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DRAFT AMENDED ENVIRONMENTAL IMPACT REPORT

PROPOSED RUSTENBURG STRENGTHENING PHASE 2 (MARANG) WITHIN RUSTENBURG LOCAL MUNICIPALITY OF BOJANALA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

DEA REF: 14/12/16/3/3/2/611

PREPARED BY

DYNAMIC INTEGRATED GEO-ENVIRONMENTAL SERVICES

FOR

Eskom

ESKOM HOLDING SOC LIMITED

ESKOM MEGAWATT PARK

1 MAXWELL DRIVE

SUNNINGHILL

MARCH 2016

ESKOM HOLDING SOC LIMITED

PROPOSED RUSTENBURG STRENGTHENING PHASE 2 (MARANG) WITHIN RUSTENBURG LOCAL MUNICIPALITY OF BOJANALA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

FEBRUARY 2016

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EXECUTIVE SUMMARY

1. BACKGROUND

ESKOM Holdings SOC Ltd appointed Dynamic Integrated Geo-Environmental Services (DIGES) in 2013 to carry out an Environmental Impact Assessment (EIA) for the strengthening of the Rustenburg electrical network within Rustenburg Local Municipality of Bojanala District Municipality, North West Province. An application form was submitted to the Department of Environmental Affairs (DEA) on the 31st of October 2013 and was granted permission to carry out an Environmental Impact Assessment on the 02 December 2013 as per section 26 and 27 of EIA Regulations, Government Notice No. R543 of 18 June 2010. The applied activities were as follows:

i. *Construction of a new Marang B 400/132 kV substation comprising of 3x500MVA Transformers. The substation areas under assessment are approximately ±30 ha per site;*

ii. *The construction of ±2km of 400kV loop in loop out power lines which will feed off the existing 400 kV Matimba-Marang or Medupi-Marang or Midas-Marang power lines and feed into the new substation; and*

iii. *Construction of an access road to the new substation with a width of ± 6.5m.*

The Final Environmental Impact Report (FEIR) submitted to DEA on the 18th of May 2015 was retracted citing the identification of an additional feasible alternative that had to be assessed. At the time of submission of the final EIR, the following three activity alternatives had been assessed;

i. *The extension of the existing substation with 2 x 315 MVA 400/88kV. This option would lock Marang Voltage 88kV in the 20 years forecasted and it would not allow distribution voltage to gradually migrate to 132kV for reliability in the area. For this reason this option was not considered;*

ii. *The construction of a new Transmission Substation, Marang B with an end state design of 3 x 500, 400/132 kV substation by 2018. The load including all distribution upgrades would be done all at once and this would result in a high capital expenditure. Therefore this option was also not considered; and*

iii. *The construction of a new transmission substation: this option is the same as option 2. The load shift would be done in two phases ensuring that the spare capacity at the new substation will be more due to the load being moved in small volumes and Phase 2 load shift is optional and will be determined by the load changes and requirements in the Marang supply area. This was the preferred option and Phase 1 would entail the construction of a new Marang B 400/132kV substation and 400kV loop in loop out power lines. The construction of this infrastructure would trigger Activity 8 and 15 of Listing Notice 2, Government Notice R545 and Activity 4 (c)(i) ee Listing Notice 3, Government Notice R546 of 18 June 2010. The final*

Environmental Impact Report submitted to the Department of Environmental Affairs after public review recommended that alternative substation and corridor 1 be authorised as it resulted in minimum environmental damage, had good accessibility during maintenance and the Interested and Affected Parties approved of it.

Eskom Holdings SOC Ltd has since addressed the challenges cited in Activity alternative 1 and the extension of the existing substation will make provision for new 3x 500MVA 400/132kV transformers as follows:

- *Extension of the existing 400kV Busbar;*
- *Establish a new 132kV Busbar to enable installation of 2 x 500MVA 400/132kV Transformers;*
- *1 x future 500MVA 400/132kV Transformer;*
- *Establish and Equip 4 x 132kV feeders to allow existing 88kV Marang load shift;*
- *Establishing 4 x future 132kV feeders.*

The extension will require ±10hectares of land and will not require the construction of transmission power lines as compared to activity 3 which requires ±30hectares of land and the construction of a new substation and loop in loop out 400kV power lines. Taking into account the land required for the activity, the cost of constructing the development and the landowner's opinion this alternative becomes the preferred alternative and will be assessed in addition to the location alternatives assessed during the Scoping phase. This activity will trigger Activity 23 (ii) of Listing Notice 1, Government Notice R544.

This report therefore takes into account the assessment of extending the substation and will be referred to as alternative 4.

2. LOCATION

The proposed development is in close proximity to the existing 400/88kV Marang Substation, 400kV and 88kV power lines which traverse the proposed project area. The proposed substation and corridor sites are located on Farm Klipgat 281 JQ and Portion 2 of the Farm Elandsheuvel 282 JQ, located approximately 14 km North East of Rustenburg.

3. REPORT LAYOUT

This Environmental Impact Report (EIR) represents the outcome of the EIA process and contains the following sections:

***Section 1:** Introduction– deals with background of the project including the objectives of this EIA.*

***Section 2:** Technical details – discusses the technical details of the project.*

***Section 3**: Administrative, Legal and Policy Requirements – all relevant requirements from applicable laws, and provincial and local regulations.*

***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 – an evaluation of the environmental and social acceptability of the route and substation and tower structures considered.*

***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 alternative.*

***Section 9:** Conclusions and recommendations.*

***Section 10:** References*

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

4. APPROACH TO THE STUDY

A Scoping and Environmental Impact Assessment was prescribed to assess the damage that will be done during the project cycle (construction, operation and decommissioning) as the activity falls under activities 23 (ii) of R544, 8 and 15 of R545, and 4 (c)(i) cc of R546 which are listed in the table below.

Relevant Government Notice	***Activity***	***Description***	***Applicability***
R544	*23 (ii)*	*Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use outside an urban area where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.*	*The extension of the existing Marang 400/88kV Main Transmission substation where the area required is ±10 hectares.*
R545	*8*	*The construction of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.*	*The construction of ± 2km, 400kV loop in loop out power lines from the Bighorn-Marang, Marang-Midas or Medupi-Marang 400kV power line.*
R545	*15*	*Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.*	*The construction of a Main Transmission Substation, Marang B and associated substation infrastructure covering ±30 hectares.*
R546	*4 (c)(i) ee*	*The construction of a road wider than 4 metres with a reserve less than 13.5metres in North West in critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional*	*There will be a need for construction of access road to the substation. The construction of an access road with a width of 6.5m in a Terrestrial Type 2.*

		plans.	

An application for the proposed project submitted to the Department of Environmental Affairs (DEA) on the 31st of October 2013 was acknowledged and rejected on the 14th of November 2013 due to an incorrect co-ordinate. A list with the amended coordinates was then submitted to the Department on the 15th of November 2013 and accepted on the 2nd of December 2013. The project was assigned ***DEA Reference No.:*** *14/12/16/3/3/2/611.The scoping and plan of study submitted to DEA on the 25th of June 2014, was accepted on the 28th of August 2014.See* ***Appendix B-3.*** *An amended application will be submitted with the Environmental Impact Report to include Activity 23(ii) recorded in Listing 1, Government Notice R544.*

5. PUBLIC PARTICIPATION

Scoping Phase

Public Participation Process was done according to Regulation 54 of the Government Notice R543 in terms of the Environmental Impact Assessment Regulation amended in June 2010 that set out the need and the processes that have to be followed when doing public participation. As part of the development process DIGES consulted with the local community and stakeholders by giving them the opportunity to consider the project in detail and addressing their concerns during the entire scoping phase.

Prior to submission of the application form a notification letter was sent to the landowner, Royal Bafokeng Nation, informing them of Eskom's intention to strengthen the Rustenburg network. The proof of notification was appended to the application form. During the scoping assessment, as part of the public participation process, an advert was placed in the Sowetan and Rustenburg Herald on the 9th of December 2013 and 10th of January 2014 respectively informing the public about Eskom's intention to construct the power lines and substation. In addition to the adverts, several site notices were placed in noticeable areas in the project area. Notification letters and Background Information Documents (BID) were given to the landowner, ward councillors, Local and District Municipalities, various Government Departments and the community during the public participation meetings.

To get the baseline environmental information and the public's perspective of the proposed power lines and substation alternatives and how it would affect them, DIGES liaised with the Royal Bafokeng Administration and the ward councillor for Boitekong Township to arrange public meetings. Prior to the community meetings, DIGES and Eskom Holdings SOC Ltd had consultations with the landowner, Royal Bafokeng and the leadership of the community on the 15th and 31st of January 2014 respectively. Meetings with the community were then arranged through the Royal Bafokeng Administration. The meetings were also advertised in the newspapers, Sowetan and Rustenburg Herald on the 25th and 28th of February 2014. Though all steps were taken to inform the public about

the meetings there was a poor attendance. In Thekwana and Photsaneng villages, the meetings had to be rescheduled. DIGES provided information on various issues throughout the consultation phases, and the issues raised were evaluated and taken into consideration during the evaluation process. DIGES and ESKOM's responses to the issues raised were attached to the final scoping report submitted to DEA.

Environmental Impact Assessment Phase

Draft Environmental Impact Report

During the Environmental Impact Assessment Phase, the availability of the first draft Environmental Impact Report (DEIR) was advertised in the Sowetan and Rustenburg Herald on the 19th and 21st of November 2014 respectively. In addition, public meetings were held after the public review period to discuss the findings and recommendations made during the assessment.

Amended Environmental Impact Report

This draft Environmental Impact Report will be submitted to the Interested and Affected Parties for a period of 30 days.

6. ALTERNATIVES EVALUATION

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 a proposed development. In addition to the three substation sites and corridors leading to these sites, the extension of the substation was also assessed to select the site that is preferable in terms *of minimum environmental damage, accessibility during maintenance, and the interested and affected parties concerns. Due to the nature of the environment, i.e., the various access tracks used by the communities, no alternative access road were assessed instead the access tracks will be upgraded to access the substation. The specialists' assessments and recommendations (specialists reports are attached as* ***Appendix E1-10)*** *coupled with information from the maps and the interested and affected parties' input were used in identifying the preferred site.*

Though all alternatives are in close proximity, the extension of the substation requires a smaller area and the power line is not required hence in most specialists' assessments the recommendation states that ***alternative 4 is viable****. Reference is made to the Table 2 overleaf for the specialists rating of the alternatives:*

Table 2: ***Comparison of Alternatives***

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Air Quality	2	4	1	3
Avifauna	2	2	2	1
Biodiversity	2	4	2	1
Eco-Tourism	1	1	1	1
Heritage	2	4	3	1
Palaeontology	1	1	1	1
Social	*2*	2	2	1
Soil and Land	*1*	1	1	1
Visual	*2*	2	3	1
Wetlands	*3*	4	2	1

Rating: *1 being the most preferred and 4 being least Preferred*

7. ENVIRONMENTAL IMPACT ASSESSMENT

The landscape associated with the corridors for the power lines and substation including the site for the substation extension is characterised of modified vegetation with activities such as mining, housing, cultivated lands and grazing practiced within and surrounding the project area. Anglo Platinum mine borders the project area in the south and Bospoort dam is approximately 2.5km north of the site. Site Alternative 1 is located north- west , alternative 2 is 1km south east and alternative 3 is south-east of the existing Marang 400/88kV substation and associated 400kV and 88kV power lines that feed in and out of the substation, Substation extension, alternative 4 is located north-west of the existing substation. Alternative 2 ranked best in terms of air quality due to its considerable distance from Boitekong Township whilst Alternative 4 (substation extension) ranked best in terms of all the other specialists' studies. Taking into account the specialists' studies, mapping, Interested and Affected Parties opinions, costs associated with construction and operation and the significance of the impacts expected; Alternative 4 is preferred as it entails the extension the existing Marang substation which requires less land and no power line construction. Effective implementation and adherence to

the mitigation measures proposed in Section 8 and the attached Environmental Management Programme will reduce the biodiversity, air quality and wetland impacts expected resulting in a ***LOW*** *significance. A summary of the key socio-economic and biophysical impacts anticipated are as follows:*

i. *Change in Physical and Chemical Characteristics of Water bodies: the proposed development will be located approximately 1.6km from the wetland, and construction and operation activities can result in the contamination and sedimentation of this non perennial river. The wetland area is not within the area that is recommended for development hence it should be demarcated as a* ***"NO GO"*** *area;*

ii. *Poor waste management practices are practiced in close proximity to the site by the local communities. During construction, the contractor and the ECO should ensure that solid waste is stored in a designated area covered, tip proof metal drums for collection and disposal. The significance of the impact after mitigation is therefore rated* ***LOW;***

iii. *Disturbance associated with construction, operation and decommissioning activities may lead to the introduction of alien species, the impact will be* ***LOW-MEDIUM*** *before mitigation measures have been implemented****;***

iv. *Destruction to vegetation. The impact is considered to be of* ***LOW-MEDIUM*** *significance; since the vegetation is severely modified. A koppie located in the north west is in a fair-good condition and should be demarcated as a* ***'NO GO'*** *area;*

v. *Various pieces of potsherds were noted on site and these have a very low significance. Though the possibility of finding these objects is high, its significance is* ***LOW;***

vi. *The impact on palaeontology is* ***VERY LOW.*** *Paleontological materials are known to preserve well in ancient dunes. There was no indication, or signs of dunes on the site;*

vii. ***Cumulative visual impacts:*** *Visual impacts are expected to be cumulative due to the fact that the infrastructure become permanent objects within the environment. The landscape impact of the extension is considered to be moderately low due to the existing land uses (cultivated areas, settlements and subsistence farming) and other Eskom infrastructure. The potential visual impact is considered to be low-moderate on residents, and low for motorists;*

viii. *The residual impact is expected to be* ***MODERATE*** *if the mitigation measures are put in place.*

8. 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 Regulation 33 of the EIA Regulations Government Notice R543 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 H.

9. CONCLUSION AND RECOMMENDATIONS

All biophysical and socio-economic impacts were assessed for the project area and the following conclusions and recommendations were made;

a. *No major significant negative impacts were identified during the environmental impact assessment;*

b. *According to the specialist studies carried out on site, Alternative 4 for the substation extension is favoured over Alternative 1, 2, 3 for constructing substation and 400kV power line) and the NO-GO alternative.*

The following recommendations must be included within the authorisation issued;

- *The stipulations and provisions of the attached Environmental Management Programme on Appendix H be conveyed to and familiarised by the contractor and workers responsible for construction;*
- *Permits required by Eskom SOC Ltd from other competent authorities should be acquired before the commencement of the activity;*
- *A waste management collection system must be established and the waste must be disposed of at a licensed facility;*
- *Adequate erosion controls should be implemented when removing vegetation;*
- *The applicant is reminded to take precautions during construction of the proposed project, should any archaic material be unearthed, construction should be halted immediately and SAHRA be notified.*
- *Opened trenches and pits must be rehabilitated immediately to avoid injuries to pedestrians and animals.*

TSHOBOKANYO E E TSWANG GO BAKHUDUTHAMAGA

1 TSHEDIMOSETSO KA POROJEKE

ESKOM Holdings SOC Ltd e ne ya tlhoma Setlamo sa Ditirelo Tse di Kopantsweng Tsa Tikologo le Thutafatshe kgotsa Dynamic Integrated Geo-Environmental Services (DIGES) ka 2013 gore se dire Tshekatsheko ya Diphelelo Tsa mo Tikologong gore go nonotshiwe neteweke ya motlakase ya Rustenburg mo teng ga Mmasepala wa Selegae wa Rustenburg wa Mmasepala wa Kgaolo ya Bojanala, kwa Porofenseng ya Bokone Bophirima. Go ne ga romelwa foromo ya go dira kopo kwa Lefapheng la Merero ya Tikologo kgotsa Department of Environmental Affairs (DEA) ka di 31 tsa Diphalane 2013 mme se ne sa newa tetla ya go diragatsa tiro ya Tshekatsheko ya Diphelelo Tsa mo Tikologong ka di 02 Sedimonthole 2013 go ya ka karolo 26 le 27 ya Melawana ya EIA, Kitsiso ya Puso ya No. R543 of 18 Seetebosigo 2010. Ditiro tse go neng go dirilwe kopo ya gore di dirwe e ne e le tse di latelang:

- *Go agiwa ga seteišene-potlana se se ntša sa Marang B 400/132 kV se se nang le diteransefoma tsa 3x500MVA. Mafelo a seteišene-potlana a a santseng a sekasekwa lengwe le lengwe la one ke setsha sa mo e ka nnang ±30 ha;*
- *Go agiwa ga diphaephe tse di tsamaisang megala ya maatla a motlakase a 400kV tsa boleele jwa ±2km e e tla tsayang maatla a yone go tswa mo megaleng ya motlakase ya maatla a 400 kV a Matimba-Marang kgotsa Medupi-Marang kgotsa Midas-Marang e bo e fepa seteišene-potlana ka one; le*
- *Go aga tsela e e tsenang kwa seteišeneng-potlana ya bophara jwa ±6.5m.*

Pego ya Bofelo ka Diphelelo tsa mo Tikologong kgotsa Final Environmental Impact Report (FEIR) e e rometsweng go DEA ka di 18 Motsheganong 2015 e ne ya beelwa kwa thoko ka jaanong go ne go bonwe setsha se sengwe se sele se se neng se tshwanetse go sekasekwa. Ka nako ya go romela ga EIR ya bofelo, go ne go dirilwe tshekatsheko ka ditiro tse di latelang tseno di sele tse tharo;

i. *Go atolosiwa ga seteišene-potlana se se leng teng ka 2 x 315 MVA 400/88kV. Tlhopho eno e tla tshola Maatla a Motlakase a 88kV mo dingwageng di le 20 tse di boleletsweng pele mme ga e kitla e letla gore maatla a motlakase a go tlamelwang ka one a fudugele go 132kV gore go se nne le kgaogo ya one mo lefelong. Ka ntlha ya lebaka leno tlhopho eno e ne e sa akanyediwa;*

ii. *Go agiwa ga Seteišene-potlana se se ntša se se Tsamaisang Maatla a Motlakase, sa Marang B se se nang le dipatlafalo tse di batlegang tsa seteišene-potlana sa 3 x 500, 400/132 kV ka 2018. Selekanyo sa maatla a motlakase go akaretsa le ditlhabololo tsotlhe tsa go o anamisa se tla dirwa sotlhe ka gangwe fela mme tiro eno e tla nna le ditshenyegelo tse di kwa godimo thata. Ka jalo tlhopho eno le yone e ne e sa akanyediwa; le*

iii. *Go agiwa ga seteišene-potlana se se tsamaisang maatla a motlakase: tlhopho eno e tshwana le tlhophgo 2 Go fudusa selekanyo sa maatla a motlakase go tla dirwa ka dikgato tse pedi go tlhomamisa gore maatla a a beetsweng kwa thoko a a tla dirisiwang fa a tlhokwa kwa seteišeneng-potlana se se ntša ke a a lekaneng ka ntlha ya selekanyo sa motlakase se se tla bong se sutisiwa ka dibolumo tse dinnye mme go sutisisa selekanyo sa maatla a motlakase ga Kgato 2 ga go patelesege mme go tla laolwa ke go fetolwa ga selekano sa maatla a motlakase le dipatlafalo mo lefelong la Marang le le tlamelang ka motlakase. Eno ke kgato e e neng e elediwa ke botlhe mme Kgato 1 e tla akaretsa go agiwa ga seteišene-potlana se se ntša sa Marang B sa 400/132kV le diphaephe tse di tsamaisang megala ya maatla a motlakase ya 400kV. Go agiwa ga ditirelo tseno go tla simolola Tiro ya 8 le 15 ya Kitsiso 2 e e mo Lenaaneng la Kitsiso ya Puso ya R545 le Tiro 4 (c)(i) ee e e mo Lenaaneng le Kitsiso 3, Kitsiso ya Puso ya R546 ya di 18 Seetebosigo 2010. Pego ya bofelo ka Diphelelo tsa mo Tikologong e e rometsweng go Lefapha la Merero ya Tikologo morago ga e sena go sekasekwa ke baagi e ne ya tshitshinya gore go ntshiwe taolo ya gore go agiwe seteišene-potlana se sele le setsha 1 sa porojeke ka gonne go ne go se kitla go nna le tshenyego e e kalo mo tikologong, go ne go le motlhofo go tsena mo go sone ka nako ya go se baakanya e bile Makoko a a Kgatlhegelang Porojeke Eno e bile a Angwa ke Yone a ne a e amogela semmuso.*

Fa e sa le ka nako eo, Eskom Holdings SOC Ltd e rarabolotse dikgwetlho tse di umakilweng tsa Tiro ya setsha se sele 1 mme go atolosiwa ga seteišene-potlana se se leng teng go tla baakanyetsa ka go tsennga ga diteransefoma tse dintša ka mokgwa o o latelang:

- *Go atolosiwa ga Setsamaisa-motlakase se se leng teng sa 400kV ,*
- *Go tlhoma Setsamaisa-motlakase se se ntša sa 132kV go dira gore go kgonege go tsenya 2 x 500MVA 400/132kV;*
- *Diteransefoma pele mme morago ga moo Teransefoma ya mo isagweng ya 1 x 500MVA 400/132kV;*
- *Go tlhoma le go Tlhomelela difepi di le 4 x 132kV go letlelela phuduso ya selekanyo sa maatla a 88kV a motlakase sa Marang;*
- *Go tlhoma difepi tsa mo isagweng tsa 4 x 132kV.*

Katoloso eno e tla tlhoka setsha sa diheketara di ka nna ±10 me ga e kitla e tlhoka gore go agiwe megala e e tsamasang maatla a motlakase fa e bapisiwa le tiro 3 eo yone e batlang setsha sa diheketara di ka nna ±30 le go agiwa ga seteišene-potlana se se ntša le megala ya maatla a motlakase ya 400kV . Fa go akanyediwa setsha se se tlhokegang sa go dira tiro eno, ditshenyegelo tsa go aga tlhabololo eno le kgopolo ya mong wa setsha, setsha seno se sele se ratwa go di feta tsotlhe mme se tla sekasekwa mo godimo ga lefelo le lengwe le sele le le sekasekilweng ka nako ya

Go Dira Patlisiso ka setsha. Tiro eno e tla simolola Tiro 23 (ii) ya Kitsiso 1 e e mo Lenaaneng, Kitsiso ya Puso ya R544.

Ka jalo pego eno e akanyetsa tshekatsheko ya go atolosa seteišene-potlana mme e tla bidiwa setsha se sele 4.

2 LEFELO

Tlhabololo e go tshitshintsweng gore e dirwe e dirwa gaufi thata le Seteišene-potlana sa Marang sa 400/88kV , megala ya maatla a motlakase ya 400kV le 88kV e kgabaganya lefelo la porojeke e go tshitshintsweng gore e dirwe. Seteišene-potlana le setsha se se golaganyang mafelo a mabedi di mo Polasing ya Klipgat 281 JQ le Karolo 2 ya Polasi ya Elandsheuvel 282 JQ, e e leng bokgakala jwa mo e ka nnang 14 km go ela kwa Bokone Botlhaba jwa Rustenburg.

3 THULAGANYO YA PEGO

Pego ka Diphelelo tsa mo Tikologong kgotsa Environmental Impact Report (EIR) e emela dipholo tsa thulaganyo ya EIA mme e na le dikarolo tse di latelang:

***Karolo 1:** Matseno – a tlotla ka tshedimosetso ka porojeke go akaretsa le mekgele ya EIA eno.*

***Karolo 2:** Dintlha tsa setegeniki – di tlotla ka dintlha tse setegeniki tsa porojeke.*

***Karolo 3**: Dipatlafalo tsa Tsamaiso, tsa Semolao le tsa Pholisi - dipatlafalo tsotlhe tse di maleba go tswa go melao e e dirang, le melawana ya porofense le ya naga yotlhe.*

***Karolo 4:** Tikologo e e tlileng go amega – tshobokanyo ka tikologo e e tlileng go amiwa ke ditiro tsa porojeke.*

***Karolo 5:** Go ikgolaganya le Baagi– tshobokanyo ya thulaganyo e e tlileng go nna teng ya go ikgolaganya le bana-le-seabe le Makoko a a Kgatlhegelang Porojeke Eno e bile a Angwa ke Yone kgotsa Interested and Affected Parties (di I&AP), le mathata a a lemogilweng ka nako ya thulaganyo eno.*

***Karolo 6**: Go sekaseka ditsela di sele tse di ka dirisiwang – go sekaseka go amogelesega ga tsela mo tikologong le mo loagong le seteišene-potlana le go agiwa ga ditora tse di akanyeditsweng.*

***Karolo 7:** Dintlha-kakaretso tsa dipatlisiso tsa bomankge - tshobokanyo ka dinonyane tsa setsha seo, boleng jwa mowa, boleng jwa dilo tsa boswa, jwa boemo jwa ikholoji, jwa bojanala, jwa mmu le jwa setsha, go dira dipatlisiso ka go fetoga ga ponalo ya tikologo le ka ditsha tse go ikgarileng metsi mo go tsone.*

***Karolo 8:** Diphelelo tse go ka diregang gore di nne gone le Tlhotlhomiso ya go Bona gore ke Tsa Bogolo jo bo Kae – tshekatsheko ya diphelelo tse di nnang gone mo loagong le mo ikonoming le mo ditsheding, tse go lebeletsweng gore di nne gone ka nako ya go agiwa le go dirwa ga tsela e go dumalanweng ka yone.*

***Karolo 9:** Dikonelo le ditshitshinyo*

***Karolo 10:** Ditshupetso*

***Dintlha-tlaleletso:** Dintlha-tlaleletso tse di amanang le Kgato ya Tshekatsheko ya Diphelelo Tsa mo Tikologong di kokoantswe kwa morago ga tokomane eno*

4 KAFA PATLISISO E TLILENG GO DIRWA KA GONE

Tshekatsheko ya Setsha le Tshekatsheko ya Diphelelo Tsa mo Tikologong e ne e direlwa go lekola tshenyo e e tla dirwang ka nako ya porojeke yotlhe (go aga, go dira le tiro ya go tlhatlhamolola) ka gonne tiro eno e wela ka fa tlase ga ditiro 8 le 15 tsa R545, le 4 (c)(i) cc ya R546 tse di tsentsweng mo lenaanethalong le le fa tlase.

Kitsiso e e Maleba ya Puso	***Tiro***	***Tlhaloso***	***Go tshwanelega***
R544	*23 (ii)*	*Go fetola setsha se go sa agiwang sepe mo go sone, se se senang sepe kgotsa se se tobekaneng fela gore e nne lefelo le le dirisiwang ke baagi, le le nang le mabenkele, kgwebo, la boitapoloso, la intaseteri kgotsa la ditheo tse di rileng, kwa ntle ga motsesetoropo, leo karolo ya lone e e tshwanetseng go fetolwa e leng ya bogolo jo bo fetang heketara e le 1 mme le le kwa tlase ga diheketara di le 20.*	*Go atolosiwa ga seteišene-potlana se se leng teng se se Tsamaisang Maatla a Motlakase mo lefelong le neng le batla diheketara di ka nna ±10 gone.*
R545	*8*	*Go tsenngwa ga ditirelo tsa go tsamaisa le go anamisa motlakase wa bogolo jwa 275 kilovolts kgotsa go feta joo, ka fa ntle ga motsesetoropo kgotsa tikatikwe ya madirelo.*	*Go tsenngwa ga diphaephe tse di tsamaisang megala ya maatla a motlakase ya 400kV tsa boleele jwa ± 2 km, go tswa mo megaleng e e tsamaisang maatla a motlakase ya 400 kV ya Bighorn-Marang, Marang-Midas kgotsa Medupi-Marang.*
R545	*15*	*Go fetola setsha se go sa agiwang sepe mo go sone, se se senang sepe kgotsa se se tobekaneng fela gore e nne lefelo le le dirisiwang ke baagi, le le nang le mabenkele, la kgwebo, la boitapoloso, la*	*Go agiwa ga Seteišene-potlana sa Konokono se se Tsamaisang Maatla a Motlakase, Marang B le ditirelo tse di amanang le*

		intaseteri kgotsa la ditheo tse di rileng leo karolo ya lone e e tshwanetseng go fetolwa e leng ya diheketara di le 20 kgotsa go feta.	*seteišene-potlana seno tse di akaretsang diheketara di le ±30.*
R546	*4 (c)(i) ee*	*Go agiwa ga tsela e bophara jwa yone bo fetang dimetara di le 4 mme lefelo le le leng gaufi le yone la tshomarelo ya dimela le ditshedi tse di botlhokwa thata (Tsa Mofuta wa 1 le 2 tsa mo Mmung le tsa Mofuta wa 1 tsa mo Metsing) e le la bophara jo bo leng ka fa tlase ga dimetara di le 13.5 kwa Bokone Bophirima jaaka di tlhaotswe mo dithulaganyong tse di dirwang kgato ka kgato tsa dimela le ditshedi, e leng dithulaganyo tse di dirwang ke balaodi ba ba nang le bokgoni kgotsa ke mokgatlho wa tshomarelo ya ditsompelo tsa tlhago.*	*Go tla tlhokega gore go agiwe tsela e e tsenang kwa seteišeneng-potlana. Go agiwa ga tsela e e tsenang kwa go sone ya bophara jwa 6.5m mo lefelong le Ditshedi Tsa Mofuta 2.*

Go ne ga umakiwa gore go bonwe kopo ya porojeke e go tshitshintsweng gore e dirwe e e neng e rometswe go Lefapha la Merero ya Tikologo kgotsa Department of Environmental Affairs (DEA) ka di 31st tsa Diphalane 2013 mme e ne ya ganwa ka di 14th tsa Ngwanaatsele 2013 ka ntlha ya go bo e ne e s lolamisiwa sentle. Morago ga moo Lefapha le ne la romelelwa lenaane la ditolamisa tse di tlhabolotsweng ka di 15th tsa Ngwanaatsele 2013 mme la amogelwa ka di 2nd tsa Sedimonthole 2013. Porojeke e ne ya newa ***Nomoretshupetso ya DEA:*** *14/12/16/3/3/2/611.Patlisiso ka ditshekatsheko tsa mo tikologong le thulaganyo ya patlisiso e e neng ya romelelwa DEA ka di 25th tsa Seetebosigo 2014, e ne ya amogelwa ka di 28th tsa Phatwe 2014. Leba* ***Ntlha-tlaleletso B-3.*** *Kopo ya go dira tlhabololo e tla romela le Pego ka Diphelelo tsa mo Tikologong gore e akaretsa Tiro 23(ii) e e rekotilweng go Lenaane 1, Kitsiso ya Puso ya R544.*

5 GO NNA LE SEABE GA BAAGI

Kgato ya Patlisiso ka Setsha

Thulaganyo ya go Nna le Seabe ga Baagi e ne ya dirwa go ya ka Molawana wa bo 54 wa Kitsiso ya Puso ya R543 go ya Molawana wa Molawana wa Tshekatsheko ya Diphelelo Tsa mo Tikologong o o tlhabolotsweng ka 2010 o o neng wa tlhalosa dithulaganyo tse di neng di tshwanetse go latelwa fa go

nna le thulaganyo ya go nna le seabe ga baagi . Jaaka karolo ya thulaganyo ya tlhabololo DIGES e ne ya ikgolaganya le baagi ba lefelo leo mmogo le bana-le-seabe ka go naya tšhono ya go akanyetsa porojeke ka botlalo le go rarabolola matshwenyego a bone ka nako ya kgato yotlhe ya go dira patlisiso ka setsha.

Pele go romelwa foromo ya go dira kopo go ne ga romelwa lekwalo la kitsiso kwa go mong wa setsha, e leng Royal Bafokeng Nation, go ba itsitse ka maikaelelo a Eskom a go nonotsha mafaratlhatlha a tlamelo ka motlakase mo Rustenburg. Bosupi jwa kitsiso eo bo ne jwa tshwaraganngwa le foromo ya go dira kopo. Ka nako ya go tshekatsheko ya go dira patlisiso ka setsha, jaaka karolo ya thulaganyo ya go nna le seabe ga baagi, go ne ga tsenngwa papatso mo kuranteng ya Sowetan le ya Rustenburg Herald ka di 9 tsa Sedimonthole 2013 le ka di 10 tsa Ferikgong 2014 go itsise baagi ka boikaelelo jwa Eskom jwa go tsenya megala e e tsamaisang motlakase le go aga seteišene-potlana. Mo godimo ga dipapatso, go ne ga manegwa dikitsiso di le mmalwa ka setsha mo mafelong a di neng di bonala sentle mo go one mo lefelong la pororjeke. Makwalo a kitsiso le Ditokomane tsa Tshedimosetso ka Porojeke kgotsa Background Information Documents (BID) a ne a newa mong wa setsha, bakhanselara ba dikgaolo-potlana, Bommasepala ba Selegae le ba Kgaolo le baagi ka dinako tsa dikopano tsa go nna le seabe ga baagi.

