FINAL BASIC ASSESSMENT REPORT FOR THE PROPOSED 2X ELECTRICAL LINE OF 400 KV FROM ARIES SUBSTATION NEAR KENHARDT TO UPINGTON SUBSTATION NEAR UPINGTON AND THE LINE LENGTH IS 145 KM, IN THE KAI !GARIB AND KHARA HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

Produced for:

ESKOM (SOC) LTD

Produced by:

VOMBE ENVIRONMENTAL CONSULTING (PTY) LTD

May 2022

DFFE REFERENCE NUMBER: 14/12/16/3/3/1/2488

ESKOM'S PROPOSED 2X ELECTRICAL LINE OF 400 KV FROM ARIES SUBSTATION NEAR KENHARDT TO UPINGTON SUBSTATION NEAR UPINGTON AND THE LINE LENGTH IS 145KM.

FINAL BASIC ASSESSMENT REPORT

Project Name:	**THE APPLICATION OF AN ENVIRONMENTAL AUTHORISATION FOR THE 2X ARIES-UPINGTON 400KV LINE, IN THE NORTHERN CAPE PROVINCE.**
Report Name	**FINAL BASIC ASSESSMENT REPORT FOR THE PROPOSED 2X ELECTRICAL LINE OF 400 KV FROM ARIES SUBSTATION NEAR KENHARDT TO UPINGTON SUBSTATION NEAR UPINGTON AND THE LINE LENGTH IS 145KM., IN THE KAI GARIB AND KHARA HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.**
Authority Reference	**DFFE REFERENCE NUMBER: 14/12/16/3/3/1/2488**
Report Status	**FINAL**
Prepared By:	**Vombe Environmental Consulting Pty Ltd** **Address: 2121 Westbrook Estate** **Protea Road, Midrand, 1687** **Tel: 011 468 1488** **Email: esiphugu@gmail.com**
Applicant:	**Eskom Holdings (SOC) Ltd**
Report compiled by:	**Edzisani Siphugu**
Report Date:	**18 May 2022**
Status:	**Final Report**

PURPOSE OF THE DRAFT BASIC ASSESSMENT REPORT

Eskom Holdings SOC Limited (Eskom) has commissioned an Environmental Basic Assessment (EBA) to investigate the potential environmental impacts of the proposed deviations on the authorized 2x 400 KV powerline which runs from Aries substation near Kenhardt to Upington substation near Upington, in the kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province. The Basic Assessment (BA) is being undertaken by Vombe Environmental Consulting (Pty) Ltd as an independent Environmental Assessment Practitioner (EAP) and is being done in terms of the National Environmental Management Act (No 107 of 1998), in particular Regulations GN. R982, R983, R984 and R985 promulgated in December 2014, as amended.

The environmental studies are required to address the potential impacts associated with the proposed development and provide an assessment of the project in terms of the biophysical, social and economic environments. It is this assessment, which aids both the environmental authorities (in this case the National Department of Forestry, Fisheries and the Environment (DFFE)) and the proponent (i.e. Eskom) in making decisions regarding the future of the project.

In keeping with environmental legislation, it is the responsibility of the EAP to ensure that the public is provided the opportunity to participate meaningfully in the environmental investigation process. This includes the identification of issues and the review of reports. Accordingly, Interested and Affected Parties (I&APs) have been invited to review the Draft Basic Assessment Report to verify that their contributions are captured and correctly understood, and have been adequately assessed.

The comments received during the 30-day public review period are incorporated into the Final Basic Assessment Report, which will be submitted to the DFFE who will decide whether the project should be authorised or not, and if so, then on what conditions.

UNDERTAKING UNDER OATH/ AFFIRMATION

UNDERTAKING UNDER OATH/ AFFIRMATION

I, Edzisani Siphugu, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

Vombe Consulting Pty Ltd

Name of Company

14/02/2022

Date

SOUTH AFRICAN POLICE SERVICE

Signature of the Commissioner of Oaths

2022 -02- 14

Date

SOUTH AFRICAN POLICE SERVICE

DECLARATION OF THE EAP

DECLARATION OF THE EAP

I, Edzisani Siphugu, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

- ~~I have a vested interest in the proposed activity proceeding, such vested interest being~~:

_____

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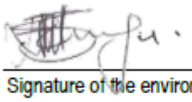

Signature of the environmental assessment practitioner

Vombe Consulting Pty Ltd

Name of company:

14/02/2022

Date

DRAFT BASIC ASSESSMENT REPORT DISTRIBUTION

The Draft Basic Report was distributed to key stakeholders outlined on Table 1-1 for commentating purposes as part of the mandatory 30-day public review period. The public review started from the **18th February to 21st of March 2022**:

Table 1-1: The Draft Basic Assessment Report was submitted to the following Key Stakeholder and Authorities as listed in the table below

AREA	ORGANIZATION	CONTACT DETAILS
Blom J	!Kheis Local Municipality	Email: jacobusb@kheis.co.za
Phete A	Dept. Cooperative Governance, Human Settlement and Traditional Affairs	Email: aphete@ncpg.gov.za
Ms Jacoline Mans	Department of Agriculture, Forestry and Fisheries	Tel: 054 338 5909 Cell: 082 808 2737 Email: jacolinema@daff.gov.za
Ms Mpumi Mogongwa	Department of Water & Sanitation (Northern Cape)	Tel: 053 836 7606 Fax: 086 650 9646 Email: lefleurd@dwa.gov.za
Mr Olebogeng Gaobonegwe	Department of Agriculture, Land Reform and Rural Development Northern Cape	Tel: 053 830 4056 Cell: 071 386 3984 Email: Olebogeng.gaobonegwe@drdlr.gov.za
Mrs Raisibe Sekepane	Department of Mineral Resources	Tel: 053 807 1700 Fax: 053 830 0827 Email: raisibe.sekepane@dmr.gov.za

AREA	ORGANIZATION	CONTACT DETAILS
Daniel Marnewick	Birdlife South Africa	Email: daniel.marnewick@birdlife.org.za
HP Van Heerden	Scatec	Email: hp.vanheerden@scatec.com
Ms. I. Engelbrecht	Upington Library	Email: Upingtonlib@ncpg.gov.za
Mrs. Lizell Stroh	South African Civil Aviation Authority	Email:strohl@caa.co.za

EXECUTIVE SUMMARY

1. BACKGROUND

Eskom Holdings SOC Ltd (Eskom) has commissioned a project to strengthen the supply of electricity in the Northern Cape, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality. Vombe Environmental Consulting (Pty) Ltd has been appointed to undertake an Environmental Basic Assessment (EBA) to support the application for Environmental Authorisation (EA) for the proposed three deviations to the authorized 2X 400 kV powerlines which run from Aries substation near Kenhardt to Upington substation near Upington. There is an existing EA in place for the 2X 400 kV line (DEA ref no. 12/12/20/2606). However, due to some challenges Eskom is proposing three deviations which fall outside of the originally authorized corridor. This basic assessment seeks to assess the environmental impact of the proposed deviations (DEA ref no. 14/12/16/3/3/1/2488).

This report documents the process and findings of the assessment of the Distribution Powerlines. This report was subject to a 30 day public comment period (**18th February to 21st March 2022),** and the comments after which were addressed as part of the Final Basic Assessment Report, before it was submitted to the competent authority for review and Final Decision. Eskom intends to start construction between **August 2023 and December 2023**, and the entire construction period will be approximately 4 years.

2. NEED FOR THE PROJECT

The project will address the following Eskom strategic objectives:

- Reduce the impact on the environment through identifying, implementing and/or supporting internal and external options for low carbon emitting generation and transportation and opportunities.
- This project will be an enabler to the country's drive to achieve energy diversification into the future.
- This is a strategic project to enable connection to Independent Power Producer (IPP)'s in the future.

The proposed development requires Environmental Authorization in order to help facilitate the integration of IPP's.

3. PROJECT DESCRIPTION

The Upington area has been identified as one of the highest solar radiation locations in the world, providing the best opportunities for using the sun to generate electricity. As such, Upington has seen an increase in Independent Power Producer projects in an effort to utilise renewable energy resources, particularly solar, to meet the growing demand in electricity. This power needs to be fed onto the national grid and Eskom therefore needs to undertake major infrastructural investments to allow this to happen. To that end, Eskom has proposed the construction of 2X 400 kV lines from Aries Substation to Upington Substation, and associated feeder bays.

It is important to note that there is currently an EA in place for the line (DEA ref no. 12/12/20/2606). However, there have since been three deviations to the line which fall outside of the original authorized corridor. This application assesses the proposed three deviations falling outside of that corridor has been authorized (DEA ref no. 14/12/16/3/3/1/2488).

4. LISTED ACTIVITIES

The proposed project triggers several activities listed in the National Environmental Management Act (No 107 of 1998) (NEMA), as amended, as requiring environmental authorisation before they can commence (**Table 1-2**). The purpose of this study is to undertake an EIA process, with associated Public Participation Process (PPP) and specialist studies, to enable the competent authority to decide whether the project should go ahead or not, and if so, then on what conditions.

Table 1-2: listed activities pertaining to this application.

ACTIVITY NO(S):	PROVIDE THE RELEVANT BASIC ASSESSMENT ACTIVITY(IES) AS SET OUT IN LISTING NOTICE 1 OF THE EIA REGULATIONS, 2014 AS AMENDED	DESCRIBE THE PORTION OF THE PROPOSED PROJECT TO WHICH THE APPLICABLE LISTED ACTIVITY RELATES.
47	The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	The development of 2X 145km 400kV lines from Aries to Upington.

ACTIVITY NO(S):	PROVIDE THE RELEVANT SCOPING AND EIA ACTIVITY(IES) AS SET OUT IN LISTING NOTICE 2 OF THE EIA REGULATIONS, 2014 AS AMENDED	DESCRIBE THE PORTION OF THE PROPOSED PROJECT TO WHICH THE APPLICABLE LISTED ACTIVITY RELATES.
9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex	The development of 2X 145km 400kV lines from Aries to Upington.
ACTIVITY NO(S):	**PROVIDE THE RELEVANT BASIC ASSESSMENT ACTIVITY(IES) AS SET OUT IN LISTING NOTICE 3 OF THE EIA REGULATIONS, 2014 AS AMENDED**	**DESCRIBE THE PORTION OF THE PROPOSED PROJECT TO WHICH THE APPLICABLE LISTED ACTIVITY RELATES.**
12	The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. e.g. Northern Cape Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; Within critical biodiversity areas identified in bioregional plans; Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or on land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	The proposed development will vegetation clearing along the servitude. The proposed deviations are 45km long which is less than 32% of the 145km lines. A 55 metre (27.5 metres on either side of the power line) servitude is required for the proposed 400 kV power line, tall trees will be pruned, or where absolutely unavoidable, cleared along the entire length of the servitude (the vegetation will also be maintained by Eskom in the operational phase of the project). Only an 8m strip may be cleared to allow vehicular passage during construction. Approximately 247ha will be cleared on the proposed deviations.

5. RECEIVING ENVIRONMENT

The project is located in the Northern Cape Province, the area has Rainfall largely in late summer/early autumn (major peak) and very variable from year to year. The Mean Annual

Precipitation ranges from about 70 mm in the west to 200 mm in the east. The Mean maximum and minimum monthly temperatures for Kenhardt are 40.6°C and –3.7°C for January and July respectively. The corresponding values for Pofadder are 38.3°C and –0.6°C. The Frost incidence ranges from around 10 frost days per year in the northwest to about 35 days in the east. Whirl winds (dust devils) are common on hot summer days.

The area consists of the NKb 3 Bushmanland Arid Grassland., which is distributed within the Northern Cape Province. Spanning about one degree of latitude from around Aggeneys in the west to Prieska in the east. The southern border of the unit is formed by edges of the Bushmanland Basin while in the northwest this vegetation unit borders on desert vegetation (northwest of Aggeneys and Pofadder). The northern border (in the vicinity of Upington) and the eastern border (between Upington and Prieska) are formed with often intermingling units of Lower Gariep Broken Veld, Kalahari Karroid Shrubland and Gordonia Duneveld. Most of the western border is formed by the edge of the Namaqualand hills. Altitude varies mostly from 600–1 200 m.

Vegetation & Landscape Features Extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland dominated by white grasses (Stipagrostis species) giving this vegetation type the character of semidesert 'steppe'. In places low shrubs of Salsola change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

6. DEVIATIONS

It is important to note that the 145km long 2x 400kv Powerlines route/corridor is authorized, and thus this new application assesses the proposed deviations that are located within the pre-negotiated properties but outside of the authorized corridor. **Eskom proposes three (3) deviations outside of the authorized route.**

Site-Specific Considerations that informed the proposed deviations:

- **Outside Upington S.S**: There was a deviation outside Upington S.S. due to IPP projects that deviated out of the authorised corridor.
- **Close to N14 crossing**: difficult landowner that forced Eskom out of the approved corridor after negotiations failed with the land owner.
- **Close to Aries S.S**: This deviation was also to cater for landowner requirements. The request was to move the line to the edge of the property rather than running straight through the middle.

The proposed development consists of three Powerline deviations from the original corridor, namely:

Deviation 1

Deviation 1 is approximately 15.668 km in length and is made up of the proposed deviation to the existing 400kv Powerline within Groot Riet and De Tuin Zuid Farm Portions. The deviation will turn off from the existing route and move for approximately 6.480km in a Northeast direction before going back to an authorized line and move the remaining 9.188 km to join in with the authorized powerline.

Deviation 2

Deviation 2 is approximately 5.997 km in length and is made up of the proposed deviation to the existing 400Kv & 132 Kv within Baviaans Krantz Farm Portions. The deviation will move away from the existing route and move Southeast direction before joining the authorized line again.

Deviation 3:

Deviation 3 is approximately 23.45 km in length and is made up of the proposed deviation to the existing 400kv & 132 KV from Zoovorby to Klip Punt Farm Portions. The deviation will move from the authorized route and travel South direction before turning back to authorized route.

It is important to note the route is already pre-negotiated, and thus no alternative deviations were considered for this application. Refer to Table 7-1 for evidence of the pre-negotiated route.

7. PUBLIC PARTICIPATION IN THE DRAFT BASIC ASSESSMENT PHASE

Public participation is an important aspect of any EBA, with the objective to assist stakeholders to table issues of concern, suggestions for enhanced benefits and to comment on the findings of the EBA. The Public Participation Process is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner.

A I&AP database has been established to record the details of stakeholders that wish to register for the project. Key stakeholders have been identified and notified of the project

and provided with the opportunity to participate in the process. A Background Information Document was compiled and distributed to all registered I&APs. A Newspaper advertisement was placed in the **Gemsbok Newspaper**, in addition to the newspaper advert onsite notices were erected at 11 locations in the study area.

This report was made available for a 30-day public comment period. All the comments that were received were considered when finalizing the report for submission to the competent authority (DFFE).

8. SPECIALIST STUDIES

This Basic Assessment Report uses input from specialists to assess the key impacts, determine their significance, and recommend appropriate measures to mitigate negative impacts and enhance benefits. The specialist studies that have been undertaken are summarised below. Mitigation measures recommended have been included in the Draft Environmental Management Programme (EMPr).

(i) **An assessment of the local ecology associated with the proposed powerlines was undertaken by Mr. Takalani Mudau**. This study predicted that:

- The direct loss of floral species/vegetation types and biodiversity will have a moderate significance after mitigations;
- The loss of species of special concern (protected species) would have a minor impact after mitigation; and
- The impact of alien vegetation establishment will be negligible after mitigation

(ii) **MORA Ecological Services (Pty) Ltd was appointed by Vombe Consulting to conduct an avifaunal impact assessment for the proposed 2X 400 kV Transmission line**:

- The current state of avifauna in the study area was described, outlining important characteristics which may be influenced by the proposed infrastructure, or which may influence the proposed infrastructure during construction and operation.
- Potential impacts that have been identified during the study include bird collision, electrocution, and loss of habitats. Mitigation measures to safeguard the avifauna around the area were provided.

- Sensitive avifaunal areas of the site were identified and discussed in the report. These areas were found to be associated with the Orange River and several drainage lines along the transmission powerline route.

Overall, the avifaunal sensitivity of the study area was regarded as Low-Medium around majority of the habitats. With the exception of the Orange River crossing. With proper mitigations as recommended in this report, impacts can be reduced to Low.

(iii) **Integrated Specialist Services (Pty) Ltd (ISS) was retained by Vombe Consulting Pty Ltd to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed 2X 400 kV powerline. The report makes the following recommendations**:

- The construction teams must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during clearance and digging at the site prior to commencement of work on the site in order to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.
- If archaeological materials are uncovered, work must cease immediately and the SAHRA/Northern Cape PHRA be notified, and activity should not resume until appropriate management provisions are in place.
- The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the legislations.

(iv) **Mveledzo environmental and safety solution (Pty) Ltd has been appointed by Vombe Pty LTD on behalf of Eskom Holdings SOC Ltd to undertake Floodline studies for the proposed 2X 400 kV Powerline**.

- It is recommended that the design event is 1:100-year and design heights for upstream, middle and downstream segments are determined to avoid structure inundation. The poles closer to the 1:100 floodline are recommended to be located at approximately 30 m away from the identified floodline and poles on the east side (close to riverbank) must be placed 30 m from the where the riparian vegetation ends.

9. CONCLUSION AND RECOMMENDATION

This EBA investigated the potential impacts of the proposed three deviations that fall outside of the authorized 2X 400 kV powerlines starting from Aries substation near Kenhardt to Upington substation near Upington, the entire line is expected to be 145km in line length. The project will address the following Eskom strategic objectives namely; reduce the impact on the environment through identifying, implementing and/or supporting internal and external options for low carbon emitting generation and transportation and opportunities. This project will be an enabler to the country's drive to achieve energy diversification into the future. This is a strategic project to enable connection to IPP's in the future. Environmental Authorisation needs to be obtained and servitudes acquired to reduce time to integrate IPP's after receiving preferred bidder status.

10. ENVIRONMENTAL IMPACT STATEMENT

Summary of the potential impacts after management and mitigation have been taken into account and are as follows:

Loss of habitat/biodiversity and impact on fauna and flora

It is expected that most of the current vegetation in the proposed area will be lost to construction activities. However, it has been proposed that indigenous vegetation be used for all landscaping activities. A rescue operation will be conducted to relocate the medicinal plants spotted on site. Considering the initial condition of the site, the resultant significance of the impact on habit and biodiversity loss will be low.

Noise

Construction activities will be responsible for noise pollution due to the presence of heavy vehicles and machinery, as well as the associated construction activity itself. The construction activity will be temporary in nature and standard methods can be employed to ensure that machinery and vehicular noise are kept to a minimal. Therefore, the resultant significance of the noise impact after mitigation measures is expected to be very low. Noise nuisance related to the operational phase of the development will result largely from vehicle movement. Noise impacts will be low taking into account the nature and size of the properties in the area for the operational phase.

Water, soil and air pollution

Various construction activities, if not properly managed, may result in pollution of soil, air and water resources. Best management practices should be applied in terms of fuel usage, dust suppression and general waste management should such measures be implemented, the significance of impact on soil, air and water are expected to be low.

Property Values

The operational phase of the site should include good housekeeping measures to ensure that the development does not contribute to area neglect, and screening of the property by indigenous plants, these mitigation measures will bring the impact down to low.

Traffic

Traffic hindrances during the construction phase of the project will be temporary. The impact on traffic during the operational phase is expected to return to normal flow during the operational phase.

Impact on existing services

Civil services such as sewage, water and electricity must be established and made available at the site of the proposed development. Sufficient capacity must also be established to fully service the proposed development. Service installation must be undertaken by qualified engineers and contractors. The resultant impact of the development on services in the area is therefore expected to be moderate.

Socio Economic Impact

The proposed activities will supply employment opportunities for locals and working there supplies them with skills development. Construction of powerlines will require more employees thereby expanding employment opportunities and uplifting the rural community thereby contributing to a Moderate Positive Impact.

