M	+
Gendered division of Labor	R	LT	ME	L	M	+
Displacement and relocation of households	F	P	ME	D	M	-
Land use change impact on tourism	F	P	MI	HL	M	-
Change/alteration in hunting season	F	ST	LO	HL	M	-
Waste generation	F	ST	MI	D	L	-
Noise	F	ST	MI	D	L	-
Air quality	F	ST	MI	D	L	-
Infrastructure Framework- Roads	F	ST	MI	D	L	-

9. CONCLUSION

9.1 ENVIRONMENTAL IMPACT STATEMENT

The “feasibility” and “reasonability” of an alternative was measured against the general purpose, requirements and need of the activity and how it impacts on the environment and on the community that may be affected by the activity. It was therefore vital that the identification, investigation and assessment of alternatives address the issues/impacts of the proposed development. To strengthen the Limpopo East Corridor, Eskom intends to construct a 400kV power line and extent Spencer substation. A Scoping and EIA was therefore undertaken as per the EIA Regulations R982 as amended. The preliminary investigations and consultations undertaken indicated that there are informal and formal nature game reserves in the pristine environment in some sections of the power line corridors, commercial agricultural activities and settlements in the areas near Spencer substation. As such avifauna, Biodiversity, Heritage, Palaeontology, Social, Soil and Land Capability, Tourism, Visual, and Wetland Delineation specialist studies were undertaken at the EIA Phase to fully assess the potential impacts identified at the scoping phase and to recommend the best alternative and mitigation measures. Based on the outcome of this assessment, the EAP has to recommend to the Department of Environmental Affairs whether the project should be approved and the conditions and/ stipulations of such approval. The recommendations are based on:

- The information provided by the applicant with regards to the project activities;
- Legislative requirements;
- Assumptions and limitations during the assessment;
- The specialists input;
- Geographic Information Systems;
- The public input, i.e., stakeholders and Interested and affected parties; and
- The EAP’s past experience.

In summary, the key findings identified in this assessment are detailed below:

The project area is within Mopani District Municipality traversing 4 Local Municipalities which are characterized by pristine areas which are rich in biodiversity of both flora and fauna species, and severely modified vegetation in the vicinity of Spencer substation. The proposed power line alternative corridors fall within the Kruger to Canyons Biosphere Reserve with landscapes of high scenic and conservation value. The first section of the power line south of Groot Letaba River is also within 10km

of the Kruger National Park and is characterised by informal and formal nature reserves. The natural vegetation in this area is in a fair to good condition with a moderately high to high ecological integrity with both corridors and deviation 1b traversing across Critical Biodiversity Areas. Ecologically, the area north of Groot Letaba River is severely modified for both corridors and substation area with a low ecological integrity. It should be noted that Corridor 1 traverses farm Begin 765LT and Volstruis 753LT which are currently used by the National Defense Forces for training purposes. Corridor 2 traverses across landing strips at farms Archie 156KT and Lillie 148KT and it also has a larger area characterized of agriculturally productive land.

The area is also endowed with drainage lines, ephemeral and perennial streams/rivers such as Groot Letaba, Olifants and Ga-Selati which are also modified with a low ecological significance. The results of the Visual Impact Assessment for the proposed Limpopo East Corridor Strengthening Project consequently found that the overall visual impact of the route alternatives is summarised as being of a **medium to high** negative significance in the vicinity of sensitive receptors and a **low negative** significance in the vicinity of less sensitive receptors. The sense of place, and most other expected impacts of the proposed activity, will not alter to such an extent where users might experience the visual landscape in a less appealing or less positive light. From an avi-fauna perspective, collision of birds and habitat transformation poses a moderate risk which can be reduced to low with mitigation measures whilst the eco-tourism assessment indicated that the proposed project poses a **medium to high negative** significance. Avi-fauna and wetland assessment preferred Corridor 2 whilst the soil and land capability preferred a combination of corridor 1,2 and 1b. All the other specialists studies indicated that all routes were viable.