Go bona tshedimosetso ya ntlha ka tikologo le ka fa baagi ba neng ba leba ka gone tshitshinyo e e dirilweng ya go tsenngwa megala ya maatla a motlakase le diteišene-potlana tse di ka agiwang le ka fa di tlileng go ba ama kagone, DIGES, e ne ya buisana le Royal Bafokeng Administration le mokhanselara wa kgaolo-potlana ya Lekeišene la Boitekong go rulaganya gore go tshwarwe dikopano tsa baagi. Pele go tshwarwa dikopano tsa baagi, ditlamo tsa DIGES le Eskom Holdings SOC Ltd di ne tsa ikgolaganya le mong wa setsha e leng Royal Bafokeng ka di 15 tsa Ferikgong 2014 le baeteledipele ba baagi ka di 31 tsa Ferikgong 2014. Morago ga moo go ne ga rulaganngwa dikopano le baagi ka Royal Bafokeng Administration. Gape go ne ga dirwa papatso ka dikopano tseno mo dikuranteng, Sowetan le Rustenburg Herald ka di 25 le di 28 tsa Tlhakole 2014. Le fa go nega tsewa dikgato tsotlhe tsa go itsise baagi ka dikopano go ne ga tla ba le mokawanyana fela. Kwa metseng ya Thekwana le Photsaneng dikopano di ne tsa tshwanelwa ke go rulaganyediwa nako e nngwe e sele. DIGES e ne ya tlamela ka tshedimosetso malebana le mathata a a farologaneng ka nako ya go dikgato tsa go ikgolaganya le botlhe, mme mathata a a neng a tsoswa a ne a tlhatlhobiwa le go akanyediwa ka thulaganyo ya go ditshekatsheko. Dikarabelo tsa mathata a a neng a tsositswe tsa DIGES le ESKOIM di ne tsa tshwaraganngwa le pego ya bofelo ya go dira patlisiso ka setsha mme ya newa DEA.

<u>Kgato ya Tshekatsheko ya Diphelelo tsa mo Tikologong</u>

Terafote ya Pego ka Diphelelo tsa mo Tikologong

Ka nako ya Kgato ya Tshekatsheko ya Diphelelo Tsa mo Tikologong, go ntshiwa ga Pego ya ntlha ka Diphelelo tsa mo Tikologong kgotsa draft Environmental Impact Report (DEIR) go ne ga tlhagisia mo

pampiring ya Sowetan le ya Rustenburg Herald ka di 19th le di 21st tsa Ngwanaitsele 2014. Mo godimo ga moo, go ne ga tshwarwa dikopano tsa baagi botlhe morago ga lobaka lwa go sekaseka pego ga baagi gore go tlotlwe ka diphitlhelelo le ditshitshinyo tse di neng tsa dirwa ka nako ya tshekatsheko.

Pego ya Tlhabololo ka Diphelelo tsa mo Tikologong

Pego eno ka Terafote ya Diphelelo tsa mo Tikologong e tla romelelwa Makoko a a Kgatlhegelang Porojeke Eno e bile a Angwa ke Yone mo tsamaong ya malatsi a le 30

6 TSHEKATSHEKO YA DITSELA DI SELE TSE DI KA DIRISIWANG

Go ne ga lekanngwa "kgonego" le "mabaka a a utlwalang" a go leka ditsela di sele a bo a bapisiwa le boikaelelo jwa ka kakaretso, le dipatlafalo le go tlhokega ga tiro eno le diphelelo tsa yone mo tikologong le mo baaging ba ba ka nnang ba amiwa ke tiro eo. Ja kalo go ne go le botlhokwa gore go tlhaolwa ga ditsela di sele, go dira patlisiso ka tsone le go di lekola go rarabolole mathata/diphelelo tsa tlhabololo e go tshitshintsweng gore e dirwe. Mo godimo ga ditsha di le tharo tsa seteišene-potlana le dipata tse di felelang ka ditsha tseno, go atolosiwa ga seteišene-potlana le gone go ne ga sekasekwa go tlhopha mo go sone setsha se se tshwanelegang gore *go se nne le tshenyegelo e kgolo mo tikologong ya sone, go kgona go tsena mo go sone ka nako ya dipaakanyo tse di rileng, le go dira tumalanong le maikutlo a makoko a a kgatlhegelang porojeke eno e bile a angwa ke yone. Ka ntlha ya mofuta wa tikologo, ke gore, ditselana tse di farologaneng tse di dirisiwang ke baagi go tsena mo setsheng ka tsone, go ne ga se ka ga lekolwa tsela epe e sele e e ka dirisiwang mme mo boemong jwa moo ditselana tse di dirisiwang tsa go tsena mo setsheng ka tsone di tla tlhabololwa gore go iwe kwa seteišeneng-potlana ka tsone. Ditshekatsheko tsa bomankge le ditshitshinyo (dipego tsa bomankge di tshwaragantswe le* ***Ntlha-tlaleletso ya E1-10)*** *tse di patilweng ke tshedimosetso go tswa mo dimmepeng le ditshwaelo tsa makoko a a kgatlhegelang porojeke eno e bile a angwa ke yone di ne tsa dirisediwa go tlhaolwa setsha se go eletswang gore go dirisiwe tsone.*

Le fa ditsha tsotlhe di sele tse go ka nnang ga dirisiwa tsone di atamalane thata, go atolosiwa ga seteišene-potlana go batla lefelo le le nnye fela mme mogala wa maatla a motlakase ga o tlhokege ka jalo mo ditshekatshekong tse dintsi tse di dirilweng ke bomankge, ditshitshinyo di bolela gore ***setsha se sele 4 ke sone se se solofetsang****. Ka a morago ga tsebe eno, go umakiwa Lenaanethalo 2 le mo go bone bomankge ba nayang ditsela di sele tse di ka dirisiwang maduo:*

Lenaanethalo 2: ***Go Bapisiwa ga Ditsela di Sele Tse di ka Dirisiwang***

	SETSHA SE SELE 1	**SETSHA SE SELE 2**	**SETSHA SE SELE 3**	**SETSHA SE SELE 4**
Boleng Jwa Mowa	2	4	1	3
Dinonyane tsa setsha seo	2	2	2	1
Dimela le ditshedi	2	4	2	1
Bojanala kwa Mafelong a Tlhago	1	1	1	1
Dilo tsa Boswa	2	4	3	1
Masaledi	1	1	1	1
Go tsalana le ba bangwe	*2*	2	2	1
Mmu le Setsha	*1*	1	1	1
Go fetoga ga ponalo ya tikologo	*2*	2	3	1
Ditsha tse di Ikgarileng Metsi	*3*	4	2	1

Go tlhoma maduo: *1 ke e e eletswang thata mme 4 ke E e eletswang*

7 TSHEKATSHEKO YA DIPHELELO TSA MO TIKOLOGONG

Boalo jwa setsha jo bo amanang le mafelo a megala ya maatla a motlakase le seteišene-potlana go akaretsa le setsha se seteišene-potlana se tla atolosediwang mo go sone bo bonwa ka go fetolwa ga

dikgwa ka ditiro tse di jaaka tiro ya moepo, tlamelo ka matlo, ditsha tse di lemilweng le go fudusa diruiwa mo teng ga lefelo le porojeke e tlileng go direlwa mo go lone le go le dikologa. Moepo wa Anglo Platinum o fa molelwaneng wa lefelo le porojeke e tlileng go direlwa mo go lone ka fa borwa mme letamo la Bospoort le bokgakaja jwa mo e ka nnang 2.5km go ela kwa bokone jwa setsha. Setsha se sele 1 se kwa bokone-bophirima, setsha se sele 2 se bokgakala jwa 1km kwa bokone botlhaba mme setsha se sele 3 sone se kwa borwa-botlhaba jwa seteišene-potlana se se leng teng sa Marang sa 400/88kV mme se amana le megala ya maatla a motlakase ya 400kV le ya 88kV e e romelang maatla a motlakase mo seteišeneng-potlana seno le go a ntsha mo go sone, go atolosa Seteišeneng-potlana, setsha se sele 4 se kwa bokone-bophirima jwa seteišene-potlana se se leng teng. Setsha se sele 2 se ne se di gaisa tsotlhe ka ntlha ya boleng jo bo siameng jwa mowa ka ntlha ya sekgala se segolo sa sone go tswa kwa Lekeišeneng la Boitekong mme Setsha se sele 4 sone (se seteišene-potlana se tla atolosediwang mo go sone) se ne se di gaisa tsotlhe ka ntlha ya dipatlisiso tse bomankge ba bangwe botlhe ba di dirileng mo go sone. Go akanyediwa ga dipatlisiso tsa bomankge, go dira dimmepe, dikgopolo tsa Makoko a a Kgatlhegelang Porojeke Eno e bile a Angwa ke Yone, ditshenyegelo tsa go aga le go dira tiro le bogolo jwa diphelelo tse go lebeletsweng gore di nne gone; Go eletswa gore go dirisiwe setsha se sele 4 ka gonne se na le sebaka sa go atolosetsa seteišene-potlana mo go sone se se leng teng sa Marang e bile ga e tlhoke go na setsha se segolo gape ga se tlhoke go stenngwa megala ya maatla a motlakase. Go tsenngwa tirisong ka tsela e e siameng le go ngaparela dikgato tsa go fokotsa bomasisi jwa diphelelo tsa mo tikologong tse di tshitshintsweng mo go Karolo 8 le Lenaneo la Botsamaisi Jwa Tikologo le le tshwaragantsweng fano go tla fokotsa diphelelo tse di sa siamang tse do lebeletsweng gore di ame dimela le ditshedi, boleng jwa mowa le setsha se se ikgarileng metsi mme seno se tla felela ka bomasisi ***JO BO KWA TLASE.*** *Tshobokanyo ya diphelelo tsa konokono tse di lebeletsweng mo loagong le mo ikonoming le mo ditsheding e ka mokgwa o o latelang:*

(i) Go Fetoga ga Boleng le Dikhemikale tsa Madiba a Metsi: tlhabololo e go tshitshintsweng gore e dirwe e tla bo e le bokgakala jwa mo e ka nnang 1.6km go tswa kwa setsheng se se ikgarileng metsi, mme ditiro tsa go aga le go tsamaisa tiro ya porojeke go ka felela ka kgotlhelo ya noka eno e e itshekileng. Lefelo la setsha se se ikgarileng metsi ga le mo teng ga lefelo leno le go tshitshinngwang gore le tlhabololwe ke gone ka moo le tshwanetseng go beelwa molelwane wa gore e nne lefelo ***"LE GO SA TSENWENG MO GO LONE"****;*

(ii) Baagi ba ba leng gaufi le setsha seno ba latlhela matlakala gongwe le gongwe. Ka nako ya go aga, ditlamo tsa konteraka le sa ECO di tshwanetse go tlhomamisa gore mathata a a thata a bolokwa mo lefelong le le tshwailweng mme a khurumediwe, le ditoromole tsa tshipi gore a tle go tsewe le go ya go latlhwa. Ka jalo bomasisi jwa diphelelo tse di tlang nnang gone morago ga dikgato tsa go fokotsa bomasisi jwa tsone e tla nna ***JO BO KWA TLASE:***

(iii) Go iteega tsebe go go bakwang ke tiro ya go aga, go dirwa ga porojeke le ditiro tsa go tlhatlhamolola di ka felela ka go tsena mo setsheng ga dilo tsa mefuta ya seeng, mme

*bomasisi e tla nna **JO BO KWA TLASE KA SELEKANYO SE SE MO MAGARENG pele go tsewa dikgato tsa go fokotsa bomasisi jwa diphelelo tsa mo tikologong;***

*(iv) Go senngwa ga dimedi. Go tsenwa gore bomasisis jw adiphelelo tsa teng ke **JO BO KWA TLASE KA SELEKANYO SE SE MO MAGARENG**; ka gonne dimedi di fetotswe fela thata. Thotana e e kwa bokone bophirima e mo boemong jo bo siawmeng mme e beelwe molelwane jaaka lefelo le **'GO SA TSENWENG MO GO LONE'**;*

*(v) Go ne ga lemogwa manathwana a le mmalwa a letsopa mo setsheng mme ga a na bomasisi bo kalo gotlhelele. Le fa go na le kgonego e kgolo ya go bona dilo tseno, bomasisi jwa tsone **BO KWA TLASE;***

*(vi) Diphelelo tsa masaledi **DI KWA TLASE THATA.** Masaledi a itsege ka go tshwarelela lobaka lo lo leele mo teng ga dithota tsa santa tsa bogologolo. Go ne go sena bosupi bope, kgotsa sesupo sa dithota tsa santa mo lefelong.*

*(vii) **Koketsego ya go fetoga ga ponalo ya tikologo** Go lebeletswe gore go fetoga ga ponalo ya tikologo go oketsege ka ntlha ya gore dilo tse di tlileng go tsennga mono di fetoga go nna dilo tsa leruri mo tikologong. Diphelelo tse di nnang gone mo setsheng di tsewa e le tsa bomasisi jo bo kwa tlase ka tsela e e lekaneng ka ntlha ya gore setsha se a dirisiwa (mafelo a a tlhagotsweng, mafelo a bonno le go itshedisa ka go lema) le ditirelo tse dingwe tsa Eskom. Diphelelo tse go fetoga ga ponalo ya tikologo go tsewa e le ga selekanyo se se kwa tlase mo baaging, le se se kwa tlase mo bakgweetsing;*

*(viii) Go lebeletswe gore diphelelo tsa masaledi e nne **TSE DI MO MAGARENG** fa go tsewa dikgato tsa go fokotsa bomasisi jwa diphelelo tsa mo tikologong.*

8 LENAANE LA BOTSAMAISI JWA TIKOLOGO kgotsa Environmental Management Programme (EMPr)

Lenaneo la Botsamaisi Jwa Tikologo ke thulaganyo ya go leka go fitlhelela mokgele o o beilweng e bile e tlotla ka ga gore go tla fokotswa jang, go tla laolwa leng e bile go tla bewa jang leitlho bomasisi jwa ditiro tse di nang le diphelelo tse di masisi mo tikologong kgotsa tse di ka nnang le diphelelo tse di masisi mo tikologong EMP e ne ya lkwalwa go ya ka Molawana wa bo 33 wa Melawana ya EIA ya Kitsiso ya Puso ya R543 mme e tlotla ka diphelelo tse go lebeletsweng gore di nne gone ka nako ya kgato ya go aga, ka nako ya go dira ga porojeke le ka nako ya dikgato tsa go fokotsa bomasisi jwa diphelelo tsa mo tikologong tse go tshitshintsweng gore di tsewe go fokotsa bomasisi jwa diphelelo tseo. Tokomane eno gape e umaka dikgato tsa go baakanya mathata fa go bewa ga one leitlho go bontsha gore dipatlafalo tsa go dira tiro ga di a fitlhelelwa mme e itsise bao ba sikiereng boikarabelo jwa seno gore ba tseye kgato e e tlhokegang. Melaometheo ya Botsamaisi jo bo Kopanetsweng Jwa Tikologo kgotsa Environmental Management (IEM) e ne ya tlhotlheletsa go tsewa ga dikgato tseno, tse boikaelelo jwa tsone e leng go fitlhelela ditekanyetso tse di amogelwang gotlhe kwantle ga diphelelo dipe tse di masisi. Dikgato tseno, mekgwa-tsamaiso le dikaelo tsa go baya maemo leitlho di diretswe go tlhomamisa gore diphelelo tse go lebeletsweng gore di nne gone ka ntlha ya tlhabololo e

go tshitshintsweng gore e dirwe ke tsa bomasisi jo bo amogelesegang jo patlisiso e bo boleletseng pele. EMP e tshwaragantswe le Ntlha-tlaleletso H.

9 DIKONELO LE DITSHITSHINYO

Go ne ga sekasekwa diphelelo tsotlhe mo ditsheding le mo ikonoming mmogo le mo loagong mo lefelong le porojeke e tlileng go direlwa mo go lone mme go ne ga dirwa dikonelo le ditshitshinyo tse di latelang;

a) *Ga go a bonwa diphelelo dipe tse dikgolo tse di sa siamang ka nako ya tshekatsheko ya diphelelo tsa mo tikologong;*

b) *Go ya ka dipatlisiso tsa bomankge tse di dirilweng mo setsheng, Setsha se sele 4 sa go atolosiwa ga seteišene-potlana se ratwa thata go gaisa Setsha se sele 1, 2, 3 sa go agiwa ga seteišene-potlana le mogala wa maatla a motlakase wa 400kV) le setsha se sele SE GO SA TSENWENG MO GO SONE.*

Go tshwanetse ga akarediwa ditshitshinyo tse di latelang fa go ntshiwa tetla;

- *Ditaelo le melao ya Ntlha-tlaleletso H e e mametleletsewng fano ya Lenaneo la Botsamaisi Jwa Tikologo di tshwanetse go romelwa go konteraka le badiri ba ba ikarabelang ka tiro ya go aga gore ba itlwaelanye le tsone;*
- *Eskom SOC Ltd e tshwanetse ga amogela makwalotetla go tswa go balaodi ba bangwe ba ba nang le bokgoni pele go simololwa ka tiro;*
- *Go tshwanetse go tlhomiwa tsamaiso ya go olelwa ga matlakala mme matlakala a latlhelwe kwa lefelong le le ntshiditsweng laesense ya gore matlakala a latlhelwe kwa go lone;*
- *Go tshwanetse ga tlhomiwa ditsela tse di lekaneng tsa go laola kgogolego ya mmu fa go tlosiwa dimedi;*
- *Modirakopo o gakololwa go tsaya dikgato tsa go nna kelotlhoko ka nako ya go aga porojeke e go tshitshintsweng gore e dirwe, fa go ka ribololwa dilo dipe tsa bogologolo, tiro ya go aga e tshwanetse go emisiwa ka bonako mme go itsisiwe SAHRA ka bonako.*
- *Diforo le dikhuti tse di atlhameng di tshwanetse go katelwa ka bonako go tila dikgobalo tse di ka tlhagelang batsamaya ka dinao le diphologolo.*

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Appendix F:	*Public Participation*
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Appendix F-1:	*Rustenburg Local Municipality Draft Scoping Report & Draft Environmental Impact Report*
Appendix F-1:	*SAHRA Draft Scoping Report & Draft Environmental Impact Report Comments*
Appendix F-1:	*DREA Draft Environmental Impact Report Comments*
Appendix F-2:	*List of Stakeholders*
Appendix F-3:	*Sowetan and Rustenburg Herald_Initial*
Appendix F-4:	*Sowetan and Rustenburg Herald_Public Meetings*
Appendix F-5:	*Sowetan and Rustenburg Herald_Draft Scoping Report*
Appendix F-6:	*Sowetan and Rustenburg Herald_Draft Environmental Impact Report*
Appendix F-7:	*Proof of Submission of Draft Impact Report*
Appendix F-7:	*Proof of Notification for the revised scope*
Appendix F-8:	*Attendance Register_Photsaneng, Thekwana, Mfidikoe and Boitekong*
Appendix F-9:	*Flyers*
Appendix G:	*Waste Disposal Letter*
Appendix H:	*Draft EMPr*

LIST OF ABBREVIATIONS

CARA	*Conservation of Agricultural Resources Act*
DAFF	*Department of Agriculture, Forestry and Fisheries*
DEA	*Department of Environmental Affairs*
DEAT	*Department of Environmental Affairs and Tourism*
DEDECT	*Department of Economic Development, Environment, Conservation & Tourism*
DREAD	*Department of Rural, Environmental and Agricultural Development*
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*
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*
PPP	*Public Participation Process*
RBA	*Royal Bafokeng Administration*
RBH	*Royal Bafokeng Holdings*
RBN	*Royal Bafokeng Nation*
RLM	*Rustenburg Local Municipality*
ROW	*Right Of Way*
SAHRA	*South African Heritage and Resources Agency*
SANS	*South African National Standards*

DEFINITIONS

1. ***Affected environment:*** *Those parts of the socio-economic and biophysical environment impacted on by the development.*

2. ***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 "no action" alternative may also require investigation in certain circumstances;*

3. ***Assessment:*** *The process of collecting, organizing, analysing, interpreting and communicating data that is relevant to some decision.*

4. ***Development:*** *The act of altering or modifying resources in order to obtain potential benefits.*

5. ***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.*

6. ***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.*

7. ***Environmental impact assessment:*** *A process of examining the environmental effects of a proposed development.*

8. ***Environmental issue:*** *A concern felt by one or more parties about some existing, potential or perceived environmental impact.*

9. ***Environmentally Sensitive Area:*** *An area designated in regional or local land use plans, or by a local, regional, provincial or federal government body as being sensitive to disturbance or identified by an applicant as being sensitive for some reason.*

10. ***Erosion:*** *The process by which material, such as rock or soil, is worn away or removed by wind or water.*

11. ***Evaluation:*** *The process of weighing information, the act of making value judgments or ascribing values to data in order to reach a decision;*

12. ***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.*

13. ***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.*

14. ***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.*

15. ***Power line:*** *An overhead line of whatever voltage, erected for the conducting of electricity.*

16. ***Right of Way (ROW):*** *The strip of land acquired for which Eskom SOC Ltd has obtained the rights for construction and operation of the transmission line.*

17. ***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;*

18. ***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.*

19. ***Study Area:*** *The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.*

20. ***Substation:*** *is a high-voltage electric system facility that is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another, and/or change alternating current to direct current or direct current to alternating current.*

1. INTRODUCTION

1.1 BACKGROUND

ESKOM Holdings SOC Ltd appointed Dynamic Integrated Geo-Environmental Services (DIGES) in 2013 to carry out an Environmental Impact Assessment (EIA) for the strengthening of the Rustenburg electrical network within Rustenburg Local Municipality of Bojanala District Municipality, North West Province. An application form was submitted to the Department of Environmental Affairs (DEA) on the 31st of October 2013 and was granted permission to carry out an Environmental Impact Assessment on the 02 December 2013 as per section 26 and 27 of EIA Regulations, Government Notice No. R543 of 18 June 2010. The applied activities were as follows:

i. *Construction of a new Marang B 400/132 kV substation comprising of 3x500MVA Transformers. The substation areas under assessment are approximately ±30 ha per site;*

ii. *The construction of ±2km of 400kV loop in loop out power lines which will feed off the existing 400 kV Matimba-Marang or Medupi-Marang or Midas-Marang power lines and feed into the new substation; and*

iii. *Construction of an access road to the new substation with a width of ± 6.5m.*

The Final Environmental Impact Report (FEIR) submitted to DEA on the 18th of May 2015 was retracted citing the identification of an additional feasible alternative that had to be assessed. Eskom Holdings SOC Ltd has since identified a feasible alternative of extending the existing Marang Substation to make a provision for new 3x 500MVA 400/132kV transformer as follows:

- *Extension of the existing 400kV Busbar;*
- *Establish a new 132kV Busbar to enable installation of 2 x 500MVA 400/132kV Transformers initially;*
- *1 x future 500MVA 400/132kV Transformer;*
- *Establish and Equip 4 x 132kV feeders to allow existing 88kV Marang load shift;*
- *Establishing 4 x future 132kV feeders.*

Taking into account the new alternative, the scope of work for the proposed project therefore entails acquiring an Environmental Authorization (EA) from the Department of Environmental Affairs for the Rustenburg Strengthening Project.

1.1.1 EAP'S QUALIFICATIONS

Section 17 of EIA Regulations, Government Notice No. R543 clearly indicates that an Environmental Assessment Practitioner (EAP) should be independent and have expertise in conducting Environmental Impact Assessments, including knowledge of the Acts, and any guidelines that have relevance to the proposed activity. The author of the report has ten years' experience in the environmental conservation field working on different projects. See the EAP's curriculum vitae in ***Appendix A****.*

1.2 LOCATION

The project is located on Portion 2 of Elandsheuvel 282 JQ and Klipgat 281JQ within Rustenburg Local Municipality which falls under Bojanala Platinum District Municipality of North West Province. Rustenburg Local Municipality is bordered by Madibeng Local Municipality to the east, Moses Kotane Local Municipality to the north, Kgetlengrivier Local Municipality to the south and Venterdorp and Merafong City Local Municipalities to the south. The Local Municipality can be accessed via the N4 Freeway/ Platinum corridor which links Rustenburg with Tshwane in the east and Zeerust in the west. R24 links Rustenburg to Johannesburg in the south and Pilanesberg in the north.

The project area is approximately 14km north east of Rustenburg and is bordered by Boitekong in the west, Anglo Platinum mine in the south and Bospoort dam is approximately 2.5km north of the site. The sites are adjacent to the existing Marang 400/88kV substation and associated 400kV and 88kV power lines that feed in and out of the substation traverse across the area. The area can be accessed via D522 road. Reference is made to Figure 1-1 overleaf and Appendix D-1 and D-2 for the Regional and Locality Map.

1.3 LAND OWNERSHIP

According to the Royal Bafokeng Nation Strategic Environmental Assessment, 2010, the Royal Bafokeng Nation (RBN) owns 1 200m² of land nestled between Rustenburg to the south, Magaliesburg to the west and Pilansberg to the north. The project area also falls under the ownership of the Bafokeng Tribe and Moklatle tribe also considered to be Bafokeng. The area is located in the south east region of Royal Bafokeng Nation land. Reference is made to the Table below for the property details and Figure 1-2 for RBN land within the Municipality:

Table 1-1: **Property Details**

DISTRICT MUNICIPALITY	***LOCAL MUNICIPALITY***	***FARM NAME***	***SG CODE***	***LAND-OWNER***
Bojanala	*Rustenburg*	*Klipgat 281 JQ*	*T0JQ000000028100000*	*Moklatle Tribe*
Bojanala	*Rustenburg*	*Portion 2 of Elandsheuvel 282 JQ*	*T0JQ000000282000002*	*Royal Bafokeng Nation*

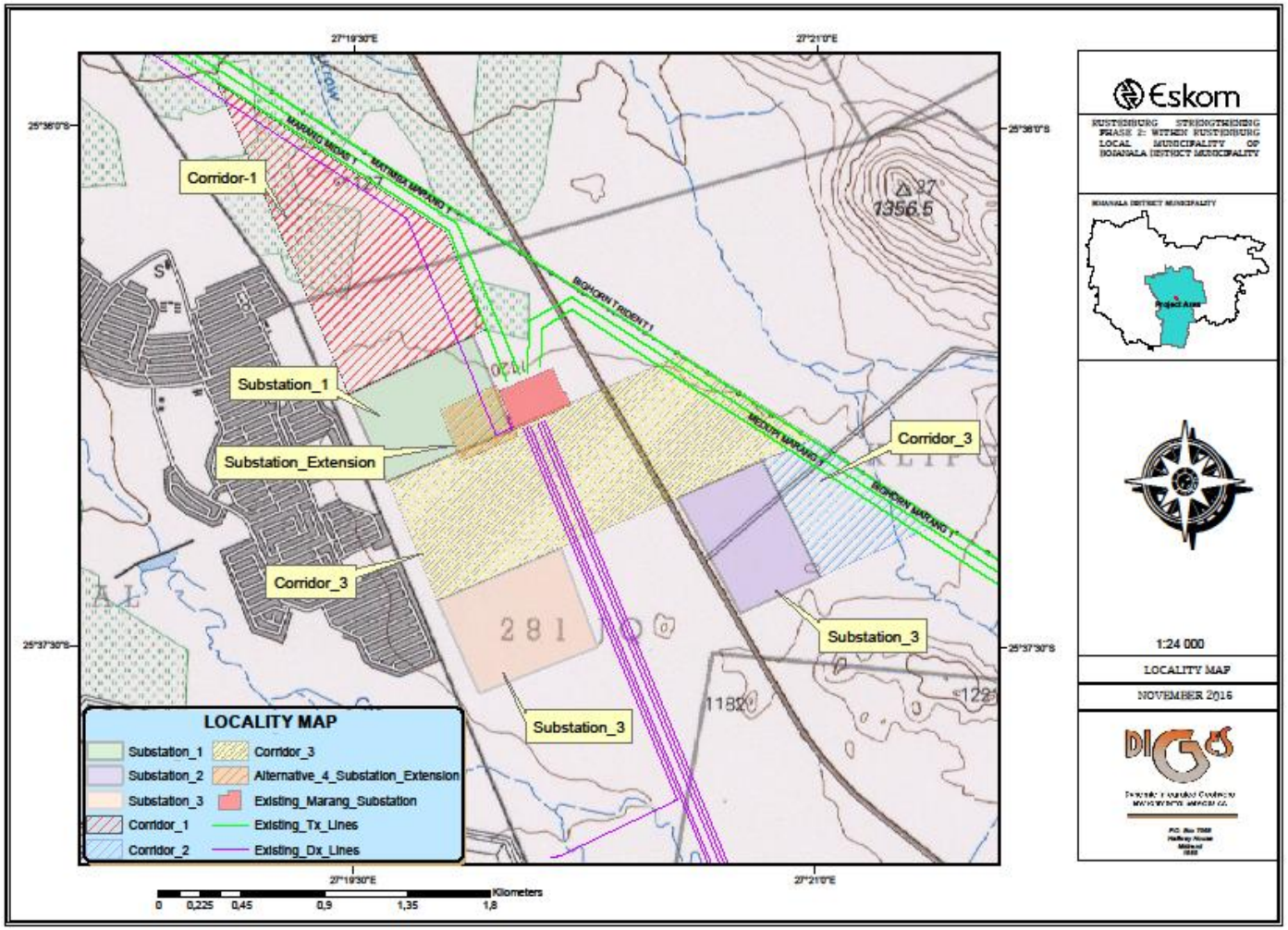

Figure 1-1: **Locality map**

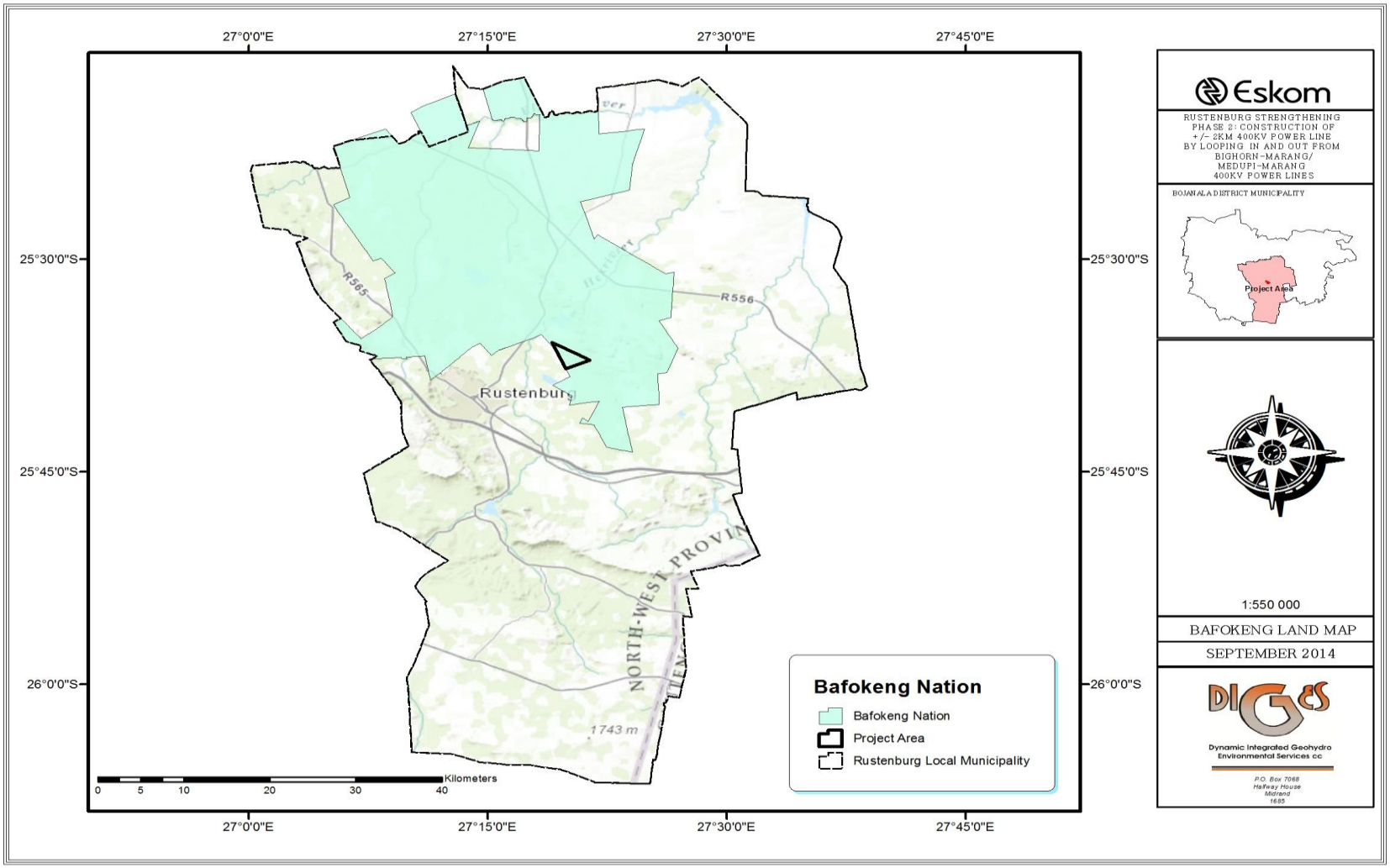

Figure 1-2: **Areal extent of Bafokeng Land**

1.4 NEED AND DESIRABILITY OF THE PROJECT

A reliable electricity supply of acceptable quality is essential for the economic development as it paves the way to access education, improved nutrition and health care and jobs among others. ESKOM Holdings SOC Ltd is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Its core business is in the generation, transmission and distribution of electricity and its role makes it imperative for Eskom to plan accordingly and anticipate load growth.

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 centres and very large end-users. The transmission system needs to be well maintained to deliver a reliable supply of electricity and it also needs to be strengthened to meet changing customer needs.

As 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 a particular electricity transmission path cannot accommodate increased power flow. Although the reasons for congestion vary, the common consequence is that increased power flow on a particular transmission path is not possible without risking system reliability. As such Rustenburg Transmission Network needs to be strengthened.