Heritage impact

In terms of the archaeology and heritage with respect to the proposed development site there are no obvious 'Fatal Flaws' or 'No-Go' areas. No archaeological sites were recorded within the proposed development site. The field survey also established that the affected project area is degraded by existing infrastructure, landscaping, previous agriculture activities and associated infrastructure. This report concludes that the proposed development may be approved by SAHRA/PHRA-G to proceed as planned subject to

recommendations herein made which include a heritage monitoring plan being incorporated into the construction EMP (refer to Appendix H)

ESKOM'S PROPOSED ELECTRICAL 2x 400 KV POWERLINES FROM ARIES – UPINGTON SUBSTATION

FINAL BASIC ASSESSMENT REPORT

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LIST OF ACCRONYMS

APM	Archaeology, Palaeontology and Meteorites
BID	Background Information Document
C-Plan	Conservation Plan
DFFE	Department of Forestry, Fisheries and the Environment
DEA	Department of Environmental Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EBA	Environmental Basic Assessment
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EO	Environmental Officer
Eskom	ESKOM Holdings SOC Ltd
GIS	Geographic Information System
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IBAs	Important Bird Areas
NEMA	National Environmental Management Act (Act 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SHEQ	Safety, Health, Environment and Quality

LIST OF UNITS

Km	Kilometre
m	Meter
Kv	Kilo Volts

GLOSSARY OF TERMS

No-go area:	An area in which the Powerlines cannot be routed due to resulting significant environmental, technical and social impacts.
Sense of place:	Defining oneself in terms of a given piece of land. It is the manner in which humans relate or feel about the environments in which they live.
Social change process:	A discreet, observable and describable process that changes the characteristics of a society, taking place regardless of the societal context (that is, independent of specific groups, religions etc.) These processes may, in certain circumstances and depending on the context, lead to the experience of social impacts.
Social Impact:	Something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense.
Study area:	The area that has been covered by the EIA process within which possible substation and corridors for the 2x 400 kV powerlines have been investigated.
Substation:	A collection of equipment for the purpose of raising, lowering and regulating the voltage of electricity.

ESKOM'S PROPOSED ELECTRICAL 2X 400 KV TRANSMISSION POWERLINES FROM ARIES SUBSTATION

FINAL BASIC ASSESSMENT REPORT

CHAPTER 1

1. INTRODUCTION

1.1 BACKGROUND

Vombe consulting has been appointed by Eskom Holdings SOC Ltd to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014 as amended. Eskom had previously conducted the EIA for the proposed line, which was authorized by the Department of Environmental Affairs (DEA), however there have been design changes which have caused deviations on three different locations within the approved line. This assessment will only focus on the deviations from the authorized Powerlines of 400 kV runs from Aries substation near Kenhardt to Upington substation near Upington. An EIA authorisation application is required in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA), and the Environmental Impact Assessment (EIA) Regulations, 2014 (and amended on 7 April 2017) for the Eskom 400 kV project, which is submitted to the Department Forestry, Fisheries and Environment (DFFE) for review and approval.

Eskom intends to start construction between August 2023 and December 2023, with the entire construction period being approximately is 4 years.

1.2 PURPOSE OF THIS STUDY

The proposed project triggers several activities listed in the National Environmental Management Act (Act 107 of 1998) (NEMA) as requiring environmental authorisation before they can commence. The purpose of this study is to undertake an Environmental Basic Assessment (EBA) process, with associated Public Participation Process (PPP) and specialist studies, to enable the competent authority to decide whether the project should go ahead or not, and if so, then on what conditions.

A Basic Assessment process is required for the authorization of the Proposed deviations which are located outside of the authorized two 400 kV Transmission powerlines corridor.

1.3 OBJECTIVES OF THIS REPORT

This report documents the process and findings of the Basic Environmental Assessment. This report was subjected to a public review period after which it was finalised and submitted to the competent authority for review.

1.4 DETAILS OF THE APPLICANT

The applicant is Eskom Holdings SOC Ltd represented by the Program Manager, **Mr Itumeleng Moeng**.

Physical Address: Megawatt Park, Maxwell Drive, Sunninghill, Johannesburg

Postal Address: P O Box 1091, Johannesburg, 2000

Telephone number: 011 800 4114

Fax: +27 86 665 2128

1.5 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

The Environmental Assessment Practitioner (EAP) undertaking this EIA is Mr Edzisani Siphugu from Vombe Environmental Consulting (Pty) Ltd. Edzisani Siphugu has extensive experience in conducting Environmental Impact Assessments across within South Africa. In addition, he has been responsible for compiling and updating Environmental Management Programmes (EMPr), the management of Environmental Control Officers (ECOs) and Environmental Officers (EOs) and providing environmental project implementation advice and overall project management for over 14 years.

1.6 STRUCTURE OF THIS REPORT

The location of the project is presented in Chapter 2 and project description in Chapter 3. Assumptions and Limitations are presented in Chapter 4, legislation that is applicable is discussed in Chapter 5 and the Need and Desirability in Chapter 6. Alternatives assessed are presented in Chapter 7. The PPP undertaken is covered in Chapter 8. Key issues raised in the PPP and how they were addressed in the EBA are described in Chapter 9. Attributes associated with the footprint are discussed in Chapter 10. Chapter 11 covers the impact and risk assessment of the proposed project. Summary of findings and recommendations of specialists' studies are described in Chapter 12. The Environmental Impact Statement is outlined in Chapter 13. Chapter 14 presents aspects to be included as conditions of

authorisation. Conclusion and Recommendations are in Chapter 15, and references are listed in Chapter 16.

1.7 COMPLIANCE WITH THE EIA REGULATIONS

Section 3 of Appendix 1 of GN R982, as amended by GN R326 gazetted on 7 April 2017, specifies the content requirements for a Basic Assessment Report. Table 1.1 indicates how this document complies with these requirements.

Table 1-1: Regulatory content requirements for a Basic Assessment Report

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
3(a) details of- (i) The EAP who prepared the report	Section 1.5
(ii) the expertise of the EAP, including a curriculum vitae;	Section 1.5
(b) the location of the activity, including- (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates or the boundary of the property or properties;	Chapter 2
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 2

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered. (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Chapter 3
(e) a description of the policy and legislative context within which the development is proposed including (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Chapter 5 Chapter 5 and Chapter 6.2 Chapter 5 and 6
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 6
(g) a motivation for the preferred site, activity and technology alternative;	Chapter 7
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including – (i) details of all the alternatives considered;	Chapter 7

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
(ii) details of the PPP undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 8
(iii) a summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Chapter 9
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 10
(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) can be reversed. (bb) May cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 11
(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Chapter 11
(vii) positive and negative impacts that the proposed activity and alternatives will have on	Chapter 11

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
(viii) the possible mitigation measures that could be applied and level of residual risk	Chapter 11
(ix) the outcome of the site selection matrix;	Chapter 7
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Not Applicable
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Chapter 7
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including -	Chapter 11
(i)a description of all environmental issues and risks that were identified during the EIA process; and	Chapter 11
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 11

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
(i) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Chapter 11
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Chapter 11
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 12
(l) an environmental impact statement which contains— (i) a summary of the key findings of the EIA;	Chapter 13

SECTION OF APPENDIX 1 GN R.982	SECTION IN THE BASIC ASSESSMENT
(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii)a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives and the impact management outcomes for the development for inclusion in the EMPr;	
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 14
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 14

CHAPTER 2

2. LOCATION OF THE PROJECT

GN 982 Appendix 1

(b) the location of the activity, including-

(i) the 21-digit Surveyor General code of each cadastral land parcel;

(ii) where available, the physical address and farm name;

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-

(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai! Garib Local Municipality and Khara Hais Local Municipality (**Figure 2-1)** . The route for the proposed powerline deviation extending from Aries substation near Kenhardt to Upington substation near Upington, the total length of the proposed line is approximate 145 km however this study will only cover the distance of about +/-48 km (**Table 2-1**).

Table 2-1: Deviation co-ordinates

Deviation 1		
Point	Latitude	Longitude
Start	29°25'0.01"S	20°45'51.24"E
End	29°18'1.71"S	20°45'19.19"E
Deviation 2		
Point	Latitude	Longitude
Start	28°46'45.59"S	20°41'59.44"E
End	28°44'11.93"S	20°40'44.10"E
Deviation 3		
Point	Latitude	Longitude
Start	28°38'14.59"S	20°56'28.94"E
End	28°32'57.74"S	21° 8'15.81"E

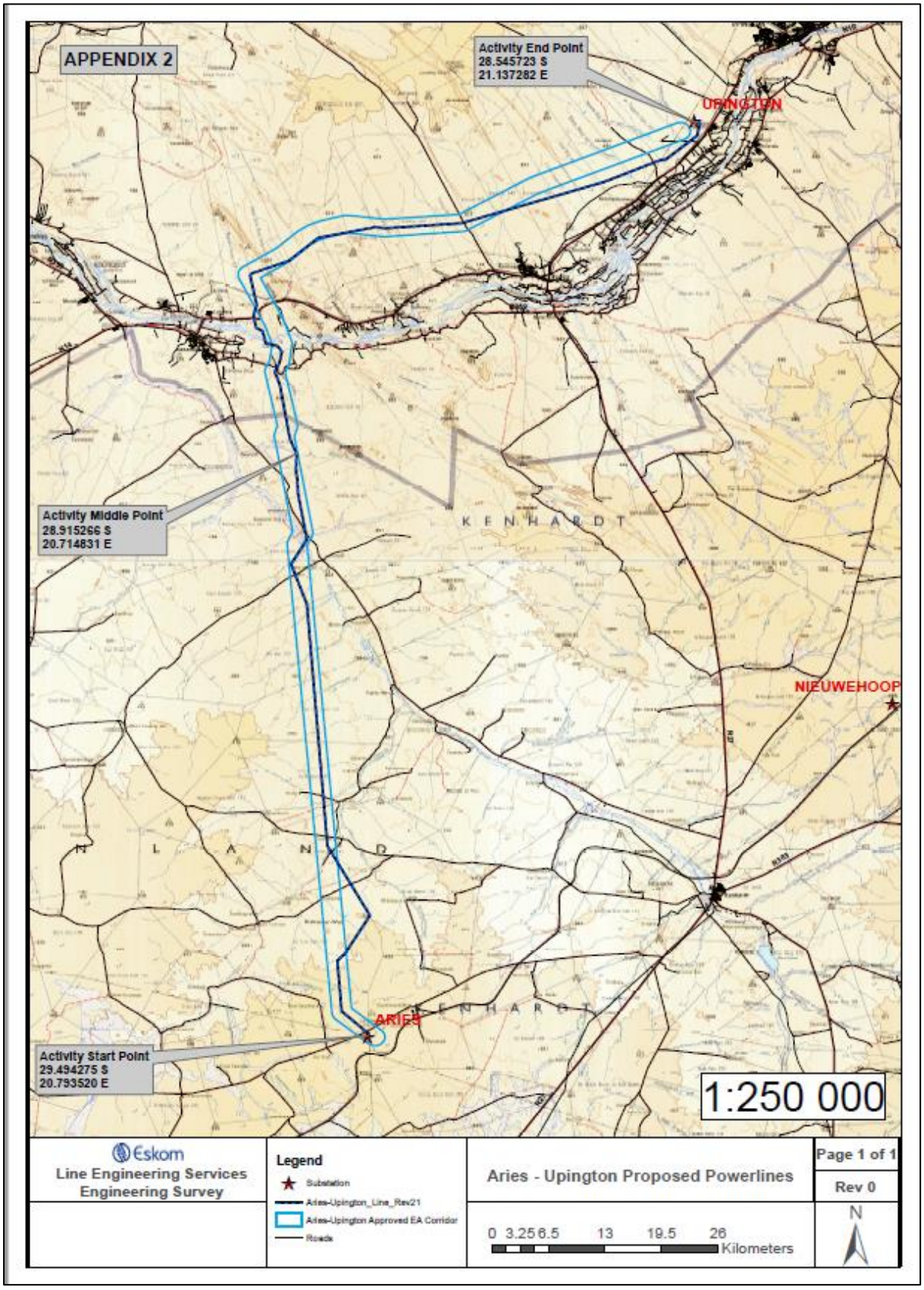


Figure 2-1: Locality Map

Table 2-2: Information on properties negotiated that affect the Aries-Upington 400kV Lines

Item	Parcel	Portion	Farm/Town Name	Negotiated on	Registered on	General Right	SG 21 digit codes	Affected by the deviation	Map sheet no
1	188	1	KLEIN ZWART BAST	26/02/2017	25/04/2018		C036000000000018800001		
2	188	0	KLEIN ZWART BAST	21/02/2017	11/05/2018	K0052/2018S	C036000000000018800000		
3	163	3	DE TUIN	26/11/2016	21/09/2017	K0053/2017S	C036000000000016300003		
4	163	1	DE TUIN ZUID	23/08/2018	27/08/2019	K0057/2019S	C036000000000016300001	Deviation 1	Sheet 2 & 3
5	163	2	DE TUIN ZUID	23/08/2018	27/08/2019	K0058/2019S	C036000000000016300002	Deviation 1	Sheet 2 & 3
6	162	7	GROOT RIET	23/08/2018	08/04/2019	K0023/2019S	C036000000000016200007	Deviation 1	Sheet 2 & 3
7	162	5	GROOT RIET	15/02/2017	19/04/2018	K0040/2018S	C036000000000016200005		
8	162	4	GROOT RIET	03.03.2017	09/04/2018	K0030/2018S	C036000000000016200004		
9	130	1	DE BANKEN	09/03/2017	23/04/2018	K0041/2018S	C036000000000013000001		
10	130	0	DE BANKEN	27/06/2017	In the process of being registered		C036000000000013000000		
11	130	10	DE BANKEN	02/06/2017	08/12/2017	K0081/2017S	C036000000000013000010		
12	130	9	DE BANKEN	30/06/2017	21/12/2017	K0087/2017S	C036000000000013000009		
13	130	4	DE BANKEN	13/07/2017	20/12/2017	K0088/2017S	C036000000000013000004		
14	129	2	PYP KLIP WEST	07/02/2017	In the process of being registered		C036000000000012900002		
15	129	1	PYP KLIP WEST	06/12/2016	22/11/2019		C036000000000012900001		
16	103	2	WITVLEI	08/02/2017	05/12/2019	K0095/2019S	C036000000000010300002		
17	103	0	WITVLEI	08/02/2017	05/12/2019	K0094/2019S	C036000000000010300000		
18	102	0	KLEIN GOEGAB	15/02/2017	14/08/2019	K0053/2019S	C036000000000010200000		
19	102	4	KOEGAB	15/02/2017	14/08/2019	K0052/2019S	C036000000000005900004		
20	59	0	KOEGAB	10/02/2017	05/12/2019	K0096/2019S	C036000000000005900000		
21	60	0	MIDDEL POST	10/12/2016	28/03/2018	K0024/2018S	C036000000000006000000		
22	61	0	OMKYK	17/04/2019	In the process of being registered		C036000000000006100000		
23	61	1	OMKYK	07/02/2017	21/08/2018	K0126/2018S	C036000000000006100000		
24	1184	0	KAKEMAS SUID SETTLEMENT	13/02/2017	04/07/2018	K0104/2018S	C036000700001184000000		
25	1738	0	ERF 1738	04/06/2018	28/03/2019	K0016/2019S	C036000700001738000000		
26	1486	0	ERF 1486	11/09/2018	In the process of being registered		C036000700001486000000		
27	1219	0	ERF 1219	19/09/2018	In the process of being registered		C036000700001219000000	Deviation 2	Sheet 11 & 12
28	677	0	ZWART BOOIS BERG SUID	02/08/2017	In the process of being registered		C028000000000677000000	Deviation 2	Sheet 11 & 12
29	474	10	BAVIAANZ KRANTZ	15/08/2017	In the process of being registered		C028000000000474000010	Deviation 2	Sheet 11 & 12
30	475	7	ZWART BOOIS BERG ANNEX	02/08/2017	In the process of being registered		C028000000000475000007		
31	584	0	PLAAS 584	06/02/2017	19/07/2018	K0093/2018S	C028000000000058400000		
32	595	0	PLAAS 595	14/02/2017	08/10/2018	K0139/2018S	C028000000000059500000		
33	602	0	DIE PLAAS	08/12/2016	15/01/2019	K0001/2019S	C028000000000060200000		
34	466	27	FRIERS DALE	13/02/2017	29/06/2018	K0081/2018S	C028000000000046600027		
35	464	9	LOXTON VALE	13/02/2017	11/04/2018	K0055/2018S	C028000000000046400009		
36	465	39	EENDUIN	28/11/2016	In the process of being registered		C028000000000046500039		
37	465	40	EENDUIN	09/12/2016	In the process of being registered		C028000000000046500040		
38	461	51	TKABIES	28/11/2016	In the process of being registered		C028000000000046100051		
39	616	0	PLAAS 616	09/12/2016	30/05/2019	K0060/2019S	C028000000000061600000		
40	1152	0	ERF 1152	02/08/2017	05/11/2019	K0144/2019S	C028000600001152000000	Deviation 3	Sheet 17 to 20
41	468	5	ZOOVOORBY	23/12/2016	In the process of being registered		C028000000000046800002	Deviation 3	Sheet 17 to 20
42	467	1	CURRIES CAMP	23/12/2016	In the process of being registered		C028000000000046700001	Deviation 3	Sheet 17 to 20
43	466	0	GEEL KOP	06/02/2017	In the process of being registered		C028000000000046600000	Deviation 3	Sheet 17 to 20
44	465	5	BLOEMSMOND	22/06/2017	In the process of being registered		C028000000000046500005	Deviation 3	Sheet 17 to 20
45	465	14	BLOEMSMOND	22/06/2017	In the process of being registered		C028000000000046500014	Deviation 3	Sheet 17 to 20
46	464	0	DYASON'S KLIP 464	13/07/2017	In the process of being registered		C028000000000046400000	Deviation 3	Sheet 17 to 20
47	617	0	ROOIPUNT	02/08/2017	In the process of being registered		C028000000000061700000	Deviation 3	Sheet 17 to 20
48	638	0	TUNGSTEN LODGE	29/04/2022	In the process of being registered		C028000000000063800000	Deviation 3	Sheet 17 to 20

Confirmed by Eskom Land Development

Name: L. Padi

Signature:

Date: 2022/05/13

Department: Transmission Land and Rights

CHAPTER 3

3. PROJECT DESCRIPTION

GN 982 Appendix 1:

(d) a description of the scope of the proposed activity, including-

(i) all listed and specified activities triggered and being applied for; and

(ii) a description of the activities to be undertaken, including associated structures and infrastructure;

This section describes the proposed project and activities listed in the EIA Regulations 2014, as amended, that will be triggered by the project.

It is important to note there is an Environmental Authorisation in place for the line (DEA ref no. 12/12/20/2606). However, Eskom is proposing three deviations which fall outside of the original authorized corridor. This application is aimed at assessing the proposed deviations (DEA ref no. 14/12/16/3/3/1/2488).

3.1 OVERVIEW OF THE ELECTRICAL NETWORK

The South African electrical power system can be broadly divided into the generators that supply the power, the Transmission system that carries the power from the generating centres to the load centres, and the distribution system that feeds the power to consumers (**Figure 3-1**).

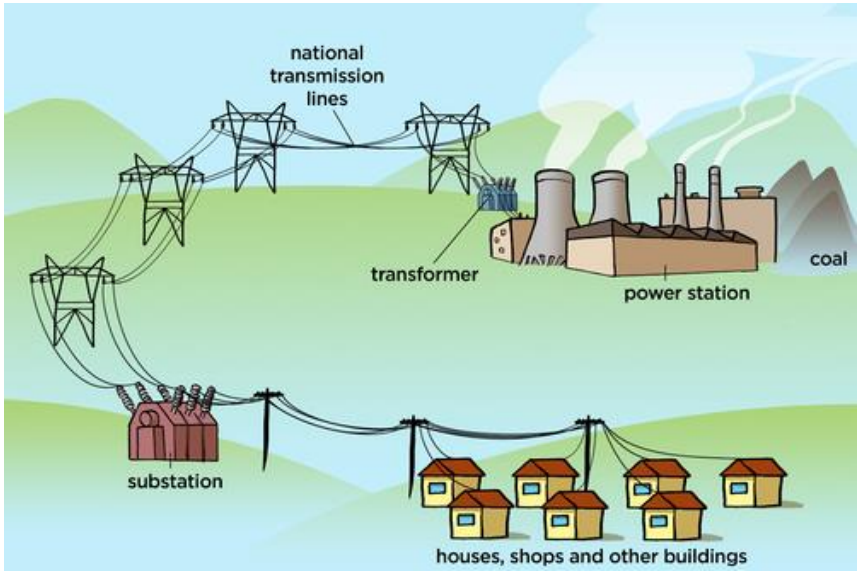


Figure 3-1:Electrical Networks

To reduce the cost of transporting bulk electricity over long distances, the electricity is transmitted at higher voltages typically 765 kV, 400 kV and 275 kV. In South Africa most of the load centres are situated far from the generators, therefore the voltage is stepped-up (increased) at the generation point and stepped down (decreased) near the load. Substation transformers are used to step-up or step-down voltages to adjust the voltage along the network (long distance transmission lines to sub-transmission and distribution lines). For safety reasons power is generally distributed to consumers at lower voltages.