Cognizance is taken that generally the project area is pristine, rich in biodiversity and has a booming eco-tourism industry. However there is also a need to strengthen the Limpopo East Corridor thereby indirectly boosting the regional economy. Most of the specialists undertaken have concluded that all the corridors assessed are viable however all the mitigations measures should be effectively implemented. The corridor recommended should be technically viable and should result in minimal residual negative impacts. Taking into account all stakeholder concerns, the specialists' recommendations and my professional experience on related projects, I as an EAP recommend that a combination of Corridor 1, 2 and deviation 1b be authorized where the power line will follow Corridor 1 from Foskor substation until the north eastern border of Selati Game reserve where it will deviate following Corridor 1b to Corridor 2 to Spencer Substation. This route:

- i. avoids a highly visually sensitive area next to R526, which traverses within the backdrop of Selati Game Reserve

- ii. Avoids the farms Begin 765LT and Volstruis 753LT used by the National Defense Forces for training. Military installations and training grounds where live ammunition is used poses a significant risk to power lines and security of supply of the Eskom network. In addition, acquiring this land from the Department of Defense and replacing it with another piece of land poses many challenges since this land has historically been used for this purpose and the neighbors are aware;
- iii. Avoids tourism related infrastructure such as the landing strips on farm Archie 156KT and Lillie 148KT;
- iv. Will traverse in close proximity to the boundaries of Selati Game Reserve thereby minimizing habitat fragmentation; and
- v. At deviation 1b, the corridor runs parallel an existing 132kV power line and towards Spencer Substation the route runs parallel to the existing power line infrastructure where the sense of place has already been modified.

It is further recommended that where there are fences and existing power lines, Eskom should follow these infrastructure to minimize further environmental modification. In addition, the graves observed in Corridor 2, the vulture restaurant in deviation 1b should be marked as 'no-go' areas. The extension of the substation is also recommended as it is within a modified environment and the substation is already existing. Due to the high risk associated with the section of the corridor south of Groot Letaba River, the following recommendations should be effectively implemented and failure to comply by both Eskom and the contractor should be penalised:

- ❑ The stipulations and provisions of the attached Environmental Management Programme on Appendix G be conveyed to and familiarized by the contractor and workers responsible for construction;
- ❑ The final powerline alignment must be inspected on foot by the avifaunal, biodiversity and heritage specialists prior to construction to ascertain if any Red Data species, avi-faunal nests, protected tree species and archaeological objects are present;
- ❑ Permits required by Eskom SOC Ltd from other competent authorities should be acquired before the commencement of the activity;
- ❑ An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with conditions of approval;
- ❑ Demarcate sensitive areas and no-go areas with danger tape to prevent disturbance during construction;

- ❑ Construction activity should be restricted to the immediate footprint of the infrastructure;
- ❑ The river, stream and associated buffers must be treated as sensitive environment areas: caution must be exercised near the watercourses;
- ❑ Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm-water discharge point(s);
- ❑ Only clear larger vegetation that will impact directly to the conductors. No total clearing of the basal layer" must be allowed in the Critical Biodiversity Areas;
- ❑ Plan construction times in such a manner to have the least impact on surrounding properties;
- ❑ Monitor land surface in the vicinity of the substation, access roads and pylons/towers to prevent loss of vegetation;
- ❑ Create a channel for runoff to avoid numerous runoff channels that erode the soil;
- ❑ Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity
- ❑ Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the power line and take immediate corrective action where invasive species are observed to establish;
- ❑ All towers must be placed at least 32m from any drainage line and streams;
- ❑ It must also be noted that, smaller towers or those with a more compact design (e.g. cross-rope suspension towers) should be used. By keeping the proposed lines as straight as possible, fewer strain towers will be required. This is preferable as strain towers are visually obtrusive compared to the suspension towers used when alignments are straight. The galvanising of the pylon should be allowed to weather a matt grey finish rather than be painted silver, as is often the case. This allows the structures to blend in with the existing environmental colours more readily than the silver that is highly reflective especially early morning and late afternoon. Should it be necessary to paint, it is recommended that a neutral matt finish be used; and
- ❑ In order to ensure that health impacts are minimised, structures are not permitted to be constructed underneath the conductors of a Transmission line (i.e. within the servitude). In addition, this fulfils safety requirements, ensuring that no person is able to have physical contact with a line conductor.