Rustenburg's platinum mining, smelting operations and commercial operations is supplied by four Main Transmission Substations (MTS) with Marang 400/88kV MTS being one of them. The load profile undertaken by Eskom Holdings SOC Ltd at the substation indicated that the recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. The existing MTS has space limitations in terms of increasing its installed capacity beyond the fourth 315MVA transformer; hence Marang re-enforcement will require a new site or an extension outside the existing terrace.

1.5 SCOPING ENVIRONMENTAL IMPACT ASSESSMENT APPROACH AND METHODOLOGY

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 EIA 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 taken into account. 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. ***Figure 1-3*** *overleaf presents the EIA process to be followed for the proposed development.*

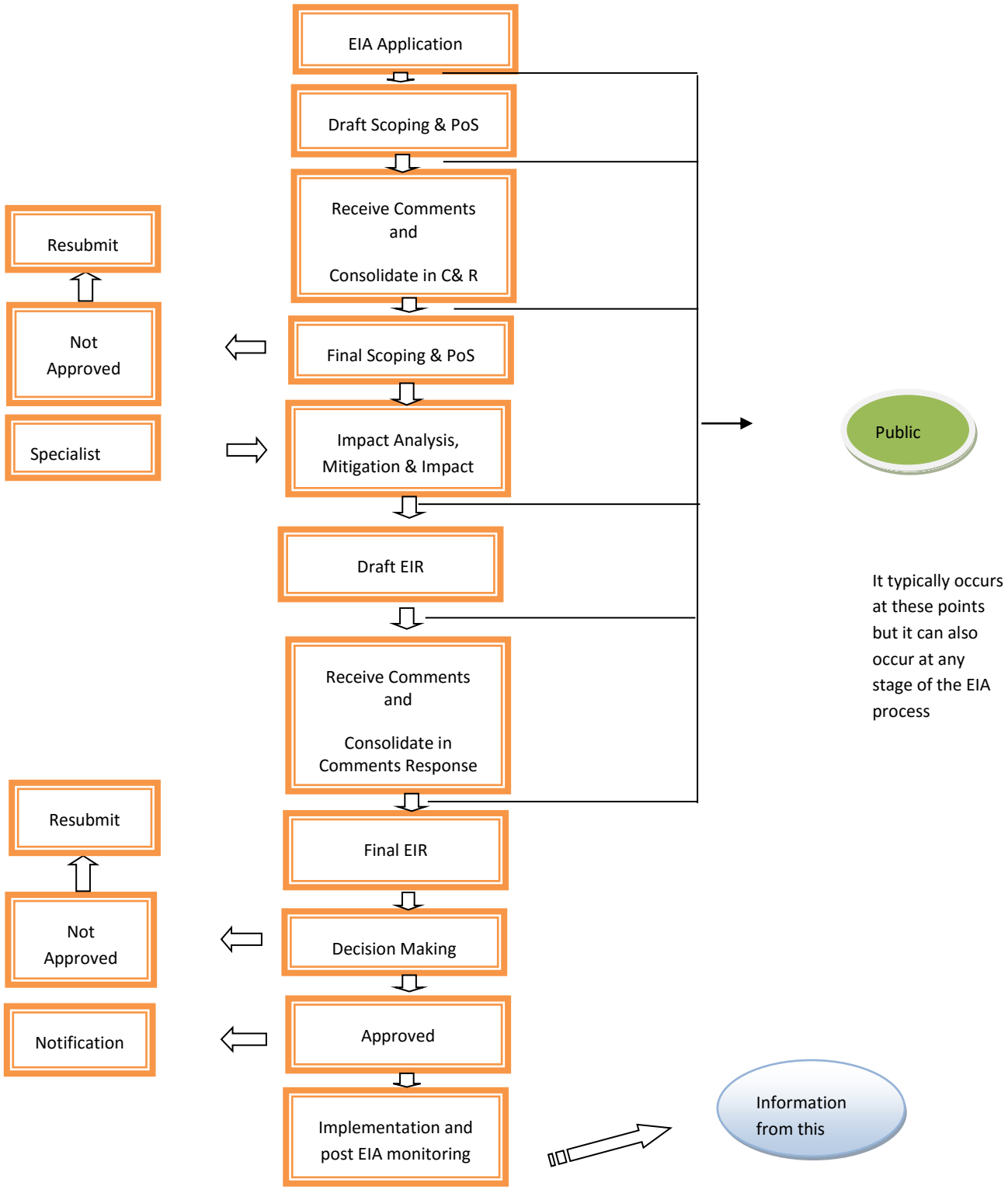

Figure 1-3: ***EIA Process Flow***

1.5.1 OBJECTIVES OF EIA

This Environmental Impact Assessment has been undertaken in order to: primarily, satisfy the requirements of the Environmental Regulations promulgated in June 2010 in terms of Section 24 and 24D of the National Environment Management Act (Act 107 of 1998) which are as follows;

- *Ensure that all relevant environmental legal requirements will be met by the proponent;*
- *Provide information on the proposed development by describing the nature and scale thereof;*
- *Describe the affected environment;*
- *Inform the public about the proposal and identify the main stakeholders and their concerns and values;*
- *Define the reasonable and practical alternatives to the proposal;*
- *Identify the likely beneficial and detrimental consequences of the proposal;*
- *Ensure that all environmental consequences are recognized early on and taken into consideration in the design, construction, operation and maintenance of the activity; and*
- *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 manner.*

1.6 THE PROCESS

The proposed activity to be undertaken (together with the infrastructure to be provided) is listed as activities 23 (ii) of R544, 8, 15 of R545 and 4 (c)(i) ee of R546 dated 18 June 2010 which read as follows:

- ***23(ii) of R544:** Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use outside urban areas where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;*
- ***8 of R545:** The construction of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex;*
- ***15 of R545:** Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;*

- ***4 (c)(i) ee of R546:*** *The construction of a road wider than 4 metres with a reserve less than 13.5metres in North West in critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*

1.6.1 SCOPING AND PLAN OF STUDY FOR EIR

During the Scoping Phase, the following general stages were followed as a basis for this assessment:

a) **Application:** *As per the application form, the landowners, Royal Bafokeng Nation were notified about the proposed project. An application for the proposed project submitted to the Department of Environmental Affairs (DEA) on the 31st of October 2013 was acknowledged and rejected on the 14th of November 2013 due to an incorrect co-ordinate. A list with the amended coordinates was then submitted to the Department on the 15th of November 2013 and accepted on the 2nd of December 2013. Reference is made to Appendix B-1 and B-2 for the acknowledgement letters.*

b) **Determination of Policy, Legal and Administrative Framework** *and requirements through identification of relevant legal documents, guidelines and planning procedures. These have been reviewed in order 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 3 of this report.*

c) **Public Participation:** *An active approach was taken to identify potential Interested and Affected Parties. Preliminary information for identifying the Interested Parties was solicited from the Royal Bafokeng Administration who have Tribal jurisdiction over the communities except for Boitekong Township. Information with regards to the Rustenburg Local Municipality's ward councillors was solicited from the office of the Speaker. Government Departments were also contacted to get the contact details of the relevant officials. Notification letters and Background Information Documents were then submitted to stakeholders via e-mails and post.*

Notices containing all information concerning the proposed development were placed on site to inform local people about the proposed project. Adverts were also placed in the Sowetan and Rustenburg Herald newspaper on the 9th of December 2013 and 10th of January 2014 respectively, to notify the public about the proposed development. See Appendix F-3 for the adverts. Public meetings were also advertised in the Sowetan and Rustenburg Herald dated the 22nd and 25th of February 2014 respectively. Reference is made to Appendix F-4 for the newspaper adverts. Public meetings were then held from the 4th to the 18th of March 2014. The draft scoping report was made available to all the registered Interested and Affected Parties

(I&AP) and the local communities. Site Notices were placed on site and adverts were placed in the Sowetan and Rustenburg Herald on the 30th of April 2014 and 2nd of May 2014 respectively, to inform the public about the availability of the draft report. During the EIA phase, adverts were placed in the Sowetan and Rustenburg Herald to inform the public about the availability of the Draft Environmental Impact Report for review and comments. Reference is made to Appendix F-6 for the newspaper adverts. In addition, public meetings were held after the end of the public review period to inform the communities about the recommendations made in the report. Reference is made to Section 5 of this report for the comprehensive details of the public participation process.

d) **Determination of the Current Environmental Baseline Conditions** *was done 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 in order to comprehend the status quo of the project area and its surroundings. Topographic and thematic maps outlining the project area were also utilised.*

Dynamic Integrated Geo-Environmental Services (DIGES) conducted several site inspections with the applicant and specialists from November 2013 to January 2014. The first site inspection undertaken by both Consultants and applicant was sort of reconnaissance field survey where the different alternatives were briefly assessed. During the field surveys, most of the project area was covered on foot and with a vehicle where access routes existed. Photographs were taken to document the existing environmental conditions on site. Reference is made to ***Appendix C-4*** *for the site photos.*

e) **Acceptance:** *The final scoping report and Plan of Study submitted to DEA on the 27th of June 2014 was accepted by DEA on the 28th of August 2014. Reference is made to DEA acceptance letter attached in* ***Appendix B-3.***

f) **Environmental Impact Report:** *After the public review of the draft report and public meetings, the draft Environmental Impact Report (EIR) was finalised and submitted to the Department of Environmental Affairs on the 18th of May 2015. This report was later retracted on the 11th of June 2015 citing an identification of a preferred feasible alternative by the client;*

g) **Amending of Environmental Impact Report:** *The identified additional alternative entails the extension of the existing Marang MTS to make a provision for new 3 x 500MVA 400/132kV transformer. This activity will require ±10hectares and no construction of the 400kV power line will be required. After consultations with DEA, it was agreed that this alternative would be assessed with the three substation and corridors alternatives initially identified. This entailed that an extension of time in which the report could be submitted was required. Reference is*

made to Appendix B-5 for the letter submitted to DEA for the extension and B-6 for the e-mail confirming continuance with the existing application. The amended report will be submitted to the Interested and Affected parties for review for 30 days.

1.6.2 SPECIALIST STUDIES

This document includes the revised specialist impact assessment reports commissioned as part of the environmental process to investigate and assess the three alternative substation sites, three alternative corridors, the substation extension site and their associated impacts as well as provide additional information required by I&APs to inform their comment and the decision-making process. Air Quality, Avi-faunal, Ecological, Heritage, Palaeontology, Social, Soil and Land Capability, Tourism, Visual and Wetland Assessment Reports are attached in ***Appendix E1-10*** *respectively.*

1.6.3 IMPACT ASSESSMENT

An impact assessment has been carried out and 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, substation and existing substation extension, 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 maximising 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.*

1.7 ASSUMPTIONS AND LIMITATIONS

The following assumptions have been made during this study:

- *The study team obtained its data on affected farm owners on Windeed-Deeds office which was confirmed by the land-owner, Royal Bafokeng Nation and the Mokatle tribe;*
- *It is assumed that the information in this report including specialists' reports is correct and factual;*
- *It is assumed that the public participation carried out is adequate and has identified all the Interested and Affected Parties;*
- *It is also assumed that the Applicant has provided adequate details with regards to the processes to be followed during the construction and operation phase; and*
- *It is assumed that the mitigation measures stated in the draft Environmental Management Programme if implemented would result in minimal negative impacts and maximum environmental benefits.*

2. TECHNICAL DETAILS OF THE PROJECT

2.1 TECHNICAL DETAILS FOR THE 400KV POWER LINE

2.1.1 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 a number of criteria, including geographical location, topography, and height above sea level, span length and conductor type. For 400kV power lines that run parallel, a minimum separation distance of 50 m is required in order to ensure the reliable operation of both lines, i.e. a total footprint of each tower will be 80 m x 50 m. The servitude width for a 400 kV transmission line is 55 m.

2.1.2 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 400, with an average span of 350m between supports.

2.1.3 SERVICES ACCESS

Services Access for construction traffic will be required and maintained to all sites during the construction phase. The width of the access roads will be less than 6.5m. Services Access arrangements for maintenance and fault repairs will have to be arranged with the relevant land owners prior to the implementation of the project.

2.1.4 LINE CLEARANCE

New lines will be positioned to maintain statutory clearances from buildings, structures, trees, vegetation, etc. Line routes shall, in general, be chosen to minimize tree cutting/lopping.

2.2 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. Approximately 102 individuals will be employed on site and the procurement of local labor will be according to the labor laws and social development laws of South Africa. The main works for the construction of the 400kV power lines and substation include the following:

2.2.1 PRE-CONSTRUCTION

- ***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 in close proximity to trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned prior to the construction of the line.

- **Soil sampling**

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

- **Structure Stacking**

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

- **Clearing**

The Right Of Way 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.

- **Access Road Construction**

Where there is no existing Services Access available or where ground conditions prevent normal Services Access, temporary Services Access routes may have to be constructed. If temporary Services Access roads need to be installed then either a trackway system or temporary stoned Services Access roads are technically acceptable.

2.2.2 CONSTRUCTION PHASE

Overhead power line construction follows a standard sequence of activities mentioned below:

- **Construction Camp**

The Right Of Way corridor may be used as an area for temporary storage and handling for equipment and materials related to construction. Steel components of structures may be delivered and placed on

the ground near foundation sites. Vehicles will not be re-fueled on site but should that be done, there is a bunded area south east of the existing Marang substation which can be upgraded and used for re-fuelling. Reference is made to the Figure 2-1 below for the location of the bunded areas.

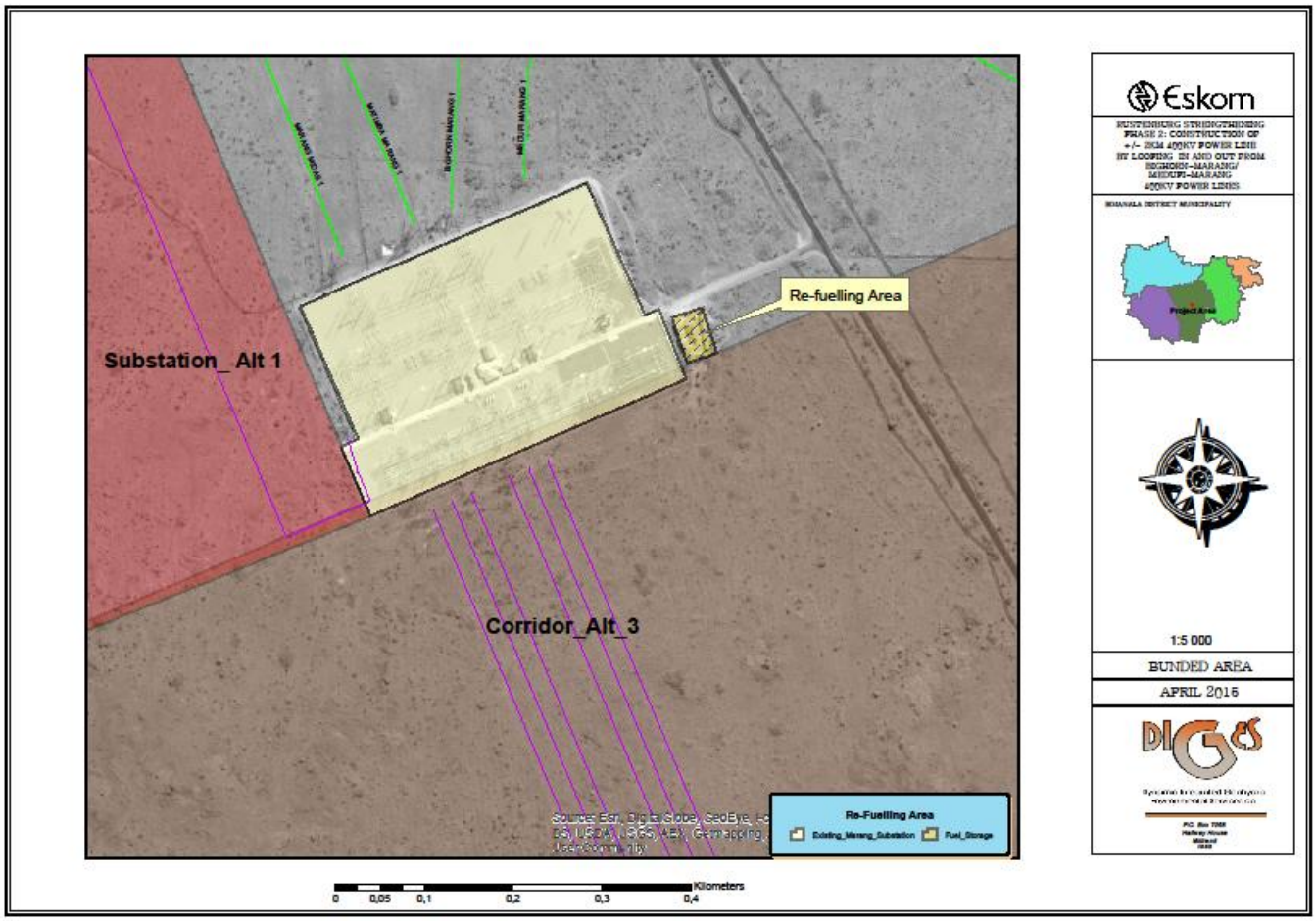

Figure 2-1: **Map showing the re-fueling area**

- **Foundation Installation**

A work crew will excavate the foundations for the towers. 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.

- **Erecting structures and stringing Conductors**

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.*

2.2.3 SUBSTATION CONSTRUCTION

The construction of a substation typically consists of, but is not limited to the following sequence of activities:

- *Cut and fill grading;*
- *Placement and compaction of structure fill to serve as a foundation for equipment;*
- *Grading to maintain drainage patterns;*
- *Oil spill containment facilities;*
- *Crushed rock surfaced yard, parking areas and roads;*
- *Fencing and gating;*
- *Landscaping with native plants where applicable;*
- *Installation of equipment and structure foundations;*
- *Installation of structures and equipment;*
- *Installation of bussing materials;*
- *Installation of control shelter; and*
- *Installation of control and relaying equipment and wiring.*

2.2.4 BULK SERVICES AND INFRASTRUCTURE

2.2.4.1 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 analyses on surrounding water resources is included in the wetlands assessment report, which forms part of this report.

2.2.4.2 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 for which a septic tank will be provided. However, such a mechanism requires adequate maintenance to prevent leakages.

2.2.4.3 STORM WATER

A noticeable feature of the topography is its gentle sloping terrain, most likely prone to periodic flooding. Flat terrain reduces surface water runoff, especially during torrential and flash episodes. Storm-water measures to be put in place are documented in the attached EMPr in Appendix H.

2.2.4.4 SOLID WASTE

It is anticipated that some quantity of 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. However, the contractor can use the municipality's landfill to dispose of general waste. Reference is made to Appendix G for the Municipality's letter of permission to use their landfill. A solid management plan is detailed in the EMPr.

2.3 OPERATION AND MAINTENANCE

During the operation phase, ESKOM shall perform the following activities;

i. *Vegetation maintenance within the Right Of Way (ROW) and access roads. This will ensure that vegetation does not interfere with human safety, transmission line conductors, towers and impede access to the transmission line for maintenance crews. Vegetation clearance shall be performed using a variety of methods such as manual, mechanical and herbicidal applications;*

ii. *Access road maintenance to ensure that the roads are in good condition for all weather access by maintenance crews; and*

iii. *Transmission power lines and substation maintenance which will include routine checks and system upgrade and repairs.*

2.4 DECOMMISSIONING

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*
- *Backfiling and compaction of the excavation with suitable material.*

3. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

Laws and principles have dominated and guided this environmental assessment process, namely the Principles of Integrated Environmental Management (IEM), the South African Constitution, the National Environmental Management Act (NEMA), National Energy Regulator and Strategic Integrated Projects. Other regulations and legislation with which the project will have to comply are the National Heritage Resources Act (NHRA), the National Water Act, National Environmental Management: Biodiversity Act 10 of 2004, National Environmental Management: Waste Act, National Environment Management: Air Quality Act 39 of 2004 and Occupational Health Safety Act 85 of 1993. Those that are relevant to this study are reviewed below:

3.1 THE CONSTITUTION

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."

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107 OF 1998)

In addition to the Constitution, we also have special environmental legislation in South Africa: the National Environmental Management Act (NEMA). The National Environmental Management Act 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 - (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 take into account 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.*

3.2.1 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

EIA contributes to giving effect to the objectives of integrated environmental management as decision makers are informed of the desirability of such activities and on the conditions which authorization of

the activity should be subject to, where relevant. The proposed activity is listed in terms of Listing Notice 1, Government Notice R544, Listing Notice 2, Government Notice R545 and Listing Notice 3, Government Notice R546, listed in the table overleaf:

Table 3-1: **Power lines and substation List of Activities**

Relevant Government Notice	***Activity***	***Description***	***Applicability***
R544	*23(ii)*	*Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use outside urban areas where the total area to be transformed is bigger than 1 hectare but less than 20 hectares or more.*	*The extension of the existing Marang 400/88kV Main Transmission substation where the area required is ±10 hectares*
R545	*8*	*The construction of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.*	*The construction of ± 2km, 400kV loop in loop out power line from the Bighorn-Marang or Medupi Marang 400kV power line.*
R545	*15*	*Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.*	*The construction of a Main Transmission Substation, Marang B and associated substation infrastructure covering ±30 hectares.*
R546	*4 (c)(i) ee*	*The construction of a road wider than 4 metres with a reserve less than 13.5metres in North West in critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by*	*The construction of an access road with a width of 6.5m in a Terrestrial Type 2.*

		the competent authority or in bioregional plans.	

3.3 THE PRINCIPLES OF INTEGRATED ENVIRONMENTAL MANAGEMENT

The principles of Integrated Environmental Management (IEM), first published in 1992, aim to guide the integration of environmental management into decision-making throughout the life cycle of the project (DEAT 1992). The IEM principles also aim to ensure that environmental impacts are considered before actions are taken or implemented and to ensure that there are adequate opportunities for public participation in decisions that may affect the environment (See below).

The Principles of Integrated Environmental Management - (DEAT 1992)

- *Informed decision-making.*
- *Accountability for information on which decisions are taken.*
- *Accountability for decisions taken.*
- *A broad meaning given to the term environment that includes physical, biological, social, economic, cultural, historical and political components.*
- *An open, participatory approach in planning of proposals.*

The following series of IEM Guidelines will be 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;*
- *DEAT (2004), Criteria for determining alternatives, Integrated Environmental Management, Information Series 11;*
- *DEAT (2004), Environmental Management Plans, Integrated Environmental Management, Information Series 12;*
- *DEAT (2004), Review in EIA, Integrated Environmental Management, Information Series 13;*
- *DEAT (2005), Environmental Reporting, Integrated Environmental Management, Information Series 17.*

3.4 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY NO ACT, 10 OF 2004)

This Act controls the management and conservation of South African biodiversity within the Framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically makes provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

3.5 NATIONAL WATER ACT (ACT NO. 36 OF 1998)

National Water Act 1998 (Act 36 of 1998) & Water Services Act 1997 (Act 108 of 1997): The purpose of this Act is to "ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled. The Water Act takes into account the meeting of basic human needs of present and future generations, equitable Services Access to water, redressing the results of past discrimination, efficient, sustainable and beneficial use of water in the public interest, and other factors.

The National Water Act (Act 36 of 1998) recognizes that the entire ecosystem and not just the water itself in any given water resource constitutes the resource and as such needs to be conserved. No activity may therefore take place within a water course unless it is authorized by the Department of Water Affairs (DWA). Any area within a wetland or riparian zone is therefore excluded from development unless authorization is obtained from DWA in terms of Section 21.

3.5.1 GENERAL NOTICE 1199 AS PUBLISHED IN THE GOVERNMENT GAZETTE 32805 OF 2009 AS IT RELATES TO THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998)

Wetlands are extremely sensitive environments and as such, the Section 21 (c) and (i) water use General Authorization does not apply to any wetland or any water resource within a distance of 500 meters upstream or downstream from the boundary of any wetland or estuary. This chapter outlines the requirements of national legislation that is relevant and applicable to the Hex River and its tributaries.

3.5.2 CHAPTER 4 (USE OF WATER)

Water use, as defined in the Act (Section 21) includes:

a. *Taking water from a water resource;*
b. *Storing water;*
c. *Impeding or diverting the flow of water in a watercourse;*
d. *Engaging in a stream flow reduction activity contemplated in section 36;*
e. *Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);*
f. *Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;*
g. *Disposing of waste in a manner which may detrimentally impact on a water resource;*
h. *Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;*
i. *Altering the bed, banks, course or characteristics of a watercourse;*
j. *Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and*
k. *Using water for recreational purposes.*

Sub-sections (a), (e) (f),(g), (h), (i) and (k) relate to activities that could directly impact on the Hex River and its tributaries are self-explanatory, whilst (b), (c), (d) and (j) could relate to indirect human impacts affecting a river and or tributary (respectively, recharging an aquifer, with waste or water containing waste - all of which can affect the quantity and quality of the water in the river and or tributary).

3.6 THE NATIONAL HERITAGE RESOURCES ACT (ACT NO. 25 OF 1999)

3.6.1 STRUCTURES (SECTION 34 (1))

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.

3.6.2 ARCHAEOLOGY (SECTION 35 (4))

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.

3.6.3 BURIAL GROUNDS AND GRAVES (SECTION 36 (3))

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.*

3.6.4 APPLICATION REQUIREMENTS AND PROCEDURE

Permit applications must be made on the official form:

- *Application to destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of a Provincial Heritage Site or demolish a structure 60 years old or more, as protected in terms of the National Heritage Resources Act (Act No. 25 of 1999)*
- *Application for permit to destroy: Archaeological and paleontological sites and meteorites.*
- *Application for permit: Burial Grounds and Graves.*
- *The Proponent must submit permit applications to SAHRA or the relevant provincial heritage resources authority.*

3.7 MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002 (ACT 28 OF 2002)

In the case where the need may arise that additional material is needed and the only source for this material are borrow pits that fall outside the construction site. In this scenario, the submission of an Environmental Management Programme Report (EMPR) to the Department of Minerals and Energy to obtain a licence would be a legal requirement.

3.8 CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT 43 OF 1983)

The Conservation of Agricultural Resources Act ([CARA] Act 43, 1983) provides for the:

- *Protection of wetlands; and*

- *Requires the removal of listed alien invasive species.*

The National Department of Agriculture is the responsible authority for enforcing the CARA. This Act also requires that any declared invader species on Eskom land must be controlled according to their declared invader status.

3.9 NATIONAL ROAD TRAFFIC ACT (ACT 83 OF 1996)

This Act is relevant if the Municipality intends to transport, load, off-load or package dangerous goods as listed in SANS Code of Practice 10228.

3.10 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT 59 OF 2008)

The National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008), came into operation on the 1st of July 2009. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA) and introduced new provisions regarding the licensing of waste management activities. In terms of the Waste Act no person may commence, undertake or conduct a waste management activity except in accordance with:

- *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.*

A list of waste management activities was published on the 3rd of July 2009. This list of activities identifies activities that may not be commenced, undertaken or conducted by any person unless a waste management licence is issued in respect of that activity.

3.11 THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT NO.39 OF 2004

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.

The Act makes provision for the setting and formulation of national ambient air quality standards for substances or mixtures of substances which present a threat to health, well-being or the environment.

3.12 OCCUPATIONAL HEALTH AND SAFETY ACT 85 OF 1993

The act aims to provide for the health and safety of persons at work and for the health and safety of persons in connection with 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 in connection with the activities of persons at work.

3.13 NATIONAL ENERGY ACT OF 2008 & ELECTRICITY REGULATION ACT

The purpose of the act is ensure that diverse energy resources are available, in sustainable quantities and at an affordable prices 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 also establish institutions responsible for energy research.

3.14 WHITE PAPER ON ENERGY POLICY 1998

The policy has five objectives for energy sector which are:

- *increased access to affordable energy services;*
- *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. The paper recognises the potential of renewable energy in securing supply through diversity. It further noted that Government should not only increase its capacity to address the need of the day, but also improve long term issues, such as development of renewable energy resources to achieve a more sustainable mix.*

3.15 STRATEGIC INTEGRATED PROJECTS

The South African Government adopted an Infrastructure Plan that is intended to transform the economic landscape of the country, create a significant number of new jobs, strengthen the delivery of basic services to the people of South Africa and support the integration of African economies. 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 two of the SIPs namely:

- ***SIP 4: Unlocking the economic opportunities in North West Province***

The acceleration of identified investments in road, rail, bulk water, water treatment and transmission infrastructure will result in reliable supply, basic service delivery and facilitate further development of

mining, agricultural activities and tourism opportunities and open up beneficiation opportunities in North West Province.

- ***SIP 10: Electricity transmission and distribution for all***

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.

3.16 PROMOTION OF ACCESS TO INFORMATION ACT (ACT NO. 2 OF 2000)

Section 32 of the Constitution enshrines the right of access to certain information, and the Promotion of Access to Information Act (PAIA) gives effect to that right. 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 open and democratic society.

3.17 PROMOTION OF ADMINISTRATIVE JUSTICE ACT (ACT NO.3 OF 2000)

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 objectives and purpose of PAJA are the as follows:

- *It ensures that administrative procedures are fair;*
- *It gives people the right to ask for reasons; and*
- *It gives citizens the right to have administrative action reviewed by the courts.*

4. THE RECEIVING ENVIRONMENT

Site information used during the environmental assessment process was compiled by the following specialists:

Table 4-1: **List of Specialists**

AREA OF SPECIALIST	SPECIALIST
Avi-fauna	*Chris Van Rooyen*
Air Quality	*Rayten Engineering Solutions*
Biodiversity	*Dr. Wynand Vlok*
Heritage and Palaeontology	*Vhubvo Archaeo-Heritage Consultant*
Social Assessment	*Strategic Environmental Focus*
Soil and Land Capability	*Holistic Environmental Services*
Tourism	*Nuleaf Planning and Environmental*
Visual	*AXIS Landscape Architects*
Wetlands	*Farai Dondofema*

4.1 CLIMATE

4.1.1 TEMPERATURE

The North West Province generally experiences warm to hot summers and mild to cool winters. Average minimum temperatures range from approximately 10-18ºC in summer to 3-9ºC in winter. Table 4-2 shows that there is a slight temperature increase from 2001 and 2010 in all the months except for June where it decreased.

Table 4-2: **Average Minimum Monthly Temperature (˚C)**

Months	2001	2010
January	16.60	18.81
February	16.90	18.14
March	15.75	17.57
April	13.60	14.22
May	7.40	8.81
June	4.15	3.16
July	3.05	5.10
August	5.55	6.16
September	10.55	10.89
October	14.70	15.31
November	15.20	17.10
December	16.40	17.36

Source: RLM IDP 2013-2014

4.1.2 RAINFALL

The project area falls within the summer rainfall area, receiving most of its rainfall in the summer months. Table 4-3 shows that average rainfall generally range from 300 to 488mm except for 2004, 2005 and 2006 which receive average rainfall ranging from 571-835mm. Relative humidity is lowest during winter and spring and highest during summer and autumn.

Table 4-3: **average Annual Rainfall (2001-2010)**

Year	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
A.A.R	*436.92*	*335.50*	*487*	*606.76*	*571.32*	*834.97*	*436.14*	*400.49*	*487.19*	*363.41*

A.A.R*= Average Annual Rainfall (mm)*

Source: *RLM IDP 2013-2014*

4.1.3 WIND

According to Rayten Engineering Solutions, 2014, local meteorological data was obtained from a meteorological station operated by the South African Services in Rustenburg for the period January 2010- December 2012. Data collected include wind speed, wind direction, temperature, pressure, humidity and precipitation.

Table 4-4**: Data Captured from the Rustenburg Metereological Centre**

PARAMETER	***DATA CAPTURE (%)***
Wind Speed	*89.97*
Wind direction	*89.97*
Temperature	*90.88*
Pressure	*90.40*
Humidity	*90.87*
Precipitation	*91.34*

Source: *Rustenburg Strengthening Project- Air Quality Impact Assessment, 2014*

The predominant wind direction recorded at Rustenburg is from the south west. Wind speed is generally slow to moderate with wind speed exceeding 6m/s recorded infrequently. Calm conditions which are defined as wind speeds less than 1m/s occur frequently.

According to the Air Quality Impact Assessment carried out in the project area, a distinct variation in winds is not observed in the meteorological dataset in Rustenburg. In the early morning and late morning, winds originate predominantly from the south west although occurring with less frequency from the latter. Stronger winds are also observed from the northerly and the easterly direction. During the afternoon (12:00-18:00), winds originate predominantly from the westerly, northerly and easterly whilst in the evening they shift back to the south west. Slower winds are recorded during the night time as compared to day-time.

There is no distinct seasonal variation with winds originating predominantly from the south west during all seasons with a higher occurrence in winter. An increase in wind speeds is noted during the spring months (September- November). Reference is made to the Air Quality Impact Assessment Report attached in Appendix E-1.

4.2 SOILS AND LAND CAPABILITY

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 strongly structured soils mainly dark coloured dominated by swelling clays. The clay content in this area is greater than 35%. These may occur associated with one or more melanic and red structured soils with a water holding capacity of 0-20mm making them difficult to cultivate due to their narrow range of available moisture. Though the soils are highly fertile, the land capability class of the area is classified as moderate agriculture potential. This is mainly due to the shallow depth of the soils which limits the range of crops that can be grown on such soils. Reference is made to the map in Appendix D-4.