3.2 LISTED ACTIVITIES TRIGGERED BY THE PROPOSED DISTRIBUTION POWERLINES

Activities Triggered by the proposed 2X 400 kV electrical Powerlines are presented in **Table 3-1**.

Table 3-1: Applicable Legislation and Policies

Listing Notice 1: GNR 327	Activity No.: 47	The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.
Listing Notice 2: GNR 325	Activity No.: 9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
Listing Notice 3: GNR 324	Activity No.: 12	The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. e.g. Northern Cape Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically

		endangered in the National Spatial Biodiversity Assessment 2004; Within critical biodiversity areas identified in bioregional plans; Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or on land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

3.3 DESCRIPTION OF THE PROPOSED TRANSMISSION POWERLINES

Eskom is proposing the construction of transmission powerlines of 2x 400KV Powerlines from Aries substation near Kenhardt to Upington substation near Upington and the line length is 145 km. The 2x 400KV Powerlines will have three deviations which fall outside of the original authorized corridor. The proposed deviations are 45km long which is less than 32% of the 145km lines. A combination of self-supporting and strain towers will be used.

3.4 CONSTRUCTION PROCESS

The co-ordinates of the centre line of the route and position of the towers has been determined by surveyors. Refer to the Microsoft Excel Spreadsheet on Appendix D2, outlining the tower positions and the dimensions of the structures.

The construction process consists of the following phases:

- Survey and pegging of tower positions (**Appendix D2-Tower Positions**);
- Access road negotiation and construction (**Appendix D1-Pre-negotiated Properties**);
- Gate installation and vegetation clearing (**Refer to the Sensitivity Map on Appendix A2)**;

- Foundation excavation and installation (**Refer to Appendix C2 for the proposed foundations**);
- Tower assembly and erection;
- Conductor stringing and tensioning, and
- Servitude clean-up and rehabilitation.

Any plants that could interfere with the construction, maintenance or operation of the powerline, will be removed or trimmed in accordance with relevant legislation and the EMPr. The EMPr specifies standards to be adhered to for vegetation clearing and protected species management. This will result in a loss of flora. Once the centre line has been cleared, the tower positions will be pegged.

A maximum of 8 m is required for Civil Engineers to access each tower position in order to conduct Geotechnical Investigations (**Figure 3-2**). These 8 metres also caters for centre phase clearance. An additional 7.2 m is required to ensure that Eskom conforms to all required clearances for the outer phases. Construction vehicles drive within this 7.2 metre during stringing of pilot cable for earthwire and outer conductors.

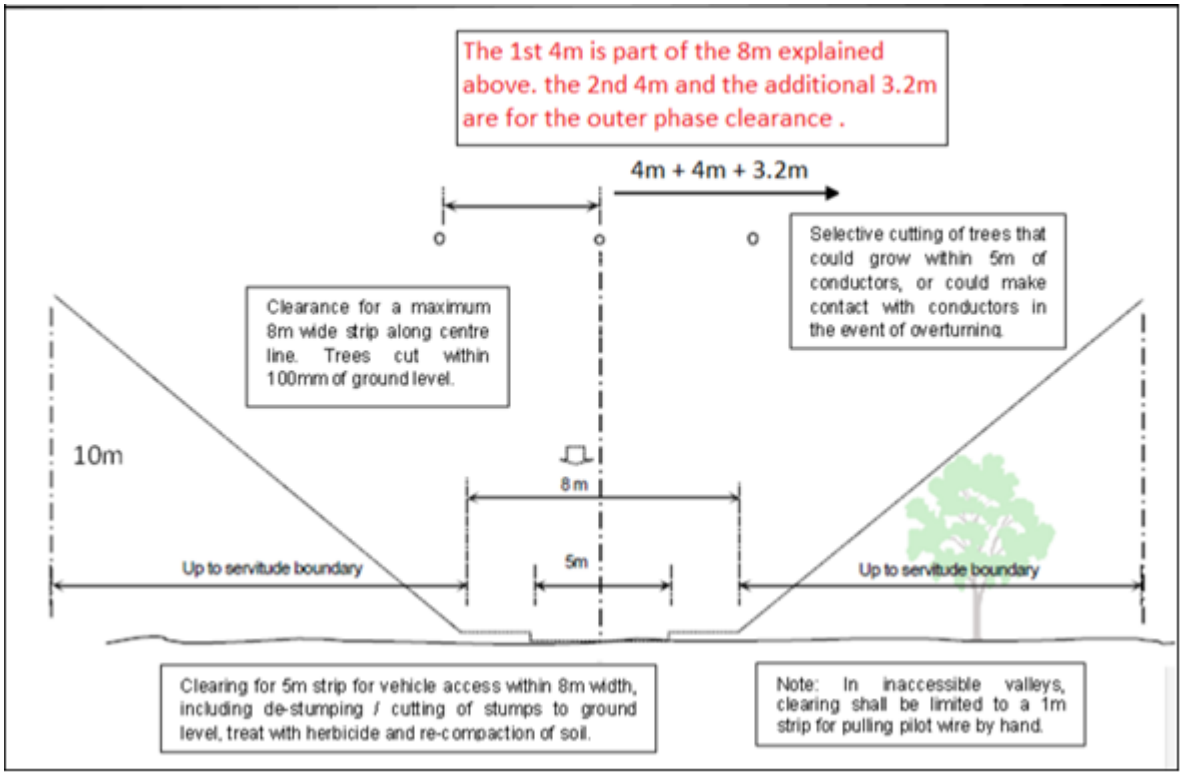


Figure 3-2: Bush Clearing required in servitudes

Vehicle access is usually required along the entire route for construction, maintenance and operation purposes. Existing roads will be used as far as possible, and the

construction will be restricted to the authorised corrodor. Access roads will all be less than 6 m wide, only existing roads will be used. Since the proposed development is located within 500m of a watercourse, the prosed development requires a water use licences from Department of Water and Sanitation (DWS) in terms of Section 21 (c and i). The details of the ongoing water use licence application are outlined on **Appendix F**. Any existing infrastructure will be maintained in its existing condition. Access points and use of existing roads will be negotiated with the relevant landowners.

The type of foundation required for each tower is dependent on the geo-technical conditions (**Refer to Appendix C2**). If the area is bushveld, then it will be cleared, but if it is grassland, then it will just be trampled by activities. Foundations may be drilled, mechanically excavated, or dug by hand. No blasting will take place. Concrete is then placed. Helicopters may be used to transport equipment and materials if tower positions are inaccessible. Due to the costs involved, this is not the standard method of accessing the towers and line and access roads will still be used for the majority of the route.

Any incomplete excavations will be protected to prevent animals and people from injury. All foundations are backfilled and stabilised through compaction and capped with concrete at ground level. Towers are assembled on the ground and then lifted into position by cranes or helicopters.

The conductor is then strung between towers by first passing a guide wire through the desired position. Cable drums (containing 2.5 km of cable, can be steel or wooden approximately 2.5 to 3 m in size) are placed at 5 km intervals in the cleared section of the servitude, and passed 2.5 km in each direction.

3.5 OPERATION AND MAINTENANCE

Ongoing maintenance of the powerlines will be required throughout its lifespan.

3.5.1 Line Inspections

Line inspections are usually undertaken once or twice per annum. The maintenance process encompasses the identification and correction of defects which could have detrimental effect on future line operation. This includes a means of inspection, evaluation and repair of the identified defects in a reasonable period so as to prevent imminent failure, mal-operation or reduced reliability. This may be done via the access routes, or by helicopter.

3.5.2 Servitude Management

The following documents highlight the most pertinent issues in the servitude management:

- Pro-active Bird Mortality Mitigation in Distribution: ENV16-R223;
- Soil Erosion Guideline: Unique Identifier 41-337;
- Vulture Electrocution Risk Areas: Distribution Technical Bulletin: 03TB-026;
- Vegetation management and Maintenance within Eskom Land, Servitudes and Rights of Way: Unique Identifier 240-70172585;
- Approved Bird Flight Diverters to be used on Eskom's Lines (Mitigation Devices): Technical Bulletin 09 TB-01;
- Utilization of Bird Flight Diverters on Eskom Overhead Lines: Unique Identifier 240-03563150; and
- Covering of jumpers on MV auxiliary structures: Distribution Technical Bulletin 02TB 023

The environmental impact due to the modification of the habitat of birds and plant species must be closely monitored to ensure that no negative influences result. In the case of birds, it could relate to increased collisions and electrocutions. The stimulation of alien or invasive species of plants should be avoided where possible.

A readily accessible servitude road facilitates quicker line patrols and maintenance. It also expedites the execution of emergency repairs. It is thus imperative for these to be properly maintained and managed. More importantly is the exposure of concrete foundations, which introduces the risk of tower collapse during high wind loading conditions. The environmental deterioration is another concern which constitutes contravention of environmental legislation. The encroachment on the right of way by settlements poses a safety risk to the public.

3.5.3 Insulator

Glass insulators in highly polluted areas should regularly be evaluated. Appropriate cleaning should be done and insulators found to be under specified in creepage for the prevailing pollution level should be replaced with units of the appropriate creepage level. The methods of washing, whether by hand or spray washing, shall be determined by the urgency and the resources at hand. Alternatively, where regular cleaning/ washing is required at a great expense, the glass insulators should be replaced with polymeric, silicone insulators. Insulators should be scanned with a corona camera to ascertain the

extent of corona. On detection of corona activity, a program should be put in place to monitor and replace the insulators.

3.5.4 Hardware

Earthing, and line hardware should be inspected, and any defects identified should be monitored and prioritised for replacement or repair. Action plans should be initiated, as a matter of priority, to ensure that imminent failures are averted.

3.5.5 Anti-climbs

Anti-climbs are essential for preventing the public (especially children) from climbing to within critical distance from live conductors. Damaged or removed anti-climbs should be replaced as soon as reasonably possible, as it constitutes a regulatory requirement on the part of the business. They should be affixed between 2,5 m to 3 m above ground and maintained in operable condition.

3.5.6 Foundations

Exposed foundations due to flooding or erosion, constitutes a safety hazard and should be addressed, through the rehabilitation of the surrounding soil and damaged foundations. Currently no standard or guideline exist for rehabilitation of damaged tower foundations.

3.5.7 Tower Earthing

Loose and corroded earth straps should be fixed to ensure the electrical integrity of the connection to the tower.

3.5.8 Tower corrosion protection

The painting or coating of structures must be preceded by a thorough surface preparation which encompasses, removal of loose paint, scale and rust by means of scraping or sanding, followed by washing using clean sponges and clean potable water. The specification details the procedure to be followed under various corrosive environments. It also addresses the type of coating system suited for specific applications, with recommended and approved products for use. It is imperative that the operational lines staff are guided in the optimum application of coating systems by the relevant corrosion specialists.

3.5.9 Live Line Maintenance

Two techniques of live working have been developed on transmission voltages. The "stick" or "distance" method utilised insulated pole and special tools and equipment to perform work on live apparatus while at ground potential. This technique is mainly used

on 132 and 220 kV as the safe approach distance, and as a result the stick length, becomes impractical on the higher voltages.

For higher voltages the "bare hand" technique is used. In this method the live line worker is energised to the voltage of the live part to be worked on and physically performs the work with his hands, rather than using a stick as described earlier. Special precautions are taken to ensure an equi-potential zone around the body. Insulated aerial devices, insulated ladders as well as helicopters are used to transfer the live line worker from ground to system potential. It goes without saying that maintaining the safe approach distance at all times is critical.

Because of the risks involved, the live work environment is highly proceduralized and controlled. Strict requirements are contained in standards and procedures in the Transmission quality manual.

A major benefit of performing live line maintenance is the increased availability obtained on a specific line due to the fact that it does not have to be switched out to perform maintenance. This reduces supply risk to customers and strengthens the system from an operational point of view. The fact that maintenance can be performed on a line when required, and not subject to outages, results in increased reliability, which results in superior performance of the line. The ability to perform live maintenance reduces and/or delays the need for capital expenditure to build new lines for redundancy in order to perform maintenance under de-energised conditions.

CHAPTER 4

4. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

GN 982 Appendix 1:

(o) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

The objective of this assessment was to obtain authorisation for the proposed deviations which are located outside of the authorised corridor within which Eskom can design and construct 2X 400kV transmission powerlines. Each specialist lists their assumptions, uncertainties and gaps in knowledge in their specialist study reports (**Appendix G**). The summaries of the Limtatiosn are outlined below:

i. Ecological Impact Assessment Assumptions and Limitations:

All information contained in this report is based on what the specialist discovered on site, as well as what was provided by Vombe Consulting. The report considers likely impacts of the construction and operation of the 2X 400kVPower lines. However, some unique impacts may arise that must be recorded during monitoring. Appropriate corrective actions must be taken to mitigate these impacts. While engineering drawings and specification of rehabilitation structures fall outside of the scope of this ecological assessment report, consideration will be given to overlaying important sections on final alignment.

There is limited information on specific availability and behaviour of flora and fauna in this study area, as the assessment was done during one season only. Budget constraints and time limitations are some of the issues that might lead to limited assessment of the whole area. Findings, recommendations and conclusions presented in this report are based on the specialist's best scientific and professional knowledge. No part of this report may be amended or extended without prior written consent of the specialist. Any recommendations, statements or conclusions drawn from or based on this report must clearly cite or refer to this report. Whenever such recommendations, statements or conclusions form part of the main report under investigation, this report must be included in its entirety. Refer to Appendix G1.

ii. Avifaunal Impact Assessment Assumptions and Limitations:

- It is assumed that third party information (obtained from government, academic institutions and non-governmental organisations) is accurate and true;
- The study area was previously poorly surveyed prior to the baseline survey, as a result, species richness information is incomplete;
- The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on wetland and terrestrial environment;
- The study was conducted at a time when palearctic migrants have not arrived at their final wintering grounds;
- Limited time in the field means that important components of the local avifauna (i.e.nest sites or localised areas of key habitats for rare or threatened species) could have been missed;
- The site visits as well as personal experience of the avifauna of the area and of similar species in different parts of South Africa, through the specialist's experience working across the country, goes some way to remedying any knowledge deficiencies Refer to Appendix G2.

iii. Floodline Assessment Assumptions and Limitations:

The following are the limitation for the study. The assumptions are that the flow of the river is unsteady flow. Hence the variation in river profile indicates the elevation variation of approximately 300m. furthermore the model ignores the run-off from the storm or various season. Simulation is based on the flow data from the stations that are monitored by the Department of Water and Sanitation. Rainfall data for the area may vary from season to season. Furthermore, the Orange River flows from the Lesotho highlands where the average annual rainfall is approximately 1000mm in comparison to the Upington which has an average annual rainfall of less than 300mm. the other limitation is that the peak flow might increase when other dams upstream release more water which will then impact on the flow downstream, hence the proposed area is situated in the lower Orange River catchment. While every effort is made during the simulation of the flood (1:100-year flood) note that All information and deductions contained in this report are dependent not only on access to the relevant information but also accuracy of the results generated by the HEC RAS 6.2 software. Refer to Appendix G3.

iv. Archaeological And Heritage Impact Assessment Assumptions and Limitations:

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during clearance and construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in this document do not exempt the applicant from complying with any national, provincial, and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. ISS assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report. Refer to Appendix G4.

CHAPTER 5

5. POLICY AND LEGISLATIVE CONTEXT

GN 982 Appendix 1:

(e) a description of the policy and legislative context within which the development is proposed including –

(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and

(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments

5.1 LEGISLATION APPLICABLE TO THIS ENVIRONMENTAL BASIC ASSESSMENT

Table 5-1: Legislation of relevance to the EIA

LEGISLATION	SECTION	RELATES TO
The Constitution (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
National Environmental Management Act (No 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment
	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care

LEGISLATION	SECTION	RELATES TO
National Environmental Management: Waste Act (No. 59 of 2008)		Provides for specific waste management measures
Environment Conservation Act (No 73 of 1989) and regulations	Sections 19 and 19A	Prevention of littering by employees and subcontractors during construction and the maintenance phases of the proposed project
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution
	Section 20	Control of emergency incidents
	Section 21(c)	Impeding and diverting the flow of water in a watercourse
	Section 21(i)	Altering the bed, banks, course and characteristics of a watercourse
Occupational Health and Safety Act (No 85 of 1993)	Section 8	General duties of employers to their employees
	Section 9	General duties of employers and self- employed persons to persons other than their employees
National Heritage Resources Act (No 25 of 1999) and regulations	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority

LEGISLATION	SECTION	RELATES TO
		destroy, damage, alter, exhume, 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. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place

5.2 GUIDELINES CONSIDERED

- NEMA draft Implementation Guideline
- IAIA guidelines
- DEA (2017), Guideline on Need and Desirability, (DEA), Pretoria, South Africa (ISBN: 978-0-9802694-4-4).
- Public Participation Guideline published in 2012 (GN 807 of 10 October 2012) in terms of section J of NEMA (NEMA, 1998).
- According to the guidelines, public participation can be seen as one of the most important aspects of the environmental authorisation process. Public participation is the only requirement of the EIA process for which exemption cannot be given, unless no rights are affected by an application. This stems from the requirement in NEMA that people have a right to be informed about potential decisions that may affect them and that they must be given an opportunity to influence those decisions.
- SAHRA Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007). The guidelines provide the minimum standards that must be adhered to for the compilation of a HIA Report. Chapter II Section 7 outlines the minimum requirements for inclusion in the heritage assessment. The HRM process will be completed to adhere to the minimum standards as defined by Chapter II of the SAHRA APM Guidelines (2007).

5.3 NATIONAL AND INTERNATIONAL STANDARDS

National and international industry standards aimed at sustainable development and social justice specifically have become abundant in the last decade. Many industries use these standards as indicators for good practice. The discussion below highlights only a few of these standards.

5.3.1 ISO 26000:2010/SANS 26000:2010

Performance standards have long been a voluntary tool used by industry to achieve certain outcomes. The first standard on social responsibility, ISO 26000 was published on 1 November 2010 (ISO, 2010). It was developed using a multi-stakeholder approach involving experts from more than 90 countries and 40 international or broadly based regional organisations involved in different aspects of social responsibility (ISO, 2010).

The South African Bureau of Standards (SABS), a statutory body that is mandated to develop, promote and maintain South African National Standards (SABS, [sa]) adopted the ISO 26000 Standard as a South African National Standard (SANS) 26000:2010.

5.3.2 International Social Performance Standards/Initiatives

There is a profusion of global initiatives aiming at assisting companies to make their operations more sustainable. The most frequently used in the EIA industry is the International Finance Corporation's (IFC) principles (IFC, 2012). The IFC is a member of the World Bank group, and as a part of their sustainability framework they created performance standards on environmental and social sustainability (IFC, 2012). The standards relevant to the social environment are the following:

1. Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
2. Performance Standard 2: Labour and Working Conditions
3. Performance Standard 4: Community Health, Safety, and Security
4. Performance Standard 5: Land Acquisition and Involuntary Resettlement
5. Performance Standard 7: Indigenous Peoples
6. Performance Standard 8: Cultural Heritage (IFC, 2012).

Issues such as gender, climate change, water and human rights are addressed across the standards. A guidance note accompanies each standard (IFC, 2012:4). Environmental and social risks and impacts must be managed by using an Environmental and Social Management System. The standard applies to all the activities funded by the IFC for the duration of the loan period. A number of private banks adopted most of the IFC standards in an initiative known as the Equator Principles (Esteves, Franks & Vanclay, 2012).

5.4 ESKOM POLICY DOCUMENTS

5.4.1 Control Plans for Alien Invasive Species (AIS)

Government Notice Regulation (GNR) 598 of 2014, Alien and Invasive Species Regulations requires that Eskom as a landowner is legally obliged to clear its properties of alien invasive species. As such, Eskom is required by law to firstly determine if Alien Invasive Species (AIS) are present on its property and if so, as per the listed category, control them so as to prevent them invading outside that property. AIS are one of the initiatives set out on the Eskom's Biodiversity Implementation Plan (Eskom Biodiversity Implementation Plan, 2017).

Alien invasive plant species on land under linear infrastructure is addressed by the National Vegetation Management Commodity Strategy. The updated AIS list as per the most recent legislation is incorporated into the vegetation maintenance schedule going forward. As a priority, Eskom Real Estate, Generation Peaking and Nuclear have in place AIS Control Plans for all conservation sites. Some Power Stations do possess site specific Vegetation Assessments which need to be aligned to the Control Plan requirements (Eskom Biodiversity Implementation Plan, 2017).

