

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
DRAFT ENVIRONMENTAL IMPACT REPORT

PROPOSED TSHWANE STRENGTHENING
PROJECT PHASE 1: KWAGGA-PHOEBUS
TRANSMISSION POWER LINE & KWAGGA
SUBSTATION EXPANSION AND NEW
PHOEBUS SUBSTATION
GAUTENG PROVINCE
(DEA Ref No: 12/12/20/1471) & 12/12/20/1524

FINAL FOR SUBMISSION TO DEA
April 2010



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PROJECT DETAILS

- DEA Reference Nos.** : 12/12/20/1471 (Kwagga – Phoebus Power line)
12/12/20/1524 (Kwagga substation expansion and Phoebus substation establishment)
- Title** : Environmental Impact Assessment Process
Final Environmental Impact Assessment Report for the Proposed Tshwane Strengthening Project Phase 1, Kwagga-Phoebus, Gauteng Province
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- Client** : Eskom Holdings Limited (Eskom Transmission)
- Report Status** : Final Environmental Impact Assessment Report for Authority Review and Decision

When used as a reference this report should be cited as: Savannah Environmental (2010) Final Environmental Impact Assessment Report for the Proposed Tshwane Strengthening Project Phase 1, Gauteng Province

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PURPOSE OF THE DRAFT EIA REPORT

In order to reinforce the existing Transmission network in the Tshwane Region, Eskom Transmission is currently proposing the construction of a 400kV transmission power line between the existing Apollo and Pluto substations, as well as between the existing Kwagga and proposed Phoebus substations. In addition, increased demand for a reliable electricity supply in the Central Grid has necessitated that Eskom Transmission improves the reliability and capacity of the transmission network in the area. Further, extension of the 400/132kV Verwoerdburg substation and establishment of a new Phoebus substation is also being proposed in the area in order to improve the reliability and quality of supply problems in the Tshwane area. Numerous Distribution options were investigated by Distribution network planning, the investment and a new Transmission network was preferred as the most suitable long-term solution. Eskom Transmission is therefore proposing the construction of the **Tshwane Strengthening Project Phase 1**.

Eskom has appointed Savannah Environmental, as independent environmental consultants, to undertake the EIA. The EIA process is being undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

The EIA Report consists of the seven chapters:

- » **Chapter 1** provides background to the proposed Tshwane Strengthening project Phase 1 and the environmental impact assessment process
- » **Chapter 2** provides an overview of the proposed Tshwane Strengthening project Phase 1
- » **Chapter 3** outlines the process which was followed during the EIA Phase of the EIA process
- » **Chapter 4** provides a description of the environment which may be potentially affected by the proposed project (Kwagga-Phoebus substations and power lines)
- » **Chapter 5** provides an assessment of the potential issues associated with the proposed upgrade and establishment of the Kwagga and Phoebus substations
- » **Chapter 6** provides an assessment of the potential issues associated with the proposed 400kV power lines and comparatively assesses the identified alternative corridors
- » **Chapter 7** presents the conclusions and recommendations of the EIA and an Impact Statement
- » **Chapter 8** presents the list of references and information sources used for the compilation of this FEIR.

The Scoping Phase of the EIA identified and described potential issues associated with the proposed project, and defining the extent of studies required within the EIA. The EIA Phase addressed those identified potential environmental impacts and benefits (direct, indirect, cumulative impacts) associated with all the phases of the project including design, construction and operation, and recommends appropriate mitigation measures for potentially significant environmental impacts. The FEIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The final EIA Report incorporates all issues and responses raised during the public review period of the draft EIA report.

PUBLIC REVIEW OF THE DRAFT EIA REPORT

The Draft EIA Report was available for public review at the following public places in the project area from **03 March to 07 April 2010** at the following locations:

Laudium Public Community Library – 4 th Avenue	– City of Tshwane Metropolitan Municipality- Environment and Planning Department
KT Motubatse Public Library – Soshanguve Extension XX	– Atteridgeville Community Library –
www.savannahsa.com	

EXECUTIVE SUMMARY

Background and Project Overview

In order to reinforce the existing Transmission network in the Tshwane Region, Eskom Transmission is currently proposing the construction of a 400kV transmission power line between the existing Apollo and Pluto substations. In addition, increased demand for a reliable electricity supply in the Central Grid has necessitated that Eskom Transmission improves the reliability and capacity of the transmission network in the area. Further, upgrade of the 400/132kV Verwoerdburg substation and establishment of a new Phoebus substation is also being proposed in the area in order to improve the reliability and quality of supply problems in the Tshwane area. Eskom Transmission is therefore proposing the construction of the **Tshwane Strengthening Project Phase 1**. The Tshwane Strengthening Project Phase 1 comprises of the following:

- » **The extension and upgrade of the existing Verwoerdburg Substation.**
- » Construction of **2x 400kV loop in and out power lines from the existing Apollo-Pluto** transmission line which will feed into the Verwoerdburg Substation, a distance of approximately ~4 km.

- » Construction of the **new Phoebus Substation** adjacent to Hangklip Substation.
- » Construction of a **new 400kV transmission power line** between the Phoebus Substation and the Kwagga Substation, a distance of ~30 km.
- » Construction of Apollo-Dinaledi loop in/out power line into Phoebus substation (~1 km)
- » **Associated (infrastructure) works** to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing substation sites).