9.2 ENVIRONMENTAL MANAGEMENT PROGRAMME

An Environmental Management Programme (EMPr) is a plan that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled and monitored. An EMPr was compiled as per Appendix 4 of the EIA Regulations

Government Notice R982 as amended and it discusses the impacts that are expected during the construction phase, operational phase and the mitigation measures that have been recommended to minimize the impacts. Integrated Environmental Management (IEM) principles influenced the development of these measures, which are aimed at achieving broadly acceptable standards at minimum costs. These measures, procedures and monitoring guidelines are designed to ensure that the impacts anticipated as a result of the proposed development are limited to the acceptable significance predicted in this study. The EMPr is attached in Appendix G.

9.3 CONCLUSION

In addition to the negative impacts, the project will also have positive impacts such as adequate electricity supply, employment during the construction phase and will encourage the growth and emergence of small businesses. The implementation of the mitigation measures outlined in the EMPr (**attached as Appendix G**), will lessen the significance of the identified negative impacts. The EAP therefore recommends that a combination of **Corridor 1, 2 and deviation 1b** 400kV power line be approved. The co-ordinates for the recommended corridor are as follows:

Start: 24°01'40.05" S, 31°07'37.41" E
Mid-point: 23°56'21.25" S, 30°39'54.11" E
End: 23°29'19.37" S, 30°22'51.58" E

Reference is made to Figure 9-1 below for the recommended corridor. In addition Table 9-1 also lists the affected farms.