Eskom 5-year Alien Invasive Control Plan is compiled for submission to DEA as an overarching framework to implement AIS regulations in accordance with Eskom's operational risk and supporting finances, capacity and resources. The plan includes:

- Implementation of AIS Control Plan as per priority land specified;
- Training – Engaging with DEA's preferred suppliers and providing Eskom environmental practitioners with the relevant training of identification, effective control methodologies per species etc.;
- On the ground implementation – Setting up a national Memorandum of Understanding with Working for Water to initiate provincial collaborations;
- Spatial Support – ensuring Eskom practitioners have access to the most updated spatial data layers to inform their planning of AIS control on their sites; and
- Collaboration with DEA /other parastatals on large scale projects (Eskom Biodiversity Implementation Plan, 2017).

5.4.2 Vegetation Management within Eskom Land, Servitudes and Rights of Way

The Vegetation Management within Eskom Land, Servitude and Rights of Way (Unique Identifier 240-70172585) approved in November 2013 is a standard that specifically deal with vegetation management, specifying general requirements and servitude widths. It sets out the manner in which initial servitude route clearing, and any subsequent vegetation maintenance is to be performed. It sets minimum standards for vegetation clearing and maintenance. This standard excludes servitudes in commercial forestry areas where Eskom is guided by the draft Timber Growers Agreement.

Eskom's policy is to leave the vegetation in servitudes alone unless in impacts on safe clearance, prevents access to the servitude, poses a fire risk or there is a legal imperative to manage it. **For 2X 400 kV powerlines, 23.5m to 27.5m on either side of the centre line will be cleared. The proposed deviations are 45km long, and thus a maximum**

of approximately 247.5ha maybe cleared. However, clearing of vegetation will be avoided by all means and done if deemed extremely necessary.

5.4.3 Eskom Safety, Health, Environment and Quality (SHEQ) Policy – 2015 (32-727)

Eskom has a SHEQ policy (2015) that integrates safety, health, environment and quality requirements into its activities so that decisions are made to ensure the consideration of economic development, environmental quality, and social equity. This will assist in the continual improvement of performance and the achievement of stakeholder requirements. Eskom's commitment to SHEQ management is achieved through:

a) implementation of management systems;
b) Achieving compliance with applicable legislative and other requirements;
c) Addressing the needs and expectations of Eskom's electricity customers and stakeholders;
d) Setting SHEQ objectives and measuring performance to achieve continual improvement;
e) Conducting risk-based medical surveillance;
f) SHEQ training and awareness;
g) Stakeholder engagement;
h) Ensuring that Eskom's suppliers meet its SHEQ requirements;
i) Ensuring that adequate resources are available for SHEQ management;
j) The prevention of pollution, pursuing a low-carbon future and prioritising energy and water efficiency and conservation.

Eskom's principles and rules that underpin the way in which it approaches SHEQ are as follows:

a) Poor quality, occupational and environmental incidents are preventable;
b) A Zero Harm culture;
c) Management is accountable for SHEQ and the responsibility is with each employee;
d) Respect and care for people, the environment and assets;
e) Eskom will strive to ensure Zero Harm to employees, contractors, the public, and the natural environment;
f) Conformance to Eskom's Life-saving Rules applies to all employees, contractors, and visitors;

g) No operating condition, or urgency of service, justifies exposing anyone to negative risks arising out of Eskom's business, causing an incident with health, safety, environmental, and quality consequences.

CHAPTER 6

6. NEED AND DESIRABILITY

GN 982 Appendix 1:

(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

(g) a motivation for the preferred site, activity and technology alternative;

6.1 GENERAL PURPOSE AND REQUIREMENT FOR THE PROJECT

The Upington area has been identified as one of the highest solar radiation locations in the world, providing the best opportunities for using the sun to generate electricity. As such, Upington has seen an increase in Independent Power Producer projects in an effort to utilise renewable energy resources, particularly solar, to meet the growing demand in electricity. This power needs to be fed onto the national grid and Eskom therefore needs to undertake major infrastructural investments to allow this to happen. To that end, Eskom has proposed the construction of 2 x 400kV lines from Aries Substation to Upington Substation, and associated feeder bays.

The project will address the following Eskom strategic objectives:

- Reduce the impact on the environment through identifying, implementing and/or supporting internal and external options for low carbon emitting generation and transportation and opportunities .
- This project will be an enabler to the country's drive to achieve energy diversification into the future.

This is a strategic project to enable connection to IPP's in the future. Environmental Authorisation (EA) needs to be obtained and servitudes acquired to reduce time to integrate IPP's after receiving preferred bidder status.

6.2 STRATEGIC AND STATUTORY CONTEXT FOR THE CONSIDERATION OF NEED AND DESIRABILITY

DEA (2017), Guideline on Need and Desirability, Guideline on Need and Desirability, says that when evaluating project specific applications, the strategic context of such applications and the broader societal needs and the public interest should be considered. The contents of Municipal Integrated Development Plans (IDP), Strategic Development Frameworks (SDF), Environmental Management Frameworks (EMF) and other relevant

plans frameworks and strategies must be taken into account. Whether a proposed activity will be in line with or deviate from the plan, framework or strategy per se is not the issue, but rather the ecological, social and economic impacts that will result because of the alignment or deviation". Where an application deviates from a plan, framework or strategy the EIA must show why the deviation might be justifiable.

The DEA 2017 Guideline on Need and Desirability says that the need for and desirability of a proposed activity should specifically and explicitly be addressed throughout the EIA process when dealing with individual impacts and specifically in the overall impact summary by taking into account the answers to inter alia the questions in **Table 6-1**.

Table 6-1: Questions from DEA 2017 Need and Desirability Guideline Document

	QUESTION IN GUIDELINE DOCUMENT	RESPONSE
1.	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	See Sections 11.4.1 to 11.4.3 (refer to summaries of the Ecological study and Avifauna Specialist Studies.
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations: 2.1.1 The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	This is a strategic project to enable connection to IPP's in the future.
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? 2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED)	See 11.4.6 and 11.4.8.

	QUESTION IN GUIDELINE DOCUMENT	RESPONSE
	initiatives), or skills development programs?	
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	See section 12.6.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	Yes.
2.5	In terms of location, describe how the placement of the proposed development will: 2.5.1. Result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	No new residential areas will be created as a result of the proposed new powerlines. Limited job opportunities will be created during the construction phase and very limited during the operational phase.
2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	In the impact assessment phase of the project the impacts presented in the scoping reports will be triangulated through a participation process to ensure that the assumptions were correct, and to close any gaps in the data. The project area includes vulnerable communities, and the socio-economic studies used appropriate methods to ensure that these communities were included in the impact assessment process. This process

	QUESTION IN GUIDELINE DOCUMENT	RESPONSE
		commenced in the announcement phase where the PP team ensured that communities were not excluded from the study and consulted in a language that they are comfortable with. Given the nature of the project, no critical social resources should be affected, and once commissioned, there is a relatively low risk for social disruption. Communities will be consulted about the social mitigation measures during the impact assessment phase to ensure that the measures suggested are acceptable to the communities affected by the project.
2.7	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	The beneficiaries of the project are the general population of the region, as described in Chapter 10.
2.8	What measures were taken to pursue equitable access to environmental	This project aims to provide services in the form of reliable

	QUESTION IN GUIDELINE DOCUMENT	RESPONSE
	resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	electricity supply to the population of the region.
2.9	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Environmental health and safety standards are built into all of Eskom's specifications and standards. An example of this is the requirement for servitudes with restrictions within which powerlines are constructed.

6.2.1 National Development Plan

On 11 November 2011 the National Planning Commission (NPC) released the National Development Plan (NDP): Vision for 2030 (NPC, 2012) for South Africa and it was adopted as government policy in August 2012. The NDP was undertaken to vision what South Africa should look like in 2030 and what action steps should be taken to achieve this (RSA, 2013). The aim of the NDP is to eliminate poverty and reduce inequality by 2030.

6.2.2 Sustainable Development Goals

All 189 Members States of the United Nations (UN), including South Africa, adopted the UN Millennium Declaration in September 2000 (UN, 2000). The commitments made by the Millennium Declaration are known as the Millennium Development Goals (MDGs), and 2015 was targeted as the year to achieve these goals. The UN Open Working Group of the General Assembly identified seventeen sustainable development goals, built on the foundation of the MDGs as the next global development target (UN, 2014).

The sustainable development goals include aspects such as ending poverty, addressing food security, promoting health, wellbeing and education, gender equality, water and sanitation, economic growth and employment creation, sustainable infrastructure, reducing inequality, creating sustainable cities and human settlements, and addressing challenges in the physical environment such as climate change and environmental

resources (UN, 2014). These aspects are included in the NPD, and it can therefore be assumed that South Africa's development path is aligned with the international development agenda.

"*The consideration of "need and desirability" during an application process, … must consist of a preliminary description of the relevant consideration … in relation to the feasible and reasonable alternatives*" (DEA 2010 pg. 13).

6.2.3 Strategic Environmental Assessment for Electricity Grid Infrastructure

In order to facilitate the efficient roll out of SIPs lead by the PICC and detailed in the National Infrastructure Plan, the DEA, mandated by Ministers and Members of the Executive Council, commissioned the Council for Scientific and Industrial Research (CSIR) in January 2014 to undertake a Strategic Environmental Assessment (SEA) linked to SIP 10: Electricity Transmission and Distribution for all. The CSIR has partnered with Eskom and the SANBI to deliver on project outputs[1]. The proposed development has three (3) deviations, two (2) of the three (3) deviations fall in this SEA, and more than 50% of the transmission line as a whole fall within the SEA. The identified suitable routing corridors that will enable the efficient and effective expansion of key strategic transmission infrastructure designed to satisfy national transmission requirements up to the 2040 planning horizon, in this SEA (**Figure 6-1**).

[1] (https://egi.csir.co.za/ accessed on 15 November 2021)

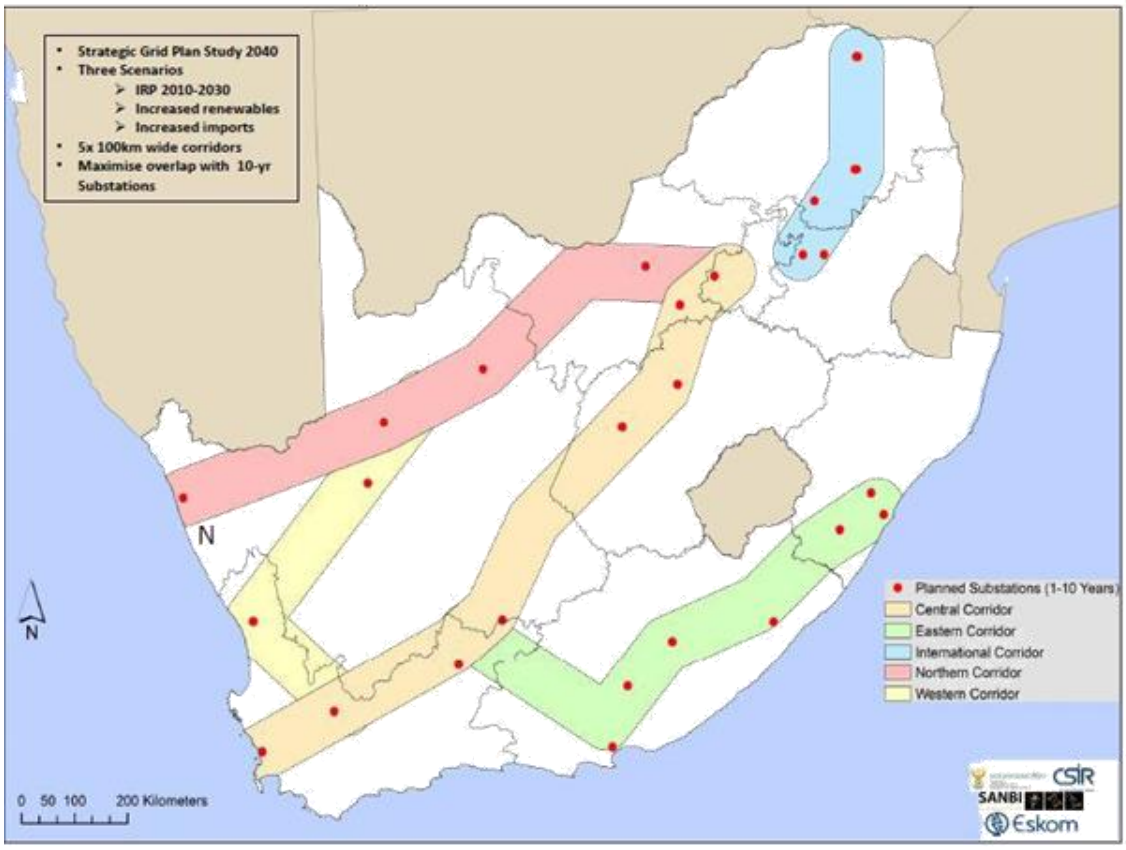


Figure 6-1: SEA suitable electricity routing corridors (https://egi.csir.co.za/)

6.2.4 Provincial Growth and Development Strategies

Provinces play an important role in contextualising acts and other tools of governance and grounding them within the realities of each province. The provincial governments must guide the local government in the implementation and development of IDPs and other programmes for sustainable development. Provincial Growth and Development Strategies (PGDS) are a critical tool to guide and coordinate the allocation of national, provincial and local resources and private sector investment to achieve sustainable development outcomes. They are not a provincial government plan, but a development framework for the province as a whole (Department Provincial and Local Government [DPLG], 2005).

PGDS are not a legislative requirement but play an important role in ensuring effectiveness and coordinating delivery of the overall objectives of South Africa as a developmental state. PGDS are based on a long-term view of the provinces' development route. Their primary purpose is to provide a collaborative framework to drive implementation within a province (DPLG, 2005).

6.2.5 Integrated Development Plans

The South African government operates on three spheres, namely local (municipal), provincial and national. IDPs are compulsory through the Municipal Systems Act 32 of 2000 on municipal level. Integrated Development Planning is a process by which municipalities prepare 5-year strategic development plans. The IDP is the written plan that results from the integrated development planning process. It is the principle strategic planning instrument that guides and informs all planning, management, investment, development and implementation decisions and actions in the local area and supersedes all other plans that guide local development (Coetzee, 2002).

The White Paper on Local Government (RSA, 1998) has contextualised the IDP as a tool for developmental local government with the intention of enabling municipalities to:

- Help align scarce resources behind agreed policy objectives and programmes;
- Make sure that actions are prioritised around urgent needs;
- Ensure the necessary integration with other spheres of government, serving as a tool for communication and interaction with them, and
- Serve as a basis for engagement between local government and communities/residents.

CHAPTER 7

7. ALTERNATIVES ASSESSED

GN 982 Appendix 1:

(h) a full description of the process followed to reach the proposed preferred alternative within the site, including—

(i) details of all the alternatives considered;

In terms of the EIA Regulations 2014 (as amended) feasible alternatives are required to be considered as part of the environmental investigations. In addition, the obligation that alternatives are investigated is also a requirement of Section 24(4) of the NEMA (Act No. 107 of 1998) (as amended). An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity which may include alternatives to:

- the property on which or location where it is proposed to undertake the activity;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity;
- the operational aspects of the activity; and
- the option of not implementing the activity.

A new application to assess the deviations falling outside of that corridor has been submitted (DEA ref no. 14/12/16/3/3/1/2488). There were a few deviations on this line for various reasons.

Site Specific Considerations that informed the proposed deviations:

- **Outside Upington:** There was a deviation outside Upington S.S. due to IPP projects that bought Eskom out of our corridor.
- **Close to N14 crossing** difficult landowner that forced Eskom out of the approved corridor after negotiations failed with the landowner.
- **Close to Aries S.S**: This deviation was also to cater for landowner requirements. The request was to move the line to the edge of the property rather than running straight through the middle.

It is important to note the route is already pre-negotiated and it has been authorized, and thus no alternative deviations were considered for this application (**Table 7-1**). **Refer to**

Appendix D1 for a Signed copy of the Pre-negotiated properties along the three deviations and the rest of the route.

Table 7-1: Evidence of 400kv line negotiated properties along the authorised corridor.

Item	Parcel	Portion	Farm/Town Name	Negotiated on	Registered on	General Right	SG 21 digit codes	Affected by the deviation	Map sheet no
1	188	1	KLEIN ZWART BAST	26/02/2017	25/04/2018		C0360000000018800001		
2	188	0	KLEIN ZWART BAST	21/02/2017	11/05/2018	KD052/2018S	C0360000000018800000		
3	163	3	DE TUIN	26/11/2016	21/09/2017	KD053/2017S	C0360000000016300003		
4	163	1	DE TUIN ZUID	23/08/2018	27/08/2019	KD057/2019S	C0360000000016300001	Deviation 1	Sheet 2 & 3
5	163	2	DE TUIN ZUID	23/08/2018	27/08/2019	KD058/2019S	C0360000000016300002	Deviation 1	Sheet 2 & 3
6	162	7	GROOT RIET	23/08/2018	08/04/2019	KD023/2019S	C0360000000016200007	Deviation 1	Sheet 2 & 3
7	162	5	GROOT RIET	15/02/2017	19/04/2018	KD040/2018S	C0360000000016200005		
8	162	4	GROOT RIET	03.03.2017	09/04/2018	KD030/2018S	C0360000000016200004		
9	130	1	DE BANKEN	09/03/2017	23/04/2018	KD041/2018S	C0360000000013000001		
10	130	0	DE BANKEN	27/06/2017	In the process of being registered		C0360000000013000000		
11	130	10	DE BANKEN	02/06/2017	08/12/2017	KD081/2017S	C0360000000013000010		
12	130	9	DE BANKEN	30/06/2017	21/12/2017	KD087/2017S	C0360000000013000009		
13	130	4	DE BANKEN	13/07/2017	20/12/2017	KD088/2017S	C0360000000013000004		
14	129	2	PYP KLIP WEST	07/02/2017	In the process of being registered		C0360000000012900002		
15	129	1	PYP KLIP WEST	06/12/2016	22/11/2019		C0360000000012900001		
16	103	2	WITVLEI	08/02/2017	05/12/2019	KD095/2019S	C0360000000010300002		
17	103	0	WITVLEI	08/02/2017	05/12/2019	KD094/2019S	C0360000000010300000		
18	102	0	KLEIN GOEGAB	15/02/2017	14/08/2019	KD053/2019S	C0360000000010200000		
19	102	4	KOEGAB	15/02/2017	14/08/2019	KD052/2019S	C0360000000005900004		
20	59	0	KOEGAB	10/02/2017	05/12/2019	KD096/2019S	C0360000000005900000		
21	60	0	MIDDEL POST	10/12/2016	28/03/2018	KD024/2018S	C0360000000006000000		
22	61	0	OMKYK	17/04/2019	In the process of being registered		C0360000000006100000		
23	61	1	OMKYK	07/02/2017	21/08/2018	KD126/2018S	C0360000000006100000		
24	1184	0	KAKEMAS SUID SETTLEMENT	13/02/2017	04/07/2018	KD104/2018S	C0360007000011840000		
25	1738	0	ERF 1738	04/06/2018	28/03/2019	KD016/2019S	C0360007000017380000		
26	1486	0	ERF 1486	11/09/2018	In the process of being registered		C0360007000014860000		
27	1219	0	ERF 1219	19/09/2018	In the process of being registered		C0360007000012190000	Deviation 2	Sheet 11 & 12
28	677	0	ZWART BOOIS BERG SUID	02/08/2017	In the process of being registered		C0280000000006770000	Deviation 2	Sheet 11 & 12
29	474	10	BAVIAANZ KRANTZ	15/08/2017	In the process of being registered		C0280000000004740010	Deviation 2	Sheet 11 & 12
30	475	7	ZWART BOOIS BERG ANNEX	02/08/2017	In the process of being registered		C0280000000004750007		
31	584	0	PLAAS 584	06/02/2017	19/07/2018	KD093/2018S	C0280000000005840000		
32	595	0	PLAAS 595	14/02/2017	08/10/2018	KD139/2018S	C0280000000005950000		
33	602	0	DIE PLAAS	08/12/2016	15/01/2019	KD001/2019S	C0280000000006020000		
34	466	27	FRIERS DALE	13/02/2017	29/06/2018	KD081/2018S	C0280000000004660027		
35	464	9	LOXTON VALE	13/02/2017	11/04/2018	KD055/2018S	C0280000000004640009		
36	465	39	EENDUIN	28/11/2016	In the process of being registered		C0280000000004650039		
37	465	40	EENDUIN	09/12/2016	In the process of being registered		C0280000000004650040		
38	461	51	TKABIES	28/11/2016	In the process of being registered		C0280000000004610051		
39	616	0	PLAAS 616	09/12/2016	30/05/2019	KD060/2019S	C0280000000006160000		
40	1152	0	ERF 1152	02/08/2017	05/11/2019	KD144/2019S	C0280006000011520000	Deviation 3	Sheet 17 to 20
41	468	6	ZOOVOORBY	23/12/2016	In the process of being registered		C0280000000004680002	Deviation 3	Sheet 17 to 20
42	457	1	CURRIES CAMP	23/12/2016	In the process of being registered		C0280000000004570001	Deviation 3	Sheet 17 to 20
43	456	0	GEEL KOP	06/02/2017	In the process of being registered		C0280000000004560000	Deviation 3	Sheet 17 to 20
44	455	5	BLOEMSMOND	22/06/2017	In the process of being registered		C0280000000004550005	Deviation 3	Sheet 17 to 20
45	455	14	BLOEMSMOND	22/06/2017	In the process of being registered		C0280000000004550014	Deviation 3	Sheet 17 to 20
46	454	0	DYASON'S KLIP 454	13/07/2017	In the process of being registered		C0280000000004540000	Deviation 3	Sheet 17 to 20
47	617	0	ROOIPUNT	02/08/2017	In the process of being registered		C0280000000006170000	Deviation 3	Sheet 17 to 20
48	638	0	TUNGSTEN LODGE	29/04/2022	In the process of being registered		C0280000000006380000	Deviation 3	Sheet 17 to 20

Confirmed by Eskom Land Development

Name: L. Padi

Signature:

Date: 2022/05/13

Department: Transmission Land and Rights

7.1 NO PROJECT ALTERNATIVE

The No-go alternative in the context of this project implies that the deviations to the powerline are not constructed. If the project does not proceed, the potential negative

impacts related to the risk of collisions of birds, clearing of vegetation, soil erosion and wetland degradation would be avoided. The surrounding area will, however, be negatively affected due to the lack of a constant and reliable electricity supply. The impacts to the surrounding environment can be proactively mitigated to acceptable levels.