In total, **approximately 36 km of new power line** is proposed as part of the entire Tshwane Strengthening project Phase 1. The purpose of this project is to:

- » Improve the reliability of the existing Central Transmission network.
- » Improve the voltage regulation on the Central Grid Distribution and City of Tshwane Metropolitan Municipality network.
- » Create additional Transmission network capacity which will supply the increasing electricity demand in the Central Grid.

As separate applications were submitted to DEA for the different components of the project, separate reports have been compiled by Savannah Environmental as follows:

- » The **nature and extent of the proposed 400kV transmission power line between the Kwagga and Phoebus Substations, the upgrade of the Kwagga Substation and construction of the Phoebus Substation**, as well as potential environmental impacts associated with the construction, operation and decommissioning of this infrastructure are **assessed in this Final EIA Report (Reference Number 12/12/20/1471 and 12/12/20/1524)**.
- » The **nature and extent of the proposed 2x 400kV loop-in lines from the existing Apollo–Pluto and the expansion and upgrade of the Verwoerdburg substation**, as well as potential environmental impacts associated with the construction, operation and decommissioning of this infrastructure are **assessed in a separate Final EIA Report (Reference Number 12/12/20/1470)**.

This draft Environmental Impact Assessment (EIA) Report consists of the following chapters:

- » **Chapter 1** provides background to the proposed Tshwane Strengthening project Phase 1

and the environmental impact assessment process

- » **Chapter 2** provides an overview of the proposed Tshwane Strengthening project Phase 1
- » **Chapter 3** outlines the process which was followed during the EIA Phase of the EIA process
- » **Chapter 4** provides a description of the environment which may be potentially affected by the proposed project (Kwagga-Phoebus substations and power line)
- » **Chapter 5** provides an assessment of the potential issues associated with the proposed upgrade and establishment of the Kwagga and Phoebus substations
- » **Chapter 6** provides an assessment of the potential issues associated with the proposed 400kV power line and comparatively assesses the identified alternative corridors
- » **Chapter 7** presents the conclusions and recommendations of the EIA and an Impact Statement
- » **Chapter 8** presents the list of references and information sources used for the compilation of this FEIR

Background and Overview of the Proposed Project

Eskom Holdings Ltd (Eskom) is responsible for the provision of reliable and affordable power to its consumers in South Africa. Electricity by its nature cannot be readily or inexpensively stored and,

therefore, must be used as it is generated. Electricity must, therefore, be efficiently transmitted from the point of generation to the end-user.

As part of its assessment of supply requirements, and as a result of the projected load growth of the Gauteng region, Eskom have determined that additional transmission capacity will be required in the Tshwane area by the year 2013. For this reason, Eskom Transmission is proposing the **Tshwane Strengthening Project**. Figure 1 provides an indication of the study area considered within the EIA process for this proposed project (TSP Phase 1). This report focuses on the following components:

- » Expansion of the existing Kwagga substation (refer to Figure 2).
- » Construction/establishment of the **new Phoebus Substation** adjacent to the existing Hangklip Substation (refer to Figure 3).
- » Construction of a **new 400kV transmission power line** between the Phoebus Substation and the Kwagga Substation, a distance of ~30 km.

Associated (infrastructure) works to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, turn-in lines, busbar feeder bay etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing substation sites).

In addition, it must be noted that the **Tshwane Strengthening Project Phase 2** consists of the proposed Lomond/Anderson power line corridor and the refurbishment of the Lomond substation, while **Phase 3** includes the Hangklip/Dinaledi 132kV corridor as well as the installation of a third transformer at the Verwoerdburg substation. Lastly, **Phase 4** includes the addition of a second transformer at the proposed Phoebus substation. The environmental impact assessment by **Nemai Consulting** is currently underway for the Tshwane Strengthening Project Phase 2 including the establishment of the Anderson substation and the 400kV power line between Dinaledi and Anderson substations, (Reference Numbers **12/12/20/1567** and **12/12/20/1568**) and the EIA for Phase 3 and 4 have not yet commenced.

The Purpose and Need for the Proposed Project

The current Eskom transmission network supplies the City of Tshwane Metropolitan Municipality (CoT) via three substations, namely: Kwagga, Njala and Verwoerdburg. The contracted reserve capacity at each point is reviewed annually. CoT has applied for new supply points and a step load increase to Eskom Transmission and Distribution. The three parties (Distribution, Transmission and the City of Tshwane Metropolitan Municipality) agreed on the 20-year load forecast

for the CoT and also concluded that the CoT and the Eskom transmission networks supplying Tshwane need to be strengthened. A number of options were analysed based on technical and economic benefits to all parties involved (refer to Figure 1).

Environmental Impact Assessment

The proposed Tshwane Strengthening Project Phase 1 is subject to the requirements of the Environmental Impact Assessment Regulations (EIA Regulations) published in GN 28753 of 21 April 2006, in terms of Section 24(5) of the National Environmental Management Act (NEMA, No 107 of 1998). In terms of sections 24 and 24D of NEMA, as read with GNs R385 (Regulations 27–36) and R387, a Scoping and EIA are required to be undertaken for this proposed project.