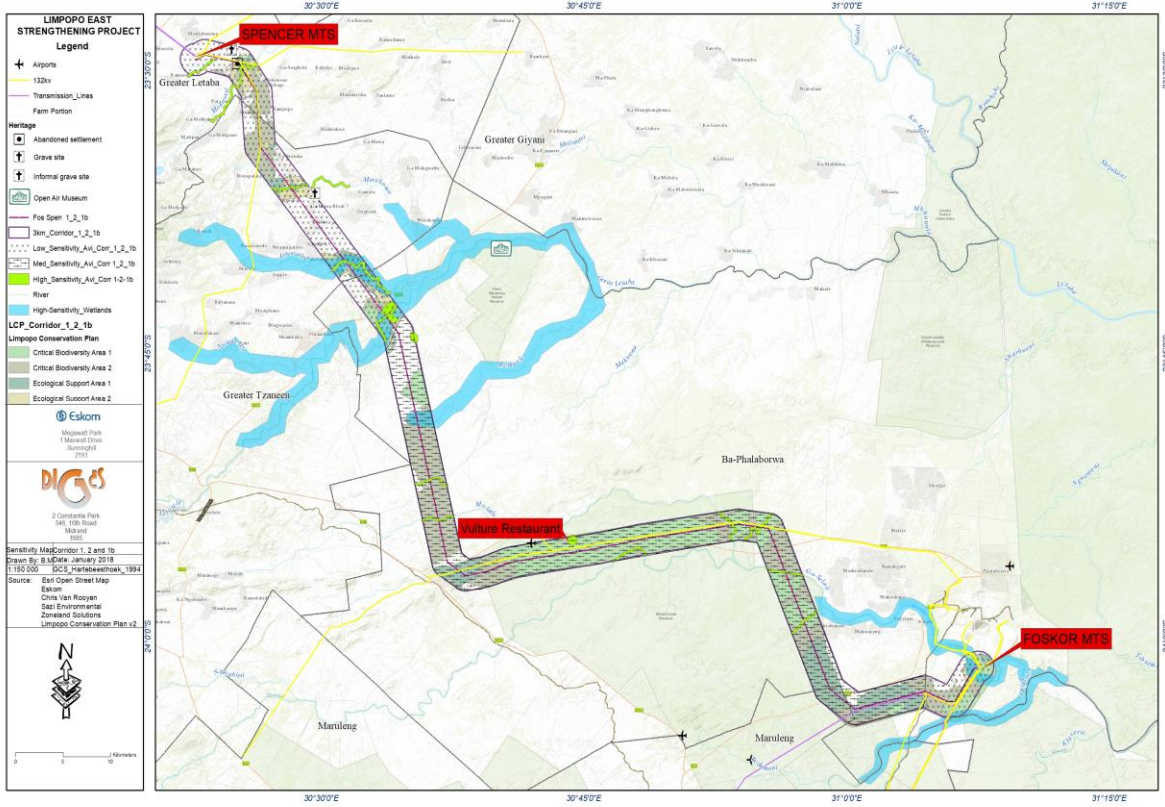


Figure 9-1: Recommended Site

Table 9-1: Affected Farms

FARM NAME	PTN	SG 21 DIGITS		OWNER
Morelag 5KU	0	T0KU00000000000500000	Agricultural	Ba-Phalaborwa Ba Maseke CPA
Morelag 5KU	1/3	T0KU00000000000500001 T0KU00000000000500003	Agricultural Game Farm	Banakome CPA
Morelag 5KU	2	T0KU00000000000500002	Mining	Freddies Prop PTB Pty Ltd
Grietjie 6KU	107	T0KU00000000000600107	Private Nature Reserve	Burger, Pieter Andries
Grietjie 6KU	106	T0KU00000000000600106	Private Nature Reserve	Plast 1 Pty Ltd
Grietjie 6KU	105	T0KU00000000000600105	Private Nature Reserve	Brown, Trevor Anthony
Grietjie 6KU	104	T0KU00000000000600104	Private Nature Reserve	Lotter, Anita
Grietjie 6KU	118	T0KU00000000000600118	Private Nature Reserve	Olifants River Estate
Grietjie 6KU	96	T0KU00000000000600096	Private Nature Reserve	Arends, Richard
Grietjie 6KU	97	T0KU00000000000600097	Private Nature Reserve	Austin, Henry Struben
Grietjie 6KU	98	T0KU00000000000600098	Private Nature Reserve	Nieprins cc
Grietjie 6KU	95	T0KU00000000000600095	Private Nature Reserve	Mount Shilo Safari cc
Grietjie 6KU	94	T0KU00000000000600094	Private Nature Reserve	Mount Shilo Safari cc
Grietjie 6KU	93	T0KU00000000000600093	Private Nature Reserve	Kruger, Johannes Hendrik Trustees
Grietjie 6KU	81	T0KU00000000000600081	Private Nature Reserve	De Swardt, Guillaume
Grietjie 6KU	82	T0KU00000000000600082	Private Nature Reserve	Vroegop cc (Mupaya Lodge)
Paul 7KU	Rem	T0KU000000000007000001	Mining	National Government
Paul 7KU	1	T0KU00000000000700001	Public Service Infrastructure	Transnet Ltd
Doreen 8KU	Rem	T0KU000000000008000001	Mining	National Government
Doreen 8KU	1	T0KU00000000000800001	Public Service Infrastructure	Transnet Ltd
Doreen 8KU	2	T0KU00000000000800002	Public Service Infrastructure	Transnet Ltd