7.2 PREFERRED DEVIATIONS

Eskom is proposing three (3) Preferred deviations from the authorised corridor between the Aries and Upington substations. These deviations were discussed and agreed to with the Independent Power Producers (IPP) and landowners affected. Since then, servitudes have been acquired for the entire line route.

7.2.1 Deviation 1

Deviation 1 is approximately 15.668 km in length and is made up of the proposed deviation to the existing 400kv Powerline within Groot Riet and De Tuin Zuid Farm Portions. The deviation will turn off from the existing route and move for approximately 6.480km in a Northeast direction before going back to an authorized line and move the remaining 9.188 km to join in with the authorized powerline (**Figure 7-1**). **Refer to the Appendix A, 1A-1B Deviation 1 Layouts**, the layouts show the Tower/structure numbers, the existing fences, watercourses, boundary fences and existing tracks).

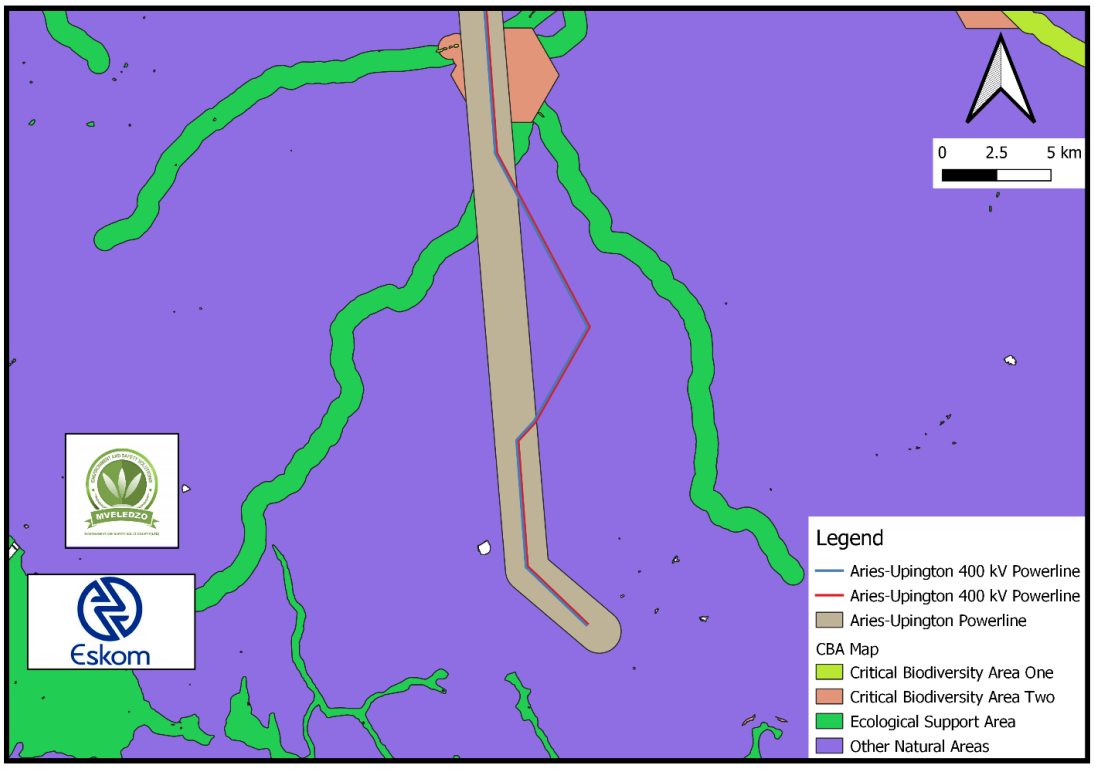


Figure 7-1: Deviation 1 at Groot Riet and De Tuin Zuid Farm Portions.

7.2.2 Deviation 2

Deviation 2 is approximately 5.997 km in length and is made up of the proposed deviation to the existing 400Kv & 132 Kv within Baviaans Krantz Farm Portions. The deviation will move away from the existing route and move Southeast direction before joining the authorized line again (**Figure 7-2**). **Refer to the Appendix A, 2A-2B Deviation 2 Layouts**, the layouts show the Tower/structure numbers, the existing fences, watercourses, boundary fences and existing tracks).

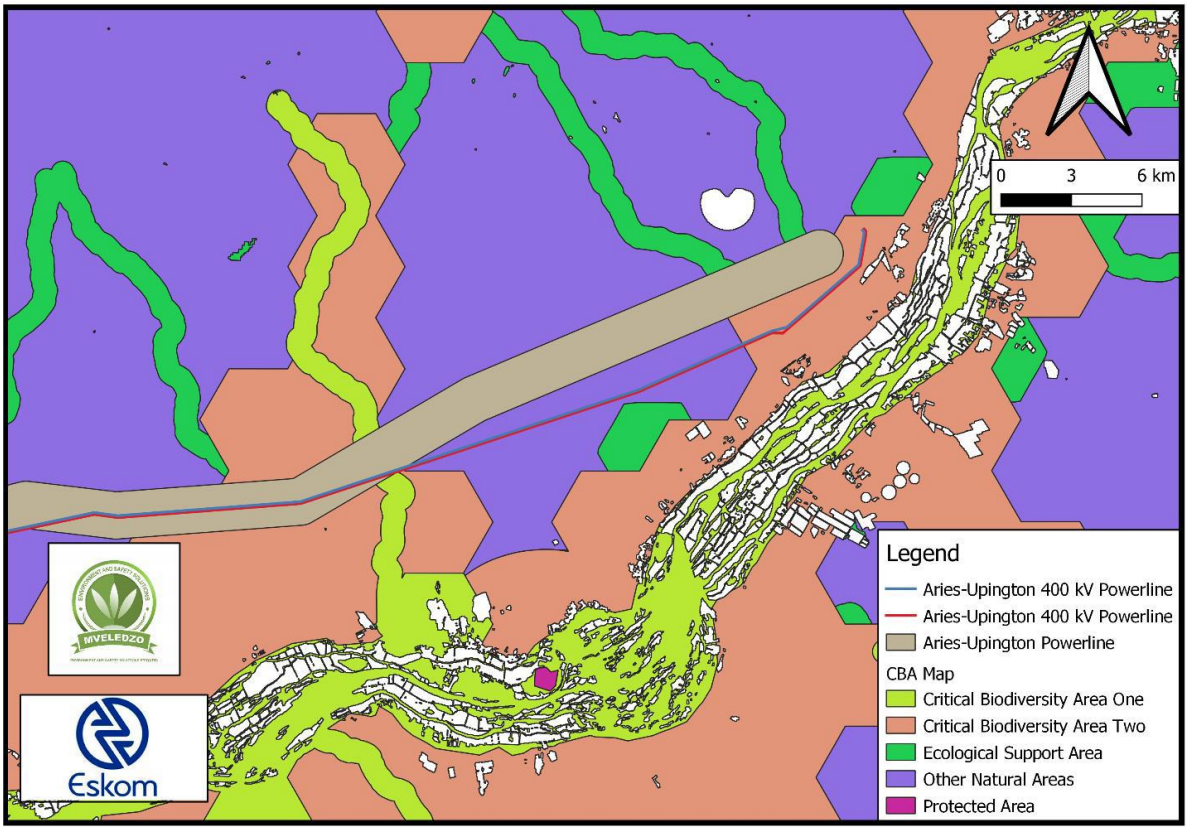


Figure 7-2: Deviation 2 at Baviaans Krantz Farm Portions.

7.2.3 Deviations 3

Deviation 3 is approximately 23.45 km in length and is made up of the proposed deviation to the existing 400kv & 132 KV from Zoovorby to Klip Punt Farm Portions. The deviation will move from the authorized route and travel South direction before turning back to authorized route (**Figure 7-3**). **Refer to the Appendix A, 3A-3D Deviation 3 Layouts**, the layouts show the Tower/structure numbers, the existing fences, watercourses, boundary fences and existing tracks).

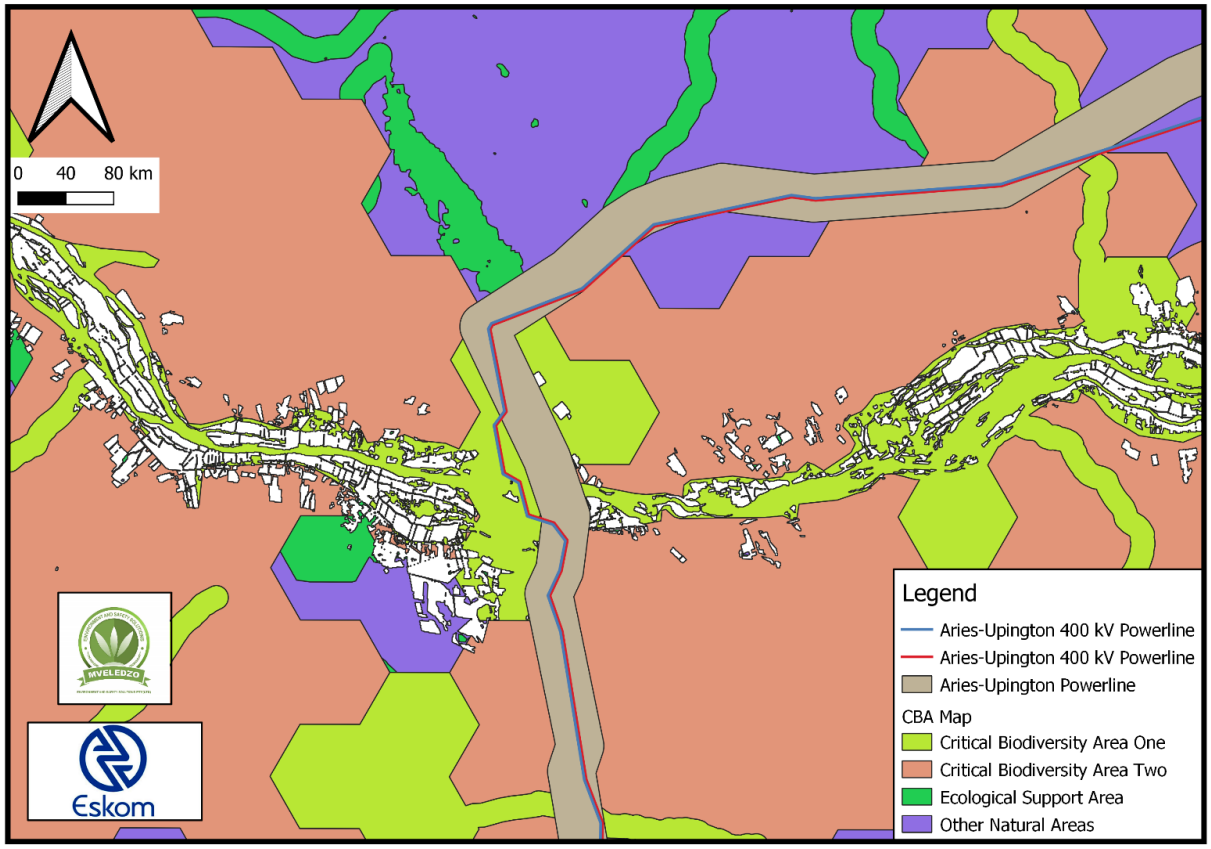


Figure 7-3: Deviation 3 from Zoovorby to Klip Punt Farm Portions.

7.3 TECHNOLOGY ALTERNATIVE

Alternative technologies have not been considered as the technology to be used is already considered as the most appropriate technology and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by standard Eskom specifications and international best practice. The pylons under consideration for this project are the most appropriate based on the terrain and design integrity as well as for the purpose for which the powerline is to be constructed.

7.4 CONSTRUCTION CONSIDERATIONS

The whole servitude along the power line route will be cleared of all trees and shrubs down the centre of a transmission power line for stringing purposes. Any tree or shrub in other areas that will interfere with the operation and/or reliability of the transmission power line must be trimmed or completely cleared. The clearing of vegetation will take place in accordance with Eskom's minimum standards for the construction of new Transmission power lines, as listed below **Table 7-2**.

Table 7-2: Minimum standards for vegetation clearing for new transmission power line

ITEM	STANDARD	FOLLOW UP
Centre line of the proposed Transmission power line	Clear to a maximum (depending on tower type and voltage) of all vegetation along the centre line. Vegetation to be cut flush with the ground. Treat stumps with herbicide.	Re-growth shall be cut within 100 mm of the ground and treated with herbicide, as necessary.
Inaccessible valleys (trace line)	Clear a 1 m strip for access by foot only, for the pulling of a pilot wire by hand.	Vegetation not to be disturbed after initial clearing – vegetation to be allowed to regrow.
Access/service roads	Clear a maximum (depending on tower type) 6 m wide strip for vehicle access within the maximum 8m width, including destumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil.	Re-growth to be cut at ground level and treated with herbicide as necessary.
Proposed tower position and proposed support/stay wire position.	Clear all vegetation within proposed tower position in an area of 20 x 20m (self-supporting, guyed suspension towers or cross rope towers) and 40 x 40m around the position, including de-stumping/cutting stumps to ground level, treating with	Re-growth to be cut at ground level and treated with herbicide as necessary.

ITEM	STANDARD	FOLLOW UP
	an herbicide and re-compaction of soil. Allow controlled agricultural practices, where feasible.	
Indigenous vegetation within servitude area (outside of maximum 8 m strip).	Area outside of the maximum 8m strip and within the servitude area, selective trimming or cutting down of those identified plants posing a threat to the integrity of the proposed power line.	Selective trimming
Alien species within servitude area (outside of maximum 8m strip).	Area outside of the maximum 8m strip and within the servitude area, remove all vegetation within servitude area and treat with appropriate herbicide.	Cut and treat with appropriate herbicide.

7.5 MULTI-CIRCUIT TOWERS

The visual and land use impacts can also be reduced by using double or multi-circuit towers. These have been assessed in the specialist studies and the findings are presented in the sections that follow.

7.6 POWERLINE SERVITUDE

A 55m servitude (27.5 m on either side of the center line) is required to accommodate the towers on which the overhead line will be strung (**Table 7-3**). The servitude is required to ensure safe construction, maintenance and operation of the line and Eskom will be entitled to unrestricted access. Minimum vertical clearance distance between the ground and power line conductors is 8.1m. The minimum safe distance required to the edge of a domestic house is 40m from the center of the power line (i.e. 27.m plus 12.5 m). The maximum crop height within the servitude is 4.3m. The maximum operation height under the conductors is 2 m (Eskom, 2015).

Table 7-3: Minimum clearances and general servitude widths

Maximum voltage	Minimum safety clearance (OHSA, No. 85 of 1993)	Servitude building restriction widths (measured from the center line of the powerline) *
11kV	0.20m	9m to 11m
22 kV	0.32m	11m
88 kV	1.00m	11m
132 kV	1.45m	15.5m
275 kV	2.35m	22m to 23.5m
400 kV	3.20m	23.5m to 27.5m
765 kV	5.50m	40m
533 kV (d.c)	3.70m	15m
Cross rope suspension		27.5m

7.7 TOWER FOOTING AND EARTHING IMPROVEMENT

The minimum tower footing resistances as per TST41-321 Eskom Internal Tower Guideline Document) should be obtained. One aspect to note is that the tower footing resistance limits stated in the preceding standard is based on conservative assumptions about the prevailing ground flash densities. In order to attain more realistic limits, it is necessary to recalculate the required footing resistance for the actual prevailing flash densities and as a function of the desired back flashover rate and tower configuration.

The installation of earthing counterpoises and electrodes should be preceded by pre-engineering studies to obtain the optimal earthing configuration. As a minimum the following activities should be undertaken (Anamuthoo & Candy, 2017):

a) Measurement of the tower footing resistance using a null balance insulation tester or other approved high frequency meters as per ELEC/178/008, Transmission Tower Footing Resistance Measurements Eskom Internal Tower Guideline Document), with a high frequency meter.
b) Where measures indicate resistance values higher than the maximum required, or indicates room for further improvement, a soil resistivity test will be undertaken at the relevant tower, utilising the Wenner soil survey method, as per ELEC/178/009, Wenner Soil Resistivity Survey Measurements Eskom Internal Tower Guideline Document)
c) This data should be modelled into an earthing simulation software, such as CDEGS, to obtain the optimum electrode configuration for the prevailing soil conditions

d) The earthing straps or conductor used, as counterpoises shall comply with Eskom Transmission standards.

7.8 SURVEYING OF TOWER POSITIONS

The tower positions are pegged using a single steel pin knocked into the ground. The position is reached by utilising GPS co-ordinates taken from the tower staking table (**Refer to Appendix D2**). Cross sections of the site will be taken to facilitate the calculation of the tower leg extensions. Whilst driving in the field, special care is taken not drive through visible wet areas and drive through streams.

Existing tracks are preferred and will be utilised as far as possible by the contractors. In the event that access is not available or impossible, the pegging process will be undertaken on foot. The surveyor will note all available access routes and problem areas. Access routes will be investigated and agreed upon in writing by the Environmental Control Officer, where after they will be marked (Anamuthoo & Candy, 2017).

7.9 FOUNDATION EXCAVATIONS

A site plan or a tower foundation excavation layout plan sdrawn up as a basis for discussion between the Contractor and the Employer (Site Representative and Environmental Control Officer) resulting in a formal signed document of how the foundation will be excavated at a given site (**Refer to Appendix C2 Foundation Layouts**). There are three basic parts of this layout plan:

a) Tower site information
b) Foundation construction survey
c) Foundation site information.

The equipment and methods that are used for the excavation of the foundation depends on the type of soil that is encountered at the excavation site. The following types of soil can be encountered on site:

a) Type1: Competent soil with equal or better consistency than would be encountered in stiff cohesive soils.
b) Type 2: A less competent soil than type"1" with weaker or equal consistency in firm to stiff cohesive soils.
c) Type 3: Dry loose non cohesive soil or very soft to soft cohesive soils.
d) Type 4: Submerged cohesion less and cohesive soils. This includes soils below the permanent water table, including soils below a re-occurring perched water.

The different types of foundations are outlined on **Appendix C2**.Often the high-water table will require dewatering of the excavation. Depending on the specific site conditions, open pumping, cut-off drains (trenches), or drainage pits may be necessary to remove the water. Should the water continue to run into or seep from the walls or the bottom of the excavation a sump hole may be dug at one of the corners of the foundation bottom and a small pump used in these pumping holes to keep the foundation dry during the foundation installation (Anamuthoo & Candy, 2017).

Whenever personnel are in the excavations, the safety hazards shall be assessed. There must be a good means of ingress and egress from the excavation. Excavated material shall be stock piled away from the edges of the excavation and round rocks and boulders must be placed in a location and manner that will prevent them from rolling back into the excavation. The stability of the side walls shall be inspected to establish the soundness thereof in mitigating the protection of collapsing sides (Anamuthoo & Candy, 2017).