The National Department of Environmental Affairs (DEA) is the competent authority for this project as Eskom is a statutory body. An application for authorisation has been accepted by DEA (under Application Reference number **12/12/20/1271** and **12/12/20/1524**). Through the decision-making process, the DEA will be supported by the Gauteng Department of Agriculture and Rural Development (GDARD) as the commenting authority.

A comprehensive public participation process was undertaken in accordance with Regulation 56 of Government Notice No R385 of 2006

during the Scoping phase of this EIA process. This public participation process comprised the following:

- » **Notification of the EIA Process** in the printed media and on site, as well as through written notification to identified stakeholders affected landowners
- » **Identification and registration** of I&APs and key stakeholders.
- » Compilation and distribution of a **Background Information Document** (BID) to all identified I&APs and key stakeholders
- » **On-going consultation** with identified I&APs and stakeholders
- » Compilation and maintenance of a **database** containing the names and addresses of all registered parties
- » Preparation of a **Comments and Response Report** detailing key issues raised by I&APs as part of the EIA Process.

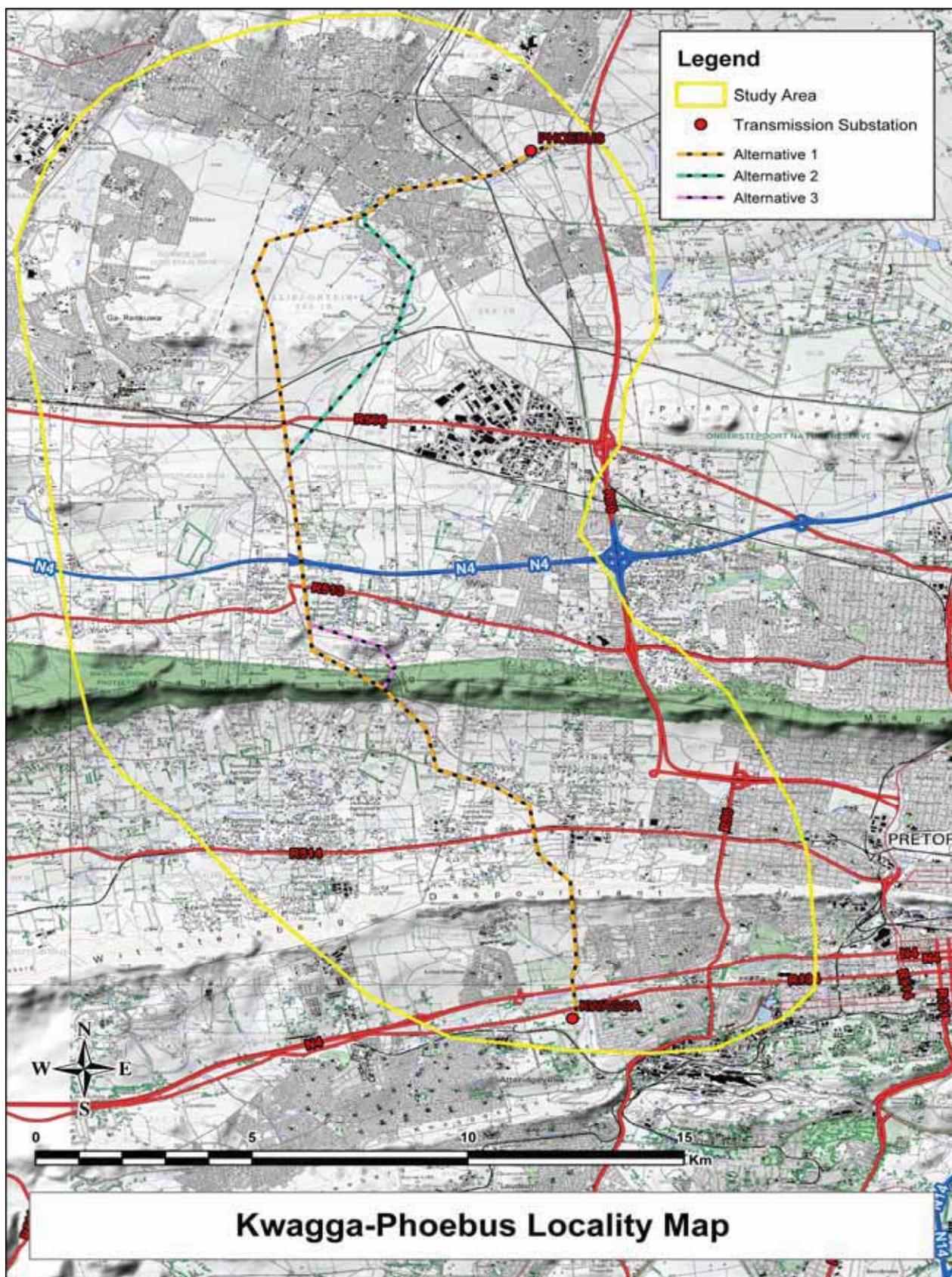


Figure 1: Locality map showing the study area for the proposed Kwagga-Phoebus transmission power line and, as well as alternatives identified for consideration in the EIA process