FARM NAME	PTN	SG 21 DIGITS		OWNER
Doreen 8KU	3	T0KU00000000000800003	Public Service Infrastructure	Transnet Ltd
Rhoda 9KU	0	T0KU00000000000900000	Mining	National Government
Sheila 10LU	Rem	T0LU00000000001000001	Mining	National Government
Sheila 10LU	1	T0LU00000000001000001	Public Service Infrastructure	Eskom Holdings Ltd
Wegsteek 30LU	Rem	T0LU00000000003000001	Mining	National Government
Loole 31LU	0	T0LU00000000003100000	Mining	National Government
Punt 151KT	2/3/6/7/8	T0KT00000000015100002 T0KT00000000015100003 T0KT00000000015100007 T0KT00000000015100008	Agricultural Game Farm	Mashishimale CPA
Try 153KT (now Amsterdam)	0	T0KU00000000015300000	Communal	National Government (Ba-Phalaborwa Ba Maseke CPA)
Try 153KT (now Amsterdam)	1	T0KU00000000015300001	Game Farm	Jedven Plaas Cc
Worcester 200LT	0	T0LT00000000020000000	Communal Land	Modjadji Traditional Authority
Northampton 201LT	0	T0LT00000000020100000	Communal Land	Modjadji Traditional Authority
Kromriviersfontein 360LT	0	T0LT00000000036000000	Communal	Modjadji Traditional Authority
Senobela 362LT	0	T0LT00000000036200000	Communal	Modjadji Traditional Authority
Makuba 425LT	0	T0LT00000000042500000	Communal	Modjadji Traditional Authority
Sirulurul 427LT	1/2	T0LT00000000042700001 T0LT00000000042700002	Communal	Modjadji Traditional Authority
Radoo 682LT	0	T0LT00000000068200000	Communal	Nyavana Traditional Authority
La Parisa 729 LT	Rem	T0KU00000000072900001	Agricultural	Gubitz Boerdery Pty Ltd
La Parisa 729LT	1	T0KU00000000072900001	Agricultural	Lompies Kwekerye Pty Ltd
Gunyula 730LT	Rem	T0LT00000000073000001	Agricultural	Grobler, Nicolaas
Gunyula 730LT	4	T0LT00000000073000004	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	13	T0LT00000000073000013	Agricultural	Lallu Farming Enterprises cc
Gunyula 730LT	16	T0LT00000000073000016	Agricultural	Malle Mathoka Albert Mohalea
Gunyula 730LT	17	T0LT00000000073000017	Agricultural	Big Rock Construction

FARM NAME	PTN	SG 21 DIGITS		OWNER
				74 cc
Gunyula 730LT	18	TOLT00000000073000018	Agricultural	GK2N Projects Trust
Gunyula 730LT	19	TOLT00000000073000019	Agricultural	Last, Andre
Gunyula 730LT	20	TOLT00000000073000020	Agricultural	Last, Andre
Gunyula 730LT	21	TOLT00000000073000021	Agricultural	Last, Andre
Gunyula 730LT	22	TOLT00000000073000022	Agricultural	Last, Andre
Gunyula 730LT	23	TOLT00000000073000023	Agricultural	Last, Andre
Gunyula 730LT	24	TOLT00000000073000024	Agricultural	Last, Andre
Gunyula 730LT	26	TOLT00000000073000026	Agricultural	Mkhavele, Vukosi Autis
Gunyula 730LT	27	TOLT00000000073000027	Agricultural	Rikhotso, Jabulani Herold
Gunyula 730LT	28	TOLT00000000073000028	Agricultural	Rikhotso, Jabulani Herold
Gunyula 730LT	29	TOLT00000000073000029	Agricultural	Alfred Mashau
Gunyula 730LT	30	TOLT00000000073000030	Agricultural	Alfred Mashau
Gunyula 730LT	31	TOLT00000000073000031	Agricultural	Mashaba, John
Gunyula 730LT	32	TOLT00000000073000032	Agricultural	Wright, Candice Rochelle
Gunyula 730LT	33	TOLT00000000073000033	Agricultural	Mbuyane Frank Jesaya
Gunyula 730LT	34	TOLT00000000073000034	Agricultural	Williams, James Ronald
Gunyula 730LT	35	TOLT00000000073000035	Agricultural	Nxumalo, Mackekwa Edwell
Gunyula 730LT	36	TOLT00000000073000036	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	37	TOLT00000000073000037	Agricultural	Manabe, Nkateko Loraine
Gunyula 730LT	38	TOLT00000000073000038	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	39	TOLT00000000073000039	Agricultural	Mashao, Malesela Alfred
Gunyula 730LT	40	TOLT00000000073000040	Agricultural	Mkhvele, Vukosi Autis
Gunyula 730LT	41	TOLT00000000073000041	Agricultural	Fasen, Coenraad Hendrik
Gunyula 730LT	42	TOLT00000000073000042	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	43	TOLT00000000073000043	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	44	TOLT00000000073000044	Agricultural	Smith, Coenraad Jacobus
Gunyula 730LT	45	TOLT00000000073000045	Agricultural	Tshehla, Edwin Thapedi
Gunyula 730LT	46	TOLT00000000073000046	Agricultural	Jooste, Charlotte Catharina
Gunyula 730LT	47	TOLT00000000073000047	Agricultural	Bill, Godfrey Morgan