7.10 INFRASTRUCTURE REQUIREMENTS DURING CONSTRUCTION

7.10.1 Potable Water and Sanitation

During the construction stage, the appointed contractor will require water for potable use by construction workers and water will also be used in the construction of the foundations for the towers. The necessary negotiations will be undertaken with Eskom, the appointed contractor and local authorities that are traversed by the transmission line to obtain water from approved sources. These negations will only take place once the contractor has been appointed by Eskom (This will happen prior to construction activities taking place). Sanitation services will be required for construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier. The securing of the required sanitation services will only be determined once the contractor has been appointed by Eskom (This will happen prior to construction activities taking place) (Anamuthoo & Candy, 2017).

7.10.2 Access Roads

Existing access roads will be utilised as far as possible. For the use of private roads, the requisite negotiations will be conducted with the affected landowners.

7.10.3 Waste

Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g., at construction camp) and will be removed at regular intervals and disposed of at approved waste disposal sites within the local municipality that are affected by the project. All the waste disposed of will be recorded. Wastewater, which refers to any water adversely affected in quality through construction-related activities and human influence, will include the following:

a) Sewage
b) Water used for washing purposes (e.g., equipment, staff)
c) Drainage over contaminated areas (e.g., cement batching / mixing areas, workshop, equipment storage areas).

Suitable measures will be implemented to manage all wastewater generated during the construction period. These measures will be detailed by the appointed contractor.

CHAPTER 8

8. PUBLIC PARTICIPATION

GN 982 Appendix 1:

(ii) details of the PPP undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

Due to the cumulative and interrelated nature of the four components of the Northern Cape 2X 400kv powerline project a combined Public Participation Process (PPP) is being undertaken. The PPP therefore covers the greater study area that include the powerline corridors.

8.1 LEGAL REQUIREMENTS

Public participation is a legal requirement for an application for environmental authorisation and is defined in NEMA (as amended) as the "process by which potential I&APs are given opportunity to comment on or raise issues relevant to the application".

Section 24(4)(a)(v) of NEMA requires that such public information and participation procedures "provide all I&APs, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures".

The PPPs required are prescribed in Chapter 6 of GN No. R982 of December 2014 (the "2014 EIA Regulations") and are also guided by relevant principles contained in Chapter 2 of NEMA. The PPP for the EBA of the proposed Eskom's 2X Electrical line of 400 KV from Aries substation near Kenhardt to Upington substation near Upington and the line length is 145 km, is designed to satisfy the requirements laid down in the above legislation. The IAIA Fast Tips have been taken into account as a guideline.

The following are minimum legal requirements required by GN R982:

- Regulation 39 (1) Obtaining written consent of the landowner or person in control of the land to undertake the activity on that land, except for linear activities (the powerline is a linear activity);
- Give notice to all I&APs by:
    - Fixing a notice board to the boundary of the proposed and all alternative sites and/or along the corridors.

- Giving written notice in accordance with Section 47D of NEMA (as below) to the owners, occupiers or persons in control of the proposed site and alternatives, adjacent land, municipal ward councillors, any organisation of ratepayers, the municipality, any organ of state having jurisdiction in respect of any aspect of the activity, and any other party as required by the competent authority.
- Placing an advertisement in one local newspaper or Gazette.
- Placing an advertisement in at least one provincial or national newspaper.
- Maintain a register of I&APs, and
- Comments and responses must be recorded in reports and plans submitted to the authorities.

1) Section 47D of NEMA says that "A notice or other document in terms of NEMA or a specific environmental management Act may be issued to a person—

(a) by delivering it by hand;

(b) by sending it by registered mail—

(i) to that person's business or residential address; or

(ii) in the case of a juristic person, to its registered address or principal place of business

(bA) by faxing a copy of the notice or other document to the person, if the person has a fax number;

(bB) by e-mailing a copy of the notice or other document to the person, if the person has an e-mail address; or

(bC) by posting a copy of the notice or other document to the person by ordinary mail, if the person has a postal address;

(c) where an address is unknown despite reasonable enquiry, by publishing it once in the Gazette and once in a local newspaper circulating the area of that person's last known residential or business address. [Subsection 1 amended by section 23(a) of Act No. 30 of 2013]

The registered I&APs were given a period of at least 30 days to submit comment on each of the documents that form part of the EBA as they are completed, i.e. the Basic Assessment Report and EMPr, and all information that reasonably has or may have the potential to influence the decision with regard to the application. The 30-day public review period started from the 18 February 2022 to the 21 March 2022.

8.2 SERVITUDE NEGOTIATION AND THE EIA PROCESS

8.2.1 Servitude Negotiation and the EBA Process

Transmission powerlines are constructed and operated within a servitude (23.3m to 27.5m wide for 400 kV lines) that is established along its entire length. The servitude allows Eskom certain rights and controls that support the safe and effective operation of the line The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or just the negotiation process. The negotiation process is undertaken directly by Eskom. Important points relating to the EBA process are as follows:

- Servitude negotiation is a private matter between Eskom and the landowner concerned.
- The negotiation process involves a number of stages and culminates in the 'signing' of a servitude. Here Eskom enters into a legal agreement with the landowner.
- The agreements will detail such aspects as the exact location and extent of the servitude, and access arrangements and maintenance responsibilities.
- Compensation measures are agreed in each case.
- It may take place at any time in the planning of a new powerline.
- It must be completed (i.e. the agreement must be signed) before construction starts on that property.
- It is independent of the EBA process.

The EBA process has become important in the initial planning and route selection of a new Transmission powerline. As indicated above the negotiation process began and the properties and the majority of the properties have been registered. A greater confidence in the route to be adopted has been confirmed.

Since the main route is already is already authorised, the negotiation process started earlier. The properties that are affected by the proposed deviation have either been regstred or are in the process of being registered.

8.2.2 The Negotiation Process

The negotiation process can be extensive, often running into years on the longer lines. It is therefore critical that it is correctly programmed into the planning of a new powerline. The negotiation process involves:

- Initial meeting with the landowner.

- The signing of an 'option' to secure a servitude (this indicates that the owner will accept that the line will cross his property, subject to conditions to be finalised in the negotiation of the servitude agreement). An option is valid for one year.
- Once the route is confirmed (i.e. options signed with the upstream and downstream landowners) the servitude agreement will be finalised with the individual landowners. This agreement will set out the conditions for the establishment and operation of the servitude and will be site specific (different landowners may have different requirements). Compensation payments are made when the servitude is registered at the Deeds office.
- Once the construction is complete and the land rehabilitated to the landowner's satisfaction, the landowner signs a 'Final Release' certificate. Until such time Eskom Distribution remains liable for the condition of the land.
- Once the clearance certificate is signed, the responsibility for the powerline and servitude is handed over to the regional Eskom office. Prior to this the Eskom national office is responsible for the process.

8.3 PUBLIC PARTICIPATION TASK LEADER

The PPP Task Leader, **Edzisani Siphugu**, has 15 years of experience in communications management, stakeholder engagement and PPPs, in support of environmental management and development processes. He has extensive experience in running complex yet successful communication programmes. He has the ability to communicate and interact with all levels of stakeholders (local, provincial and national), in both rural and urban settings, and has contributed to effective approaches for monitoring and maintaining stakeholder relationships. He is well-versed in the requirements of public participation as applied in environmental assessments in South Africa.

8.4 THE EIA PROCESS AND LINKS TO THE PUBLIC PARTICIPATION PROCESS

An EBA is a planning and decision-making tool, it identifies the potential negative and positive consequences of a proposed project or development at an early stage and recommends ways to enhance positive impacts and to avoid, reduce or minimize negative impacts. The EBA findings will also inform further technical and financial investigations and decisions. The EBA is undertaken in terms of section 24C of NEMA.

Public participation is an important aspect of any EBA, with the objective to assist stakeholders to voice out issues of concern, suggestions for enhanced benefits and to

comment on the findings of the EBA. The PPP is designed to provide sufficient and accessible information to I&APs in an objective manner.

Public Participation can be divided into the following phase:

1. **Announcement Phase**-– I&APs are identified and notified of the proposed project. They are given an opportunity to raise any concerns that they have and suggest any alternatives not considered.
2. **Impact Assessment Phase**- The findings and recommendations of the specialist studies and impact assessment will be presented to the I&APs in this phase, primarily by an opportunity to comment on the Draft Basic Assessment Report (DBAR). The DBAR for this Distribution Powerlines is also available for review during this period.
3. **Decision making phase** – I&APs will be notified of DFFE's decision regarding the project and of their opportunity to appeal.

8.5 PUBLIC PARTICIPATION ACTIVITIES IN THE ANNOUNCEMENT AND SCOPING PHASES

8.5.1 Stakeholder Identification

Taking into account the legal requirements set out in the regulations 39 – 44, the following steps were undertaken to identify, notify and register I&APs:

Through newspaper advertisements, networking, referral to existing databases of projects undertaken in the study area, stakeholder and/or public meetings. An effort was made to ensure that individuals and/or organisations were identified from an institutional and geographic point of view. A single comment was received from HP Van Heerden on behalf of SCATEC (Pty) Ltd on the **15 October 2021**, they requested KMZ Files of both corridors. Mr HP Van Heerden was provided with KMZ as requested on the **18 October 2021**. Refer to the Public Participation Report on **Appendix E**.

I&APs identified and notified included the following:

- National and Provincial government departments:
    - DWS,
    - DFFE,
    - Department of Agriculture, Land Reform and Rural Development Northern Cape.
    - Department of Mineral Resources

- South African Civil Aviation Authority

- Organs of state which have jurisdiction in respect of the activity to which the application relates:
  - Eskom Holdings SOC Limited
  - District Municipalities and Local:
    - !Kheis Local Municipality
    - ZF Mgcawu District Municipality
  - Landowners/Land Occupiers:
    - Private Landowners

8.5.2 I&AP Database

An Excel database has been used which allows for stakeholders to be registered, categorised into sectors and for a full record of their participation in the project, including comments submitted, to be recorded (Appendix E).

8.5.3 Newspaper Adverts

Advertisements announcing the project were drafted in English and placed in the newspapers listed in **Table 8-1**. Copies are included in Appendix C.

Table 8-1: Newspapers where advertisements have been published

NEWSPAPER	LANGUAGES	GEOGRAPHIC AREA COVERED	DATA OF PUBLICATION
Gemsbok	English	Arid-Upington Area	29 October 2021

A second round of newspaper advertisements will be placed in the same newspapers to announce the outcome of this EBA.

8.5.4 Onsite Notices

On-site notices were erected for the entire larger study area. Notices have complied with GN 982 Regulation 41 (2), (3) and (4) (**Figure 8-1**).

8.5.5 Background Information Document (BID)

A 5-page BID was compiled in English and circulated to the I&AP including organs of state via email. (**Appendix E**).

8.5.6 Draft Report Comment Periods

The 2014 EIA Regulations require a 30-day comment period for all draft reports prior to submission to the competent authority. The report was subjected to a 30-day public participation, which started on the 18 February 2022- 21 March 2022. The DBAR was also be emailed to I&APs who have access to email, the reports will also be sent to the I&APs upon request.

Figure 8-1: Examples of Site Notices

8.5.7 Comments and Responses Report

The issues were raised in emails during the announcement phase have been recorded in a Public Participation Report (Appendix E) that will be updated as the project progresses. A copy of the public participation report with comments received up until this point will be made available to stakeholders for review as part of the 30-day public review period in order for them to confirm that their issues have been accurately captured and understood.

CHAPTER 9

9. ISSUES RAISED

GN 982 Appendix 1:

(iii) a summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

An issue is a point of concern around which debate can be held. These have been identified during the Project Announcement Phase of the project. An impact is how the natural, social or economic environment will be affected by a specific activity. These have been assessed in this phase (Impact Assessment Phase) of the project. **Issues are expected during and after the 30-day public review phase of the project. The comments will be summarised on Table 9-1.**

Table 9-1: Comments and Responses

STAKEHOLDER/I &AP	SOURCE	ISSUE/ COMMENT	RESPONSE
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	The draft Basic Assessment Report (BAR) dated February 2022 and received by this Department on 18 February 2022, refer. This letter serves to inform you that the following information must be included to the final BAR:	Noted
(a) Listed Activities & Application Form			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. Only activities applicable to the	All the relevant listed activities are applied for, are specific, and linked to the development activity. Refer to Page 10 of 39 of the application form.

		development must be applied for and assessed.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	In your application on page 10 activity 11 is applied for. Since you are applying for a 400kV line, how is this activity applicable to the application. Please confirm the relevance of this activity. Should this activity not be triggered, you will have to remove this activity and an amended application must be submitted to this Department together with the final BAR.	Activity 11 has been removed, and an amended application will be submitted together with the final BAR. Refer to Page 10 of 39 of the application form.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	On page 12 of your application form you indicated that vegetation will be removed, however no indication is given on the amount of vegetation that will be removed.	The proposed deviations are 45km long which is less than 32% of the entire 145km. A 55 metre (27.5 metres on either side of the power line) servitude is required for the proposed 400 kV power line, tall trees will be pruned, or where absolutely unavoidable, cleared along the entire length of the servitude (the vegetation will also be maintained by Eskom in the operational phase of the project). Only an 8m strip may be cleared to allow vehicular passage during construction. Approximately 247.5ha will be cleared on the proposed deviations.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	The application form on page 28 indicates that the application falls under SIP10, however no proof from the relevant SIP coordinator is attached to Appendix 5 as instructed on page 30 of the application form. Proof from the relevant SIP coordinator must be submitted together with the amended application form and the final BAR. Failure to do provide proof, the Department will review your application as a normal BAR application.	The application form has been amended to include proof from the relevant SIP coordinator. Refer to Appendix 5 of the application form on Page 26 of 39.

Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	If the activities applied for in the application form differ from those mentioned in the final BAR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms .	An Amended application form will be submitted along with the Final Basic Assessment Report on or before the 18 May 2022.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	It is imperative that the relevant authorities are continuously involved throughout the basic assessment process as the development property possibly falls within geographically designated areas in terms of numerous GNR. 985 Activities. Written comments must be obtained from the relevant authorities and submitted to this Department. In addition, a graphical representation of the proposed development within the respective geographical areas must be provided.	The relevant authorities were continuously involved throughout the basic assessment process. The relevant authorities were informed about Eskom's intention to apply for environmental authorisation for the three deviations that fall outside of the authorised corridor during the project announcement phase. The interested and affected parties were given an opportunity to comment on the draft BAR during the public review period. Refer to the Public Participation report for the full details of the Public Participation Process on Appendix E.
(b) Layout & Sensitivity Maps			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Please provide a layout map which indicates the following:	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	The proposed power line of the 2X 400kV which runs from Aries Substation near Kenhardt to Upington Substation near Upington with associated infrastructure for each development.	Noted.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Appendix 7 in your application form indicates the two lines which are proposed. Confirmation is needed whether these lines are pre-negotiated or whether negotiations	These lines are pre-negotiated, and the negotiated have already begun, some of the affected property owners have already signed agreements with Eskom. Refer to Page 34 of the application form.

		with landowners will take place after the EA is issued. The applicant should have liaised with the competent authority (CA) to confirm which format the pre-negotiated route should take. Confirmation whether this was done must be included in the final BAR.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	All supporting onsite infrastructure for the project: - Roads (existing and proposed); - Contractor site establishment; - Survey and pegging of tower positions; - Gate installation and vegetation clearing; - Foundation excavation and installation; - Tower assembly and erection; and - Servitude clean-up and rehabilitation.	A layout map outlining the proposed development (Authorised 2x 400kv lines and proposed three deviations) has been developed. Refer to Page 33 of the Application Form, Appendix A (Appendix A1-A4) of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected;	The sensitivity map superimposes the proposed development in relation to the sensitive environmental features on site. Refer to Page Figure 10-1 on Page 96. The Sensitivity maps of the proposed deviations are outlined on Page 97-98 (Figures 10-1,10-22,10-3, and 10-4).
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Buffer areas; and all "no-go" areas.	The sensitivity map includes all the necessary buffers areas and all "no-go" areas. Refer to page 96 of the Final BAR, and Appendix A of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Google maps will not be accepted.	Noted.
(c) Alternatives			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	The department has noted that following power line alternatives/ or deviations are being assessed:	
Jay Jay Mpelane (DFFE)	Letter/Email	i. Deviation 1 is approximately 15.668km in length and is made up of the proposed	Noted.

Date: 22/03/22		deviation to the existing 400kV Power line within Groot Riet and De Tuin Zuid Farm Portions. The deviation will turn off from the existing route and move for approximately 6.480km in a Northeast direction before going back to an authorized line and move the remaining 9.188km to join in with the authorized power line.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	ii. Deviation 2 is approximately 5.997km in length and is made up of the proposed deviation to the existing 400Kv & 132Kv within Baviaans Krantz Farm Portions. The deviation will move away from the existing route and move Southeast direction before joining the authorized line again.	Noted.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	iii. Deviation 3 is approximately 23.45km in length and is made up of the proposed deviation to the existing 400kV & 132kV from Zoovorby to Klip Punt Farm Portions. The deviation will move from the authorized route and travel South direction before turning back to authorized route.	Noted.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	From the above power line alternatives: The EAP is required to provide clear assessment for all identified Alternatives (as stated above), and further provide clear motivation and reasons as to why the preferred Alternative proves to be the preferred compared to other Alternatives.	As indicated in the Final Basic Assessment Report, the 2X 400kv line is authorised however due to some challenges with some of the affected landowners three deviations were proposed. Since the route is pre-negotiated no alternatives were considered. Refer to Chapter 7 of the Final Basic Assessment Page 56.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Please note that you are required to provide a full description of the process followed to reach the proposed preferred alternative (deviation) within the site, in terms of	As indicated in the Final Basic Assessment Report, the 2X 400kv line is authorised however due to some challenges with some of the affected landowners three deviations were proposed. Since the route is

		Appendix 1(3)(1)(h) of the EIA Regulations 2014, as amended, including the following content:	pre-negotiated no alternatives were considered. Refer to Chapter 7 of the Final Basic Assessment Page 55.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(a) details of all the alternatives considered;	The details of the preferred deviations are outlined on Page 57-61 of the Final Basic Assessment Report
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(b) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	The details of the public participation process undertaken in terms of regulations in terms of regulation 41 are outlined in the Public Participation Report on Appendix E of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(c) a summary of the issues raised by interested and affected parties, and an indication of the way the issues were incorporated, or the reasons for not including them;	Refer to page 76 of the Final Basic Assessment Report for a summary of the issues raised by the interested and affected parties. A detailed description of the issues raised by the interested and affected parties are outlined in the Public Participation Report.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(d) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	The environmental attributes associated with the proposed development are outlined on Page 96 of the Final Basic Assessment. The following environmental attributes are discussed: • Regional Vegetation (Page 100) • Flora (Page 100) • Fauna (Pag 101) • Amphibians (Page 101) • Invertebrates (Page 102) • Birds (Page 102) • Land Capability (Page 104)
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(e) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of

		the impacts, including the degree to which these impacts—	the impacts, including the degree to which these impacts are outlined on Page 113.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(f) (aa) can be reversed;	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(g) (bb) may cause irreplaceable loss of resources; and	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(h) (cc) can be avoided, managed or mitigated;	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(i) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives is outlined on Page 118 of the Final Basic Assessment Report.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(j) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	The findings of the impact assessment are outlined on Page 122 of the Final Basic Assessment Report, and the cumulative impacts are outlined Page 123 of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(k) the possible mitigation measures that could be applied and level of residual risk;	The potential impacts, significance rating of the impacts, and the proposed mitigation measures are outlined on Table 11-10 on Page 132.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(l) the outcome of the site selection matrix;	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(m) if no alternatives, including alternative locations for the activity	As indicated in the Final Basic Assessment Report, the 2X 400kv line is authorised however due to some challenges with some of the affected landowners

		were investigated, the motivation for not considering such; and	three deviations were proposed. Since the route is pre-negotiated no alternatives were considered. Refer to Chapter 7 of the Final Basic Assessment Page 57.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(n) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 1.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Taken the above-mentioned into account, you are reminded that you have indicated in your application form that this application falls within the Renewable Energy Development Zone (REDZ) and it forms part of an Electricity Grid Infrastructure (EGI). When applying for power lines within the REDZ and when it forms part of an EGI, no alternatives must for part of the report. Paragraph 5 of Government Notice (GN) No. 145 of Government Gazette (GG) 44191 of 26 February 2021 (GN 145) indicates that the applicant must submit a pre-negotiated route with the application for environmental authorisation, which means that only one route is submitted with the application without alternatives. It is not clear in the draft BAR whether a pre-negotiated route is submitted for approval, because the draft BAR refers to alternatives. Please confirm and if a pre-negotiated route is part of this application, if not, the application will be treated as a normal application.	The Proposed development falls within the Renewable Energy Development Zone (REDZ). The Pre negotiated route information is included in the Amended Application Form on Page 34. The amended application form also includes confirmation of the SIP Project on Page 26.
(d) Specialist Declaration of Interest			

Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email		Specialist Declaration of Interest forms must be attached to the final BAR. You are therefore requested to submit original signed Specialist Declaration of Interest forms for each specialist study conducted. The forms are available on Department's website (please use the Department's template).	The original signed Specialist Declaration of Interest for each Specialist will be submitted with the FBAR.
(e) Specialist Assessments				
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	i.	Specialist studies to be conducted must provide a detailed description of their methodology, as well as all other associated infrastructures that they have assessed and are recommending for the authorisation.	All the specialist studies include a detailed description of the methodology, key issues and associated mitigation measures and recommendations.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	ii.	The specialist studies must also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted.	All the specialist studies provide a detailed description of all limitations to their studies, and they were all conducted in the right seasons.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	iii.	Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice.	None of the specialist studies have proposed contradicting recommendations. All the reports were reviewed prior to being incorporated into the Final Basic Assessment.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	iv.	It is further brought to your attention that Procedures for the Assessment and Minimum Criteria	The proposed development was subjected to the online screening tool in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental

			for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e."the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols.	Management Act, 1998, when applying for Environmental Authorisation. The specialist studies were conducted according to the prescribed protocols. Refer to Table 11-3 on Page 116 of the Final BAR.
(f) Undertaking of an Oath				
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	i.	The Department has noted that the submitted application form has an undertaking under oath or affirmation by the EAP. Please note that the final BAR must also have an undertaking under oath/ affirmation by the EAP.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	ii.	Based on the above, you are therefore required to include an undertaking under oath or affirmation by the EAP (administered by a Commissioner of Oaths) as per Appendix 1(3)(r) of the NEMA EIA Regulations,	The Final BAR includes the undertaking under oath/ affirmation by the EAP on Page IV-V.