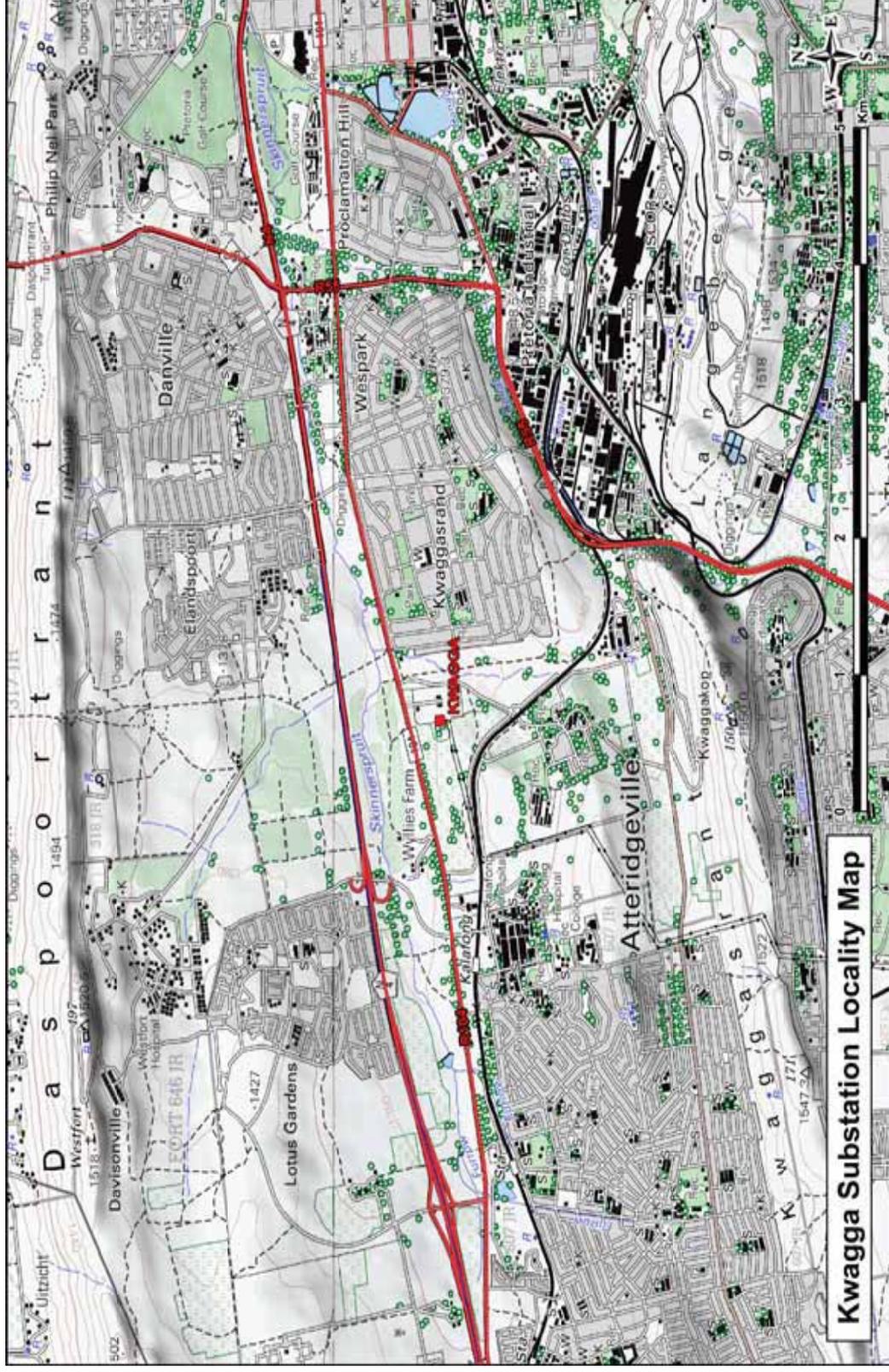


Figure 2: Locality map showing the locality of the Kwagga substation near Kwaggastrand in Pretoria, as well as the extension under investigation during the EIA process