FARM NAME	PTN	SG 21 DIGITS		OWNER
Gunyula 730LT	48	TOLT00000000073000048	Agricultural	Potgieter, Stephanus Johannes
Gunyula 730LT	49	TOLT00000000073000049	Agricultural	Mbiza, Tinyiko Nicolas
Gunyula 730LT	50	TOLT00000000073000050	Agricultural	Smith, Coenraad Jacobus
Gunyula 730LT	51	TOLT00000000073000051	Agricultural	Phosa, Sanny
Gunyula 730LT	52	TOLT00000000073000052	Agricultural	Phosa, Sanny
Gunyula 730LT	53	TOLT00000000073000053	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	56	TOLT00000000073000056	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	57	TOLT00000000073000057	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	58	TOLT00000000073000058	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	59	TOLT00000000073000059	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	60	TOLT00000000073000060	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	61	TOLT00000000073000061	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	62	TOLT00000000073000062	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	63	TOLT00000000073000063	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	66	TOLT00000000073000066	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	67	TOLT00000000073000067	Agricultural	Erasmus, Carel Petrus Johannes
Gunyula 730LT	68	TOLT00000000073000068	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	69	TOLT00000000073000069	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	70	TOLT00000000073000070	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	71	TOLT00000000073000071	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	72	TOLT00000000073000072	Agricultural	Risaba, Ernest Mkansi
Gunyula 730LT	73	TOLT00000000073000073	Agricultural	Wolvaardt, Jurie Francois
Henley 734LT	2	TOLT00000000073400002	Agricultural	Kidson, Dina Johanna
Henley 734LT	5	TOLT00000000073400005	Agricultural	Labuschagne, Pieter Willem
Henley 734LT	7	TOLT00000000073400007	Agricultural	Last, Andre
Henley 734LT	8	TOLT00000000073400008	Agricultural	David Maswanganyi Family Trust
Henley 734LT	9	TOLT00000000073400009	Agricultural	David Maswanganyi Family Trust
Henley 734LT	10	TOLT00000000073400010	Agricultural	Alida & Basie Jacobs Family Trust
Henley 734LT	11	TOLT00000000073400011	Agricultural	Ntimbane, Gaza Edney

FARM NAME	PTN	SG 21 DIGITS		OWNER
Henley 734LT	12	TOLT00000000073400012	Agricultural	Mathebula, Mishell
Henley 734LT	13	TOLT00000000073400013	Agricultural	National Government
Henley 734LT	14	TOLT00000000073400014	Agricultural	National Government
Henley 734LT	15	TOLT00000000073400015	Agricultural	Dos Santos, Antonio Sardinha
Henley 734LT	16	TOLT00000000073400016	Agricultural	Zeni, Robert
Henley 734LT	17	TOLT00000000073400017	Agricultural	Zeni, Robert
Henley 734LT	18	TOLT00000000073400018	Agricultural	Heydenrych, Alida Cornelia
Henley 734LT	19	TOLT00000000073400019	Agricultural	Alcro Trust
Henley 734LT	20	TOLT00000000073400020	Agricultural	Alcro Trust
Henley 734LT	21	TOLT00000000073400021	Agricultural	Alcro Trust
Henley 734LT	22	TOLT00000000073400022	Agricultural	Jacques Burger Family Trust
Henley 734LT	23	TOLT00000000073400023	Agricultural	Jacques Burger Family Trust
Henley 734LT	24	TOLT00000000073400024	Agricultural	Jacques Burger Family Trust
Henley 734LT	25	TOLT00000000073400025	Agricultural	Jacques Burger Family Trust
Henley 734LT	26	TOLT00000000073400026	Agricultural	Labuschagne, Saskia Jean
Henley 734LT	27	TOLT00000000073400027	Agricultural	Jacques Burger Family Trust
Henley 734LT	28	TOLT00000000073400028	Agricultural	Jacques Burger
Henley 734LT	30	TOLT00000000073400030	Agricultural	Strathearn Mervyn Gerrity Dubaj
Henley 734LT	34	TOLT00000000073400034	Agricultural	Van Heerden Family Trust
Henley 734LT	35	TOLT00000000073400035	Agricultural	Botha, Antonie Johannes Carolus
Matuma 735LT	0/4/5/8/9/ 11	TOLT0000000007350000 TOLT0000000007350004 TOLT0000000007350005 TOLT0000000007350008 TOLT0000000007350009 TOLT0000000007350011	Agricultural	Xcelsior Letsitele Prop Pty Ltd
Matuma 735LT	1/2/6/10	TOLT0000000007350001 TOLT0000000007350002 TOLT0000000007350006 TOLT0000000007350010	Agricultural	Matuma Citrus Eiendomme Pty Ltd
Matuma 735LT	3/7	TOLT0000000007350003 TOLT0000000007350007	Agricultural	Dreanco Pty Ltd