An agricultural potential assessment of the area was undertaken and the report is attached in Appendix E-7.

4.3 SURFACE WATER RESOURCES

The study area is located in the Limpopo Primary Catchment with the quartenary catchment being A22H. The main river system that runs through the catchment is Hex River which has Waterkloospruit and Rooikloofspruit as tributaries. Table 4-5 below shows the ecological status of A22H.

Table 4-5: **Ecological Status of the Quartenary Catchment A22H**

Catchment	Province	Resource	EIS	PEMC	DEMC
A22H	*North West*	*Hex*	*Moderate*	*Class C: (Class D based on desktop certainty)*	*Class C: Moderately Sensitive System*

Source: Wetland Assessment Report, Rustenburg Strengthening Project, 2014

The ecological functions, importance and sensitivity in this catchment are as follows:

- *The riverine systems in this catchment have a moderate diversity of habitat types, with some pools, riffles and rapids present; and*
- *The site has a low importance in terms of conservation.*

The site is drained by means of surface run off collecting in the north-east at Bospoort Dam which is the largest artificial surface water body, with a surface area of approximately 379ha and is in close proximity to the study area. According to the Municipality's IDP 2013-2014, the dam has been subjected to a large amount of fishing effort and is used for irrigation and domestic water supply. NFEPA wetlands classifies the dam as heavily to critically modified and this might be due to possible sewerage contamination from treatment works upstream, agricultural run-off, urban run-off mining effluents and re-circulation of nutrients from bottom sediments.

A non-perennial stream traverses across corridor 2 from the south eastern border to the northern border whilst a non-perennial stream is located approximately 160m from the north western border of corridor 1 and a wetland is located approximately 300m from the southern border of substation 3. A detailed Wetland Assessment Report is attached to the in Appendix E-10.

4.4 GROUND WATER

Groundwater forms part of the four sources of water available within the Local Municipality. 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 15m. 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.

4.5 GEOLOGICAL CONDITIONS

4.5.1 LITHOSTRATIGRAPHY

The geology is underlain by mafic intrusive rocks of the Rustenburg Layered suite of the Bushveld Igneous rocks that include gabro, norite, pyroxenite and anorthosite. Some quartzites and shales associated with the Pretoria group part of the Transvaal supergroup.

4.5.2 TOPOGRAPHY

Due to the close proximity of the alternative sites and corridors, the terrain is the same. Surrounding elevations range from approximately 1040 – 1340 metres above mean sea level with the proposed sites situated at approximately 1122 – 1138 metres above sea level. The area is characterised of plains with open low hills or ridges. There is a koppie in the northern section of corridor 1 and in the south eastern border of substation site alternative 2. The vegetation in these areas is relatively intact. Sections of substation alternative 1 and 3 and corridor 3 is characterised of small rocky outcrops in some areas. Reference is made to Figure 4-1 to 4-3.

Figure 4-1: **Koppie and vegetation in the south western border of substation site 2**

Figure 4-2: **Rocky outcrops in the western side of the substation site 1**

Figure 4-3: **Rocky outcrops in the northern part of substation 3**

4.6 FLORA & FAUNA

4.6.1 LOCAL VEGETATION

According to the National Biodiversity Assessment (2011), the vegetation type of the area is classified as Marikana Thornveld previously referred to as Sourish Mixed Bushveld or Other Turf Thornveld (Acocks, 1953) and Clay Thorn Bushveld (Low and Rebelo, 1996). It is mainly associated with plains to the east of Rustenburg, around Marikana to Brits and Pretoria. The vegetation is characterized by open Acacia karroo woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Reference is made to Figure 4-4 below for the surrounding vegetation types.

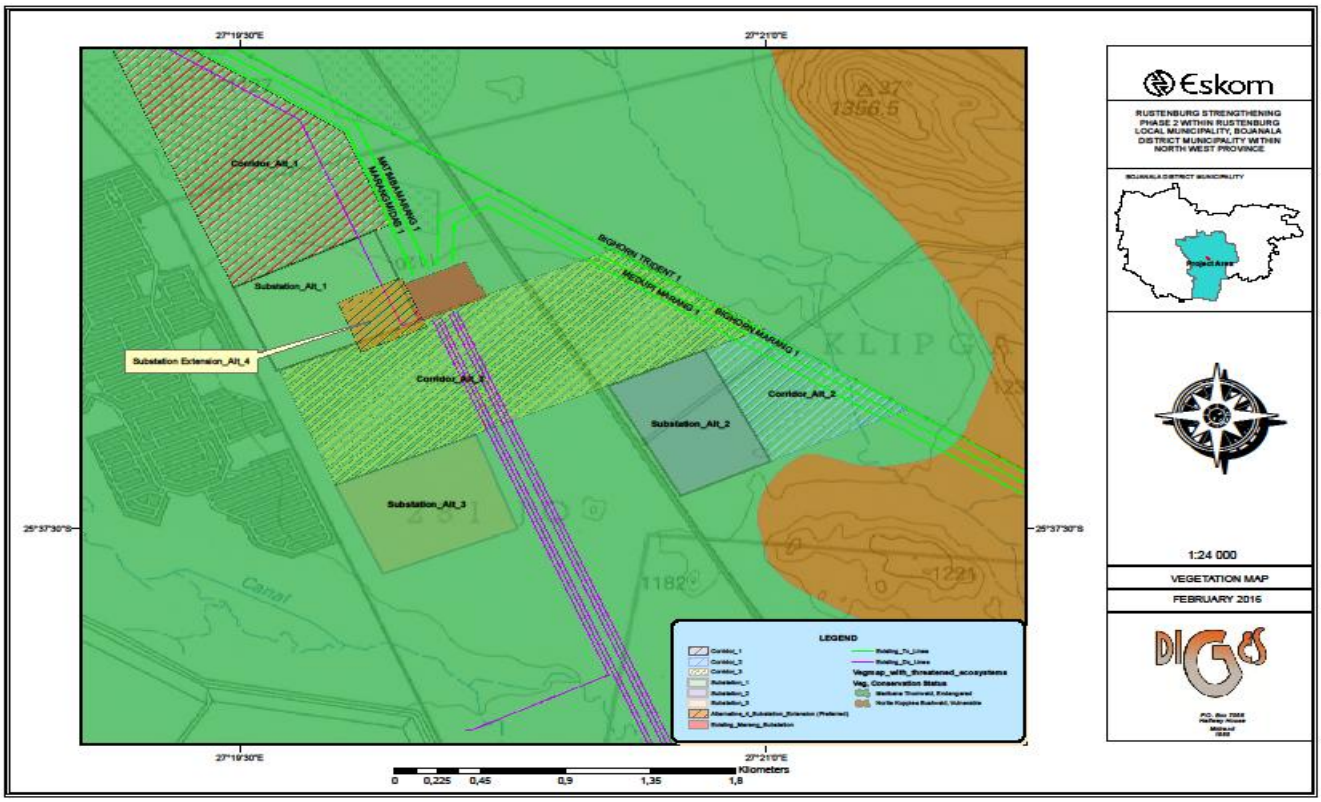

Figure 4-4: **Vegetation Map of the area**

Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other places protected from fire. This vegetation type is categorised under endangered with 52.1% remaining, 2.2 % protected and 19% targeted. The vegetation has been modified due to urban development, grazing, cultivation and mining activities.

- *Important taxa within this vegetation type include:*
- *Tall tree: Acacia burkei;*
- *Small trees: Acacia caffra, A. gerrardii, A. karroo, Combretum molle, Rhus lancea, Ziziphus mucronata, Acacia nilotica, A. tortilis subsp. heteracantha, Celtis africana, Dombeya rotundifolia, Pappea capensis, Peltophorum africanum, Terminalia sericea;*
- *Tall shrubs: Euclea crispa subsp. crispa, Olea europaea subsp. africana, Rhus pyroides var. pyroides, Diospyros lyeioides subsp. guerkei, Ehretia rigida subsp. rigida, Euclea undulata, Grewia flava, Pavetta gardeniifolia;*
- *Low shrubs: Asparagus cooperi, Rhynchosia nitens, Indigofera zeyheri, Justicia flava;*

- *Woody climbers: Clematis brachiata, Helinus integrifolius;*
- *Herbaceous climbers: Pentarrhinum insipidum, Cyphostemma cirrhosum; graminoids: Elionurus muticus, Eragrostis lehmanniana, Setaria sphacelata, Themeda triandra, Aristida scabrivalvis subsp. scabrivalvis, Fingerhuthia africana, Heteropogon contortus, Hyperthelia dissoluta, Melinis nerviglumis, Pogonarthria squarrosa;*
- *Herbs: Hermannia depressa, Ipomoea obscura, Barleria macrostegia, Dianthus mooiensis subsp. mooiensis, Ipomoea oblongata, Vernonia oligocephala; and*
- *Geophytic herbs: Ledebouria revoluta, Ornithogalum tenuifolium, Sansevieria aethiopica.*

4.6.2 ON-SITE VEGETATION

The natural vegetation at all substation sites and corridors is severely modified and very few large trees are present. This is due to grazing; wood harvesting and agricultural activities. According to the ecological survey done on the site, the trees that dominate the site are Acacia mellifera, A. robusta, Searsia lancea, Ziziphus mucronata and Sclerocarya birrea which was observed on the rocky outcrop on the northern section of corridor 1 and southern section of corridor 2. These koppies are considered as an important habitat and refuge areas for migrating biota and plant diversity. The few rocky outcrops present in substation extension site and corridor 3 are not considered as an important ecological habitat due to their small size. No alien invasive infestations and limited erosion was observed on sites 1 and 3. Trampling at the stream near substation site 2 has resulted in erosion.

4.6.3 AVI-FAUNA

Woodland is the dominant natural vegetation within the project area. Bird species that might be present from time to time include the White-backed Vulture, Cape Vulture Gyps coprotheres, Martial Eagle, Tawny Eagle, and Lappet-faced Vulture. Apart from Red Data species, it also serves as the stronghold of several non-Red Data raptor species, such as the Brown Snake Eagle Circaetus cinereus, Black-chested Snake Eagle Circaetus pectoralis, and a multitude of medium-sized raptors for example the migratory Steppe Buzzard Buteo vulpinus, African Harrier Hawk (Gymnogene) Polyboroides typus, Wahlberg's Eagle Aquila wahlbergi and African Hawk Eagle Aquila spilogaster.

According to Van Rooyen, 2014, the project area is situated within a 50km radius of two Important Bird Areas (IBA) namely SA025 (Magaliesberg and Witwatersberg), and SA023 (Pilanesberg). The Magaliesberg forms the core of the Magaliesberg and Witwatersberg IBA. The area north of Rustenburg towards Pilanesberg, particularly those areas that belonged to the former Bophutatswana homeland, has extensive populations of livestock, particularly donkeys, and carcasses of the latter are scavenged

by Cape Vultures. Pilanesberg IBA is important in that it represents a large, well-managed protected area. It has extensive populations of waterbirds, centred on the Mankwe River and dam.

Avifaunal habitats within the study area are classified based on the vegetation structure and not on the plant species composition. The habitat at the alternative sites is similar consisting of open, moderate to heavily disturbed woodland. The vegetation consists mostly of short trees and shrubs, with an extensive but heavily grazed grass under storey. According to Van Rooyen, 2014, it shows signs of sustained high stocking rates which in turn has led to a depletion of the grass layer. In rocky areas, vegetation is less disturbed such as the rocky area in the northern section of Corridor 1 which is relatively small and will not have an impact on the avi-fauna that can be expected in the area.

4.7 LAND USE

The landscape associated with the corridors for the power line, substation and extension site is characterised of modified vegetation with activities such as mining, housing, cultivated lands and grazing surrounding the project area. Anglo Platinum mine borders the project area in the south, Bospoort dam is approximately 2.5km north of the site and Boitekong Township is in the west. The sites are adjacent to the existing Marang 400/88kV substation and associated 400kV and 88kV power lines that feed in and out of the substation traverse across the area. Illegal dumping of household and building refuse is present within corridor alternative 1. Reference is made to the attached ***Appendix D-3*** *for the Land Use Map.*

4.8 ARCHAEOLOGICAL AND PALAEONTOLOGICAL 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 could potentially impact on heritage sites. A detailed heritage study is attached in Appendix E -5.

4.9 VISUAL ENVIRONMENT

The following activities/infrastructure can be classified as landscape disturbances that affect the quality of the visual resource:

- *agricultural farms,*
- *the settlements with their subsistence farming and*
- *existing infrastructure, including transmission lines, roads, etc.*

The project area is characterised by rural settlements, electrical infrastructure and previously cultivated areas. The proposed power lines and/or substation will not set a precedent to the area as there are existing distribution and transmission lines and the Marang Transmission substation. However, the visual impacts of the proposed project can be localised by strategic placing of structures. A Visual Impact Assessment Report is attached in Appendix E-9.

4.10 AIR QUALITY

4.10.1 SOURCES OF AIR POLLUTION

The air quality in Rustenburg Local Municipality (RLM) is generally poor due to activities from different land uses 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 the following:

i. **Agriculture activities**

Agricultural activities within the Local Municipality are mainly concentrated in the south where they practice commercial dry-land farming. Areas surrounding the proposed project practice small scale agriculture. Expected emissions resulting from these activities include particulates associated with wind erosion, burning of crop residue, chemicals associated with crop spraying and foul smelling emissions resulting from manure, fertilizer and crop residue. Dust resulting from these activities may contain seeds, pollen and pesticides. Vehicles travelling at high speeds on gravel roads can also increase particulates in the air.

ii. **Domestic Fuel Burning**

Some of the areas surrounding the project area use domestic fuels such as wood and paraffin for cooking and heating. Pollutants released from this activity include carbon monoxide (CO), Nitrogen dioxide (NO_2), sulphur dioxide (SO_2), inhalable particulates and poly aromatic hydrocarbons. Poly aromatic hydrocarbons are produced as a result of incomplete combustion whilst the particulates released from wood contain respirable particles that are small enough to be deposited in the lungs.

iii. ***Mining***

Anglo Platinum Mine is located in close proximity to the proposed project area. Mining operations such as bulldozing, dragline removal of overburden, blasting, vehicles travelling on unsealed roads and emissions from vehicles result in the emission of dust particles. In addition, wind erosion on tailing dams also contribute to dust being emitted. Dust emissions from the neighbouring mine will contribute to ambient particulate concentrations.

iv. **Vehicle Tailpipe Emissions**

The project area is accessed from D522 road. In addition to vehicles which will be used on-site, vehicles using this road will also contribute to atmospheric pollutants such as carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NO_x), sulphur dioxides (SO_2) and particulates. These pollutants are produced from the tailpipe, from the engine, fuel supply systems and tyres.

4.10.2 BASELINE AIR QUALITY SITUATION

According to Rayten Engineering Solutions cc, 2014, Rustenburg Local Municipality operates Boitekong Air Quality Monitoring Station (BAQMS) which is located approximately 1km west of the proposed sites. Pollutant concentrations recorded at this station are therefore representative of the existing baseline condition on the project site and in areas in the immediate vicinity.

Table 4-5 shows the percentage data capture for all the pollutants recorded at BAQMS which falls below the SANAS requirements of 90% data capture per parameter hence the monitoring data could not be used to assess the existing baseline air quality situation.

Table 4-6: **Percentage Data Capture recorded at BAQMS**

POLLUTANT	***DATA CAPTURE %***
PM10	*12.49*
SO_2	*62.42*
NO_2	*12.95*
CO	*14.95*
O_3	*46.40*

Source: *Air Quality Impact Assessment-Rustenburg Strengthening Project, 2014*

4.11 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 Rustenburg Local Municipality, Bojanala District Municipality, North West Province and Royal Bafokeng Nation documents pertaining to the project area were consulted.

4.11.1 POPULATION DEMOGRAPHICS

According to Census 2011, the total population of the municipality is 549 575 accounting for 5.6% of the province's total population. There are 199 044 households with an average size of 2.8 persons.

There is a slow population growth rate within the province with Rustenburg Local Municipality (RLM) having a high population growth rate of 3.5% as compared to 2.4% and 1.6% for Bojanala District and North West Province.

4.11.2 GENDER

The 2011 census results have shown that the municipality has an even gender profile with approximately 54.9% of the population being females and 45.1% being males. Economic active category group was approximately 72.5% whilst elderly people and the dependant age group (0-19 years) are 3.4% and 24.1% respectively.

4.11.3 LANGUAGE

The most dominant language is Setswana.

4.11.4 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. A high proportion of the population within the Local Municipality is regarded as literate or functionally illiterate. The number of highly skilled people also remains limited with only 8.9% of the adult population with tertiary education which has increased by 2% from .9% in 2001. According to Statistics South Africa, 2011 census 5.4% of adult population within the Local Municipality is illiterate with no form of schooling which is lower than the District's 7.6%.

4.11.5 EMPLOYMENT PROFILE

Unemployment rate within the Local Municipality has decreased by 5.4% in 10 years within the period 2001 to 2011. At the district level the rate decreased by 10.2% in the same period. According to RLM

Integrated Development Plan (IDP) 2013-14, there has been a significant decrease among females from 14 512 in 2001 to 10 705 in 2010.

4.11.6 HOUSEHOLDS BY DWELLING TYPE

According to the Rustenburg Local Municipality IDP 2013-2014, there are four broad types of settlements within the Local 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 Rustenburg, Tlhabane, Boitekong, Rankolenyane, Phatsima, Hartbeesfontein, Kroondal and Marikana.

ii. Tribal Settlements

These are mainly located on Bafokeng tribal land and the households living in these settlements are considered Bafokeng citizens. Although these households do not own title deeds, they have security of tenure through their association with the tribe and are characterised by varying levels of service. Settlements that fall within this category include areas such as Phokeng, Kanana, Luka, Chaneng, Tlaseng, Thekwane and Photsaneng.

iii. Rural Settlements

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

iv. Informal Settlements

These have mainly developed along the mining belt. These include areas such as Wonderkoppies, Nkaneng, Zakhele, Popo Molefe and Freedom Park. The informal settlements are characterised by a lack of security of tenure and a lack of basic municipal services. Some of these settlements are in the process of being upgraded or relocated.

4.11.7 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***

According to the 2007 Census, the most frequently use of electricity in the municipality is lighting 35.3% followed by cooking and heating with 34.1 % and 30.6% respectively.

- ***Water***

84.3% of the households have access to piped water inside dwellings which is an improvement from the 62.4% of 2001. 20.6% have piped water outside their yard whilst 17% had no access to water. (Stats SA, Census 2011)

- ***Toilet facilities***

According to Statistics South Africa, 2011, households within the Municipality with flush toilets have increased from 42.1% in 2001 to 58.1% in 2011; this is higher than Bojanala's 38.3%. The percentage of people with no toilets has decreased significantly from 12.7% in 2001 to 3.9% in 2011.

- ***Refuse removal***

The municipality is responsible for the collection of domestic waste generated through door-to–door collection. However, in certain areas waste is collected by a private waste contractor (Millennium Waste, C&D Plastics), which was contracted by the municipality to help fulfill part of its service.

The standard of refuse removal in the municipality has improved tremendously increasing with 72.5% of households' waste being removed by the municipality or a private company and 5.8% of the households not having any waste removal facilities.

4.11.8 ECONOMIC ACTIVITY

According to Rustenburg Local Municipality (RLM) LED, the main contributor towards total exports within the district municipality is platinum in a semi-manufactured form. Platinum is the largest contributor to exports followed by ferro-chromium (28.2%), rhodium (8.9%) and palladium (6%). Due to the high concentration of platinum mining within RLM, a high concentration occurs within the local municipality. The Local Municipality is too dependent on the mining sector which could cause major problem if the mines are closed or when the strikes persist.

The mining sector employs more than half of the economically active people followed by trade (15.3%) and community services (8.3%). The electricity sector employs the least people accounting for 0.2%. Reference is made to Figure 4-1 for the formal employment sector.

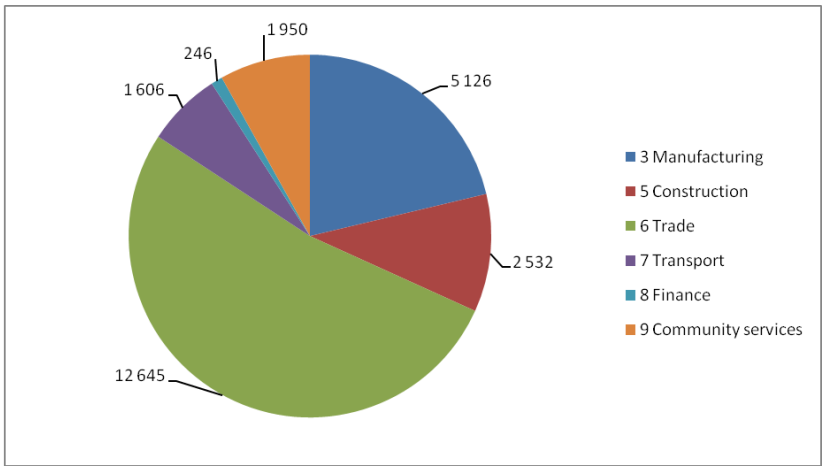

Figure 4-5: **Formal Employment sectors within Rustenburg Local Municipality**

(Source: RLM IDP 2013-14)

In the informal sector, the majority of people are employed in the trade sector followed by manufacturing and construction. Reference is made to Figure 4-2 overleaf for the informal trade sectors.

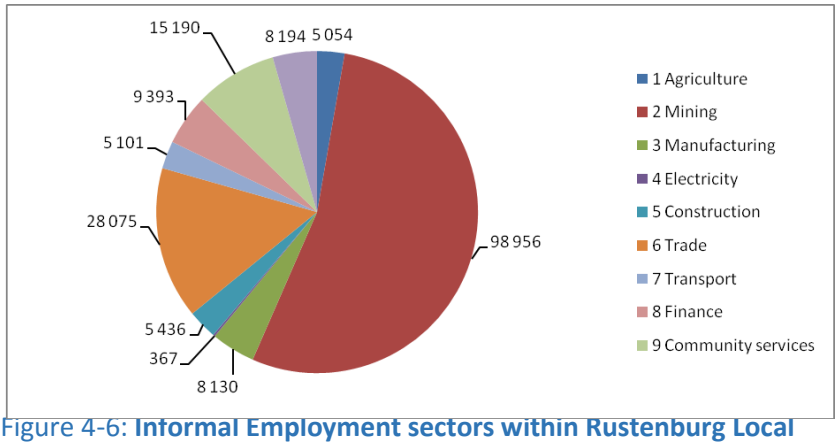

Figure 4-6: **Informal Employment sectors within Rustenburg Local Municipality**

(Source: RLM IDP 2013-14)

4.12 TOURISM

4.12.1 NATIONAL TOURISM TRENDS

South Africa is highly diverse in terms of its climate, culture, tourist activities and infrastructure catering for every tourism niche from business, eco- and cultural tourism through to adventure, sport and paleo-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.

The National Tourism Sector Strategy launched in 2011, aims to ensure the sector realizes its full potential in terms of job creation, social inclusion, services exports and foreign exchange earnings, fostering a better understanding between people, cultures and green transformation. Tourism opportunities that exist to grow South Africa's National Market share include wine, medical, and rural tourism.

4.12.2 PROVINCIAL TOURISM TRENDS

The North West Province lies in the north of the country on the Botswana border, boarded by Kalahari Desert in the west, Gauteng Province in the east and the Free State in the south. The province is largely characterized by flat regions of scattered trees and grassland. The attractions that highlight the natural beauty of the province are Magaliesberg mountain range, Pilanesberg Game Reserve, Taung Heritage Site, Vredefort Dome, Madikwe Game Reserve and various cultural villages.

The province has experienced a decline in international tourists by 1.1% to 5.4% which is far less than Gauteng's 44.6%. Locally the province received 6% of the tourist. (NuLeaf Planning Environmental, 2013).

4.12.3 LOCAL TRENDS

In Rustenburg Local Municipality, tourism also plays an important role. The typical Bushveld climate and vegetation of the Municipal Area as well as the unique topography of the Magaliesberg, 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. Primary tourism areas and facilities located within the municipal area are as follows:

- *Rustenburg Town;*
- *Kgaswane Game Reserve;*
- *Vaalkop Dam Nature Reserve;*

- *Kroondal;*
- *Bafokeng Sport Palace; and*
- *Buffelspoort Dam.*

5. PUBLIC PARTICIPATION PROCESS

5.1 INTRODUCTION

Public Participation Process (PPP) was done according to Regulation 54 of the Government Notice R.543 in terms of the Environmental Impact Assessment Regulation, June 2010 that sets out the need and the processes that have to be followed when doing public participation. The PPP is viewed as a process of empowering communities in their efforts to safeguard the resource-base in more efficient ways and to use the resources sustainably. It will also enable 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.

The general public includes business, industry, academics, and people at the grass root level that may have additional non-indigenous knowledge and information which may help the sustainability of an activity. The Public Participation Process (PPP) forms a key component of Environmental Impact Assessment and has resulted in the identification of a number of issues. The approach and objectives of the PPP are outlined below.

5.2 OBJECTIVES AND APPROACH TO THE PPP

The objectives of the PPP were:

- *To gather input from Interested and Affected Parties (I&APs) regarding the level and nature of their interest in order 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 the Environmental Impact Report 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.*

5.3 PUBLIC PARTICIPATION PROCESS

As part of the development process, DIGES consulted with the stakeholders by giving them the opportunity to consider the project in detail and addressing their concerns during the entire project duration.

5.3.1 SCOPING PHASE

Prior to submission of the application form a notification letter was sent to the landowner, Royal Bafokeng Nation, informing them of Eskom's intention to strengthen the Rustenburg network. The proof of notification was appended to the application form. During the scoping assessment, as part of the public participation process, an advert was placed in the Sowetan and Rustenburg Herald on the 9th of December 2013 and 10th of January 2014 respectively informing the public about Eskom's intention to construct the power lines and substation. See Appendix F-3. In addition to the adverts, several site notices were placed in noticeable areas in the project area. Notification letters and Background Information Documents (BID) were given to the landowner, ward councillors, Local and District Municipalities, various Government Departments and the community during the public participation meetings.

To get the baseline environmental information and the public's perspective of the proposed power lines and substation alternatives and how it would affect them, DIGES liaised with the Royal Bafokeng Administration and the ward councillor for Boitekong Township to arrange public meetings. Prior to the community meetings, DIGES and Eskom Holdings SOC Ltd had consultations with the landowner, Royal Bafokeng and the leadership of the community on the 15th and 31st of January 2014. Meetings with the community were then arranged through the Royal Bafokeng Administration. The meetings were also advertised in the newspapers, Sowetan and Rustenburg Herald on the 25th and 28th of February 2014. Reference is made to Appendix F-4 for the newspaper adverts. DIGES held six public meetings from the 4th of March to the 18th of March 2014 to provide project information including potential impacts to the public. Reference is made to Table 5-1 for the location and dates of the public meeting.

Table 5-1: **Public Participation Meetings**

Date	***Venue***	***Time***
04 March 2014	*Thekwane Primary School, Thekwane, North West*	*1700hrs*
05 March 2014	*Mfidikoe Primary School, Mfidikoe, North West*	*1700hrs*
06 March 2014	*Photsaneng Primary school, Photsaneng, North West*	*1700hrs*
10 March 2014	*Thekwane Primary School, Thekwane, North West*	*1700hrs*
18 March 2014	*Tsholofelo College*	*1400hrs*
18 March 2014	*Photsaneng Primary School, Photsaneng, North West*	*1700hrs*

Though all steps were taken to inform the public about the meetings there was a poor attendance. In Thekwana and Photsaneng villages the meetings had to be rescheduled. DIGES and Eskom's responses to the issues raised during the meeting were recorded in the Comments and Response Report attached in Appendix F-1.

During the public review of the Draft Scoping Report, an advert was placed in the Sowetan and Rustenburg Herald on the 30th of April 2014 and 2nd of May 2014 respectively informing the public about the locations where they could access the scoping report. (See Appendix F-5 for the newspaper adverts) In addition to the newspaper adverts, notices were also placed on site. The Draft Scoping Report was also submitted to all the stakeholders listed in Appendix F-2 and the proof was appended to the report.

5.3.2 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

An advert was placed in the Sowetan and Rustenburg Herald on the 19th and 21st of November 2014 informing the public about the locations where they could access the draft environmental impact report. In addition, public meetings were held in all four areas to inform the public about the findings and recommendations made during the impact assessment phase. The newspaper adverts are attached in Appendix F-6. The draft report was made available to the identified stakeholders in Appendix F-2 and in addition the report could also be accessed at the following locations:

1. *DIGES, Suite 2, 546, 16th Road, Midrand. Contact Person: Brenda Makanza;*
2. *Boitekong Community Library in Boitekong Township. Contact Person: The Librarian;*
3. *Reception Desk at Tsholofelo College in Boitekong Township, North West;*
4. *Reception Desk at Mfidikwe Primary School in Mfidikwe Village, North West;*
5. *Reception Desk at Thlage Primary School in Thekwana Village, North West Province;*
6. *Reception Desk at Photsaneng Primary School in Photsaneng Village, North West Province.*

Reference is made to Appendix F-7 for the proof of submission.

Public meetings were also held in all the areas after the public review period. Reference is made to Appendix F-1, F-8 for the Comments and Response Report and attendance registers. Table 5-2 cites the places where the public meetings were held:

Table 5-2: **Public Participation Meetings**

Date	***Venue***	***Time***
04 March 2015	*Tsholofelo College, Boitekong Township, North West*	*1600hrs*
24 March 2015	*Photsaneng Primary School, Mfidikoe, North West*	*1700hrs*
26 March 2015	*Thekwane Primary School, Thekwane, North West*	*1600hrs*
16 April 2015	*Mfidikoe Primary School, Mfidikoe, North West*	*1630hrs*

Revision of Environmental Impact Report

The revision of the EIR to include the assessment of the additional alternative of extending the existing Marang substation entails that Interested and Affected Parties be notified of this revision. I&APs were notified of the change in the scope of works via e-mails. Reference is made to Appendix F-7 for the proof of notification. The revised report will be availed to them for a 30 day review period.

5.4 SUMMARY OF COMMENTS RECEIVED AND RESPONSE

The table below gives a summary of the comments that were received from Rustenburg Local Municipality, South African Heritage Resources Authority and the Department of Rural, Environment, Agriculture and Development. Comments received to date and the responses given are attached in Appendix F-1 and F-3.

Table 5-2: **Comments and Response**

STAKEHOLDERS	***COMMENTS***	***RESPONSE***
Rustenburg Local Municipality	***At Scoping Phase*** *i. All hazardous and solid waste must be disposed of at a licensed waste disposal site;* *ii. Precautionary measures must be taken to reduce the possibility of soil erosion;* *iii. Adequate storage of contaminated substances should be provided; and* *iv. Complaints Register must be kept on site to document all complaints and how they were addressed;* *v. The project is located in an area that has already been severely modified hence the project is supported with the inclusion of mitigations measures that reduce further degradation.* ***At Environmental Impact Assessment Phase*** *i. The Integrated Environmental Management unit has no objection to the proposed construction power line, however, wishes to indicate that the recommendation*	▪ *Comments were noted and will be included in the Environmental Impact Report (EIR) and the Environmental Management Programme (EMP)*

	stated on draft scoping report dated 28 May 2014 still stands.	
South African Heritage Resources Authority	***At Scoping Phase*** *i. A Heritage impact Assessment should be undertaken before sites are disturbed;* *ii. A paleontological Desk Top study should be undertaken where bedrock is to be affected. An exemption letter from a Paleontologist is needed to indicate that there is no need of a Phase 1 Paleontological Impact Assessment;* *iii. Heritage Resources such as built structures over 60 years and graves that may be impacted must be assessed.* ***At Environmental Impact Assessment Phase*** *i. SAHRA has no objection to the proposed project ;* *ii. The recommendation for the substation is site 1, the preferred option for the substation will have the least impact on the heritage resources.* *iii. If any heritage resources are discovered during construction contact Mr. Phillip Hine (SAHRA) on 021 482 4502.*	• *Comments were noted. An archaeologist and Paleontologist were appointed to undertake studies.*

Department of Rural, Environmental and Agricultural Development	*i. The preferred route and site for the proposed construction of Rustenburg strengthening (Marang B) is supported due to the close proximity of the existing substation. The proposed substation must be located more towards the existing substation than the community of Boitekong;* *ii. Power lines must be marked with bird flight where they cross over rivers;* *iii. An Environmental Control Officer (ECO) must be appointed for the duration of the construction phase;* *iv. All the proposed mitigation measures as outlined in the draft EIA report and draft EMPr report must be implemented and adhered to at all time;* *v. The proposed area must be demarcated; all plant species must be removed from demarcated area. Removal of protected trees must be done at DAFF; and* *vi. Archaeological remains are protected by National heritage resource act, 1999. SAHRA must be notified should any archaeological artefacts be exposed or removed.*	• *Noted and incorporated in the EMPr.*

6. ALTERNATIVES

This Section identifies and describes the alternative infrastructure options and motivation for site and site selection for the proposed projects. In terms of the NEMA EIA Regulations, one of the criteria to be taken into account 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.

6.1 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.