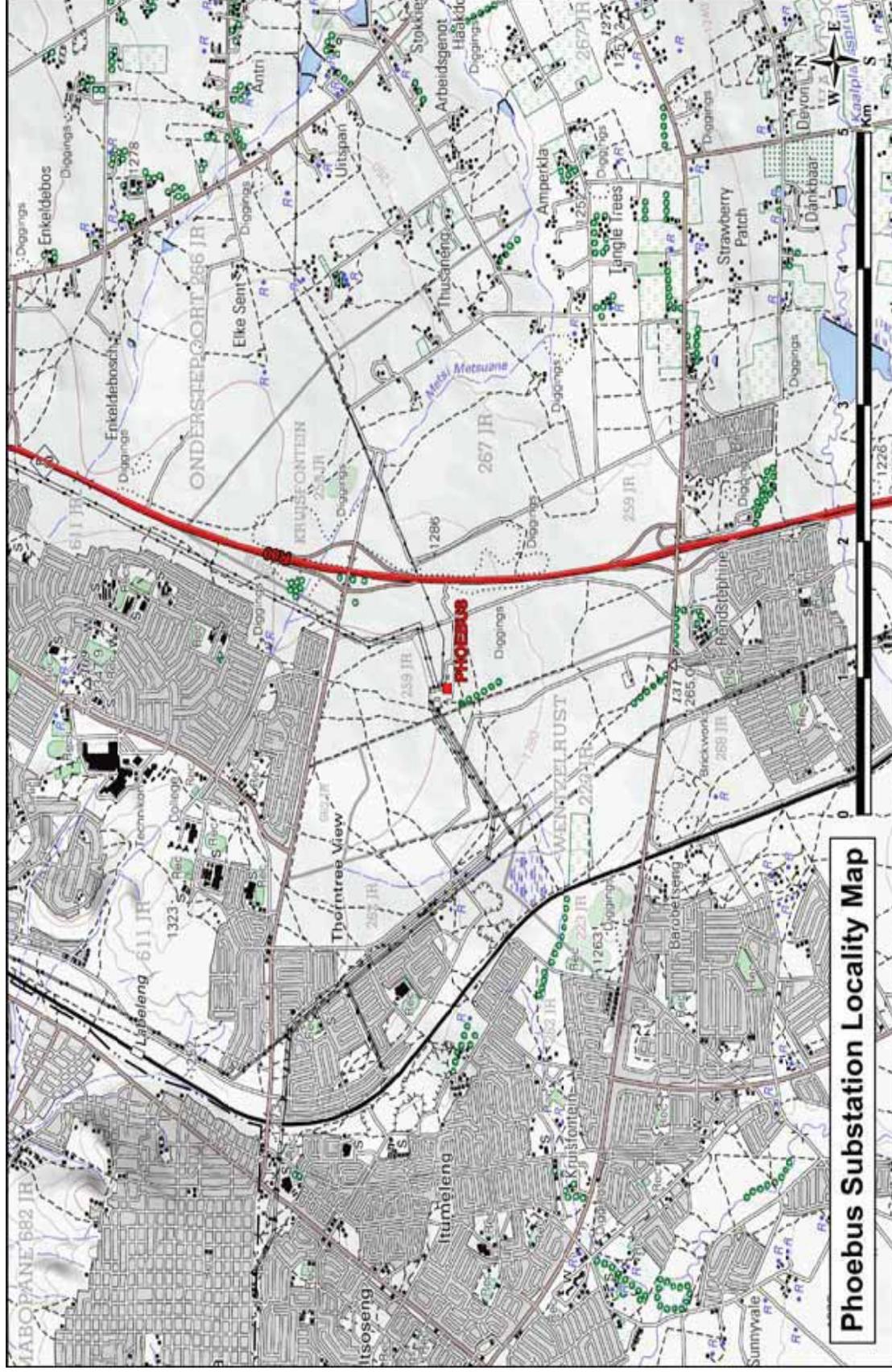


Figure 3: Locality map showing the locality of the proposed Phoebus substation in Soshanguve under investigation during the EIA process

The Need for Additional Transmission Capacity in the Tshwane Area

Studies undertaken by Eskom have shown a steady 3% per annum average load growth for the area fed from Verwoerdburg, Wildebeest and Apollo substations, the main bulk supply substations to the Tshwane Region. This is due to light industrialisation, commercialisation, urban growth and electrification within this area. It is also a sign of good economic growth in this area.

Alternatives for Satisfying the Additional Electricity Supply Need within the Tshwane Area

Electrical supply constitutes a complex system of generation facilities, substations, and transmission and distribution power lines. The system operates on a demand-supply structure with the power being generated and transmitted at the moment it is needed.

The "Do Nothing" Option

The 'do nothing' alternative is the option of not extending the existing Verwoerdburg substation as well as not constructing any new transmission power lines looping in from the Apollo-Pluto power lines. By not taking any action, Eskom Transmission may end with a situation of not being able to ensure firm supply into some parts of the country and the Tshwane area in particular, in the very near future

(i.e. by 2012). This option is therefore discarded as a feasible alternative as it would neither supply the projected demand for electricity nor optimise the existing infrastructure.

Demand Side Management

Demand Side Management (DSM) can generally be defined as the activities performed by the electricity supply utility, which are designed to produce the desired changes in the load shape through influencing customer usage of electricity and to reduce overall demand by more efficient use.

New Generation Systems

The option of a new coal-fired, gas, renewable or nuclear generation plant being commissioned near to the load centre could be considered. This may have a more negative overall impact on the environment due to the land requirements, fuel resources, etc., and would take at least five years to implement and would not address the foreseen supply demand in the short-term.

Upgrade Existing Transmission Power Lines by using Bigger Conductors

The upgrade of existing transmission lines in the area by using bigger conductors would require these existing power lines to be permanently off while being upgraded to thicker conductors. This would put the existing and future load at risk

should the remaining lines in the area trip. The upgrade option would result in the physical load on the existing towers increasing substantially, resulting in sagging of the conductors. The existing towers would be inadequate to support this physical load. The power transmission from the Apollo substation would not be able to be evacuated to the load centres without causing dynamic instability in the Eskom network which could result in black-outs. This option would not improve the reliability of the Transmission system nor be sustainable and is therefore not considered to be a feasible alternative.

Upgrade of the Kwagga Substation, establishment of Phoebus Substation and construction of a 400kV Transmission power line between Kwagga and Phoebus Substations

The alternative is part of the new generation and transmission capacity alternatives. The need for increased capacity and the need for optimising existing infrastructure would be met through the implementation of this option.