FARM NAME	PTN	SG 21 DIGITS		OWNER
Matuma 735LT	12	TOLT00000000073500012	Agricultural	Merite Pakkers Pty Ltd
La Cotte 736LT	Rem	TOLT00000000073600000	Agricultural	Xcelsior Letsitele Prop Pty Ltd
La Cotte 736LT	1	TOLT00000000073600001	Agricultural	Nouvelle-Lacott Pty Ltd
La Cotte 736LT	2	TOLT00000000073600002	Agricultural	R Pretorius & Kinders Pty Ltd
La Cotte 736LT	3	TOLT00000000073600003	Agricultural	R Pretorius & Kinders Pty Ltd
La Cotte 736LT	4	TOLT00000000073600004	Agricultural	R Pretorius & Kinders Pty Ltd
La Cotte 736LT	5	TOLT00000000073600005	Agricultural	CLB La Cotte Trust
Josephine 749LT	1	TOLT00000000074900001	Agricultural Game Farm	Piet Warren Plase Pty Ltd
Chester 754LT	2	TOLT00000000075400002	Agricultural Game Farm	Balepye CPA
Eden 757LT	Rem/1/2	TOLT00000000075700001 TOLT00000000075700001 TOLT00000000075700002	Agricultural Game Farm	Balapye CPA
Quagga 759LT	Rem/2	TOLT00000000075900001 TOLT00000000075900002	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
Solomons Mine 762LT	Rem/3/4	TOLT00000000076200000 TOLT00000000076200003 TOLT00000000076200004	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
The Beacon 769LT	0	TOLT00000000076900000	Agricultural Game Farm	Balapye CPA
Ziek 771LT	1	TOLT00000000077100001	Communal	National Government
Brook 772LT	Rem/1	TOLT00000000077200001 TOLT00000000077200001	Agricultural Game Farm	Mashishimale Traditional Council
Breakfast 773LT	Rem	TOLT00000000077300001	Communal Land	Mashishimale CPA
Breakfast 773LT	1	TOLT00000000077300001	Agricultural Game Farm	Majeje Traditional Authority
Landraad 774LT	Rem	TOLT00000000077400001	Agricultural Game Farm	Majeje Traditional Authority
Landraad 774LT	1	TOLT00000000077400001	Agricultural Game Farm	Mashishimale CPA
Vorster 775LT	1	TOLT00000000077500001	Game Reserve	Selaturus Pty Ltd
Vorster 775LT	2	TOLT00000000077500002	Servitude	Telkom
Vorster 775LT	3	TOLT00000000077500003	Game Reserve	Gedeelte 3 van die plaas Voster Pty Ltd
B.V.B Ranch 776LT	7	TOLT00000000077600007	Agricultural Game Farm	Ryk Nagel Selati Familie Trust
B.V.B Ranch 776LT	9	TOLT00000000077600009	Agricultural Game Ranch	Joubert Phillip Joseph