To address these load constraints, Eskom evaluated the technical and economic feasibility of the four options discussed below:

6.1.1 EXTEND MARANG TRANSMISSION SUBSTATION (MTS) (PREFERRED)

This option entailed the extension of the existing Marang Transmission Substation with 2 x 315 MVA 400/88kV. The assessment indicated that this option would lock Marang Voltage 88kV in the 20 years forecasted and it would not allow distribution voltage to gradually migrate to 132kV for reliability in the area. At the time of application this option was not considered as it would not cater for 132kV power lines. In May 2015, after the Final Environmental Impact Report (FEIR) had been submitted to the Department of Environmental Affairs, the applicant Eskom Holdings SOC Ltd, indicated that a solution had been identified to allow migration to 132kV and it would entail the following:

- *Extension of the existing 400kV Busbar;*

- *Establish a new 132kV Busbar to enable installation of 2 x 500MVA 400/132kV Transformers initially;*
- *1 x future 500MVA 400/132kV Transformer;*
- *Establish and Equip 4 x 132kV feeders to allow existing 88kV Marang load shift;*
- *Establishing 4 x future 132kV feeders.*

The location of the extension will be addressed in Section 6.2 and will be referred to as alternative 4

6.1.2 CONSTRUCT A NEW MTS MARANG B

This option would entail the integration of Marang B with an end state design of 3 x 500, 400/132 kV substation by 2018. The load including all distribution upgrades would be done all at once and this would result in a high capital expenditure. Therefore this option was also not considered.

6.1.3 CONSTRUCTION OF A NEW MTS WITH PHASED DISTRIBUTION UPGRADES

This option is the same as option 2 which entails the introduction of a 132kV injection in the Marang supply area by establishing a new MTS to create space capacity for the next 20 years. The load shift would be done in two phases ensuring that the spare capacity at the new substation will be more due to the load being moved in small volumes and Phase 2 load shift is optional and will be determined by the load changes and requirements in the Marang supply area. The proposed new MTS is expected to de-load Marang MTS as well as create spare capacity to cater for Anglo Platinum's future load growth as well as other loads. At the time of application, this option was recommended and Phase 1 of the proposed works for this option would entail the construction of a new 400/132kV substation referred to as Marang B and loop in loop out 400kV power lines. Three substation and corridor alternatives were assessed for this activity alternative. Reference is made to Section 6.2.

6.1.4 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 Marang Network. This option was not considered due to the following network restraints:

- *Risk of load shedding from 2015 onwards;*
- *Capped 88kV load growth in the Marang network area;*
- *Further constraint on the Marang 400/88kV transformation; and*
- *Unutilised network capacity provided by the 400kV Medupi in feeds in the Rustenburg CLN.*

6.2 SITE 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.

Three substation sites and corridor alternatives and one substation extension alternative will be assessed. Co-ordinates for the alternatives are attached in Appendix C-3.

6.2.1 SUBSTATION SITE AND CORRIDOR ALTERNATIVE 1

The proposed substation site is approximately 39 hectares whilst the corridor has a width ranging from approximately 55-812m and length of 1800m respectively. The area is located to the North West of the existing Marang Transmission Substation (MTS) and East of Boitekong Township. The area is accessed via D522 tarred road and is also characterized by access tracks and existing 88kV power lines traversing across the substation and corridor site. The natural vegetation is severely modified due to activities related to agriculture, mining and urbanization. It is dominated by acacia shrubs and few large trees. A koppie is located in the northern side of the corridor and there are areas used as dumping grounds by the Boitekong community. Reference is made Figure 6-1 below for alternative 1 for the substation site and corridor.

Figure 6-1: **Alternative 1 for substation site and corridor**

6.2.2 SUBSTATION SITE AND CORRIDOR ALTERNATIVE 2

The proposed substation site is approximately 34 hectares whilst the corridor has a width of approximately 705m and length ranging from 268m to 698m respectively. The proposed area is located south east of the existing Marang Transmission Substation east of the D522 road and a gravel road to some mines cuts through the substation site. A small koppie is located in the south eastern border of the substation and substation and corridor. The vegetation is also modified due to past agricultural activities. A non-perennial stream that feeds into the Bospoort Dam located approximately 5km North West of the site cuts in the south eastern border of the corridor. Few rocky outcrops were observed within the substation and corridor sites. Reference is made Figure 6-2 below for alternative 2 for the substation site and corridor.

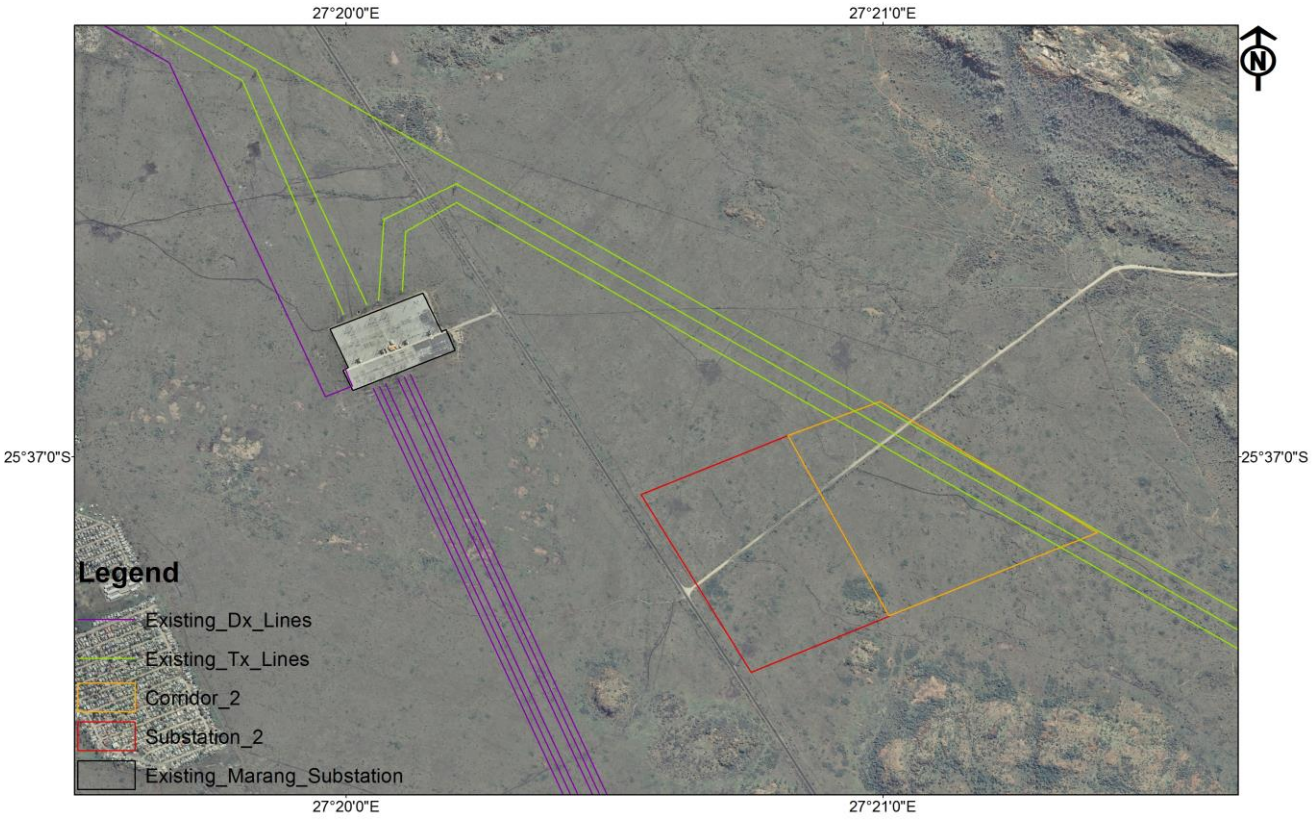

Figure 6-2: **Alternative 2 for the substation site and corridor**

6.2.3 SUBSTATION SITE AND CORRIDOR ALTERNATIVE 3

The proposed substation site is approximately 38 hectares whilst the corridor has a width and length of approximately 706m and 2 237m respectively. The proposed area is located to the south of the existing Marang Transmission Substation (MTS) and south east of Boitekong Township. Corridor 3 will start from the existing 400kV power lines located to the east to south east of the existing MTS. The corridor will cross D522 running parallel to MTS and substation Alternative 1 and 3. The area is also characterized by access tracks and existing 88kV power lines traversing across corridor site. The natural vegetation is severely modified due to activities related to agriculture, mining and urbanization. A small koppie is located to the east of the substation site and within the substation and corridor site there are a few small rocky outcrops.

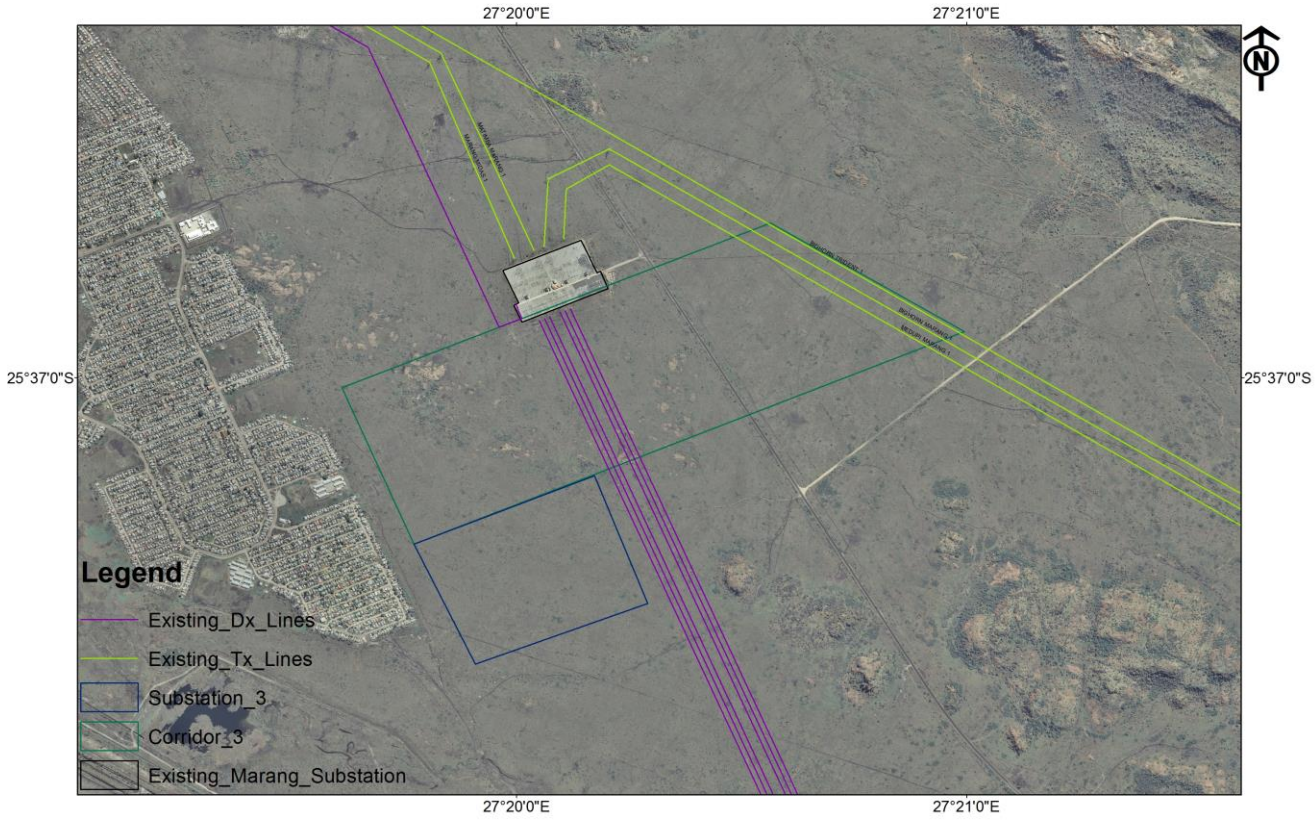

Figure 6-3: **Alternative 3 for the substation site and corridor**

6.2.4 SUBSTATION EXTENSION

The proposed substation extension site is approximately 10 hectares and will extend in Western section of the existing Marang Transmission Substation (MTS) and East of Boitekong Township. The area is accessed via D522 tarred road and is also characterized by access tracks and existing 88kV power lines traversing across the substation extension footprint. The natural vegetation is severely modified due to activities related to agriculture, mining and urbanization. It is dominated by acacia shrubs and few large trees. Reference is made to Figure 6-4 below for alternative 4 for the substation extension site.

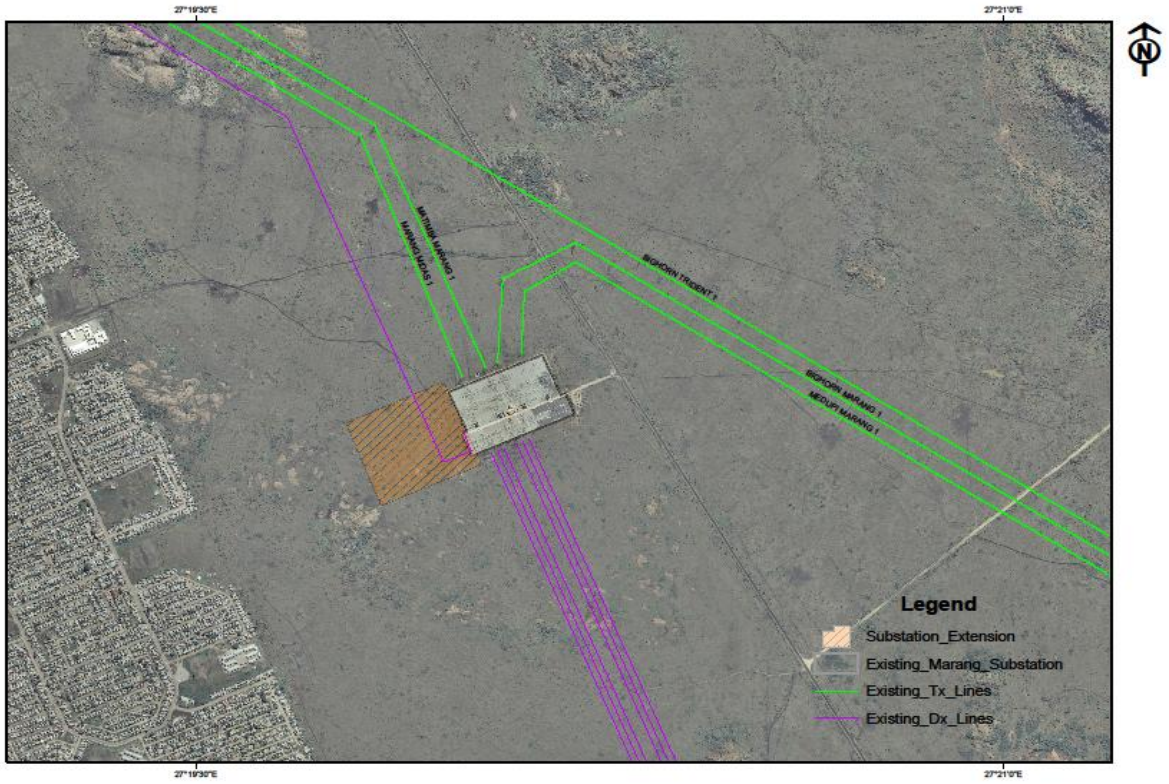

Figure 6-4: **Alternative 4 for substation extension**

6.2.5 ACCESS ROADS

Due to the nature of the environment, i.e., poor vegetation, presence of access tracks and roads and existing infrastructure, alternatives for the access road to the substation were not considered instead the existing tracks will be upgraded.

The proposed access road to substation 1 will start from D522 and follow the road used to access the existing substation from where it will turn north to follow the existing fire break around Marang Substation to the new substation. The total length of the road is approximately 760m. Alternative 2 will be accessed via the gravel road that cuts across the substation site whilst Alternative 3 will be accessed via an existing access track that starts from D522 to the substation. The length of the roads leading to substation 1, 2 and 3 are approximately 760m, 59m and 740m respectively. Reference is made to the locality map below. Use of existing access tracks will result in minimum vegetation clearance.

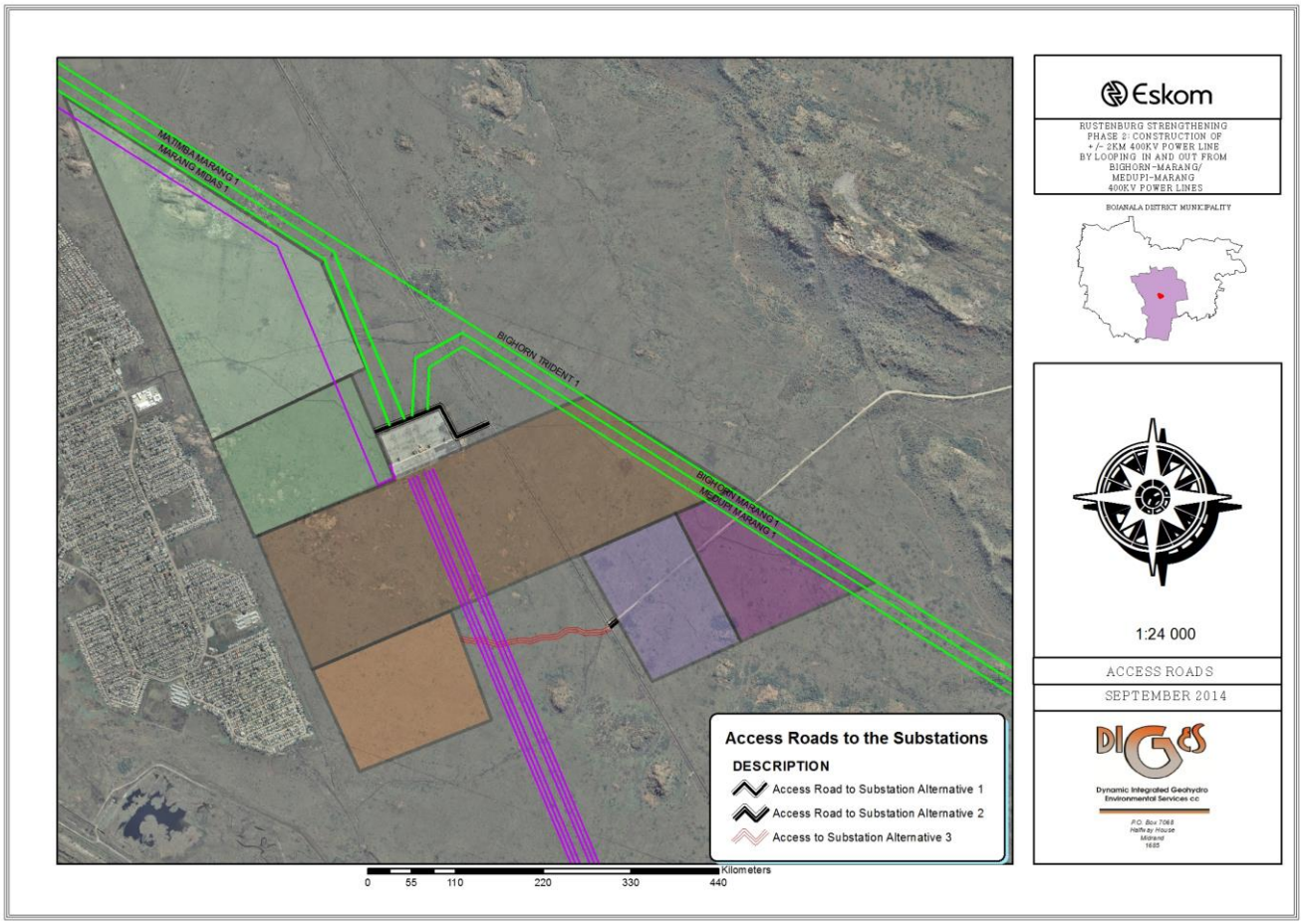

Figure 6-5: **Locality of Access Roads**

6.3 DESIGN ALTERNATIVES

6.3.1 TOWER STRUCTURES

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 in order to stabilize the towers. This tower is easy to assemble and the structure and requires less galvanized steel than the guyed V tower making it lighter.

Forces from the earthwires, 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 36m and requires servitude of 55m. See Figure 6-5 below for the tower structure.

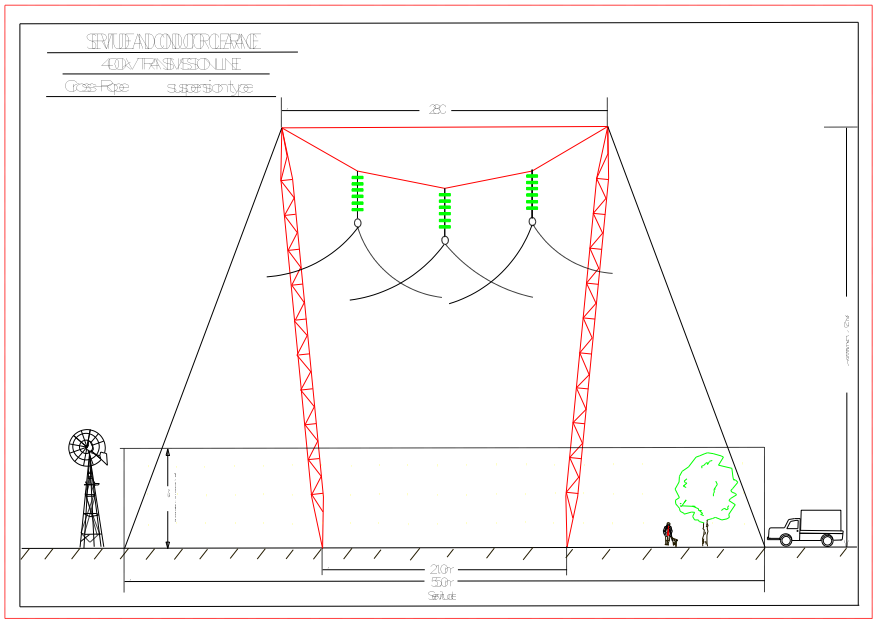

Figure 6-6: **Cross Rope Suspension Tower**

- ***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 maintenace.The towers have an average height of 33m.

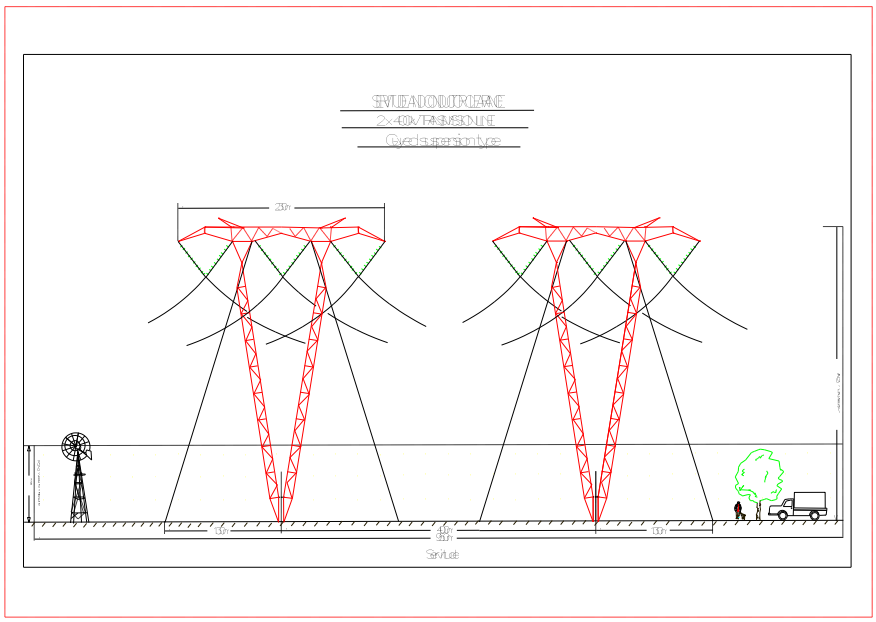

Figure 6-7: **Guyed Suspension Tower**

- ***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 was 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 6-7 overleaf for the tower.

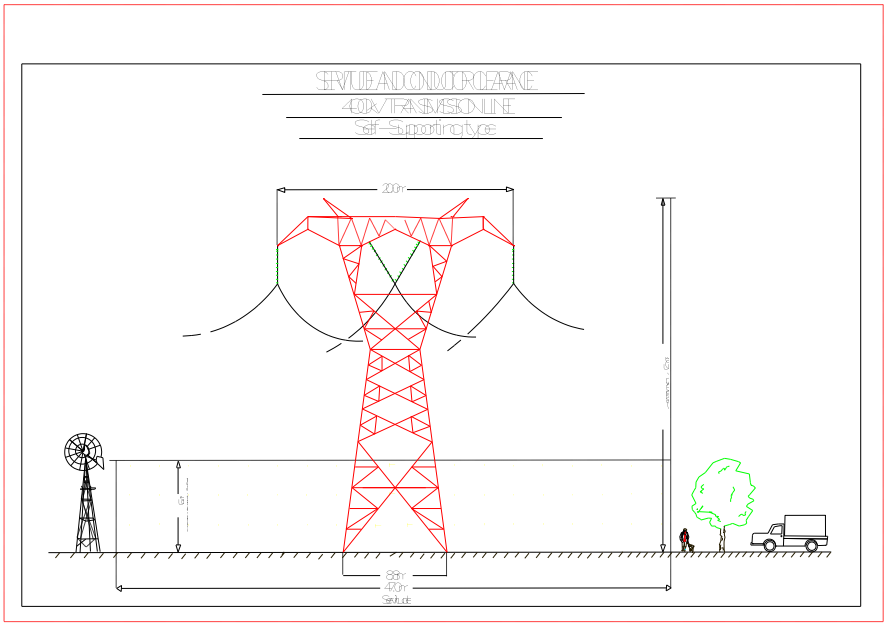

Figure 6-8: **Self Supporting Tower**

7 OVERVIEW OF SPECIALIST SURVEYS

7.1 AIR QUALITY IMPACT ASSESSMENT

The Air Quality Impact study was carried out by Rayten Engineering Solutions cc and the full report is attached in ***APPENDIX E-1.***

The Terms of Reference were as follows:

- *To provide an overview of the prevailing meteorological conditions in the area which influence the dilution and dispersion of pollutants in the atmosphere;*
- *To identify existing sources of emissions and characterisation of the ambient air quality within the area using available monitoring data;*
- *To review the current legislative and regulatory requirements for air quality;*
- *To review emissions from the proposed activities and the associated health effects;*
- *To identify sensitive receptors, such as local communities surrounding the study area;*
- *To compile a detailed emissions inventory for proposed sources of emissions; and*
- *To provide recommendations for the mitigation and management of identified potential impacts.*

7.1.1 ASSUMPTIONS AND LIMITATIONS

- *The meteorological data was collected from a station located approximately10km to the west-south-west of the site and is considered to be site representative of the prevailing conditions at the site;*
- *Emission calculations were based on the operational times provided for the construction phase by the client;*
- *Data input was based on the parameters provided by the applicant, it is therefore assumed that the information provided is accurate and complete at the time of modelling;*
- *Emissions from the construction activities at each proposed site were estimated on an area wide basis using the USEPA emission factor for heavy construction activities; and*
- *Data capture for all pollutant parameters fell below the SANAS requirements and as such the monitoring data could not be used to assess the existing baseline air quality situation in the area.*

7.1.2 METHODOLOGY

In addition to the guidelines determined in the various Acts and standards relating to air quality, the following steps were undertaken to determine the impact on air quality:

(i) A baseline assessment was undertaken by reviewing the available meteorological and air quality monitoring data.

(ii) The potential impact of the emissions from the proposed project on the surrounding environment was evaluated through the compilation of an emission inventory which was later followed by dispersion modelling simulations using AERMOD. Data input into the model included site specific surface and upper air meteorological data with wind speed, wind direction, temperature, pressure, precipitation and cloud cover for January 2010- December 2012. Boitekong was included as a discrete receptor since it is in close proximity to the sites.

(iii) A comparison with the National ambient air quality standards was made to determine compliance in terms of potential human health impacts.

7.1.3 IMPACT ASSESSMENT

The main emissions, i.e., Particulate Material PM10 and dust fallout were assessed for the construction phase. These emissions were estimated at each proposed site on a wide area basis. The emission factor was calculated as follows:

E= 1.2tons/acre/month of activity

Table 7-1 and 7-2 overleaf shows the estimated Emissions during the construction phase and the predicted maximum incremental PM10 and dust fallout concentrations at Boitekong boundary.

Table 7-1: **Estimated Emissions during Construction Phase**

SOURCE	EMISSION RATE (G/S)			
	UNMITIGATED		MITIGATED	
	TSP	PM10	TSP	PM10
Substation Site 1	*141.20*	*49.42*	*70.60*	*24.71*
Corridor 1	*28.48*	*9.97*	*14.24*	*4.98*
TOTAL	***169.68***	***59.39***	***84.84***	***29.69***
Substation Site 2	*117.48*	*41.12*	*58.74*	*20.56*
Corridor 2	*14.24*	*4.98*	*7.12*	*2.49*
TOTAL	***131.72***	***46.10***	***65.86***	***23.05***
Substation Site 3	*150.42*	*52.65*	*75.21*	*26.32*
Corridor 3	*50.22*	*17.58*	*25.11*	*8.79*
TOTAL	***200.64***	***70.23***	***100.32***	***35.11***
Extension Site	*10.43*	*3.65*	*5.21*	*1.82*

7.1.3.1PM10 CONCENTRATIONS AND DUST FALLOUT

Table 7-2: **Predicted Maximum Incremental PM10 and Dust Fallout Concentrations at Boitekong Boundary**

POLLUTANT	***AVERAGING PERIOD***	***GUIDELINE/ STANDARD***	***PREDICTED INCREMENTAL PM10 CONCENTRATION µG/M³***				***PREDICTED INCREMENTAL DUST FALLOUT CONCENTRATION (MG/M³/DAY)***	
			UNMITIGATED	***FOE (4)***	***MITIGATED***	***FOE***	***UNMITIGATED***	***MITIGATED***
SITE 1								
PM10	*Daily Average*	*120(1), 75(2)*	*73.09*	*0*	*36.56*	*0*	*-*	*-*
	Annual Average	*50(1), 40(2)*	*14.71*	*-*	*7.36*	*-*	*-*	*-*
TSP	*Daily average*	*600(3)*	*-*	*-*	*-*	*-*	*567.11*	*283.55*
SITE 2								
PM10	*Daily average*	*120(1), 75(2)*	*6.51*	*0*	*3.26*	*0*	*-*	*-*
	Annual average	*50(1), 40(2)*	*0.99*	*-*	*0.49*	*-*	*-*	*-*
TSP	*Daily average*	*600(3)*	*-*	*-*	*-*	*-*	*35.55*	*17.76*

SITE 3								
PM10	*Daily average*	*120[(1)], 75[(2)]*	*92.73*	*16, 12, 16*	*46.39*	*0*	*-*	*-*
	Annual average	*50[(1)], 40[(2)]*	*18.02*	*-*	*9.01*	*-*	*-*	*-*
TSP	*Daily average*	*600[(3)]*	*-*	*-*	*-*	*-*	*767.43*	*383.55*
EXTENSION SITE								
PM10	*Daily average*	*75*	*75-120*	*>4*	*30*	*0*	*-*	*-*
	Annual average	*40*	*10-40*	*-*	*5-15*	*-*	*-*	*-*
TSP	*Daily average*	*600[(1)]*	*-*	*-*	*-*	*-*	*300*	*<300*

Notes

(1) Current National PM10 ambient standards;

(2) Compliance required by 1 January 2015

(3) Residual dust fallout limit

(4) Frequency of exceedance of the future daily average PM10 standard for PM10 standard for 2010, 2011 and 2012

Table 7-1 shows the estimated emissions during the construction site. The larger the land the higher the emission rate, hence Site 3 is expected to have a higher emission rate than site 1, Site 2 and the extension site. Table 7-2 shows unmitigated and mitigated PM10 and dust fallout.

Site 1: *the predicted incremental PM10 concentrations associated with the construction activities are in compliance with both the current and future daily and annual average standards as shown in Table 7-2. The predicted dust fallout is estimated at 567.11mg/m^2/day which is slightly below the allowable limit of 600 mg/m^2/day. When mitigation measures are implemented both PM10 and dust fallout will still be below the allowable limits.*

Site 2: *the predicted incremental PM10 and dust fallout will also be below the allowable limit with PM10 for daily and annual average being 6.51µg/m^3 and 0.99µg/m^3 respectively. Predicted dust fall out is also very low and will not impact upon the neighboring Boitekong Township. Implementation of mitigation measures will further reduce the emission of the particles.*

Site 3: *Incremental PM10 concentrations are in compliance with the current daily average PM10 standard in Boitekong whereas when compared to the future daily average standard of 75 µg/m^3, PM10 will not be in compliance. Predicted annual average concentrations are in compliance with both the current and future annual average standards. The highest PM10 concentrations are observed in Boitekong when construction is undertaken on this site. Predicted dust fall out on this site is also above the allowable dust fall out limit with a maximum 767.43 mg/m^2/day. Implementing mitigation measures will reduce PM10 and dust fall out to below the average daily limit and the PM10 will also be below the average annual standard.*

Extension Site*: Predicted incremental daily average PM10 concentrations associated with construction activities at the extension site are in non-compliance with the daily and annual average PM10 standard of 75 µg/m3 and 40 µg/m3 beyond the site boundary. Implementing mitigation measures will reduce the daily and annual average PM10 concentrations to within limits.*

Predicted incremental dust fallout deposition rates due to construction activities at the extension site exceeded the dust fallout limit of 600 mg/m2/day for residential areas whilst rates observed at all surrounding sensitive receptors, including the adjacent residential area Boitekong, fall below the dust fallout limit of 600 mg/m2/day for residential areas. With the implementation of mitigation measures, dust fallout reduces to within the allowable limit.