Due to current land use and development in the country, very limited open corridors remain that could be utilised to install major transmission power lines. New routes must, however be secured to ensure servitudes for the expansion of the network and to be able to meet the

forecast increase in demand. Therefore, Eskom Transmission is proposing the upgrade of the Kwagga 400/132kV substation, establishment of the Phoebus substation and 400kV transmission power lines between Kwagga and Phoebus Substations to strengthen the existing transmission network.

Due to the current land use and developments in the Soshanguve, Pretoria, and small holdings area (Fundus), very little open space remains that could be utilised to install major transmission power lines with a servitude of 55 m. New routes must however be secured to ensure servitudes for the expansion of the network and to be able to meet the forecast increase in demand.

This option is most favoured by Eskom Transmission as well as the City of Tshwane Electricity Department as it is considered to be the most feasible from a technical and economic perspective, and will meet the required need for increased capacity and the need for optimising existing infrastructure in the short- and long-term. This option is therefore nominated as the preferred option by Eskom Transmission to supplement the power supply to the Pretoria North area.

Evaluation of Project Alternatives - Substation Sites and Power Lines (Kwagga and Phoebus Substation Sites)

Identification of Substation Site

The Kwagga Substation already exists in Kwaggasrand area, south-east of Danville suburb, Pretoria, hence the proposed extension of the substation was proposed southwards in order to allow for the upgrade of the capacity of this substation (refer to Figure 2). The proposed Phoebus substation was identified by Eskom for investigation within a broader study area (refer to Figure 3) based on technical criteria. Land adjacent to the existing Hangklip substation was considered to be suitable from a technical perspective and was provided to the EIA team for further investigation through the EIA process.

Alternative Transmission Power Line Corridors

After the scoping evaluation, the biodiversity specialist recommended that another alternative corridor (deviating from Alternative 1 by following the existing transmission line corridor and deviating from Alternative 3 through Hornsnek Road) be investigated in the EIA phase (Savannah Environmental, 2009). Therefore, Alternatives 1, 2, 3 and recommended deviation have been investigated in full detail within this EIA Report.

Description of Alternative Power Line Development Corridors Considered in the EIA Phase of the EIA Process

Corridor 1 (Kwagga - Phoebus)

heads southwest from Hangklip Substation for approximately 6.5 km crossing the N4 highway, then heads southeast for approximately 8 km running into Kwagga Substation for 3 km in a southerly direction, while the northern section of this route passes between informal settlements. It then crosses the Magaliesburg Protected Environment 7 km north of the Kwagga Substation.

Corridor 2 (Kwagga - Phoebus)

Splits off from alternative 1 approximately 4 km southwest of the proposed Phoebus Substation. It makes an easterly loop and joins back onto alternative 1 just south of the R566 Road. This route also follows a stream for the majority of the route.

Corridor 3 (Kwagga - Phoebus)

Splits off from alternative 1 just south of the Brits Road before making an easterly loop and joins back onto alternative 1 just southwest of the M17 Road. From M17 it crosses the Witwatersberg ridge and agricultural land.

Recommended deviation

(corridor 4) Follows Corridor 1 southwards splits off on the Farm Klipfontein 268 JR crossing over Corridor 1. This alternative then joins corridor 1 at the point where Corridor 2 joins Corridor 1. From

here it continuous downwards and deviates from Corridor 1, by crossing the Magaliesberg at a different angle. This corridor joins Corridor 1 on the Farm Boekenhoutkloof 315 JR and continuous downwards until reaching the Kwagga Substation in the south.

Conclusions and Recommendations drawn from the Assessment of the proposed Kwagga substation expansion and new Phoebus Substation

From the majority of the specialist studies undertaken, it has been concluded that the proposed expansion of Kwagga substation and the establishment of the Phoebus substation will have minimal environmental impacts. The majority of potential impacts identified to be associated with the construction and operation of the proposed substation are anticipated to be localised and restricted to an area already transformed due to the existing substation and power line infrastructure. No environmental fatal flaws were identified to be associated with the site. For this reason, the majority of the specialists recommended that the substation expansion and establishment go ahead within the two proposed development footprints (refer to Figures 5 and 6).

Conclusions and Recommendations drawn from the Assessment and Comparison of the Transmission Power Line Alternatives

Nomination of a preferred alternative is based on the specialist recommendations, public participation and the recommendations of the specialist workshop undertaken during the EIA Phase of the project.