		2014, as amended, which states that the BAR must include:	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	*"an undertaking under oath or affirmation by the EAP in relation to:*	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	a) the correctness of the information provided in the reports;	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	b) the inclusion of comments and inputs from stakeholders and I&APs;	The Final BAR includes the undertaking under oath/ affirmation by the EAP on Page IV-V.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	c) the inclusion of inputs and recommendations from the specialist reports where relevant; and	The Final BAR includes the undertaking under oath/ affirmation by the EAP on Page IV-V.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	d) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties".	The Final BAR includes the undertaking under oath/ affirmation by the EAP on Page IV-V. All the information provided by the interested and Affected parties has been incorporated into the Final BAR and the Public Participation Report.
g) Details and Expertise of the EAP			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	You are required to include the details and expertise of the EAP in the BAR, including curriculum vitae, to comply with the requirements of Appendix 1(3)(1)(a) of the NEMA EIA Regulations, 2014, as amended.	The details and expertise of the EAP are outlined on Page 18 of the Final BAR, and the Detailed Curriculum Vitae will form Part of the Final Submission.
h) Public Participation Process			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	i. The following information must be submitted with the final BAR:	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	a) A list of registered interested and affected parties as per Regulation 42 of the NEMA EIA Regulations, 2014, as amended;	A list of the interested and affected is included in the public Participation Report.

Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	b) Copies of all comments received during the draft BAR comment period; and	Copies of all the comments received during the 30-day public review period form part of the public participation report.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	c) A comment and response report which contains all comments received and responses provided to all comments and issues raised during the public participation process for the draft BAR. Please note that comments received from this Department must also form part of the comment and response report.	A comment and response report which contains all comments received and responses provided to all comments and issues raised during the public participation process for the draft BAR is incorporated into the Public Participation Report.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	i. Please ensure that all issues raised, and comments received during the circulation of the draft BAR from registered I&APs and organs of state which have jurisdiction (including this Department's Biodiversity Section) in respect of the proposed activity are adequately addressed in the final BAR.	During the 30-day public review period, we received only received comments from the competent authority. The other key stakeholders did not end any comments. The full details of the communication with the key stakeholders are included in the Final Report.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	ii. Proof of correspondence with the various stakeholders must be included in the final BAR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.	The proof of correspondence forms part of the public participation report.

Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	iii.	Please note that Mr Jay-Jay Mpelane is not an official from provincial department as it appears in your application form. Please amend the application form to provide the correct contact person from provincial department. The amended application form must be submitted together with your final BAR to the Department. Furthermore, since the incorrect contact person of the provincial department reflects in your application, you must submit evidence that the provincial department was given an opportunity to comment on the draft BAR. Failure to submit this evidence, the provincial department must be given a 30-day period to comment on the draft BAR	The error has been corrected on the application form, the correct Provincial Official is Mr Olebogeng Gaobonegwe from the Department of Agriculture, Land Reform and Rural Development (Northern Cape) (Refer to page 5 of the application form). is Mr Olebogeng Gaobonegwe was listed a key stakeholder from the beginning of the project, he was given the opportunity to review the draft basic assessment report on the 18 February 2022 (Refer to the Public Participation Report).
(i) Environmental Management Programme				
		The EMPr must also include the following:		
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(a) It is drawn to your attention that for overhead electricity transmission and distribution infrastructure, when such activities trigger activity 11 or 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and any other listed and specified activities necessary for the realisation of		Noted. The generic EMPr has been incorporated in the Final BAR.

		such activities, the generic Environmental Management Programme, contemplated in Regulations 19(4) must be used and submitted with the final report.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(b) Further to the above, you are required to comply with the content of the EMPr in terms of Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended.	The EMPr complies with the content of EMPr in terms of Appendix 4 of the Environmental Impact Assessment Regulations, 2014 as amended.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	c) Please be informed that the following content must be incorporated within the EMPr's as indicated in Appendix 4 of the EIA Regulations 2014, as amended:	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(i) Details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae.	The details of the EAP are outlined in Table 3-1, and the Detailed CV will form part of the Final BAR submission.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(ii) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.	A map with an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers has been developed. Refer to page 96-98, Figures 10-1,10-2,10-3 and 10-4 of the Final BAR, and Appendix A of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(iii) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including — (a) Planning and design; (b) Pre-construction activities; (c) Construction activities;	The description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified form the core of the EMPr.

		(d) Rehabilitation of the environment after construction and where applicable post closure; and (e) Where relevant, operation activities.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(iv) A description of proposed impact management actions, identifying the way the impact management outcomes contemplated in paragraph (d) of Appendix 4 of the EIA Regulations 2014, as amended, will be achieved, and must, where applicable, include actions to —	The description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified form the core of the EMPr.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(v) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	The EMPr entails the procedure for Avoiding, modifying, remedying, controlling or stopping any activity which causes pollutions or environmental degradation.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(vi) Comply with any prescribed environmental management standards or practices;	The EMPr complies with any prescribed Management Standards or practices.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(vii) Comply with any applicable provisions of the Act regarding closure, where applicable; and	The EMPr complies applicable provisions of the Act regarding closure, where applicable; and
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(viii) Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable.	The EMPr complies with any provisions of the Act regarding financial provision for rehabilitation, where applicable.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(ix) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f) of Appendix 4 of the EIA Regulations 2014, as amended.	The EMPr outlines the method of monitoring the implementation of the impact management actions contemplated in paragraph (f) of Appendix 4 of the EIA Regulations 2014, as amended.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(x) The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f) of	The EMPr outlines the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f) of Appendix 4 of the EIA Regulations 2014, as amended.

		Appendix 4 of the EIA Regulations 2014, as amended.	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(xi) An indication of the persons who will be responsible for the implementation of the impact management actions.	The EMPr outlines the persons who will be responsible for the implementation of the impact management actions.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(xiii) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f) of Appendix 4 of the EIA Regulations 2014, as amended.	The EMPr outlines the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f) of Appendix 4 of the EIA Regulations 2014, as amended.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(xiv) A program for reporting on compliance, considering the requirements as prescribed by the Regulations.	The EMPr outlines A program for reporting on compliance, considering the requirements as prescribed by the Regulations.
(j) Environmental Impact Statement			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(i) It is noted that an environmental impact statement is included in the draft BAR, you are further requested to include an environmental impact statement which contains -	Noted.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(a) a summary of the key findings of the environmental impact assessment;	The Environmental Impact Statement summarises of the key findings of the environmental impact assessment. Refer to page 128 of Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(b) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	A map with an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers has been developed. Refer to page 96-98, Figures 10-1,10-2,10-3 and 10-4 of the Final BAR, and Appendix A of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	(c) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	The Environmental Impact Statement summarises of the key findings of the environmental impact assessment. Refer to page 134 of Final BAR.

Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Please also ensure that the final BAR includes the period for which the Environmental Authorisation is required and the date on which the activity will be concluded as per Appendix 1(3)(1)(q) of the NEMA EIA Regulations, 2014, as amended.	Construction starts between August 2023 and December 2023. Construction period 4 years. Refer to introduction on Page 19 of the Final BAR.
General:			
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	When providing coordinates as part of the information submitted regarding the location of an activity as part of an application for environmental authorisation, such coordinates must be provided in degrees, minutes and seconds using the Hartebeesthoek94 WGS84 coordinate system as per regulation 5(6) of the NEMA EIA Regulations, 2014, as amended.	Noted. The coordinates must be provided in degrees, minutes and seconds using the Hartebeesthoek 94 WGS84 coordinate system as per regulation 5(6) of the NEMA EIA Regulations, 2014, as amended. Refer to Table 2-1 on Page 27 of the Final BAR.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	You are further reminded to comply with Regulation 19(1)(a) of the NEMA EIA Regulations, 2014, as amended, which states that:"Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority - (a) a basic assessment report, inclusive of any specialist reports, an EMPr, a closure plan in the case of a closure activity and where the application is a mining application, the plans, report and calculations contemplated in the Financial Provisioning Regulations, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received,	Noted, The Final BAR will be submitted within 90 days as per Regulation 19(1)(a) of the NEMA EIA Regulations.

		including any comments of the competent authority".	
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Should there be significant changes or new information that has been added to the BAR or EMPr which changes or information was not contained in the reports or plans consulted on during the initial public participation process, you are required to comply with Regulation 19(1)(b) of the NEMA EIA Regulations, 2014, as amended, which states: "the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority - (b) a notification in writing that the documents contemplated in sub regulation 1(a) will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the documents which changes or information was not contained in the original documents consulted on during the initial public participation process contemplated in sub regulation (1)(a) and that the revised documents will be subjected to another public participation process of at least 30 days."	Noted.
Jay Jay Mpelane (DFFE) Date: 22/03/22	Letter/Email	Should you fail to meet any of the timeframes stipulated in Regulation 19 of the NEMA EIA Regulations, 2014, as amended, your application will lapse.	Noted

Daniel Marnewick (Birdlife South Africa)	-	The stakeholder did not send any comments during the public review period.	No comments were received from the Birdlife South Africa.
Mr Olebogeng Gaobonegwe (Department of Agriculture, Land Reform and Rural Development Northern Cape)	-	The stakeholder did not send any comments during the public review period.	Mr Olebogeng Gaobonegwe did not comment on the Draft BAR, follow-up emails were sent to encourage the him to comment on the draft BAR.
Mrs Raisibe Sekepane (Department of Mineral Resources and Mineral Resources)	-	The stakeholder did not send any comments during the public review period.	No comments were received from Department of Mineral Resources and Energy.
Blom J (Kheis Local Municipality)	-	The stakeholder did not send any comments during the public review period.	No comments were received from the Kheis Local Municipality.
HP Van Heerden From Scatec	Emails	Good day Mr Siphugu Thank you for reaching out to Scatec as we hereby confirm that we would like to register as a I&AP for the below mentioned developments in question. Subsequently we wish to enquire for more information on both corridors at hand. In other words, would it be possible to provide kmz files for both the proposed 2X Electrical line of 400 KV from Aries substation to Upington substation route and; the approved and proposed change of route from the Upington MTS (Solar Park Sub) to the Nieuwehoop Substation.	Mr HP Van Heerden was provided with KMZ as requested on the 18 October 2021.

		Thank you in advance and looking forward to hearing from you. Best regards, HP Van Heerden Sustainability Manager	---------- Forwarded message --------- From: **edzisani siphugu** <esiphugu@gmail.com> Date: Mon, Oct 18, 2021 at 9:58 PM Subject: Re: Background Information Document (BID) for 2x Aries to Upington 400kV Powerline To: HP Van Heerden <hp.vanheerden@scatec.com> Cc: Jan Fourie <Jan.Fourie@scatec.com> Good day Thank you for for registering as the I&AP for the proposed project. Attached is the KMZ files as requested for the 2 lines as well as the previously authorized corridor. ... **2 Attachments** 

CHAPTER 10

10. ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE FOOTPRINT

GN 982 Appendix 1:

(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

The environmental attributes discussed below generally cover the greater study area that include all of these components. A sensitivity map of the entire 2x400kv line is depicted on **Figure 10-1**. The Sensitivity Map of Deviation 1 is depicted on **Figure 10-2**, the sensitivity of Map of Deviation 2 is summarised on **Figure 10-3**, and the Sensitivity Map of Deviation 3 is Summarised on **Figure 10-4**.