7.1.4 CONCLUSION AND RECOMMENDATIONS

Based on the baseline and impact assessment carried, before implementing mitigation measures predicted incremental PM10 concentrations at Site 1 and 2 are below the current and future average daily

and annual standards whilst Site 3 and extension site are in non-compliance with the daily average. For unmitigated dust fall out concentrations Site 1 and 2 comes within reach of the limit of 600 mg/m²/day whilst Site 3 and the extension site exceed the allowable limit. When mitigation measures are implemented for both PM10 concentrations and dust fallout all sites fall within the allowable limit. Site 2 is therefore preferred for the proposed development as particulate emissions from this site will have the least impact on residents in Boitekong. The following recommendations should be implemented during construction

- *Wet suppressions, wind speed reduction methods or chemical suppression can be used to minimise dust emissions;*
- *To minimise dust, vegetation clearance should be limited to work areas;*
- *Timing the development by carrying out topsoil stripping during calm wind conditions;*
- *Appropriate wind barriers should be used to provide protection against movement and impact of dust on nearby land-uses;*
- *Planning earth moving works so as to limit the time the site is exposed;*
- *Watering should be used to reduce dust lift off from roads and other traffic areas.*

7.2 BIRD IMPACT STUDY

The Avi-faunal Impact Study was carried out by Chris Van Rooyen Consulting and the full report is attached as ***APPENDIX E-2.***

The Terms of Reference were as follows:

- *To describe the affected environment;*
- *To indicate how birdlife will be affected;*
- *To discuss gaps in baseline data;*
- *To list and describe the expected impacts;*
- *To assess and evaluate the potential of impacts; and*
- *To recommend the relevant mitigation measures.*

7.2.1 ASSUMPTIONS AND LIMITATIONS

- *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; and*
- *Non red data species will also benefit from the proposed mitigation measures as they share the same habitat with red data species.*

7.2.2 METHODOLOGY

- *In addition to the field assessment, bird distribution data was obtained from SABAP2 for the pentads where the project is located namely 2535_2715, 2535_2720 and the conservation status of all species considered likely to occur in the area was determined as per the most recent iteration of the Southern African Red Data list for birds.*
- *The specialist personal observations of avifauna and bird associations was also used to supplement the data that is available in SABAP2 including field observations carried on site;and*
- *Eskom-Endangered Wildlife Trust Strategic Partnership database on power line bird mortality incident was also consulted. Information on vultures was obtained from Kerri Wolter an independent researcher and manager at Vulpro.*

7.2.3 ASSESSMENT

The avi faunal problems in the region that are associated with electrical structures are:

i. ***Habitat destruction,*** *which happens during the construction of access roads and the clearing of the Right Of Way (ROW). These activities have an impact on bird breeding, foraging and roosting in or in close proximity of the site, through the modification of the habitat. The area has been modified due to current land use practices which has resulted in the reduction of the number and variety of species originally inhabiting the area.*

   The clearing of woodland (mostly woody shrub) under the new line should have a limited impact on the avifauna due to the small length of the power line and existing electrical infrastructure. It is not expected that Red Data species will be displaced as a result of habitat transformation resulting from the construction of the power lines. Construction of the power line will result in localized impacts on the smaller non Red Data species. Due to the heavily disturbed woodland at the proposed substation sites, Red Data species are unlikely to be found within the area. The species that will be affected by habitat transformation are the smaller non threatened passerines that are currently resident in the area. The extension of the substation, construction of a substation and power line will result in a ***LOW*** *impact.*

ii. ***Collisions with power lines:*** *due to the high level of existing impacts in the study area and the short length of the proposed line, it is not expected that the proposed power line will pose a significant collision risk to Red Data species. The collision risk is therefore regarded as* ***LOW.***

iii. ***Electrocution:*** *Transmission lines do not pose an electrocution risk because the clearances between live components or live and earthed components are too big to be bridged. No electrocution risk is foreseen.*

7.2.4 CONCLUSION AND RECOMMENDATIONS

The habitat at all proposed substation sites and corridors is similar consisting of open, moderate to heavily disturbed woodland such that potential risk to avifauna is similar. From an avifaunal impact perspective, the extension of the substation is preferred as a small area is required for the proposed works resulting in a low impact on habitat transformation.

The following recommendations were made:

i. *The vegetation clearing should be restricted to what is absolutely necessary, in order to minimize the impact on the natural woodland habitat.*

ii. *Strict adherence to Eskom standards and specifications is required during the construction phase.*

iii. *The construction of new roads should only be considered if existing road cannot be utlised.*

iv. *Access must be restricted to the footprint of the development, and access to the surrounding area must be strictly controlled.*

7.3 BIODIVERSITY

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

The Terms of Reference were:

i. *To identify potential impacts,*

ii. *To highlight sensitive and possible no-go areas;*

iii. *To identify the preferred substation site and corridor and make recommendations to the identified impacts.*

7.3.1 ASSUMPTIONS AND LIMITATIONS

a. *Prevailing weather conditions, i.e., during the survey it was moderate to hot and it seemed as if the area had received good rains as there was standing water present which could have implications on biodiversity likely to occur in the area. However the weather conditions during the survey were ideal; and*

b. *The study area is large and access to all areas was not always feasible.*

7.3.2 METHODOLOGY

A literature review of the vegetation within the study area was conducted and lists of species historically recorded at/or near the site and were likely to occur on site were generated. Maps were also consulted to identify the major habitat features. 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. Due to the modification of the habitat, limited sampling was undertaken.

7.3.3 ASSESSMENT

The landscape associated with the substation sites and corridors is severely modified due to mining, cultivated lands, grazing, housing and associated infrastructure. Substation site and corridor 1 will be back to back with the existing Marang substation and there is a koppie in the northern section of the corridor. The vegetation is characterized of very large trees and dominated by Acacia mellifera, Acacia robusta, Searsia lancea, Ziziphus micronata and Sclerocarya birrea on rock outcrops. The new power lines must not cross the koppies but rather link to the existing power lines to the east or west of the koppie.

Substation site and corridor 2 is south east of the existing Marang Substation, east of road D522 and a gravel road that leads to a mine cuts through the substation site. The corridor crosses over a non perennial stream that feeds into Bospoort Dam whilst the substation site is approximately 500m from the stream with a small drainage line cutting across the site. Trampling and a slight slope observed near the stream may be due to erosion. Vegetation is modified due to grazing and wood harvesting. A koppie is also located in the south section of substation site 2.

Substation and corridor 3 are situated south of the existing Marang substation with modified vegetation characterized of small trees and low shrubs. No alien vegetation was observed.

The existing Marang substation will extend (Alternative 4) in the western direction where vegetation is severely modified and very large trees are present. The trees are dominated by Senegalia mellifera, Searsia lancea, Ziziphus micronata and Sclerocarya birrea on the rocky outcrops.

7.3.4 CONCLUSION AND RECOMMENDATIONS

- *The corridors and sites investigated had a vegetation cover in a "poor to fair state" with some impacts related to grazing and wood collection, while roads, mines and town developments have the biggest impacts in the area.*

- *The following protected tree was observed on the rock outcrop: Sclerocarya birrea. No red book data plant species is recorded for the site. This must be confirmed once the final route and corridor is selected, as the cutting of trees are continuing and may be lost due to harvesting.*

- *From an ecological perspective alternative 1 and 3 are both viable whilst Alternative 2 is not recommended as the area north of the road is close to the koppies and mountains and the drainage line. However, the koppie in the northern section of corridor 1 should be avoided;*

- *Alternative 4 for the extension of the existing substation is recommended due to current impacts on the site and because this will lower the overall footprint related to the development and access road;*

- *Before any clearing or trimming commences, the Ecological specialist must accompany Eskom and the contractors to verify trees to be trimmed or cut (ensure no Sclerocarya birrea are present);*

- *With careful planning of construction activities impacts to the environment can be reduced. Before any clearing or trimming commences, a specialist must accompany Eskom and the contractors to verify the trees that are to be trimmed or cut. Towers should be placed 75m from the rock outcrops.*

7.4 ECO-TOURISM IMPACT ASSESSMENT

The Eco-tourism Impact Assessment for the project area was carried out by NuLeaf Planning and Environmental and the full report is attached in ***APPENDIX E-4.***

The Terms of Reference were as follows:

- *To provide status of tourism within and in close proximity to the study area;*

- *To identify conservation/protected areas in conjunction with tourism worthy areas and how the proposed development can avoid them;*

- *To identify potential impacts on eco-tourism, if any, of the proposed infrastructure per alternative corridor and substation sites to be assessed;*

- *To identify mitigation measures of the proposed infrastructure on the eco-tourism industry.*

7.4.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

- *The Ecological Assessment for the project would take into consideration the impacts on sensitive habitats or ecological features which visitors see as attractions; and*
- *Very little detailed information was provided on the components of the transmission line and the project description is therefore indicative of a typical transmission line of this nature.*

7.4.2 METHODOLOGY

The assessment was based on information from the following sources:

(i) Literature review entailed reviewing existing information on tourism statistics, geographic data and tourism hotspot data which was then used to ensure all market related data and all strategies were considered in the assessment;

(ii) Baseline search of existing tourism establishments in the area through consultation with local tourism information offices, websites and travel guides. This was done to identify tourism accommodation establishments and tourism products in the study area which could potentially be affected by the proposed development;

(iii) Identification of focus points which are regions which have high value tourism attractions and areas which see a moderate to high tourist traffic on an on-going basis;

(iv) Site visit where focus areas were traversed to identify the potential impacts on eco-tourism establishments and identifying impacts on future tourism opportunities;

(v) Review of the visual impact assessment which is related to tourism impacts that are directly related to visual intrusion of the development on the tourism experiences;

(vi) Basic GIS data capturing on tourism attractions

7.4.3 ASSESSMENT

The proposed development coincides with 3 tourism routes in the province. The most important being the Heritage Route with natural, archaeological, cultural and historical attractions. The tourism products and services within the project area and along the route include:

a. *Magaliesburg Protected Natural Environment: which was proclaimed a Natural Protected area in 1977 and Rustenburg Nature Reserve falls within this Protected Area. The proposed project is approximately 16km south west of the site;*

b. *Bospoort Dam on the Hex River, a tributary of the Elands River which is part of the Crocodile River basin. The dam is approximately 3km south of the site. The dam is mainly used for fishing purposes. The construction and operation of the substation and power line will have an impact on the sense of place;*

c. *Hartbeespoort Dam which is the epicentre of water sport fun and also offers the largest outdoor market in the province with a vast variety of South Africa's arts and crafts;*

d. *Pilanesburg National Park which is situated in a volcanic crater and it is home to the Big Five;*

e. *Sun City and Lost City which offers a full range of sporting, gambling, entertainment, conference and accommodation facilities;*

f. *Cultural Villages; and*

g. *Anglo Boer SA War.*

Anticipated eco-tourism impacts include:

- *Visual impacts on eco-tourists and ecotourism establishment;*
- *Impacts on eco-tourism impacts;*
- *Impacts on establishment and expansion of Protected Areas.*

7.4.4 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;*
- *There are no existing tourism attractions of significance in the study area;*
- *The study area is characterised by development and therefore does not have the tranquil, pristine environments present which eco-tourists expect of a region;*
- *Due to the existing electrical infrastructure in the area, tourists are being impacted in any event.*
- *Mitigation measures for the anticipated impacts are detailed in Section 8 of this report and the attached EMP in Appendix H.*

Based on the assessment carried out, all alternatives are viable from an eco-tourism perspective.

7.5 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:

i. *To identify and record heritage resources that maybe affected by the proposed development; and*
ii. *To provide recommendations on how best to appropriately safeguard identified heritage sites.*

7.5.1 ASSUMPTIONS AND LIMITATIONS

It is possible that this Phase I HIA study may have missed heritage resources in the Eskom Project Area as heritage sites may occur in thick clumps of vegetation while others may lie below the surface of the earth and may only be exposed once development commences.

7.5.2 METHODOLOGY

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

- *Surveying the proposed Eskom Project Area with a vehicle and selected spots on foot;*
- *Briefly surveying literature relating to the pre-historical and historical context of the Eskom Project Area;*
- *Consulting maps of the proposed Eskom Project Area;*
- *Consulting archaeological (heritage) data bases;*
- *Consulting spokespersons regarding the possible presence of graves and graveyards in the Eskom Project Area; and*
- *Synthesizing all information obtained from the data.*

7.5.3 IMPACT ASSESSMENT

Substation and Corridor 1

- *Most sections of substation site and corridor are heavily disturbed by activities related to agriculture, access roads and power lines. No heritage sites of significance were identified within the corridor footprint whilst several thick undecorated potsheds related to the 16th century Sotho-Tswana*

settlements were observed within the substation site. These have low heritage significance as there are abundant in the area and have been weathered over time.

Substation and Corridor 2

- *Alternative corridor 2 is characterized by three assemblages of stones forming three separate piles. These piles are located close to the water course and are in close proximity to each other. The assemblages are bigger than those associated with graves and all three are posed on granite. The substation site has a small hill on the tip of the south eastern section that is concentrated with Late Iron Age stone walled sites some of which are still intact*

The table below shows the location of the archaeological sites and the significance.

Table 7-3: **Location of archaeological objects**

Sites	***Location***	***Significance***
Pile of Stones (1)	*S25˚37'13.91",E27˚ 21'07.30"*	*Medium*
Pile of Stones (2)	*S25˚37'12.72", E27˚ 21'05.75"*	*Medium*
Pile of Stones (3)	*S25˚37'14.33", E27˚ 21'03.92"*	*Medium*
Stone Walling	*S25˚37'16.8", E27˚ 21'07.1"*	*Medium*

Substation and Corridor 3

- *Two sites of stones was observed in corridor 3 located to the west of D522 road. The nature of the first stone pile is similar to the other pile of stones located within the corridor 3 whilst the character of the other site differs from the other sites in that the site is not situated on the granite. The table below shows the objects observed within the corridor. A large midden deposit of Later Iron Age site was also noted covered by vegetation. This is associated with animal enclosures. The table below shows the location and significance of the objects.*

Table 7-4: **Location of archaeological objects**

Sites	***Location***	***Significance***
Pile of Stones	*S25˚36'51.1", E27˚ 20'29.4"*	*Medium*
Pile of Stones	*S25˚36'56.2", E27˚ 20'42.7"*	*Medium*
Stone Tools	*S25˚36'49.8", E27˚ 20'30.9"*	*Medium*
Animal enclosures	*S25˚37'12.4", E27˚ 20'05.6"* *S25˚37'11.3", E27˚ 20'05.3"*	*Medium*

Substation extension

- *The area proposed for the extension of the substation falls within substation site 1 and as such access roads, village streets, path ways and main road, coupled by power lines cut across this area proposed for development. However, several thick undecorated potsherds related to the 16th century Sotho-Tswana settlements were noted in this area. These cannot however be characterised as a site since they are found in a disturbed area and in low density. Nevertheless,* ***this study recommend that the area be monitoring by a qualified archaeologist during earthworks as there is a possibility that the density could change once the digging takes place****. No other sites of heritage significance were identified on the footprint during the survey. As such, this is the most preferred site.*

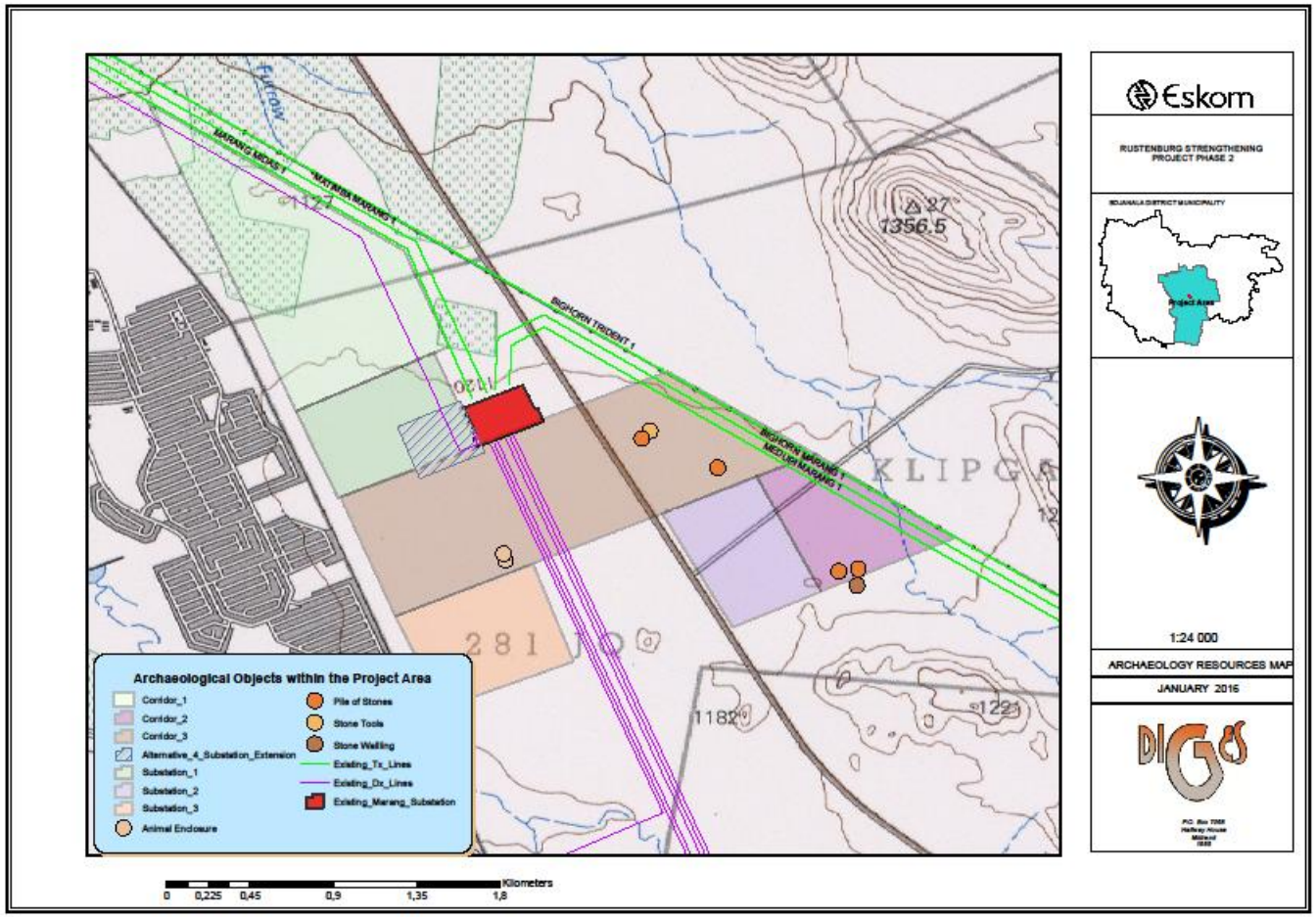

Figure 7-1: **Heritage resources Observed within the following area**

7.5.4 CONCLUSION AND RECOMMENDATIONS

- *From an archaeological perspective Substation Extension is the most preferred since the proposed development covers a smaller area and the materials noted are of low heritage significance, and the area is highly disturbed; and*
- *The area should be monitored by a qualified archaeologist during earthworks as there is a possibility that the density could change once excavation starts.*

7.6 PALEONTOLOGY

The Palaeontology Study was carried out by Dr J.F. Durand and the full report is attached as ***APPENDIX E-6.***

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.*

7.6.1 METHODOLOGY

Relevant literature and geological maps were studied.

7.6.2 DESKTOP STUDY

The study area is situated on gently sloping terrain which is flanked by mountainous ridges on the north east and borders an urban area on the south western side. There are several mines in close proximity to the study area. The area is situated on the Rustenburg Layered suite of the Bushveld Igneous Complex varying from dunite and pyroxenite to norite, gabbro anorthosite. The eastern limb of the Bushveld igneous complex abutts and overlies part of the Transvaal supergroup. This caused the agrillatious and arenateous element of the Transvaal group rocks to be mineralized into mega metagraywacke, metaquarzite, hornfels, leptite and granulite.

7.6.3 RECOMMENDATIONS

- *The rocks of the Bushveld Igneous Complex are non fossiliferous and are of no paleontological concern. It is therefore recommended that the project should be exempted from further studies. An exemption letter is attached in Appendix. E-6*

7.7 SOCIAL IMPACT ASSESSMENT

The Social Impact Assessment for the project area was carried out by Strategic Environmental Focus 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.*

7.7.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

i. *The construction impacts are provided for the length of the construction period;*

ii. *The impacts during the operational phase provide an indication of the impact during steady state operations; and*

iii. *It was assumed that local employment will be a priority for all operations.*

7.7.2 METHODOLOGY

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

- *existing data;*
- *comments received during the public participation process;*
- *Review of previous SIA for the Central Block application;*
- *Published reports including the Integrated Development Plans; and*
- *Statistical data obtained from Statistics South Africa; and*
- *Social Impact Assessment literature.*

7.7.3 ASSESSMENT

In order to assess the potential impact of the proposed project, it was important to consider North West 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 Rustenburg Local Municipality. 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 social change processes that the proposed infrastructure is likely to create are detailed in Section 8.

7.7.4 CONCLUSION AND RECOMMENDATIONS

- *Based on the impacts that were identified and the measures recommended to mitigate the impacts, no fatal flaws were identified. It was recommended that the project should proceed.*
- *Alternative 4 for the substation extension is preferred due to the smaller footprint and no necessity for the construction of new power lines as well as smaller construction crews required, resulting in fewer and less adverse social and environmental impacts.*

7.8 SOIL AND LAND CAPABILITY ASSESSMENT

The Soil and Land Capability Assessment for the project area was carried out by Holistic Environmental Services and the full report is attached in ***APPENDIX E-8:***

The Terms of Reference were as follows:

- *To 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;*
- *To classify high potential agricultural land in South Africa compiled by the Agricultural Research Council for the National Department of Agriculture;*
- *To determine the current land-use on the farm and that of the neighbourhood;*
- *To determine other Agro-ecological factors prevailing in the area;*
- *To determine the agricultural potential of the area and possible crop types; and*
- *To recommend and identify mitigation measures that will reduce the impacts determined.*

7.8.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

- *The loss of high potential agricultural lands through urbanization and unsustainable agricultural practices in South Africa is increasing at an alarming rate;*
- *South African water resources are under severe constraint;*

- *Agricultural land includes all land outside towns and cities; and*
- *There was a limitation in the acquisition of some relevant data especially long-term climatic record.*

7.8.2 METHODOLOGY

The assessment was based on a combination of the following:

i. *Desktop studies to accumulate general information. The information included definition of parameters as of land, classification of high potential agricultural land, land type classification and geophysical features of the site using GIS; and*

ii. *Site survey to determine and identify status quo, soil sampling and characterization.*

7.8.3 ASSESSMENT

Agricultural land in the North West Province is considered to be high potential if the land may be cultivated in terms of Part 1 of the Regulations of Conservation of Agricultural Resources Act 43 of 1983 and it is under permanent irrigation. The minimum depth should be 90mm and clay content between 10 and 35%. The project area will refer to all alternatives as the characteristics are similar. The following characteristics were observed within and surrounding the project area:

- *The land is fallow and consists of shrubs and grasses. The surrounding area is bordered by human settlements which were previously used as grazing land;*
- *Land types are generally determined by position of localised terrain units on the landscape. The area consists of only one land type Ib116, located mainly at the foot slopes on relatively flat terrain;*
- *The area is characterised by a mixture of rock outcrop, mispah and arcadia soil forms of which none of these forms is considered high potential. The clay content in the area is over 40% which exceeds the limit of 35% considered high potential. Arcadia soils have a strongly developed structure that has a horizon that has both high clay content and a predominance of smectitic clay minerals. The soil has a capacity to swell and shrink markedly and at 90cm depth; there is a presence of weathering saprolite;*
- *The proposed site falls under Moisture Class 4 which is interpreted as conditions marginal for rain fed agriculture, Due to the relatively low mean annual precipitation, 513mm, crop cultivation at the site is risky except under reliable irrigation;*

- *There is no surface water on the proposed site except for non-perennial streams located east of substation 3. However, the seasonal nature of the streams, the rock outcrop, mispah soil and the high clay content will make crop cultivation marginal;*

- *Though the site is also characterised by grassland, a significant part of the site has woody perennial species which reduces the availability of grass for grazing. External fodder supply either from cultivation or purchases needs to be sourced to supplement the natural pasture at the project area if successful livestock production is to be embarked upon. The poor soil condition and lack of access to irrigation water facilities will not permit the cultivation of planted pastures at the site to supplement livestock feed.*

- *The potential for successful agricultural productivity of any given area is a function of several natural or biological factors of the target area, socio-economic conditions as well as prevailing legislations impacting on agriculture.*

7.8.4 CONCLUSION AND RECOMMENDATIONS

- *As per Part 1 of the Regulation of Conservation of Agricultural Resources Act 43 of 1983, the land on site consists of combination of factors that can be considered as either high or low potential for agriculture;*

- *Based on the assessment carried out, the project area is rated as low potential due to the following:*

    i. *The proposed site is composed of rock outcrops, shallow Mispah and hard clay soils resulting in poor effective root depth hence the soil nature is not considered as high potential for arable cropping and will not support effective crop production due to potential root zone moisture limitation;*

    ii. *There is no irrigation facility nearby; and*

    iii. *The size of available grazing land is too small and will not support viable economic crop and livestock production.*

The proposed project is therefore recommended.

7.9 VISUAL IMPACT ASSESSMENT

The Visual Impact Assessment for the project area was carried out by Axis Landscape Architects cc and the full report is attached in ***APPENDIX E-9.***

The Terms of Reference were as follows:

- *To determine the extent of the study area;*
- *To describe the proposed project and the receiving environment;*
- *To identify and describe the landscape character of the study area;*
- *To identify the elements of particular visual value and quality that can be affected by the proposed project;*
- *To identify the landscape and visual receptors in the study area that will be affected by the proposed project and assess their sensitivity;*
- *To indicate the potential landscape and visual impacts;*
- *To assess the significance of the landscape and visual impacts; and*
- *To recommend mitigation measures that can reduce and/or alleviate the potential adverse landscape and visual impacts.*

7.9.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations were made and encountered:

- *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 and number 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 tents or temporary structures, ablution facilities will be portable toilets and temporary shower facilities; and*

7.9.2 METHODOLOGY

The assessment was based on information from the following sources:

i. *Topographic maps and GIS data generated from the Surveyor General and ECOGIS;*
ii. *Observations and photographs were taken on site during the field survey;*
iii. *Technical information that was received from Eskom;*

iv. Literature review; and

v. Professional judgment based on experience gained by the specialist doing similar projects.

7.9.3 ASSESSMENT

7.9.3.1 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. During the construction and operational phase of the project, the electrical infrastructure, construction camps, construction of access roads and the clearance of the servitude are expected to impact on the landscape character of the area they will be located. The magnitude of this intrusion was measured against the scale of the project, the permanence of the intrusion and the loss of the visual quality, value and Visual Absorption Capacity (VAC).

The majority of the study area is considered to have moderately low landscape character sensitivity due to the previous human induced activities and interventions that have negatively impacted on the original landscape character. In addition to the moderate terrain variability and the medium to low shrubs a moderate VAC is expected. Existing mines, roads and electrical infrastructure are also landscape disturbances that also cause a reduction in the condition of the affected landscape type and detrimentally affect the quality of the visual resource. The presence of the roads, existing power lines, mines and settlements has caused a localised reduction in the visual quality of the landscape types for all alternatives. The severity of the landscape impact during the construction and operation phase is low for all alternatives except for Alternative 2 which is expected to be moderate.

7.9.3.2 VIEWER SENSITIVITY

Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. The visual receptors included in this study are:

- *Residents;*
- *Tourists; and*
- *Motorists.*

According to the specialist, empirical research indicates that the visibility of a transmission tower, and hence the severity of visual impact, decreases as the distance between the observer and the tower increases. The significance of visual impacts for the three visual receptors is discussed below:

i. Residents

*The clearing of site, construction camps and material lay down camps will result in an anticipated **low** significance of visual impact for all substation site alternatives whilst the significance of the transmission power line will be moderate without mitigation measures, with the duration of the impact being temporary in nature. During the operation phase, the residents of the township nearby may experience a high degree of visual intrusion due to their proximity to all the proposed locations. The severity and significance of the impact is expected to be **low** and permanent in nature**.***

ii. Tourists

*The entire area is considered to have moderately-low tourism potential as the project area is not visible from the main routes that tourists use. The location and size of the construction camps and lay-down yards will be crucial in regulating the visual impact. It is anticipated that the visual impact will occur localised and the significance and severity of the impacts are considered to be **low** for all alternatives**.** During operational phase, all alternatives will cause minimal visual intrusion for tourists travelling through the study area due to the low volume of the tourists that will be travelling there.*

iii. Motorists

The potential visual impact that may be experienced by motorists during the construction phase is considered to be minimal. The major route close to the project area is R510 which connects the mines, towns, residential areas and informal settlements. The secondary and tertiary roads carry a much lower volume of motorists. The presence of the construction camp and lay-down yard may create unsightly views. Motorists' visual exposure to the impact will be brief and the severity of visual impact will be low as well as the significance.

During the operational phase, the severity and visual impact for all the alternatives is expected to be low. The speed at which motorists travel has a moderating effect on the severity of the visual impact and further reduces visual exposure.

7.9.4 CONCLUSION AND RECOMMENDATIONS

Recommendations

Based on the evaluation that was done for the four alternatives, Alternative 4 is the most preferred due to its location and position. The site's great advantage lies in the less significant landscape and visual

impact on motorists and residents as compared to the other alternatives. Table 7-5 shows the preference rating for all the sites with 1 being the most preferred and 4 being the least preferred.

Table 7-5: **Preference Rating for all Alternatives**

ALTERNATIVES	***PREFERENCE RATING***
Marang B Site 1	*2*
Marang B Site 2	*4*
Marang B Site 3	*3*
Marang Site 4	*1*

- *Mitigation measures for the anticipated impacts are detailed in Section 8 of this report and the attached EMPr in Appendix H.*

7.10 WETLAND ASSESSMENT

The Wetland Assessment for the project area was carried out by Farai Dondofema and the full report is attached in ***APPENDIX E-10.***

The Terms of Reference were as follows:

- *To undertake a wetland assessment survey on site;*
- *To provide an indication of the relative conservation importance and ecological function of the study area in terms of Aquatic Ecology;*
- *To assess the impacts of the development on the ecological integrity of the study area; and*
- *To provide recommendation on ecological mitigation measures for the proposed development.*

7.10.1 ASSUMPTIONS AND LIMITATIONS

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

- *Time constraints: samples were collected and concluded from sample plots in one season as compared to a replication of the assessment over several seasons;*
- *General observations upon walking through the proposed study site and a survey of aerial imagery also assisted in the compilation of the sensitivity map. Information about this study relied heavily on data from representative sections of natural grassland;*
- *As basic faunal sampling was undertaken the floral assessment results specifically the species*

composition was used as an indication of disturbance and to identify possible faunal habitat from floral data;

- *Presence of a few conserved areas in the Marikana Thornveld, time constraints and a high rate of grassland degradation and transformation, comparison with benchmark site was not possible. Instead published species lists from Mucina & Rutherford (2006) were relied upon for data comparison; and*
- *As some species only flower at certain periods of the year, it is necessary to undertake repetitive sampling to discover all the species within the system. It was often difficult, during the study to differentiate between grass species as some were not in flower.*

7.10.2 METHODOLOGY

The assessment was based on information from the following sources:

(i) Desktop assessment of information for National Freshwater Ecosystem Priority Areas (NFEPAs);

(ii) A digital base map on ArcGIS 10.1 was used to delineate wetland boundaries;

(iii) A site visit was undertaken on 30th November 2013 to verify the desktop interpretation of wetland locations and extent. Soil auguring was used to look for indicators of hydric conditions in order to verify whether or not the areas delineated as wetlands in the desktop study met the criteria for classification as true wetlands.

7.10.3 ASSESSMENT

The project footprint falls within the Crocodile (West) and Marico (WMA) in the Upper Vaal WMA is classified as a FEPA. The WMA is subdivided into several sub-Water Management Areas (subWMA), where catchment or watershed is defined as a topographically defined area, which is drained by a stream, or river network. The SubWMA indicated for the project footprint is the Bospoort Dam subWMA. The Upstream Vaal Dam subWMA is classified as a FEPA.

The following non-perennial streams and wetlands were observed within the sites and within a 500m zone from the alternatives. All wetlands observed are not classified as FEPA. The location and state of the wetlands is discussed below:

(i) A non-perennial stream was observed approximately 160m North West of the corridor. This area is currently used as grazing land;

(ii) A non-perennial stream was also observed cutting across Corridor 2 in the south eastern

section; and

(iii) *A channelled valley bottom wetland was observed 300m south of substation site 3. The wetland is confined to the non-perennial stream channel. The main impacts on this wetland include urbanizations and mining activities that are in close proximity to the wetland.*

In terms of FEPA the following applies to all wetlands observed:

- *No importance in terms of water supply is indicated by the FEPA database for the project footprint.*
- *No importance in terms of fish sanctuaries is indicated by the FEPA database for the project footprint.*
- *No importance in terms of wetland conservation is indicated by the FEPA database for the project footprint.*
- *The project footprint contains channelled Valley Bottom Wetlands, although none of these wetlands are important in terms of the FEPA database;*
- *No importance is indicated in terms of Amphibian or Crane conservation; and*
- *No RAMSAR wetlands are indicated near or on the project footprint.*

To determine the PES, the wetland Index Habitat Integrity was applied to the wetland features. An overall PES rating of 37.8% was obtained indicating that the wetland features fall within PES Category E which indicates that the wetland is seriously modified.