From the conclusions of the specialist studies undertaken and the specialist workshop held, it was concluded that Alternative corridor 2 is not recommended due to potential impacts of high significance on the environment, and therefore development along this corridor should be avoided. Alternative corridor 1 was nominated as the preferred alternative by the majority of the specialists. From a holistic environmental (technical, ecological, social and economic) perspective, **Alternative 1** with slight deviations proposed by the biodiversity specialist is nominated as the most preferred alternative (refer to Figure 4). In addition, it is considered vital that construction of the transmission power lines within this corridor take the recommended conditions identified by the specialist studies into consideration. Should the project be authorised by DEA, the final routing of the power line within the nominated preferred corridor should be undertaken in consultation with the affected landowner and the following specialists:

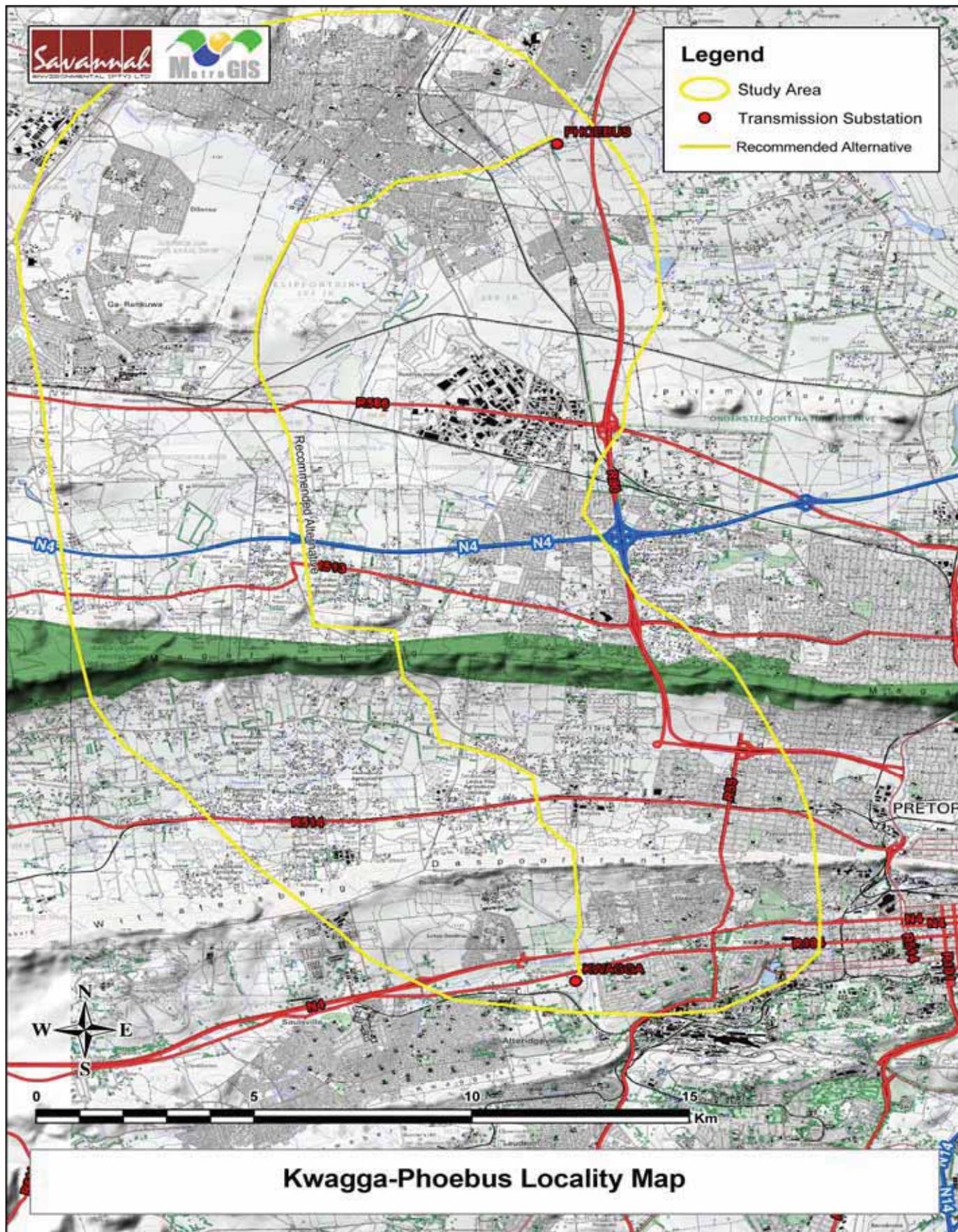


Figure 4: Nominated preferred alternative corridor for the proposed Kwagga-Phoebus power line



Figure 5: Recommended site location for the proposed Kwagga substation expansion



Figure 6: Recommended site location for the proposed Phoebus substation establishment

Overall Statement)	Conclusion	(Impact	construction of the proposed 400kV transmission power line.
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The findings of the specialist studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated as a result of the proposed project conclude that:

- » Although some impacts of potential high significance are associated with the transmission line and substations, there are no environmental fatal flaws that should prevent the proposed substation expansion, establishment and transmission power line from being constructed on the proposed sites and nominated alignment respectively, provided that the recommended mitigation measures are implemented.
- » No issues of significance were identified to be associated with the proposed expansion of the Kwagga substation and the establishment of the Phoebus substation at the identified sites.
- » Alternative corridor 2 is considered to be a **“no-go option”** from the conclusions of both the avifauna and biodiversity specialists. This alternative corridor was only preferred from a social and heritage perspectives.
- » From a holistic environmental perspective, **Alternative Corridor 1** with deviations as recommended by the biodiversity specialist is nominated as the preferred corridor for the