FARM NAME	PTN	SG 21 DIGITS		OWNER
B.V.B Ranch 776LT	10	TOLT00000000077600010	Agricultural Game Ranch	Joubert Phillip Joseph
B.V.B Ranch 776LT	12	TOLT00000000077600012	Agricultural Game Ranch	Lepelle Industrial & Mining Supplies cc
B.V.B Ranch 776LT	Rem/13	TOLT000000000776000131	Agricultural Game Ranch	J & L Fourie Trust
B.V.B Ranch 776LT	18	TOLT00000000077600018	Agricultural Game Ranch	J & L Fourie Trust
B.V.B Ranch 776LT	19	TOLT00000000077600019	Agricultural Game Ranch	J & L Fourie Trust
B.V.B Ranch 776LT	20	TOLT00000000077600020	Agricultural Game Ranch	Bezuidenhout Frederik Johannes
B.V.B Ranch 776LT	21	TOLT00000000077600021	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	22	TOLT00000000077600022	Agricultural Game Ranch	Noord Transvaalse Akediemiese Trust
B.V.B Ranch 776LT	23	TOLT00000000077600023	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	24	TOLT00000000077600024	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	25	TOLT00000000077600025	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	26	TOLT00000000077600026	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	27	TOLT00000000077600027	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	28	TOLT00000000077600028	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	29	TOLT00000000077600029	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	30	TOLT00000000077600030	Agricultural Game Ranch	Antenna Eiendomme Pty Ltd
B.V.B Ranch 776LT	31	TOLT00000000077600031	Agricultural Game Ranch	Antenna eiendomme pty ltd
B.V.B Ranch 776LT	32	TOLT00000000077600032	Agricultural Game Ranch	Bezuidenhout phillipus lourens
Claimland 780LT	Rem/1	TOLT00000000078000001 TOLT00000000078000001	Agricultural	PP Mare Boerdery Pty Ltd
Claimland 780LT	2	TOLT00000000078000002	Mining	National Government
Farrell 781LT	1	TOLT00000000078100001	Mining	Northern District Council
Farrell 781LT	Rem/5	TOLT000000000781000051	Gravelotte Town	Northern District Council

FARM NAME	PTN	SG 21 DIGITS		OWNER
Farrell 781LT	6	TOLT00000000078100006	Agricultural Game Farm	Piet Warren Plase
Farrell 781LT	7	TOLT00000000078100007	Mining	Modjadji Manufacturing Pty Ltd
Farrell 781LT	8	TOLT00000000078100008	Agricultural Game Farm	PP Mare Boerdery Pty Ltd
Farrell 781LT	9	TOLT00000000078100009	Agricultural Game Farm	Provincial Government of Limpopo
Farrell 781LT	10	TOLT00000000078100010	Agricultural Game Farm	Northern District Council
Mon Desir 782LT	Rem/1	TOLT00000000078200001 TOLT00000000078200001	Agricultural Game Farm	Gravelotte Iron Ore Company Pty Ltd
Mon Desir 782LT	2	TOLT00000000078200002	Agricultural	Pieter Oosthuizen Landgoed Pty Ltd
Willie 787LT	6	TOLT00000000078700006	Agricultural Game Farm	Klipspringer Lodge cc
Danie 789LT	1	TOLT00000000078900001	Agricultural Game Farm	Pedal Trading 168 Pty Ltd
Mashisimale 800LT	0	TOLT00000000080000000	Communal Land	Mashisimale Traditional Council
Croc-Ranch 835LT	0/1/2/7/9/11/12/13/14/15/16	TOLT00000000083500000 TOLT00000000083500001 TOLT00000000083500002 TOLT00000000083500007 TOLT00000000083500009 TOLT00000000083500011 TOLT00000000083500012 TOLT00000000083500013 TOLT00000000083500014 TOLT00000000083500015 TOLT00000000083500016	Communal Land	Mashishimale Traditional Council
Seaphole			Communal Land	Modjadji Traditional Authority

Declaration of Disclosure

DIGES Group undertakes to disclose to the Competent Authority any material information that has or may have the potential to influence the decision of the Competent Authority or the objectivity of any report or document required in terms of National Environmental Management Act (Act No. 107 of 1998) and will provide the Competent Authority with access to all information at its disposal regarding the application, whether such information is favourable to the application or not.



17/07/2018

Signature

Date

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