The impacts associated with the construction and operation phase are discussed in Section 8.

7.10.4 CONCLUSION AND RECOMMENDATIONS

Each proposed alternative has been assessed in order to determine which is least likely to affect the wetlands within and surrounding the proposed sites. The estimated numbers of wetlands to be affected were assessed in tandem with the closest substation and corridor likely to be placed in identified and potentially affected wetlands. Alternative 1 is 160m from the corridor, a stream cuts across the south eastern border of corridor 2 and substation site alternative 3 is 300m north of the wetland. Based on the assessment, the alternative that is likely to have the greatest impacts on the number of wetlands is Substation and Corridor Alternative 3.Site alternatives 1 and 2 are fairly close to the wetlands. It should also be noted that Substation site and corridor 2 has fatal flaws from a wetland perspective.

7.11 COMPARISON OF ALTERNATIVES

The table below summarises the specialists' comparison of alternatives. It indicates that all specialists' perspectives with the exception of air quality, alternative 4 for the substation extension is recommended whilst Alternative 2 is preferred from the air quality assessment perspective.

Table 7-6: **Comparison of Alternatives**

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Air Quality	2	4	1	3
Avifauna	2	2	2	1
Biodiversity	2	4	2	1
Eco-Tourism	1	1	1	1
Heritage	2	4	3	1
Palaeontology	1	1	1	1
Social	*2*	2	2	1
Soil and Land	*1*	1	1	1
Visual	*2*	2	3	1
Wetlands	*3*	4	2	1

Rating: *1 being the most preferred and 4 being least Preferred*

7.12 EVALUATION OF ALTERNATIVES

The criteria below was used to evaluate the route/corridor using a scale of Low (-1), Medium (-2) and High (-3) for disadvantages and Low (+1), Medium (+2) and High (+3) for advantages.

Table 7-7: **Criteria for Site Selection**

Aspect	*Criteria*	*Rationale*
Visual	*Avoid areas used for tourism and recreational activities.*	• *Avoid aligning the corridor and locating substation across or in front of areas with scenic and wilderness qualities, particularly areas visited frequently.* • *Keep the power lines off higher ground, and rather align them in valleys and lower lying areas where they will be less obtrusive.*
Housing Infrastructure	*Avoid crossing existing infrastructure.*	• *To avoid interference with the day to day activities of the residents during construction and maintenance.*
Biodiversity	*Avoid steep slopes, and water courses which have species diversity.*	• *To maintain the integrity of biodiversity.*
Topography	*Avoid steep terrain and rocky outcrops.*	• *These areas are difficult to access, would require roads that are prone to erosion.*
Archaeological Attributes	*Avoid vulnerable and important archaeological sites.*	• *Archaeological sites are important from a cultural and tourism perspective, and would likely be damaged during the construction activities.*

Birds	*Avoid important bird habitats, including migration routes, cliffs and steep slopes, and larger riverbeds.*	• *Electrocution/ collision of birds with the power line is likely to occur during the operation phase.*
Accessibility	*Issues concerning accessibility during construction and maintenance should be considered.*	• *The power line should be constructed where it will be accessible during construction and maintenance.*
Technical Feasibility	*Issues concerning the Right of Way.*	• *The substation and power line should follow routes where the Right of way will not be compromised.*
Stakeholder Opinions	*Issues of concern raised by the public.*	• *Stakeholder opinions should be taken into account during the assessment.*

Table 7-8: **Comparative Assessment of the Substation and Corridor Alternatives**

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Visual	The presence of vegetation, roads and existing 400kV power line and substation will cause a localized reduction in the visual quality of the landscape. (+2)	The corridor will cross the road D522 to the substation site. This section is highly visible. (-1)	The substation and corridor are located east of D522 opposite the existing substation. A substation will impact on the sense of place. (-2)	The presence of vegetation, roads and existing 400kV power line and substation will cause a localized reduction in the visual quality of the landscape. (+3)
Housing Infrastructure	The site is <1km east of Boitekong Town. (-1)	The site is 1.6km east of Boitekong Town. (+1)	The site is <1km east of Boitekong Town. (-1)	The site is <1km east of Boitekong Town. (-1)
Biodiversity	Vegetation is severely modified and koppies to the north of the corridor are considered as an important habitat and refuge areas for migrating biota and plant diversity. (-1)	Vegetation is modified and koppies in the south of the corridor are considered as an important habitat and refuge areas for migrating biota and plant diversity. (-2)	Vegetation is modified and small trees and shrubs dominate the area. A few rock outcrops are not considered as important habitats. (+1)	Vegetation is severely modified (+2)
Drainage Lines and Wetlands	A non-perennial stream is located approximately 160m from the north western border of	A non-perennial stream traverses the corridor from the south eastern border to the northern border No priority	A wetland is located approximately 300m from the southern border of substation 3. No priority wetlands,	A non-perennial stream is located approximately 1600m from the north western border of corridor 1. No

	corridor 1. No priority wetlands, rivers or fish sanctuaries are listed for this area. (-1)	wetlands, rivers or fish sanctuaries are listed for this area. (-3)	rivers or fish sanctuaries are listed for this area. (+1)	priority wetlands, rivers or fish sanctuaries are listed for this area. (+3)
Topography	The corridor and site are located within the valley floor with koppies to the north of the corridor. (+1)	The corridor and site are located within the valley floor and koppies in the south of the corridor. (+1)	Corridor traverses the valley floor and there are a few small rock outcrops. (+2)	The site is located within the valley floor and there are a few small rock outcrops. (+2)
Archaeological Attributes	Several thick undecorated potsherds related to the 16th century were noted on site. These have a low significance. (-1)	Pile of stones and stone walls were noted which have a medium significance. (-3)	Stone tools, animal enclosures and pile of stones were noted. These have a medium significance. (-3)	Several thick undecorated potsherds related to the 16th century were noted on site. These have a low significance. (-1)
Birds	The substation and corridor site consists of open, moderate to heavily disturbed woodland. The construction and operation of the substation and powerline poses a low collision risk and low impact on habitat transformation.	The substation and corridor site consists of open, moderate to heavily disturbed woodland. The construction and operation of the substation and powerline poses a low collision risk and low impact on habitat transformation.	The substation and corridor consists of open, moderate to heavily disturbed woodland. The construction and operation of the substation and powerline poses a low collision risk and low impact on habitat transformation.	The site consists of open, moderate to heavily disturbed woodland. The extension of the substation poses a low impact on habitat transformation.

	(+2)	(+2)	(+2)	(+2)
Accessibility	The site is easily accessible via D522 and the existing substation road and servitude. (+3)	The site is easily accessible via D522 and the existing substation road and servitude. (+3)	The site is easily accessible via D522 and the gravel road that leads to the mines. (+3)	The site is easily accessible via D522 and the existing substation road and servitude. (+3)
Technical Feasibility	There is adequate ROW. (+3)	There is adequate ROW. (+3)	There is adequate ROW, though a road cuts across the substation and corridor site. (+2)	There is adequate ROW. (+3)
Stakeholder Consultation	The site requires more land thereby spreading out the electrical infrastructure and reducing land for grazing. (-1)	This is the least preferred as the substation will impact on the sense of place and requires more land. (-3)	The site requires more land thereby spreading out the electrical infrastructure and reducing land for grazing. (-2)	The landowner prefers this alternative as it requires a small footprint and is an extension of an existing structure. (+3)
Total	**8**	**-2**	**3**	**19**

Alternative 2 ranked best in terms of air quality due to its considerable distance from Boitekong Township whilst Alternative 4 (substation extension) ranked best in terms of all the other specialists' studies. Taking into account the specialists' studies, mapping, Interested and Affected Parties opinions, costs associated with construction and operation and the significance of the impacts expected. Alternative 4 is preferred and effective implementation and adherence to the mitigation measures proposed in Section 8 and the Environmental Management Programme, will reduce the biodiversity, air quality and wetland impacts expected resulting in a ***LOW*** *significance. The following section, Section 8 will discuss the anticipated impacts and recommend mitigation measures to reduce the severity of the impacts for the preferred alternative, Alternative 4 for the substation extension.*

8 POTENTIAL IMPACTS AND DETERMINATION OF SIGNIFICANCE

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

- *A review of the proposed activity;*
- *The nature of the receiving environment; and*
- *Risks and key issues were identified through an internal process based on similar developments, site visits and the specialists' assessments. These included the following:*
  - *Atmospheric impact;*
  - *Biodiversity impacts;*
  - *Eco-tourism related impacts;*
  - *Heritage and archaeological impacts;*
  - *Land use impacts;*
  - *Socio-economic Impacts;*
  - *Visual and noise pollution; and*
  - *Hydrological impacts.*

8.1 POTENTIAL IMPACTS

8.1.1 AIR QUALITY

Air quality will be negatively impacted through the following activities:

- *Combustion emissions resulting from the construction equipment which includes diesel construction equipment used for site grading and excavations, heavy duty diesel tanks used to deliver materials and trucks used to transport workers to, from and around the construction site; and*
- *Fugitive dust emissions resulting from the site grading or excavation activities, construction of plant, roads and vehicles using gravel/unpaved roads.*

8.1.2 BIODIVERSITY IMPACTS

The vegetation type on site is classified as endangered and modified with grazing, mining and urbanization being the most prominent land uses. The following impacts are anticipated during the construction of access roads, power lines, substation and associated infrastructure:

- *Habitat destruction due to the removal and damage of vegetation through soil stripping.*
- *Vegetation may be impacted through removal and site disturbances due to the construction activities, leading to shifts in vegetation community and habitat unit structures;*
- *The collecting and harvesting of vegetation by construction teams ;*
- *The movement of heavy machinery will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation;*
- *Pollution of soils due to oil/fuel leaks and wastes that will affect floral species;*
- *Introduction and distribution of alien vegetation during construction and operation phase;*
- *Erosion of stockpiled topsoil and the disturbance of soils due to vegetation stripping will lead to habitat inundation;*
- *Vegetation removal and associated habitat destruction can lead to habitat loss for avifauna; and*
- *The destruction of avifaunal nests when vegetation is being cleared.*

8.1.3 ECO-TOURISM IMPACTS

The expected impacts are as follows:

- *Visual impacts on Eco-tourists and eco-tourism establishments- most impacts associated with substation extension on eco-tourism relate to visual impacts hence reference is made to Section 8.1.8;*
- *Impacts on eco-tourism products; and*
- *Impacts on establishment and expansion of protected areas.*

8.1.4 ARCHAEOLOGICAL IMPACTS

The construction of the power lines, substation and associated infrastructure will entail ground disturbing activities that could directly impact cultural resources by damaging and displacing artefacts,

diminishing site integrity and altering the characteristics that make the resources significant. Activities that may result in this includes:

- *General cutting and filling; and*
- *Foundation excavations.*

8.1.5 SOIL/LAND IMPACTS

During construction of roads and structures, unstable soils, any form of vegetation clearing and excavations presents a risk of a negative impact. The following impacts are anticipated:

- *Vegetation cover within the areas where the construction materials are laid down will be damaged, which could leave soil bare and susceptible to erosion.*
- *Oil or fuel leakages from construction equipment will contaminate soils.*
- *The movement of heavy machinery will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation.*
- *Erosion of stockpiled topsoil and the disturbance of soils due to vegetation stripping will lead to habitat inundation; and*
- *Loss of grazing land.*

8.1.6 SOCIO-ECONOMIC

The actual impacts experienced at a given project site will depend on a variety of factors that range between the baseline conditions, the public participation process, engagement and capacity building that has taken place, the type of construction methods used, the role of politics and other processes of social change either already underway or which may develop during the life of a project. Social change process expected are categorised into four groups:

i. Economic Processes

These affect economic activity in the region including the way in which people make a living as well as macroeconomic factors that affect the society as a whole. The anticipated impacts are:

- *Waged labour/ employment creation and decrease in unemployment- development directly influences changes in employment and income opportunities in communities. There will be reasonably few numbers of short and medium term employment*

opportunities available which can potentially create tension among community members;

ii. Geographic processes

These affect the land-use patterns of a community and impacts expected are:

- *Conversion and diversification of land-use- the land is currently being used for grazing by the surrounding communities. The extension of substation will change the land use for the project site.*

iii. Institutional and legal processes

These processes affect the efficiency and effectiveness of various organisations that are responsible for the supply of goods and services that people depend on. Expected impacts include:

- *Impact on equity which refers to fairness of the distribution of impacts both negative and positive across the community. The project will lead to gain on a regional level, whereas the local communities will not necessarily benefit in terms of financial and employment opportunities;*
- *Gender relations: in most societies certain roles, occupations and responsibilities and qualities are associated with being male or female. Women lack representation in high paying professions such as construction and mining; and*
- *Capacity building and skills transfer- the project is expected to have a positive impact in capacity building in the communities as opportunities exist to develop the skills of the local residents.*

iv. Socio-cultural processes

These affect the culture of a society, i.e., all aspects of the way that people live together. Impacts expected are:

- *Unacceptable social behaviour- the presence of incoming workers and or the influx of jobseekers can lead to deviant social behaviour in the communities they are based. Where sourcing of local labour is not possible, "outsiders" will need to be employed in order to provide necessary skills. These employees may be accommodated in a construction camp. Historically, such camps create social impacts by introducing new people to an area. Changes can be both positive and negative - positive in that people exchange ideas and backgrounds, and negative*

in terms of conflict that these differences may evoke. The construction camp may also attract women who may use the opportunity to generate income. This may increase the potential for family disintegration as well increased incidences of sexually transmitted diseases;

- *Loss of natural and cultural heritage during construction;*
- *Physical quality of the living environment relate to the exposure to dust, noise, risk, odour, vibration and artificial light. During the construction and operation phase the activities carried out on site have a potential to create pollution;*
- *Aesthetic quality of the living environment and sense of place- it is expected that the activities carried out on site could impact on the sense of place, visual quality and aesthetic appeal;*
- *Health and Social Well-being- construction related public health impacts are possible due to the air, nose and light pollution. Construction activities will result in increased traffic in the area, particularly from heavy vehicles, as well as disruptions to traffic flow along affected roads. This increase in traffic together with construction activities such as open trenches will lead to an increase in safety risks for local residents, motorists and passengers.*
- *Personal safety and hazard exposure/crime and violence- personal safety and risk exposure due to the construction site and related infrastructure and due to the influx of strangers entering the local communities.*

8.1.7 INFRASTRUCTURE FRAMEWORK: TRANSPORTATION

The use of the road network will play a large role in delivering materials and resources to the construction camp during construction. An increase in traffic volumes is expected to be minimal and short term, during the construction period. The roads that will be used for access include the D522, R104 and R510.

8.1.8 VISUAL IMPACTS

Visual intrusion is highly dependent on the type of infrastructure planned and the surroundings of the development. The following impacts are expected during construction and operation phase:

- *Site establishment , construction camps and access roads cause a visual intrusion;*
- *Vegetation cover within the areas where the construction materials are laid down will be damaged, which could leave soil bare; and*

- *The removal of higher growing and dense vegetation will result in disturbed areas of exposed soil and difference in texture. Exposed soil and change in texture will contrast with the intact vegetation around the disturbance footprint and servitude.*

8.1.9 NOISE

Heavy machinery is often required for construction works. This machinery contributes to tremendous amount of sustained noise. Such noise elevations affect the environment by:

- *Sonically vibrating structures*
- *Presenting a danger to human welfare*

Even when it is not perceived consciously, the noise elevations can affect human welfare in varying degrees, both physiologically and psychologically. It becomes a source of annoyance, creating communication problems and leading to elevated stress levels as well as associated behavioral and health effects.

8.1.10 WASTE GENERATION

Any construction work generates solid waste, which can spread through the environment. Solid waste generation at the site will include metal scraps, wooden packing material. Hazardous waste is the oil waste, transformer oil and sewerage.

8.1.11 HYDROLOGICAL IMPACTS

Due to the wetlands that are in close proximity to the project area, the following impacts are expected:

1) *Loss of wetland habitat and ecological structure activities ;*
2) *Changes to wetland ecological and socio-cultural services provision activities*
3) *Aspects of wetland ecological and socio-cultural services affected*
4) *Impacts on wetland Hydrological Function Activities*

The following construction and operation activities will result in the above mentioned impacts:

- *Site clearing and removal of vegetation leading to increased run-off and erosion;*
- *Earthworks within the wetlands leading to increased runoff and erosion and altered runoff patterns;*
- *Topsoil stockpiling adjacent to wetlands and runoff from stockpiles;*

- *Movement of construction vehicles within wetlands*
- *Dumping of construction material into the wetlands*
- *Direct impact on wetland habitat during construction activities;*
- *Contamination of wetland soils;*
- *Compaction and loss of wetland soils; and*
- *Sedimentation and incision leading to altered habitats.*
- *Construction of stream crossings altering stream and base flow patterns and water velocities;*
- *Loss of phosphate, nitrate and toxicant removal abilities;*
- *Loss of carbon storage capabilities; and*
- *Inability to support biodiversity.*

Operation Activities

- *Erosion of wetland areas due to altered runoff patterns;*
- *Runoff from road surface contaminating surface water and soils.*
- *Erosion and sedimentation of wetlands leading to loss of wetland habitat*
- *On-going disturbance of soils with general operational activities*
- *Earthworks in the vicinity of wetlands leading to increased runoff and altered runoff patterns*
- *Direct impact on wetland habitat;*
- *Contamination of wetland soils due to runoff from roads;*
- *Changes to the wetland community due to alien invasion vegetation leading to altered habitat conditions; and*
- *Sedimentation and incision leading to altered habitats.*
- *Site clearing and the removal of vegetation leading to increased runoff; and*
- *Site clearing and the disturbance of soils leading to increased erosion.*

8.2 DETERMINATION OF THE SIGNIFICANCE OF IMPACTS

According to Thompson (1988 &1990) in DEAT 2002, the significance of an impact is an expression of the cost or value of an impact to society. Impacts are divided according to phases, construction,

operation and decommissioning phase, assessed and mitigation measures proposed. The following parameters will be used to assess the identified environmental impacts:

i. *Intensity;*

ii. *Extent;*

iii. *Duration; and*

iv. *Probability.*

8.2.1 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, construction, operation and decommissioning phase, assessed and mitigation measures proposed. The following parameters will be used to assess the identified environmental impacts:

8.2.1.1 MAGNITUDE/ INTENSITY OF THE EFFECT

This refers to the degree to which the project area is affected by an impact.

Table 8-1: **Scoring for Intensity**

CATEGORY	***DESCRIPTION***	***SCORE***
None	*No potential for harm, correctable*	*0*
Low	*Little potential for harm, easily correctable.*	*2*
Moderate	*Somewhat harmful, correctable*	*4*
High	*Harmful but not potential fatal, difficult to correct and recover.*	*6*
Very High	*Very Harmful/ potentially fatal, great effort to correct and recover.*	*8*

8.2.1.2 EXTENT

These are geographic boundaries that reflect the physical area in which an impact occurs.

Table 8-2: **Scoring for Extent**

CATEGORY	*DESCRIPTION*	*SCORE*
Site	*Impacts limited to site*	*1*
Local	*Impacts limited to 3-7 km of the site*	*2*
Regional	*Impacts on a regional scale*	*3*
National	*Impacts on a national scale*	*4*
International	*Impacts on a international scale*	*5*

8.2.1.3 DURATION

Duration pertains to the length of time that the environmental impact will be felt by the affected entities.

Table 8-3: **Scoring for Duration**

CATEGORY	*DESCRIPTION*	*SCORE*
Immediate	*Impacts can be corrected in 3 months or less*	*1*
Short Term	*Impacts last for a period 3-12 months and are correctable.*	*2*
Medium Term	*Impacts last for a period 1-3 years and difficult to correct but recoverable.*	*3*
Long Term	*Impacts last beyond 3 years or more requires great effort to correct and recover*	*4*
Irreversible	*Controllable but not correctable*	*5*

8.2.1.4 PROBABILITY

This refers to the likelihood that serves as an indicator of probability. It attempts to rate impacts on the probability of their occurrence.

Table 8-4: **Scoring for Probability**

CATEGORY	***DESCRIPTION***	***SCORE***
Low	*Estimated less than 5% chance of impacts occurring*	*1*
Moderate	*Reasonable probability*	*2*
Likely	*Strong Probability*	*3*
Very likely	*High probability that a project will result in a detectable impact*	*4*

8.2.1.5 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 8-5: **Categories of Cumulative Impacts**

CATEGORY	***DESCRIPTION***
Marginal	*Insignificant*
Compounding	*Increased impact*

8.2.1.6 STATUS

Table 8-6: **Categories of 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.*

8.2.1.7 CONFIDENCE

Table 8-7: **Categories for the Degree of Confidence**

CATEGORY	***DESCRIPTION***
Unsure	*Less than 40% sure of a particular fact or the likelihood of an impact occurring.*
Certain	*More than 90% sure of a particular fact. Substantial supportive data exist to verify the assessment*

8.2.1.8 SIGNIFICANCE

The potential impacts are assigned a significance rating (S), based on the information in the tables above. (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.

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

Table 8-8: **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*

i. Establishment of Construction camp

Table 8-9: **Construction Materials**

Phase	*Pre-Construction, Construction*	
	With Mitigation Measures	***Without Mitigation Measure***
Extent	*Site (1)*	*Region (3)*
Duration	*Immediate (1)*	*Irreversible(5)*
Intensity	*Low (2) –Moderate (4)*	*Very High (8)*
Probability	*Likely (4)*	*Very Likely4)*
Significance	***Low (16-24)***	***High (64)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

Establishment

- *Before construction work commences, a survey of the site must be carried out, a photographic and written record should be kept;*
- *The public or the affected people within the project area or who will be affected by the construction works must be notified of the intended work to be carried out including the duration of the proposed works;*
- *The construction camp should be located in an area that is already disturbed or where it is not necessary to remove established vegetation;*
- *Footpaths or roads that will be closed or obstructed must have signage and barriers;*
- *Site boundaries set out by the engineer must be respected; and*

- *There should be proper ablution on site.*
- *During the construction phase, workers must be limited to areas under construction and access to neighbouring undeveloped areas must be strictly regulated.*

Site Layout

Before construction commences, the contractor shall submit a site layout plan to the

Site engineer for approval, including:

- *Site access (including entry and exit points);*
- *Office accommodation;*
- *Access and haulage routes;*
- *All material and equipment storage areas (including storage areas for hazardous substances such as fuel and chemicals);*
- *Areas where construction vehicles will be serviced; and*
- *The construction camp, office and storage areas for material and equipment must be fenced in to prevent impacts and human interference to spread further than the site.*

Access

- *Access for construction traffic will be required and maintained to all sites during the construction phase;*
- *Where there is no existing access available or where ground conditions prevent normal access, temporary access routes may have to be constructed; and*
- *Workers must be limited to areas under construction and access to neighbouring undeveloped areas must be strictly regulated.*

Staging Areas

- *The staging and materials storage area should be installed before any structure is constructed on the site camp;*
- *Construction equipment and vehicles should be stored at the staging area;*
- *Gravel bag berms should be installed around the perimeter to designate the staging and materials storage areas;*
- *Non-hazardous material shall be stored in a separate covered storage facility; and*

- *It is discouraged to store hazardous material on site, should they be needed, the materials should be stored in labelled sealed containers.*

Removal of indigenous vegetation

- *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;*

Destruction of Existing Infrastructure

- *The construction team shall at all times exercise due care and diligence not to damage fences, roads, tracks, buildings, hedges and trees. All damage shall be made well at first opportunity, at the Contractor's cost depending on the type of damage and the responsible party for such damage;*
- *Workers should be limited to areas under construction and access of neighbouring undeveloped areas must be strictly regulated.*

Stockpiles

- *All temporary stockpile areas, litter and rubble must be removed on completion of construction. All dumped material must be taken to an approved Rustenburg Local Municipality landfill.*

Fire outbreaks

- *Fire breaks must be constructed on the inside perimeter to prevent fires from spreading from the site as well as fires entering the site from adjacent land in accordance with the ESKOM Standard SCSASAAJ6: Rev 0, Distribution of Fire Risk Management; and*
- *A fire management plan must be identified, implemented and maintained, commencing prior to construction and maintained throughout the operational phase. The following additional measures must be included:*
    - *No fires may be made for the burning of vegetation and waste;*
    - *No open fires are to be made on site; cooking facilities must be provided;*
    - *No firewood may be collected;*
    - *Fire fighting equipment must be readily available on site during all times; and*
    - *Burning of waste material such as vegetation and old cleaning materials resulting from maintenance activities at the site is strictly prohibited.*

Noise and air pollution

- *To minimize air and noise pollution, construction team shall use only equipment in good condition, which shall be properly maintained;*
- *Disturbance or disruption of the daily lives of local communities and their livelihood, including noise and dust pollution shall be minimized in as far as is practicable; and*
- *Construction should be limited to daylight hours to prevent disturbances to the nocturnal activities of certain species and nearby human populations.*

Visual Impact

- *The Contractor shall ensure that the construction site is maintained in a neat and tidy condition at all times so as to maintain the natural scenic beauty of the border area; and*
- *The construction camp should be screened by enclosing the entire area with a dark green or black shade cloth of no less than 2m in height.*

Site Clearance/Demobilisation

- *All damage done as a result of construction works should be rehabilitated to the satisfaction of the ECO. Reference should be made to the Re-vegetation and Rehabilitation Plan in the EMP;*
- *Where soil is contaminated, the contaminated soil should be removed and disposed of at a hazardous landfill and the area cleaned up. Reference is made to the Spills Prevention Plan in the EMP;*
- *All portable toilets should be removed on site;*
- *Fences should be removed and poles filled up unless the landowner requests otherwise;*
- *Public roads and footpaths must be checked to ensure that they are in good condition and safe for public use; and*
- *Prior to leaving the site, all signage boards must be removed.*

ii. Air Quality

Table 8-10: **Air Quality**

Phase	*Construction, Operation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Local (2)*
Duration	*Immediate (1)*	*Immediate (1)*
Intensity	*Low (2)*	*High (8)*
Probability	*Very Likely(5)*	*Very Likely (5)*
Significance	***Low (20)***	***Medium (55)***
Cumulative	*Compounding*	
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

Site Preparation

Before the commencement of any site works and during the operation as much vegetation as possible should be retained including patches and strips to minimize dust. Dust emissions can be controlled using the following procedures:

- *Before any site works commence, the ECO should plan and locate the vegetation cover that needs to be retained;*
- *Vegetation should be protected by fencing or blocking off from the rest of site operations;*
- *In areas where work has not commenced, original vegetation cover should be maintained as long as possible. Retaining low or sparse vegetation is effective at dissipating wind velocity at the ground*

surface where dust lift off occurs;

- *Spray earthworks, roads and other surfaces as necessary with water.*

Vegetative Stabilisation

- *Where areas are cleared, established plants should be transplanted to areas that need vegetation.*

Timing of Development

- *Topsoil stripping should not be carried out near Boitekong Township during adverse wind conditions. Topsoil should be stripped in discrete sections allowing buffer strips between clearings.*

Wind Barriers

- *Wind barriers should be placed perpendicular to the direction of the prevailing wind;*
- *Porous barriers should be used as they provide smaller reductions in velocity for more extended distances;*
- *Wind barriers to be used should be at least 2 metres high; and*
- *The screening material should have a porosity of 50% or less.*

Dust Control

- *Exposed surfaces should be kept moist by spraying with water and dust suppressant;*
- *Exposed surfaces and stockpiles left for long should be stabilised by sealing, seeding or spraying with water or dust suppressant; and*
- *Combustible waste material shall not be burnt on site.*

Earth moving Management

- *Do not commence or continue with earth moving activities in adverse weather conditions;*
- *Use balanced cut and fill operations to reduce off-site hauling;*
- *All vehicles shall not exceed the maximum speed limit of 40km/h within the site;*
- *Trucks transporting loose material to and from the site should be covered; and*
- *Vehicles should be well services to avoid excessive emissions.*

Stockpiles

- *Stockpiles should be covered, however where they are located in open areas the height and slope should be limited to reduce wind pick up;*
- *Stockpiles should be oriented lengthwise into the wind so they offer the minimum cross sectional*

area to prevailing winds;

- *Wind barriers should be installed on three sides of the stockpile;*
- *Activity should be limited to the downside of the stockpile;*
- *Transfer points should be minimized.*

Watering

- *The surface should be dampened to prevent dust from becoming airborne but should not be wet to the extent of producing run-off;*
- *Use watering sprays on materials to be loaded and during loading; and*
- *Real time automated response systems should be used to turn on water cannon systems in response to dust levels or high wind speeds.*

iii. Biodiversity

Table 8-11: **Avi-fauna**

Phase	*Construction, Operation*		
Activity		*With Mitigation Measures*	*Without Mitigation Measure*
Habitat Transformation	***Extent***	*Local (2)*	*Local (2)*
	Duration	*Permanent (5)*	*Permanent(5)*
	Intensity	*Low (2)*	*Low (2)*
	Probability	*Moderate (2)*	*Likely (3)*
	Significance	***Low (18)***	***Low (27)***
	Cumulative	*Marginal*	*Compounding*
	Status	*Negative*	
	Confidence	*Certain*	
	Mitigation Measures	• *The removal of large trees should be avoided as much as possible.*	

Table 8-12: **Vegetation clearance**

Phase	*Pre-Construction, Construction, Operation, Decommissioning*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Site (1), Local (2)Regional (3)*
Duration	*Long Term (4)*	*Permanent (5)*
Intensity	*Low (2)*	*Low (2) Moderate (4)*
Probability	*Likely (4)*	*Likely(4)*
Significance	***Low (28)***	***Low (28)-Medium (48)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

- *Eskom must identify and demarcate the exact clearing of the servitude for the contractor to ensure that minimum debushing takes place;*
- *Selective bush clearing must take place;*
- *Indigenous vegetation which does not interfere with the safe operation of the power lines should be left undisturbed;*
- *The ECO and an ecologist should identify, locate all plants and natural features to be protected during construction. These include the non-perennial stream 1600m away from the site and aesthetically significant areas. A danger tape and steel droppers can be used;*
- *Any intended vegetation clearance must be submitted as a plan of action to the ECO;*
- *Large trees should not be removed without the permission of the ECO;*
- *Clear guidelines and proper plans must be given to the contractor. Daily inspections are needed to*

prevent problems;

- *The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement.*
- *Disturbed areas around the construction sites should be re-vegetated using specified vegetation;*
- *Where possible and without compromising the substation, all existing large trees that fall outside of the earthworks should be conserved. These will assist in softening the local visual impact and aid in visual screening from distant viewpoints.*
- *Disturbance to flora outside of approved site and access roads should not occur except where deemed unavoidable for the construction process;*
- *Plant demarcations should be maintained in position until the cessation of construction works;*
- *No open fires are to be permitted under trees;*
- *After construction the habitat restoration and re-vegetation plan should be used in disturbed areas;*
- *Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adopted to the local environmental conditions;*
- *During operation, selective bush clearing must take place, i.e. the entire servitude should not be cleared. Indigenous vegetation which does not interfere with the safe operation of the site should be left undisturbed;and*
- *Selective bush clearing must take place, i.e. the entire servitude should not be cleared. Indigenous vegetation which does not interfere with the safe operation of the power line should be left undisturbed.*

Table 8-13: **Alien Species**

Phase	*Preconstruction, Construction, Operation and Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)Local (2)*	*Site (1), Local (2)Regional (3)*
Duration	*Immediate(1)*	*Immediate (1)*
Intensity	*Low (2)Moderate (4)*	*Low (2)Moderate (4)*
Probability	*Likely(4)*	*Likely(4)*
Significance	***Low (16-28)***	***Low (16)-Medium (48)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

Clearing Methods

- *There is need to ensure all alien plants on construction sites are removed;*
- *There is need to ensure that alien vegetation is cleared on a daily basis;*
- *Care should be taken that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum; and*
- *Fire is not a natural phenomenon at the site and fires should not be used as a clearing method or vegetation management approach at the site.*

Herbicide Usage

- *Only registered herbicides shall be used by trained applicators adhering to label specifications. Eskom's standard for herbicide management, ESKPBAAD4 shall be used as a guideline;*

- *The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides;*
- *The use of herbicides shall be restricted to the removal and control of alien vegetation, and shall not be permitted within identified sensitive areas;*
- *Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control;*
- *All care must be taken to prevent contamination of the water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures;*
- *Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable site; and*
- *To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.*

Construction Works

- *The ECO is to provide permission prior to any vegetation being cleared for development;*
- *Cleared areas that have become invaded can be sprayed with appropriate herbicides provided that these break down on contact with the soil. Residual herbicides should not be used;*
- *Brush clearing of vegetation is not allowed within 32m of the wetlands;*
- *Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment;*
- *Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed;*
- *Alien vegetation re-growth must be controlled throughout the entire site during the construction period;*
- *Clearing activities must be contained within the affected zones and may not spill over into demarcated No Go areas.*

Operation

- *Alien vegetation in servitudes shall be managed in terms of the Regulation GNR. 1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of*

1983. In terms of these regulations EKOM shall 'control', i.e. to combat category 1,2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by ESKOM.