Overall Recommendation

Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the proposed establishment of Phoebus substation, Kwagga substation expansion, construction and operation of the Kwagga-Phoebus 400kV transmission power line, the findings of the EIA, and the understanding of the significance level of potential environmental impacts, it is the opinion of the EIA project team that the application for the proposed Tshwane Strengthening Project Phase 1, Kwagga-Phoebus components (EIA Ref 12/12/20/1471 and 12/12/20/1524) be authorised by DEA to include the following:

- » Construction/establishment of the **new Phoebus Substation** adjacent (north-west) to the existing Hangklip Substation.
- » Expansion of the **existing Kwagga substation**, south of the substation.
- » Construction of a **new 400kV transmission power line** between the Phoebus Substation and the Kwagga Substation within either **alternative corridor 1** a distance of ~30 km.
- » Construction of Apollo-Dinaledi loop in/out power line into Phoebus substation.
- » **Associated (infrastructure) works** to integrate the new transmission power lines and substation into the Transmission

grid (such as access roads, communication tower, 1 km turn-in and out line from Phoebus, feeder bay etc) and accommodate the new lines at existing substations.

The following conditions of this recommendation must be included within the authorisation issued:

- » All mitigation measures detailed within this report and the specialist report contained within Appendices I to N must be implemented.
- » The draft Environmental Management Plan (EMP) should form part of the contract with the Contractors appointed to construct and maintain the proposed Tshwane Strengthening Project (Kwagga-Phoebus power line and Kwagga and Phoebus substation components), and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
- » Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site and

disturbance of protected vegetation.

- » An ornithologist must identify the exact power line spans requiring marking in order to minimise the risk of collision of birds with the earth wire. Recommendations must be made regarding the installation of bird guards on all self-supporting towers according to the existing Eskom guidelines. This will prevent birds from perching in high risk areas on the towers directly above live conductors.
- » An ecological specialist must conduct a final walkthrough before construction in order to identify and relocate any possible plant species of conservation importance.
- » A heritage specialist must conduct a final walk-through before construction in order to ensure that any unidentified heritage resources are identified and protected. Power lines can be rerouted or realigned in order to avoid heritage sites and heritage resources can be conserved and unaffected .
- » During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum.
- » The EMP for construction must be updated to include site-specific information and specifications resulting from the final walk-through surveys. This EMP must be submitted to DEA for approval prior to the commencement of construction on site.

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|---|---|
| » Utilisation of cross rope suspension tower structures is recommended than the conventional self supporting strain towers that are more obstructive because both technical and space considerations permit on this site. | * A Social Management Plan during construction and operation; |
| » Utilisation of monopole structures in densely populated areas | * A social Impact Assessment during construction and operation; |
| » Mitigation of the visual impact through conventional visual impact mitigation measures (i.e. vegetation screening, landscaping or design) is highly unlikely to succeed due to the inherent functional design of the substation structures and transmission line infrastructure. The mitigation of secondary visual impacts, such as security and functional lighting, construction activities, etc. may be possible and should be implemented and maintained on an on-going basis. | * A Local Labour and Workforce Plan; |
| » The process of communication and consultation with the community representatives must be maintained after the closure of this EIA process, and, in particular, during the construction phase associated with the proposed project. | * An Influx Management Plan; |
| » Finally, to ensure that social impacts are mitigated during construction and operation it is recommended that the following be implemented and monitored by a Social Engagement Officer/ Environmental Control Officer: | * A Decommissioning and Closure Plan; |
| | * A Grievances Mechanism for the construction and operational phases; and |
| | * A Stakeholder Engagement and Education plan for construction and operation. |

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Appendix H: Comments and Responses Report

Appendix I: Vegetation Report

Appendix J: Soils and Agricultural Potential

Appendix K: Avifauna Specialist Report

Appendix L: Heritage Specialist Report

Appendix M: Visual Specialist Report

Appendix N: Social Impact Assessment Report

Appendix O: Draft Environmental Management Plan

ACCRONYMS AND ABBREVIATIONS

APASA	Association of Professional Archaeologists of Southern Africa
ASGISA	Accelerated and Shared Growth Initiative of South Africa
BID	Background Information Document
CoT	City of Tshwane
DE	Department of Energy
DEA	National Department of Environmental Affairs
DEAT	National Department of Environmental Affairs and Tourism
DPW	Department of Public Works
DEIR	Draft Environmental Impact Report
DSM	Demand Side Management
DWA	Department of Water Affairs
DWEA	Department of Water and Environmental Affairs
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EWT	Endangered Wildlife Trust
GDARD	Gauteng Department of Agriculture and Rural Development
GDP	Gross Domestic Product
GG	Government Gazette
GGP	Gross Geographical Product
GN	Government Notice
GPS	Geographic Positioning System
I&AP	Interested and Affected Party
ICNIRP	International Commission for Non-Ionising Radiation Protection
IDP	Integrated Development Plan
ISEP	Integrated Strategic Electricity Planning
KLM	Kungwini Local Municipality
kV	Kilovolt
MPNE	Magaliesburg Protected Natural Environment
MW	Mega Watt
NEMA	National Environmental Management Act (No 107 of 1998)
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (No 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
OHS	Occupational Health and Safety
PSDF	Provincial Spatial Development Framework
SAHRA	South African Heritage Resources Agency
SACNASP	South African Council of Natural Scientific Professions
SDF	Spatial Development Framework
SEIA	Socio-economic Impact Assessment