- *Due to the nature of alien vegetation, a control Programme for alien vegetation control must be implemented. The implementation thereof could be more frequent than the three year interval recommended for indigenous vegetation. Alien vegetation can grow at rates significantly faster than 1 meter per year.*
- *Alien vegetation removal will continue through all phases of the development especially in the open spaces.*

Table 8-14: **Wood Collection and Hunting**

Phase	*Construction, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Regional (3)*
Duration	*Permanent (5)*	*Permanent (5)*
Intensity	*Moderate (4)*	*High (6)*
Probability	*High (4)*	*High (4)*
Significance	***Low (24)***	***Medium (56)***
Cumulative	*Marginal- Compounding*	*Compounding*
Status	*Negative*	
Confidence	*Uncertain*	

Mitigation Measures

- *The contractor must ensure no wood collection takes place (by construction workers for cooking);*
- *Workers should not stay on site and must be limited to the construction site as far as possible; and*
- *Hunting is prohibited and anyone caught hunting should be penalized or fined.*

v. Soil

Table 8-15: **Soil**

Phase	*Pre-Construction, Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Local (2)*	*Regional (3)*
Duration	*Immediate (1)*	*Permanent(5)*
Intensity	*High (6)*	*High (6)*
Probability	*High (4)*	*Definite (5)*
Significance	***Medium (36)***	***High (70)***
Cumulative	*Marginal-Compounding*	
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

- *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.*

Spoil Sites

- *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;*
- *The use of spoil sites for the disposal of hazardous or toxic wastes shall be prohibited;*
- *Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75 mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:2. Only under exceptional circumstances shall approval be given to exceed this ratio;*
- *Appropriate re-vegetation measures to minimise soil erosion will be undertaken by the Concessionaire. This will include either strip sodding or seeding or full sodding.*
- *The Engineer may only approve a completed spoil site at the end of the construction period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability.*

Stockpiles

- *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;*
- *In determining the location of these temporary stockpile areas, cognisance must be taken of sensitive and no-go areas such as rivers and drainage lines;*
- *Should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan and submitted in writing to the Engineer for approval, together with the proposed measures for prevention, containment and rehabilitation against environmental damage;*

- *Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of these temporary stockpiles, the contractor shall at all times ensure that they are:*
    - *positioned and sloped to create the least visual impact;*
    - *constructed and maintained so as to avoid erosion of the material and contamination of the surrounding environment; and*
    - *Kept free from all alien/undesirable vegetation.*
- *After the stockpiled material has been removed, the site shall be re-instated to its original condition.*
- *No foreign material generated/deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the ECO is received.*

Erosion and Sediment Control

- *Excavation activity should be completed in periods of dry weather;*
- *All areas susceptible to erosion should be protected and there should be no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas;*
- *Natural trees, shrubbery and grass species should be retained wherever possible;*
- *Do not permit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the Work Area;*
- *Avoid access into seasonally wet areas and / or turf soils during and immediately after rainy periods, until such a time that the soil has dried out;*
- *Utilize only light equipment for access and deliveries into areas of unstable soils, in areas where erosion is evident, and at stream and river embankments;*
- *Limit vehicular access into rocky outcrops and ridges;*
- *Preserve vegetation so that it can act as a buffer in wetlands. Preserved vegetation should be temporarily fenced with an orange colored mesh;*
- *Cleared, grubbed and graded construction areas should be stabilized and erosion controls immediately after these activities are done. These areas should be stabilized with mulch or re-vegetated with temporary vegetation or erosion control blankets;*
- *Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek*

advice from the ECO;

- *The following methods should be used for control;*

a) Sediment Fences

- *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

- *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

- *Where there are gullies, gabions and reno mattresses should be used to prevent erosion.*

Rehabilitation

- *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.*

vi. Water Resources

Table 8-16: **Water Resources**

Phase	*Pre-construction, Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Regional (3)*
Duration	*Short Term (2)*	*Long Term (4)*
Intensity	*Moderate (4)*	*High (6)*
Probability	*Likely (3)*	*Likely (3)*
Significance	***Low (21)***	***Medium (39)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Uncertain*	

Mitigation Measures

Storm-water Control

- *Consideration should be given to the creation of artificial wetlands for the treatment of storm water run-off, particularly from areas where fertilizers, herbicides and pesticides are likely to be used. The proposed project area is largely characterized by grazing land and modified vegetation located near a non-perennial stream;*
- *Measures such as vegetated swales and cut-off drains must be provided in order to help divert poor quality storm water runoff to artificial wetlands, if created on site. Vegetative swales can help reduce runoff velocity, thereby allowing for better infiltration capability;*
- *Rainwater runoff from roofs of construction camp buildings must be directed into rainwater tanks, this water can be used for dust control;*

- *The provision of rainwater tanks is recommended to help store away excess water, which may create potential for flooding;*
- *Construction should be restricted to the drier months if possible to avoid sedimentation of wetland features.*

Spillages

- *Surface and groundwater should be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water and organic materials.*
- *The ECO should ensure that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.*
- *In the event of a spillage, the contractor will be liable to arrange for competent individuals to clear the affected area. Responsibility for spill treatment lies with the contractor.*
- *The individual responsible for, or who discovers a hazardous waste spill must report the incident to the ECO.*
- *In the event of a larger spill, Department of Water and Sanitation should be informed within 24 hours and they will in turn advise on the most effective method of cleaning the spill.*
- *The contractor should ensure all vehicles are well maintained to reduce the likelihood of oil leakage.*

Surface Water

- *Where possible site clearance should be scheduled in the drier season so as to reduce rainfall erosion potential which can lead to sedimentation of the water course located 1600m from the site;*
- *No water may be abstracted from any surface water body for the purpose of construction unless permitted in terms of the Contract and Department of Water and Sanitation, or specifically authorized by the ECO;*
- *It must be ensured that flow connectivity along the wetland features is maintained.*
- *Over-wetting, saturation and unnecessary run-off during dust control activities should be avoided;*
- *The contractor should not drain, fill or alter in any way, any wetland or drainage line unless instructed by the ECO;*

- *All waste produced during construction must be stored in appropriate containers and disposed of at Rustenburg Local Municipality landfill;*
- *Berms and containment measures for fuels and oils should be placed around transformers to prevent spills during accidents and maintenance;*
- *Clean-up plan/strategy should be in place in the event that spills occur.*
- *Proper mobile ablution facilities should be in place to ensure that no sewerage spills into the non-perennial stream. Collection pans should be placed underneath the mobile toilets to act as secondary containment;*
- *There should proper storage of material during construction and clean-up should be done after the construction is completed.*
- *Re-vegetate all disturbed areas with indigenous wetland species.*

Infrastructure

- *No roads shall be cut through non perennial stream banks as this may lead to erosion causing siltation of streams.*
- *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.*
- *Implement alien vegetation control program within wetland areas.*
- *Monitor all systems for erosion and incision.*

Operation

- *Well maintained vehicles should be used during maintenance;*
- *A storm water management plan should be in place during the operation phase; and*
- *Berms should be constructed to contain spills.*

vii. Eco-tourism

Impacts on eco-tourism products and establishment and expansion of Protected Areas within the area are expected to have a very low significance. Reference is also made to the mitigation measures in Table 8-18 The following mitigation measures should be implemented

Mitigation Measures

- *Eskom should establish an eco-tourism/ conservation forum for the project by engaging with all tourism associations (local and provincial) to ensure that on-going communication is provided to all role-players and to ensure that all eco-tourism products are aware of the construction timeframes;*
- *Construction activities should be conducted within the off-peak tourism seasons and outside of the hunting season which has been established for the North West Province. It should be noted that the hunting periods differ on a species specific basis but the main hunting periods are from April to September;*
- *All impacts on flora should be rehabilitated immediately to its natural state; and*
- *Eskom should engage with Provincial conservation authorities to ensure development within proposed conservation areas is managed accordingly.*

viii. Heritage

Table 8-17: **Natural and Cultural Heritage**

Phase	*Construction, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Site (1)*
Duration	*Immediate (1)*	*Irreversible (5)*
Intensity	*Low (2)*	*High (6)*
Probability	*Definite (5)*	*Likely (5)*
Significance	***Low (20)***	***High(60)***
Cumulative	*Marginal*	

Status	*Negative*
Confidence	*Certain*

Mitigation Measures

Site specific measures in terms of archaeological resources of the proposed area, as identified by ***Munyadziwa Maguma (082 535 6855)*** *must be implemented on site*

- *An archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should supervise the excavations at the towers and substation;*
- *Should any undisturbed subsurface archaeological material be exposed during the construction activities, the archaeologist should activate all necessary mitigation measures to salvage such exposed heritage remains.*
- *The Environmental Control Officer or any person responsible for site management should be aware of the indicators of sub-surface archaeological sites, this may include the following:*

- *Bone concentrations, either animal or human,*
- *Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate),*
- *Ceramic fragments, including potsherds,*
- *Bone concentrations,*
- *Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial),*
- *Fossilised remains of fauna and flora, including trees;*

- *Local residents and land owners should be consulted to determine any possible heritage sites not identified by the HIA.*

ix. Visual Assessment

Table 8-18: **Visual**

		With Mitigation Measures	*Without Mitigation Measure*
Landscape Character	***Construction***		
	Extent	*Local (2)*	*Local (2)*
	Duration	*Medium Term (3)*	*Irreversible (5)*
	Intensity	*Low (2)*	*Low (2)*
	Probability	*Likely (3)*	*Likely (3)*
	Significance	***Low (21)***	***Low (27)***
	Cumulative	*Compounding*	
	Status	*Negative*	
	Confidence	*Certain*	
	Operation		
	Extent	*Local (2)*	*Local (2)*
	Duration	*Irreversible (5)*	*Irreversible (5)*
	Intensity	*Low (2)*	*Low (2)*
	Probability	*Likely (3)*	*Likely (3)*
	Significance	***Low (27)***	***Low (27)***
	Cumulative	*Compounding*	

	Status	*Negative*	
	Confidence	*Certain*	
	Construction		
Visual Intrusion Residents	***Extent***	*Local (2)*	*Local (2)*
	Duration	*Immediate (1)*	*Short Term (2)*
	Intensity	*Low (2)*	*Moderate (4)*
	Probability	*Likely (3)*	*Likely (3)*
	Significance	***Low (15)***	***Low (24)***
	Cumulative	*Compounding*	
	Status	*Negative*	
	Confidence	*Certain*	
	Operation		
	Extent	*Local (2)*	*Local (2)*
	Duration	*Irreversible (5)*	*Irreversible (5)*
	Intensity	*Low (2)*	*Low (2)*
	Probability	*Likely (3)*	*Likely (3)*
	Significance	***Low (27)***	***Low (27)***
	Cumulative	*Marginal*	

	Status	*Negative*	
	Confidence	*Certain*	
Visual Impact on motorists	***Construction***		
	Extent	*Site (1)*	*Site (1)*
	Duration	*Immediate (1)*	*Immediate (1)*
	Intensity	*Low (2)*	*Moderate (4)*
	Probability	*Likely (3)*	*Likely (3)*
	Significance	***Low (12)***	***Low (18)***
	Cumulative	*Compounding*	
	Status	*Negative*	
	Confidence	*Certain*	
	Operation		
	Extent	*Site (1)*	*Local (2)*
	Duration	*Immediate (1)*	*Immediate (1)*
	Intensity	*Low (2)*	*Moderate (4)*
	Probability	*Very Likely (4)*	*Very Likely (3)*
	Significance	***Low (16)***	***Low (21)***

	Cumulative	*Compounding*	
	Status	*Negative*	
	Confidence	*Certain*	
Visual Impact on Tourists	***Construction***		
	Extent	*Local (2)*	*Local (2)*
	Duration	*Immediate (1)*	*Short Term (2)*
	Intensity	*Low (2)*	*Moderate (4)*
	Probability	*Low (1)*	*Low (1)*
	Significance	***Low (5)***	***Low (8)***
	Cumulative	*Compounding*	
	Status	*Negative*	
	Confidence	*Certain*	
	Operation		
	Extent	*Local (2)*	*Local (2)*
	Duration	*Irreversible (5)*	*Irreversible (5)*
	Intensity	*Low (2)*	*Moderate(4)*
	Probability	*Low (1)*	*Low (1)*
	Significance	***Low (9)***	***Low (11)***
	Cumulative	*Compounding*	

	Status	*Negative*
	Confidence	*Certain*

Mitigation Measures

- *Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors;*
- *Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and*
- *Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height.*
- *Where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp and substation, 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;*
- *Make use of existing access roads where possible;*
- *Where new access roads are required, the disturbance area should be kept as small as possible. A two-track dirt road will be the most preferred road option;*
- *Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation;*
- *Maintain no or minimum cleared road verges;*
- *Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands as not to fragment intact vegetated areas; and*
- *If possible, locate construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation like for example, naturally bare areas.*

x. Socio-Economic Impact

Table 8-19: ***Waged Labor/ Employment Creation and Decrease in Unemployment***

Phase	*Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Region (3)*	*Regional (3)*
Duration	*Medium Term (3)*	*Medium Term (3)*
Intensity	*Low (2)*	*High (6)*
Probability	*Low (1)*	*Likely (3)*
Significance	***Low (8)***	***Medium (36)***
Cumulative	*Marginal*	
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

- *Non-locals should only be hired when specialist skills which are not available locally are required and local business providing such skills cannot be created. The following aspects in this regard should receive priority:*
- *Labour based construction methods should be used whenever practically possible;*
- *Local residents and communities should be employed, wherever possible;*
- *Local construction companies should be used whenever possible, especially for subcontracting work; and*
- *Local suppliers should be used as far as possible.*

Table 8-20: **Conversion and diversification of Land use**

Phase	*Construction, Operation, Rehabilitation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Site (1)*
Duration	*Long Term (4)*	*Irreversible (5)*
Intensity	*High (6)*	*High (6)*
Probability	*Very Likely (5)*	*Very Likely (5)*
Significance	***Medium (55)***	***High (60)***
Cumulative	*Marginal*	
Status	*Negative*	
Confidence	*Certain*	
Mitigation Measures • *Eskom should take into account surrounding land uses and design land use options to support and enhance long-term development options;* • *The RBN must manage access to land for grazing and implement measures to reduce the number of cattle grazing in the area, or establishing rotational grazing practices.*		

Table 8-21: **Equity**

Phase	*Pre-Construction, Construction, Operation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Regional (3)*	*Regional (3)*
Duration	*Long Term (4)*	*Medium Term (3)*
Intensity	*Moderate (4)*	*Low (2)*
Probability	*Likely (3)*	*Low (1)*
Significance	***Medium (33)***	***Low (8)***
Cumulative	*Cumulative*	
Status	*Positive*	
Confidence	*Uncertain*	
Mitigation Measures • *Skills training and development should be maximised to benefit as many local employees as possible;* • *The use of local labour must be maximised as far as possible; and* • *Eskom's internal policies and procedures should be used to ensure a fair and transparent recruitment process.*		

Table 8-22: **Gender Relations**

Phase	*Pre-Construction, Construction, Operation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Regional (3)*	*Regional (3)*
Duration	*Long Term (4)*	*Short Term (2)*
Intensity	*High (6)*	*Low (2)*
Probability	*Likely (3)*	*Medium(2)*
Significance	***Medium (39)***	***Low (14)***
Cumulative	*Cumulative*	
Status	*Positive*	
Confidence	*Certain*	
Mitigation Measures • *Women must have equal employment opportunities;* • *Training and skills development should take place for women;* • *Salaries of women should be equal to that of men when undertaking the same job;* • *Eskom's internal policies and procedures should be used to ensure a fair and transparent recruitment process; and* • *Institute a well-designed gender equality strategy, if not already available.*		

Table 8-23: **Capacity Building and Skills Transfer**

Phase	*Construction, Operation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Regional (3)*	*Regional (3)*
Duration	*Long Term (4)*	*Short Term (2)*
Intensity	*High (6)*	*Low (2)*
Probability	*Likely (3)*	*Moderate (2)*
Significance	***Medium (39)***	***Low (14)***
Cumulative	*Cumulative*	
Status	*Positive*	
Confidence	*Certain*	

Mitigation Measures

- *The contractor should recruit and train local residents to supply unskilled labour during the construction phase;*
- *Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training);*
- *Training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area to avoid persons with trained skills leaving the area for work elsewhere; and*
- *Ensure that the employment and training of HDSA and women.*

Table 8-24: **Unacceptable Social Behaviour**

Phase	*Construction*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Regional (3)*	*Regional (3)*
Duration	*Short Term (2)*	*Long Term (4)*
Intensity	*Moderate (4)*	*Moderate (4)*
Probability	*Low (1)*	*Likely (3)*
Significance	***Low (9)***	***Medium (33)***
Cumulative	*Marginal*	
Status	*Negative*	
Confidence	*Uncertain*	

Mitigation Measures

- *Maximize local labor to allow employees to be closer to their homes and families, thereby limiting the need to accommodate employees on site.*
- *Wherever people from other areas are employed and accommodated on site, strict access control measures will be implemented with only authorized personnel allowed at the camping site.*
- *Establish a code of conduct for construction workers with strict control measures;*
- *Construction and operational personnel to wear identification badges to distinguish them from trespassers or unwanted loiterers;*
- *HIV / Aids awareness campaigns within the area should be initiated and supported by Eskom;*
- *Life orientation programmes, explaining the dangers of drug and alcohol abuse should form part of induction for all workers;*

- *Liaise with the SAPD in order to implement effective crime prevention strategies; and*
- *Liaise with existing forums in the community to communicate information to the community and to assist in the monitoring of compliance.*

Table 8-25: **Physical Quality of the Living Environment**

Phase	*Construction, Operation*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Local (2)*	*Local (2)*
Duration	*Short Term (2)*	*Long Term (4)*
Intensity	*Moderate (4)*	*High (6)*
Probability	*Very Likely (4)*	*Very Likely (4)*
Significance	***Medium (32)***	***Medium (48)***
Cumulative	*Compounding*	
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

- *Existing community(Thekwana, Photsaneng, Mfidikoe and Boitekong) forums must serve as liaison between the affected stakeholders and Eskom and can discuss traffic, dust, noise and construction related concerns with them;*
- *The contractor must prevent dust blowing off transported materials by washing vehicles, wheels and covering loads;*
- *Wet suppression should be employed to reduce particulate emissions during the construction phase, due to their close proximity to Boitekong;*

- *The maximum acceptable night time noise levels should not be exceeded; and*
- *Eskom must develop a community liaison protocol for dealing with community complaints in a way that is sensitive to their traditional and cultural practices.*

Table 8-26: **Health and Safety**

Phase	*Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Local (2)*	*Local (2)*
Duration	*Immediate (1)*	*Permanent (5)*
Intensity	*Moderate (4)*	*High (6)*
Probability	*Medium (3)*	*High (4)*
Significance	***Low (21)***	***Medium (42)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

Pedestrian Routes

- *Pedestrian routes should be wide enough to accommodate the number of people that are likely to use them at peak times;*
- *Pedestrian routes should be kept free of obstructions;*
- *Footpaths should be clearly and suitably signed; and*

- *Routes should be able to cross the main vehicle routes safely.*

Safety

- *Strict security measures should be put in place. Security personnel should be on site on a permanent basis;*
- *The construction area should be fenced to avoid unauthorised entry by humans or animals onto the site;*
- *Workers must not be allowed to leave the designated areas without permission;*
- *The specifications included under this section do no exempt the Contractor from complying with all the Regulations as included in the Occupational Health and Safety Act (Act 85 Of 1993). The contractor is further referred to this Act and all its regulations;*
- *A Health and Safety Plan should be implemented and it must be ensured that all managers are trained in First Aid and other relevant safety courses;*
- *Implement safety measures to limit fire hazards and implement fire breaks if possible;*
- *Operational safety risks should be addressed as part of the OHS Act;*
- *Appropriate fire-fighting equipment should be on site and construction workers should be appropriately trained for fire-fighting; and*
- *The site should be clearly marked and "danger" and "no entry" signs should be erected;*
- *The safety of all construction and operational personnel, as well as any member of the public on the site is the responsibility of the Contractor;*
- *Access onto and off the site should be controlled by means of a register system. This includes visitors;*
- *The contractor and Health and Safety Officer (HSO) should ensure that first aid / emergency facilities / procedures are in place;*
- *The HSO should ensure that all personnel are trained in basic site safety procedures;*
- *A register with contact numbers of all people employed and one relative for each should be kept on site;*
- *A list of all relevant emergency numbers should be kept in an easily accessible location on site;*
- *A record of all incidents, accidents and illnesses on site shall be kept and the information shall be made available at meetings;*
- *The HSO should ensure that proper footwear is worn by employees at all times.*

- *The site manager shall ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear and safety ropes as required;*
- *The site manager shall ensure that adequate drinking water, wash water and sanitary facilities are available at all times and on all work sites;*
- *The site manager shall provide a designated place for food storage, preparation and consumption on site. This should be a shaded area;*
- *The site manager shall ensure that personnel are transported legally, and in a safe and responsible manner;*
- *The site manager shall ensure that all vehicle and machine operators are qualified and licensed to operate their vehicles / machines;*
- *Dangerous excavations or works that may pose a hazard to humans and animals must be protected. These areas must be demarcated with hazard tape or fencing as required and the appropriate danger signs must be posted;*
- *The contractor/ site manager must respect workers' right to refuse to work in unsafe conditions;*
- *Ensure that strict safety measures are employed around open trenches and excavations;*
- *Implement regulated traffic safety procedures; and*
- *Minimize extent of roadside disruptions on adjoining roads where possible in order to allow for normal traffic flow.*

Vehicles

- *Pre-operational safety checks must be conducted for vehicles and equipment operating on site;*
- *Employees and construction workers driving and operating vehicles must do so in a safe manner;*
- *Employees operating equipment/vehicles shall not use alcohol and other drugs when operating equipment;*
- *Vehicles must comply with all speed limits of 40km/h;*
- *Only personnel licensed and authorized to operate designated equipment must use the equipment;*
- *Designated routes must always be used when operating equipment;*

- *Traffic signs and directional markings must be adhered to at all times;*
- *Mounting/dismounting a moving vehicle is prohibited;*
- *Vehicles must always be parked in designated parking areas.*

Table 8-27: **Infrastructure Network**

Phase	*Construction, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Local (2)*
Duration	*Immediate (1)*	*Immediate (1)*
Intensity	*Low (2)*	*High (6)*
Probability	*Definite (5)*	*Definite (5)*
Significance	***Low (20)***	***Medium(45)***
Status	*Negative*	
Cumulative	*Compounding*	
Confidence	*Certain*	
Mitigation Measures		
• *Where pipe lines are found on site, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. Any damage to pipe lines shall be repaired immediately;* • *All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties.*		

• *Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect.*

xi. Land Use

Table 8-28: **Land Use**

	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Local (2)*	*Local (2)*
Duration	*Permanent (5)*	*Permanent (5)*
Intensity	*Low (2)*	*High (6)*
Probability	*Definite (5)*	*Definite (5)*
Significance	***Medium (45)***	***High (65)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	
Mitigation Measure • *Compensation will be negotiated with landowners on an individual basis, based on the specific impacts to the particular piece of property.*		

xii. Waste

Table 8-29: **Waste**

Phase	*Pre-construction, Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Local(2)*
Duration	*Immediate (1)*	*Long Term (4)*
Intensity	*Minor (2)*	*High (6)*
Probability	*High (4)*	*Definite (5)*
Significance	***Low (16)***	***Medium (60)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	

Mitigation Measures

Site Offices

- *Recycling bins shall be made available within the site working area;*
- *No waste shall be burned at the site offices, or anywhere else on the site;and*
- *Site amenities shall be made available on site as required.*

Waste Disposal

- *The contractor's intended methods for waste management and waste minimisation must be implemented at the outset of the contract, and approved by the ECO;*
- *All personnel shall be instructed to dispose of all waste in the proper manner;*
- *Solid waste shall be stored in a designated area covered, tip proof metal drums for collection and*

disposal;

- *Signs will be located on each bin indicating type of bin and what waste may be placed in that bin;*
- *A bin system shall be established through the use of the separation bins for recyclable materials and non-recyclable waste materials. Materials collected for recycling should include:*
    - *i. Aluminium cans;*
    - *ii. Glass*
    - *iii. Cardboard; and*
    - *iv. Paper*
- *Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse;*
- *At all places of work, the contractor shall provide litter collection facilities for later safe disposal at Rustenburg Local Municipality landfill;*
- *The contractor shall ensure that no litter is disposed of within quarries or borrow pits;and*
- *A schedule for waste collection should be established to prevent the containers from over filling.*

Hazardous Waste Disposal

- *Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery should be collected in a holding tank and returned to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, should be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials;*
- *Oil collected by a mobile servicing unit should be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company;*
- *Non –PCB oils must be disposed of at a registered Class H:H hazardous waste site;*
- *Records of quantities disposed, disposal sites, disposal dates, transporters used and safe disposal certificates must be kept and copies submitted to Eskom's Environmental section in Sunninghill, Johannesburg;*
- *Hazardous materials identified for disposal must not be stored for more than 60 days while preparations are made for final disposal;*
- *Should hazardous waste be stored for longer than 60 days the Environmental section needs to be notified at the following numbers **011 800 8111** ; and*

- *All oil containment equipment must be labelled indicating its PCB status.*

Liquid Waste

- *Ensure that adequate numbers of conveniently located site toilets are available on all work sites at all times in quantities related to the number of users; 1 toilet per 30 users;*
- *Do not locate any site toilet, sanitary convenience, within the 1:100 year flood line, or within a horizontal distance of 500m of the wetland; and*
- *Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene.*

xiii. Noise

Table 8-30: **Noise**

Phase	*Pre-construction, Construction, Operation, Decommission*	
	With Mitigation Measures	*Without Mitigation Measure*
Extent	*Site (1)*	*Local (2)*
Duration	*Immediate (1)*	*Immediate (1)*
Intensity	*Low (2)*	*Very High (8)*
Probability	*Definite (5)*	*Definite (5)*
Significance	***Low (20)***	***Medium (55)***
Cumulative	*Marginal*	*Compounding*
Status	*Negative*	
Confidence	*Certain*	
Mitigation Measures		

Working Hours

- *The contractor must inform Boitekong residents of any unusually noisy activities that will be undertaken during the construction phase; and*
- *No work shall be performed outside the permitted working hours.*

Plant and Equipment

- *All machinery, including earthmoving vehicles should be regularly maintained to reduce noise intensity;*
- *Installation of sound vibration detectors on plant machinery is recommended;*
- *Construction vehicles must use designated entry and exit routes so that noise impacts can be largely confined to specific access routes; and*
- *The contractor should ensure that construction workers use ear plugs.*

9 CONCLUSION

9.1 ENVIRONMENTAL IMPACT STATEMENT

The key objectives of this assessment has been to identify the negative and positive impacts of the proposed activity on the environment, ascertain the severity of the impacts and come up with mitigation measures which can reduce the severity of impacts. Based on the outcome of the 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;*
- *Assumptions and limitations during the assessment;*
- *The specialists input; and*
- *The public input, i.e., stakeholders and Interested and affected parties.*

A Scoping and Environmental Impact Assessment was undertaken as guided by EIA Regulations, Government Notice R543 of June 2010 and this report was compiled as per Regulation 28. Avi-fauna, Air Quality, Ecological, Heritage, Palaeontology, Social, Soil and Land Capability, Tourism, Visual, and Wetland Delineation specialist studies were undertaken to fully assess the potential impacts identified at the scoping phase and recommend the best alternative.

The landscape associated with the corridors for the power line and the sites for the new substation and extension site is characterised of modified vegetation with activities such as mining, housing, cultivated lands and grazing within and surrounding the project area. Anglo Platinum mine borders the project area in the south, Bospoort dam is approximately 2.5km north of the site and Boitekong Township is west of the project area. Site Alternative 1 is located west-north west , alternative 2 is 1km south east and alternative 3 is east-south of the existing Marang 400/88kV substation and associated 400kV and 88kV power lines that feed in and out of the substation. Alternative 2 ranked best in terms of air quality due to its considerable distance from Boitekong whilst Alternative 4 ranked best in terms of all the other specialists' studies mainly due to the small footprint and the modified environment. In addition to the specialists' opinion, mapping, Interested and Affected Parties opinions; significance of anticipated impacts also contributed to this recommendation. Effective implementation and adherence to the mitigation measures proposed in Section 8 and the attached Environmental Management Programme will reduce the biodiversity, air quality and wetland impacts expected resulting in a ***LOW*** *significance. A summary of the key socio-economic and biophysical impacts anticipated are as follows:*

i. *Change in Physical and Chemical Characteristics of Water bodies: the proposed development will be located approximately 1.6km from the wetland, and construction and operation activities*

can result in the contamination and sedimentation of this non perennial river. The area is not within the proposed area that is recommended for development hence it should be demarcated as a NO GO area;

ii. *Poor waste management practices are practiced on site by the local communities as part of the corridor is being used as an illegal dumping ground. During construction, the contractor and the ECO should ensure that solid waste is stored in a designated area covered, tip proof metal drums for collection and disposal. The significance of the impact after significance is therefore rated* ***LOW;***

iii. *Disturbance associated with construction, operation and decommissioning activities may lead to the introduction of alien species, the impact will be* ***LOW-MEDIUM*** *before mitigation measures have been implemented****;***

iv. *Destruction to vegetation. The impact is considered to be of* ***LOW-MEDIUM*** *significance; since the vegetation is severely modified. A koppie located in the north west is in a fair-good condition and should be demarcated as a* ***'NO GO'*** *area;*

v. *Various pieces of potsherds were noted on site and these have a very low significance. Though the possibility of finding these objects is high, its significance is* ***LOW;***

vi. *The impact on palaeontology is* ***VERY LOW.*** *Paleontological materials are known to preserve well in ancient dunes. There was no indication, or signs of dunes on the site;*

vii. ***Cumulative visual impacts:*** *Visual impacts are expected to be cumulative due to the fact that the power line structures become permanent objects within the environment. The landscape impact of the proposed power line is considered to be moderately low due to the existing land uses (cultivated areas, settlements and subsistence farming) and other Eskom infrastructure. The potential visual impact is considered to be low-moderate on residents, and low for motorists;*

viii. *The residual impact is expected to be* ***MODERATE*** *if the mitigation measures are put in place.*

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 Regulation 33 of the EIA Regulations Government Notice R543 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.

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 impacts. The EAP therefore recommends that the extension of the existing Marang substation, Alternative 4, to make provision for new 3x 500MVA 400/132kV transformers & 8x 132kV Feeder bays be approved. This alternative triggers activity 23(ii), Listing Notice 1, Government Notice R544 of June 2010 which states the following:*

- ***23(ii) of R544:** Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use outside urban areas where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;*

Reference is made to Figure 9-1 below for the recommended site.

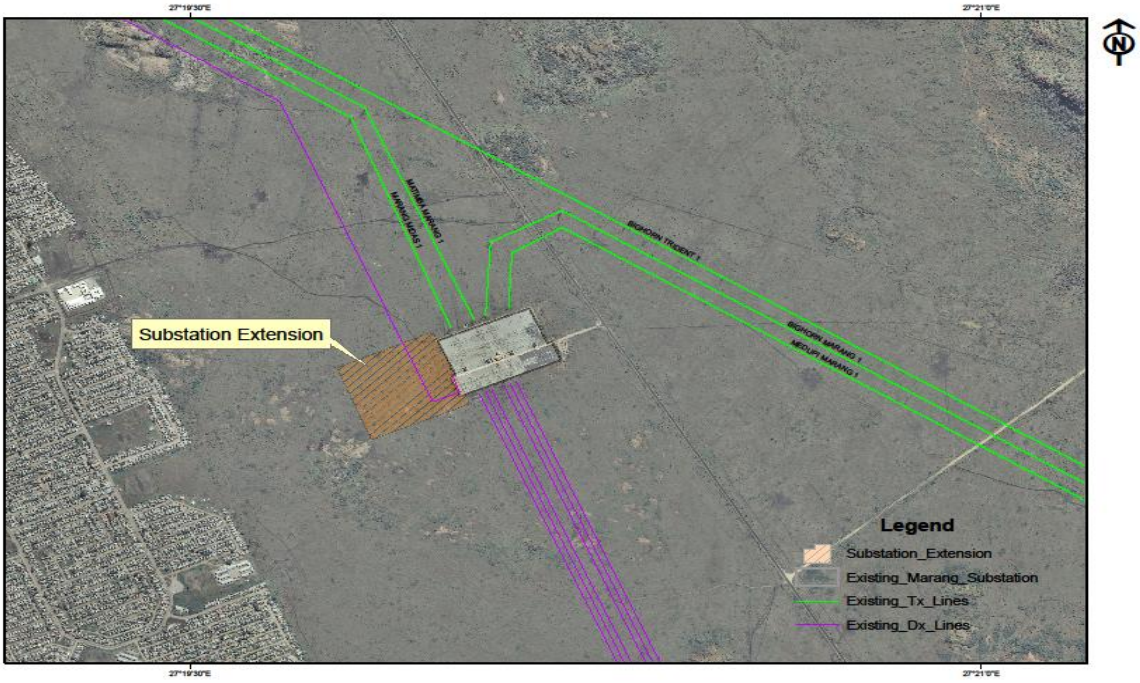

Figure 9-1: **Recommended Sites**

The co-ordinates for the recommended site are as follows:

<u>Substation Extension Site</u>

1. *27°20' 1.86"E 25°36' 53.50"S*
2. *27° 19' 57.59"E 25°36' 44.57"S*
3. *27° 19' 46.74"E 25°36' 49.05"S*
4. *27° 19' 50.64"E 25°36' 57.99"S*

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