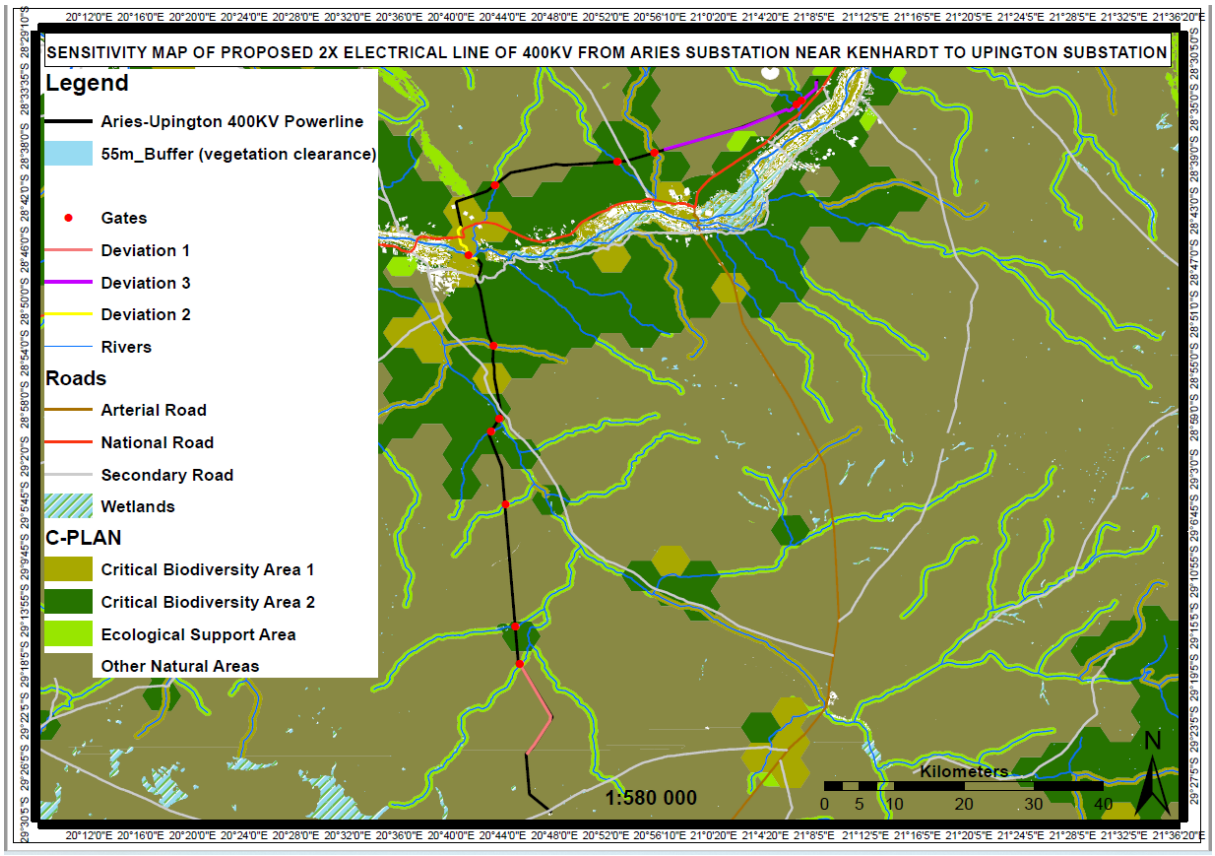


Figure 10-1: Sensitivity Map/Layout overall 2x400kv lines

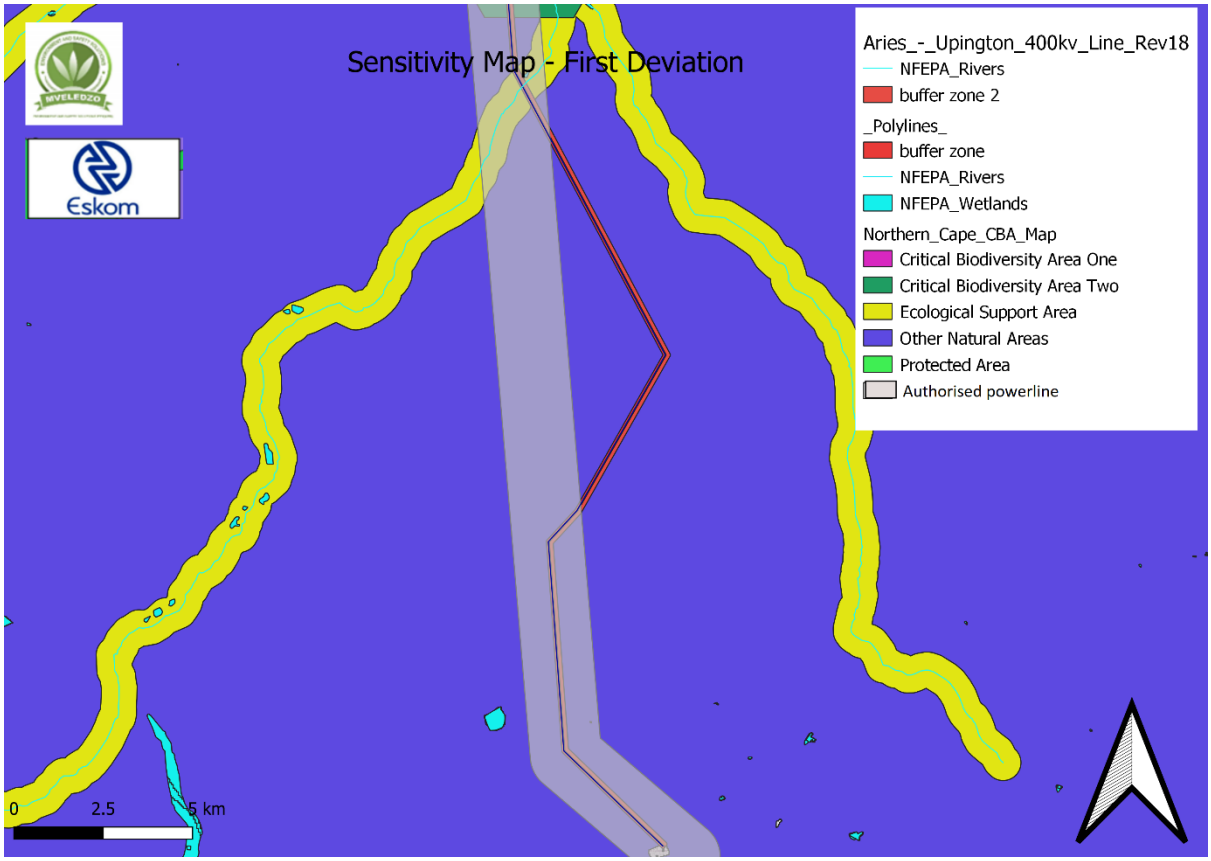


Figure 10-2: Sensitivity Map of Deviation 1

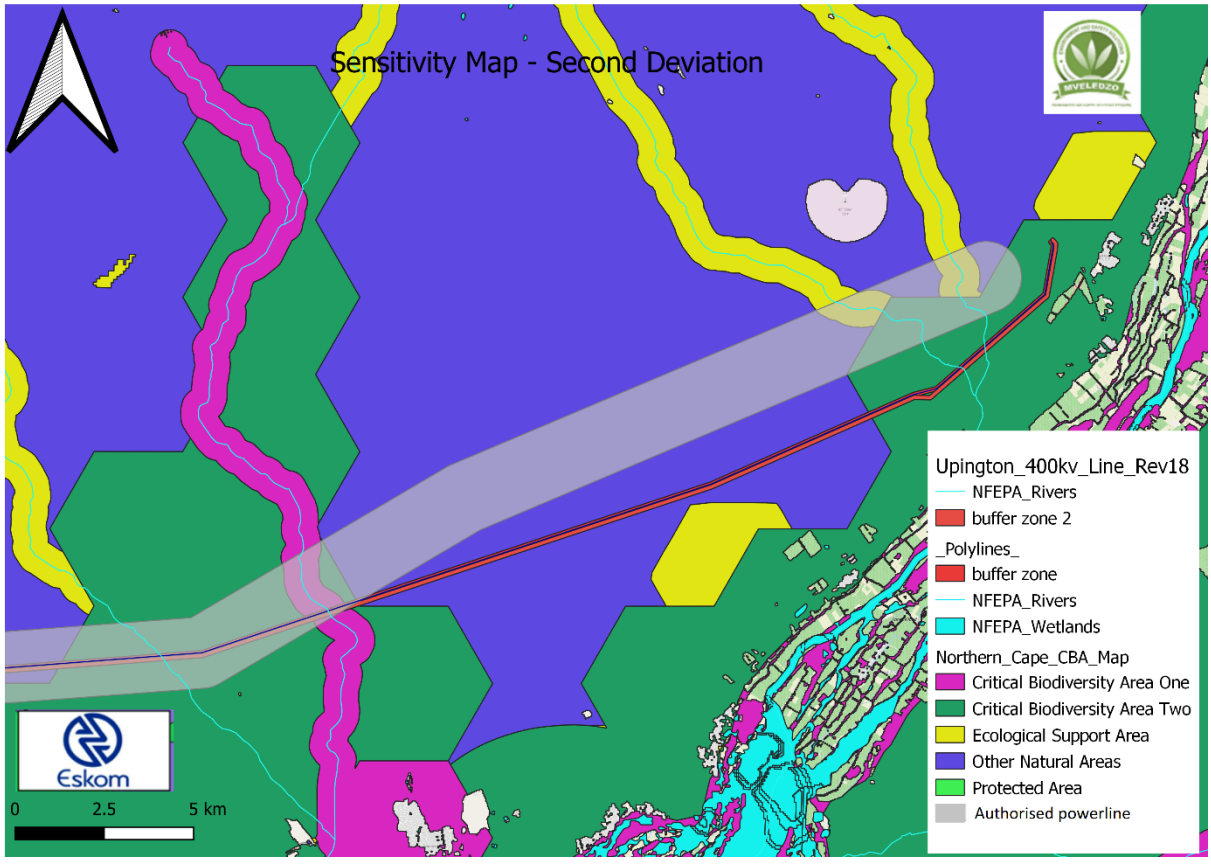


Figure 10-3: Sensitivity Map of Deviation 2

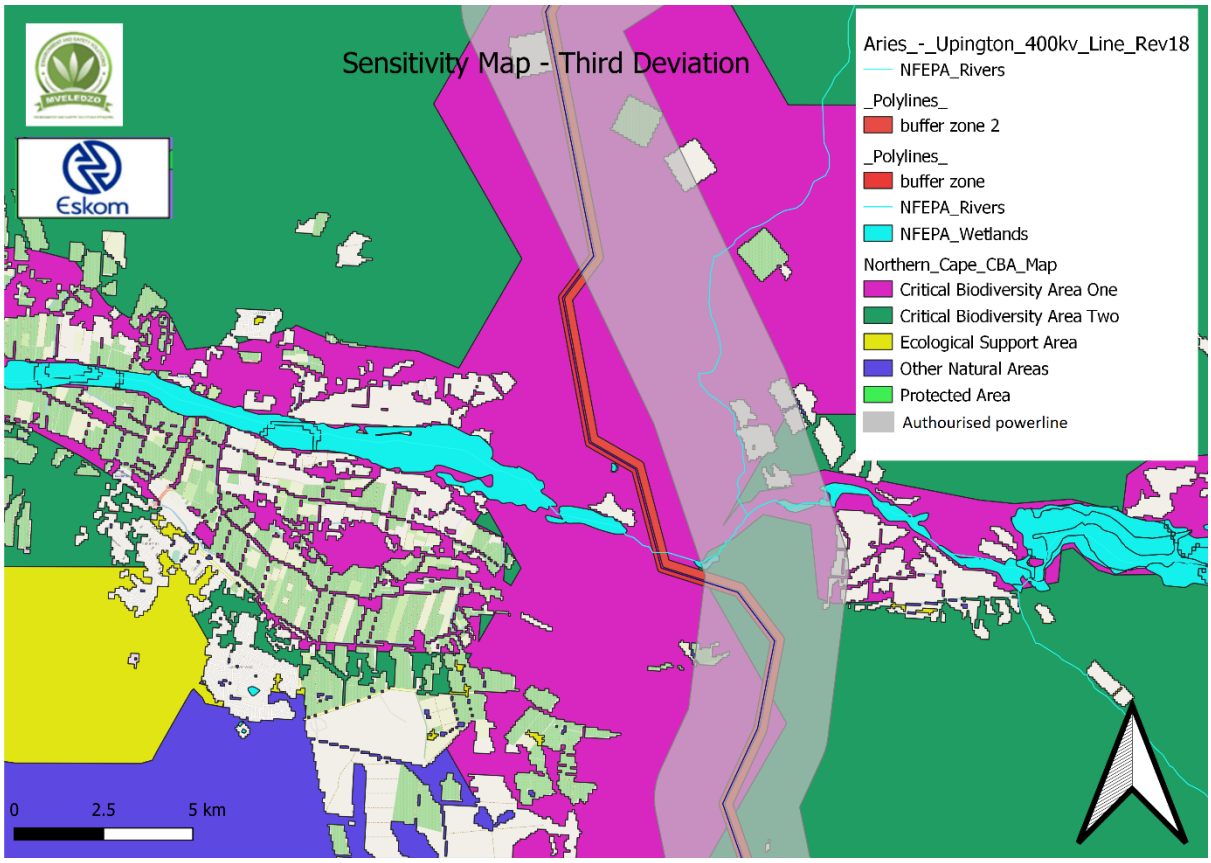


Figure 10-4: Sensitivity Map of Deviation 3

10.1 CLIMATE

The area has Rainfall largely in late summer/early autumn (major peak) and very variable from year to year. The Mean Annual Precipitation ranges from about 70 mm in the west to 200 mm in the east. Mean maximum and minimum monthly temperatures for Kenhardt are 40.6°C and –3.7°C for January and July respectively. Corresponding values for Pofadder are 38.3°C and –0.6°C. Frost incidence ranges from around 10 frost days per year in the northwest to about 35 days in the east. Whirl winds (dust devils) are common on hot summer days. See also climate diagram for NKb 3 Bushmanland Arid Grassland.

10.2 GEOLOGY & SOILS

A third of the area is covered by recent (Quaternary) alluvium and calcrete. Superficial deposits of the Kalahari Group are also present in the east. The extensive Palaeozoic diamictites of the Dwyka Group also outcrop in the area as do gneisses and metasediments of Mokolian age. The soils of most of the area are red, yellow apedal soils, freely drained, with a high base status and <300 mm deep, with about one fifth of the area deeper than 300 mm, typical of Ag and Ae land types.

10.3 VEGETATION AND LANDSCAPE FEATURES

Extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland dominated by white grasses (Stipagrostis species) giving this vegetation type the character of semidesert 'steppe'. In places low shrubs of Salsola change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

10.4 NKB 3 BUSHMANLAND ARID GRASSLAND-DISTRIBUTION

Northern Cape Province: Spanning about one degree of latitude from around Aggeneys in the west to Prieska in the east. The southern border of the unit is formed by edges of the Bushmanland Basin while in the northwest this vegetation unit borders on desert vegetation (northwest of Aggeneys and Pofadder). The northern border (in the vicinity of Upington) and the eastern border (between Upington and Prieska) are formed with often intermingling units of Lower Gariep Broken Veld, Kalahari Karroid Shrubland and Gordonia Duneveld. Most of the western border is formed by the edge of the Namaqualand hills. Altitude varies mostly from 600–1 200 m.

10.5 NKB 3 BUSHMANLAND ARID GRASSLAND-CONSERVATION STATUS

NKb 3 Bushmanland Arid Grassland is classified as Least threatened. Target 21%. Only small patches statutorily conserved in Augrabies Falls National Park and Goegab Nature Reserve. Very little of the area has been transformed. Erosion is very low (60%) and low (33%).

10.6 WATER RESOURCES

Drainage and Quaternary Catchments

The site is located within quaternary catchment D73F which is under Lower Orange Water Management Area (**Figure 10-5**). The main activities in the Lower Orange Water Management Area are therefore mining and irrigation. Extensive irrigation is practiced along the Orange River.

Figure 10-5: Orange River where the Powerline is to cross

10.7 FAUNA AND FLORA

10.7.1 Regional Vegetation

According to Mucina and Rutherford (2006), the site is consisting of NKb 3 the Bushmanland Arid Grassland. The Ecological Impact Assessment focussed on high conservation status vegetation in his field. This unit has a large longitudinal extent, with some species common in only part of the unit. Further research may lead to the split of this unit at a later stage (**Refer to Appendix G1 for the Ecological Impact Assessment**).

10.7.2 Flora

The ecosystems were not only described with respect to their plant species composition, but also their potential as habitat for red data plant species. Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected Species (NEMBA species, TOPS species) were evaluated against the list published in Department of Environmental Affairs and Tourism Notice No. 2007 (NEMBA).

Two Protected trees (Shepherd's Tree and Camel Thorn) were identified in accordance with the list of nationally protected trees published in Government Notice No. 29062 3 (2006) (National Forests Act, 1998 (Act No. 84 of 1998), as Amended (Department of Water Affairs Notice No 897, 2006). However, not all protected plant species fall under the category of threatened species (Ramarumo and Maroyi, 2020).

Threatened plant species are those species that are vulnerable or at the risk of extinction (Moraswi et al., 2019). Protected plants are those species listed in the National Forests Act No. 84 of 1998 (Dzerefos et al., 2017; Bamigboye et al., 2017). According to Version 3.1 of the IUCN's Red List Categories and Criteria, the three categories of threat in order of increasing risk of extinction are VU, EN and CR (Ramarumo and Maroyi, 2020) (**Appendix G**).

10.7.3 Fauna

The faunal communities of the area are generally not very diverse, although there are some exceptions in terms of the different groups of fauna. The only red-listed mammal that can reasonably be expected to be resident at the site is the Black-footed Cat Felis nigripes which is classified as Vulnerable. The rocky hills are however highlighted as the most important habitat for reptiles and the Klipspringer at the site. No red-listed amphibians are known from the area. The Giant Bullfrog *Pyxicephalus adspersus* is known from the area but has been down-listed to Least Concern in the latest amphibian assessment. As such, it is clear that the site and area in general is not particularly important for terrestrial vertebrates. In general, the major impact associated with the development of the site for terrestrial vertebrates would be habitat loss and the disruption of the broad-scale connectivity of the landscape. There do not appear to be any particular species that would be disproportionately affected and whose local populations might be compromised by the development. Animal manure, green grass, flowers and fruits (food) indicate the presence of certain faunal species. Infrastructural development in the vicinity significantly reduces the presence of some wild animals in certain localities. Common insects like butterflies and green house flies were also evident, especially near cow dung and the burst sewer system nearby. Rodents, amphibians and reptiles cannot be ruled out as there are settlements in the area (Appendix G1).

10.7.4 Amphibians

Amphibians are viewed to be good indicators of changes to the whole ecosystem because they are sensitive to changes in the aquatic and terrestrial environments (Waddle, 2006).

According to Carruthers (2009), frogs occur throughout southern Africa. No protected amphibian or NEMBA protected species are expected to occur in the study area.

10.7.5 Invertebrates

Butterflies are a good indication of the habitats available in a specific area (Woodhall 2005). Although many species are eurytropes (able to use a wide range of habitats) and are widespread and common, South Africa has many stenotrope (specific habitat requirements with populations concentrated in a small area) species which may be very specialised (Woodhall 2005). Butterflies are useful indicators as they are relatively easy to locate and catch, and to identify.

10.7.6 Birds

BirdLife's Important Bird and Biodiversity Area concept has been developed and applied for over 30 years. Considerable effort has been devoted to refining and agreeing a set of simple but robust criteria that can be applied worldwide. Initially, IBAs were identified only for terrestrial and freshwater environments, but over the past decade, the IBA process and method has been adapted and applied in the marine realm. In 2012, BirdLife published the first Marine IBA "e-atlas", with details of 3,000 IBAs in coastal and territorial waters as well as on the high seas.

Important Bird and Biodiversity Areas (IBAs) are:

- Places of international significance for the conservation of birds and other biodiversity.
- Recognised world-wide as practical tools for conservation.
- Distinct areas amenable to practical conservation action.
- Identified using robust, standardised criteria.
- Sites that together form part of a wider integrated approach to the conservation and sustainable use of the natural environment.

There is no IBA in proximity of the proposed transmission line. The nearest IBA is located approximately 30 km west of the transmission line (**Figure 10-6**) (**Refer to the Avifaunal Impact Assessment Report on Appendix G2**).

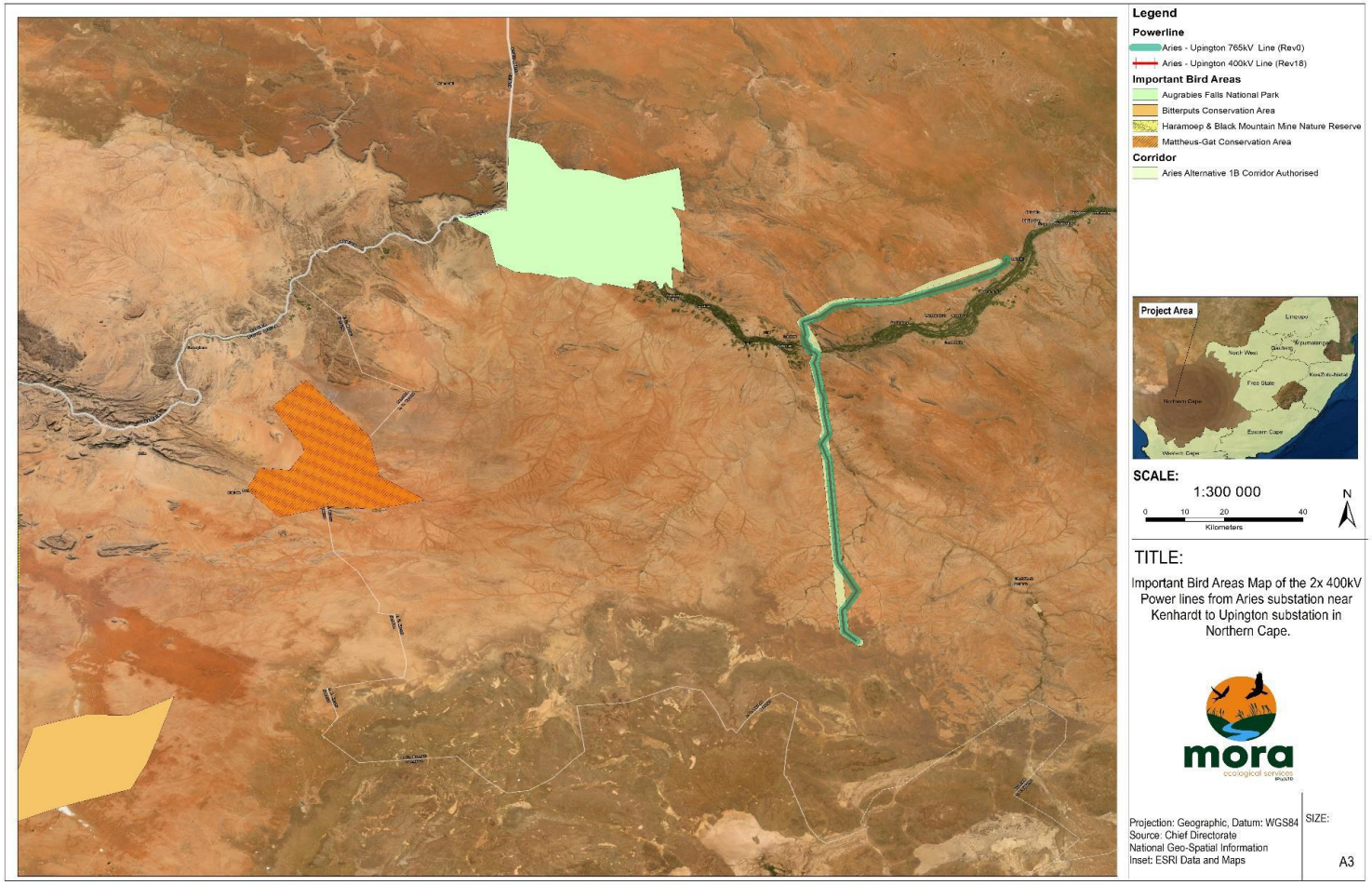


Figure 10-6: Important Bird and Biodiversity Areas in relation to the powerline.

10.7.7 LAND CAPABILITY

Data Collection and Methodology

Using the soil data collected during the site investigations and applying that to the land capability assessment methodology as outlined by the National Department of Agriculture, the agricultural potential/land capability of the site was determined.

Regional Description

Regionally the Northern Cape is not known for cultivation or high agricultural potential soils. The majority of the province is utilised for grazing of livestock due to the aridity and shallow soils that occur in the area.

Site Description

According to the land capability methodology, the potential for a soil to be utilised for agriculture is based on a wide number of factors. These are listed in the table below along with a short description of each factor (**Table 10-1**).

Table 10-1: Agricultural Potential Criteria

Criteria	Description
Rock Complex	If a soil type has prevalent rocks in the upper sections of the soil it is a limiting factor to the soil's agricultural potential
Flooding Risk	The risk of flooding is determined by the closeness of the soil to water sources.
Erosion Risk	The erosion risk of a soil is determined by combining the wind and water erosion potentials.
Slope	The slope of the site could potentially limit the agricultural use thereof.
Texture	The texture of the soil can limits its use by being too sandy or too clayey.
Depth	The effective depth of a soil is critical for the rooting zone for agricultural crops.
Drainage	The capability of a soil to drain water is important as most grain crops do not tolerate submergence in water.
Mechanical Limitations	Mechanical limitations are any factors that could prevent the soil from being tilled or ploughed.
pH	The pH of the soil is important when considering soil nutrients and hence fertility.
Soil Capability	This section highlights the soil type's capability to sustain agriculture.
Climate Class	The climate class highlights the prevalent climatic conditions that could influence the agricultural use of a site.
Land Capability / Agricultural Potential	The land capability or agricultural potential rating for a site combines the soil capability and the climate class to arrive at the sites potential to support agriculture.

The soils identified above were classified according to the methodology described above. The criteria mentioned above were evaluated in the **table 10-2** below.

Table 10-2: Land Capability of the soils within the study Site.

Soil	Agricultural	Sandy soils	Shallow Soil	Hard Rock
% on Site	1.7 %	48.3%	44.3%	5.7%
Rock Complex	None	None	Yes	Yes
Flooding Risk	High	None	None	None
Erosion Risk	Moderate	High	High	Very Low
Slope %	<4	<4	<4	>4
Texture	Loam	Sand	Sand	Rock/Sandy
Effective Depth	> 90 cm	> 30 cm	< 30 cm	< 10 cm
Drainage	Imperfect	Excellent	Poorly drained	Poorly drained
Mech Limitations	None	None	Rocks	Rocks
pH	> 5.5	> 5.5	> 5.5	> 5.5
Soil Capability	Class III	Class V	Class VI	Class VIII
Climate Class	Severe	Severe	Severe	Severe
Land Capability	Class III – Moderately Arable Land	Class VII – Grazing Land	Class VII – Grazing Land	Class VIII – Wildlife

No limitation	Low	Moderate	High	Very Limiting

The site is made up of three land capability classes, namely Class III, VII and VIII as shown in the Figure below. The Class III soils are suitable for cultivation but they have some restrictions –in this case flooding and climate. The Class VII soils have continuing limitations that cannot be corrected; in this case rock complexes, arid climate, stoniness, and a shallow rooting zone constitute these limitations. Class VIII soils are basically hard rock and have no agricultural use.

Sensitivities

Of the uses above, the agricultural soils located adjacent to the Orange River supports the agricultural cultivation core for the province. Impacts to these areas should be limited as the soils as well as the water sources are very limited (**Figure 10-7**).

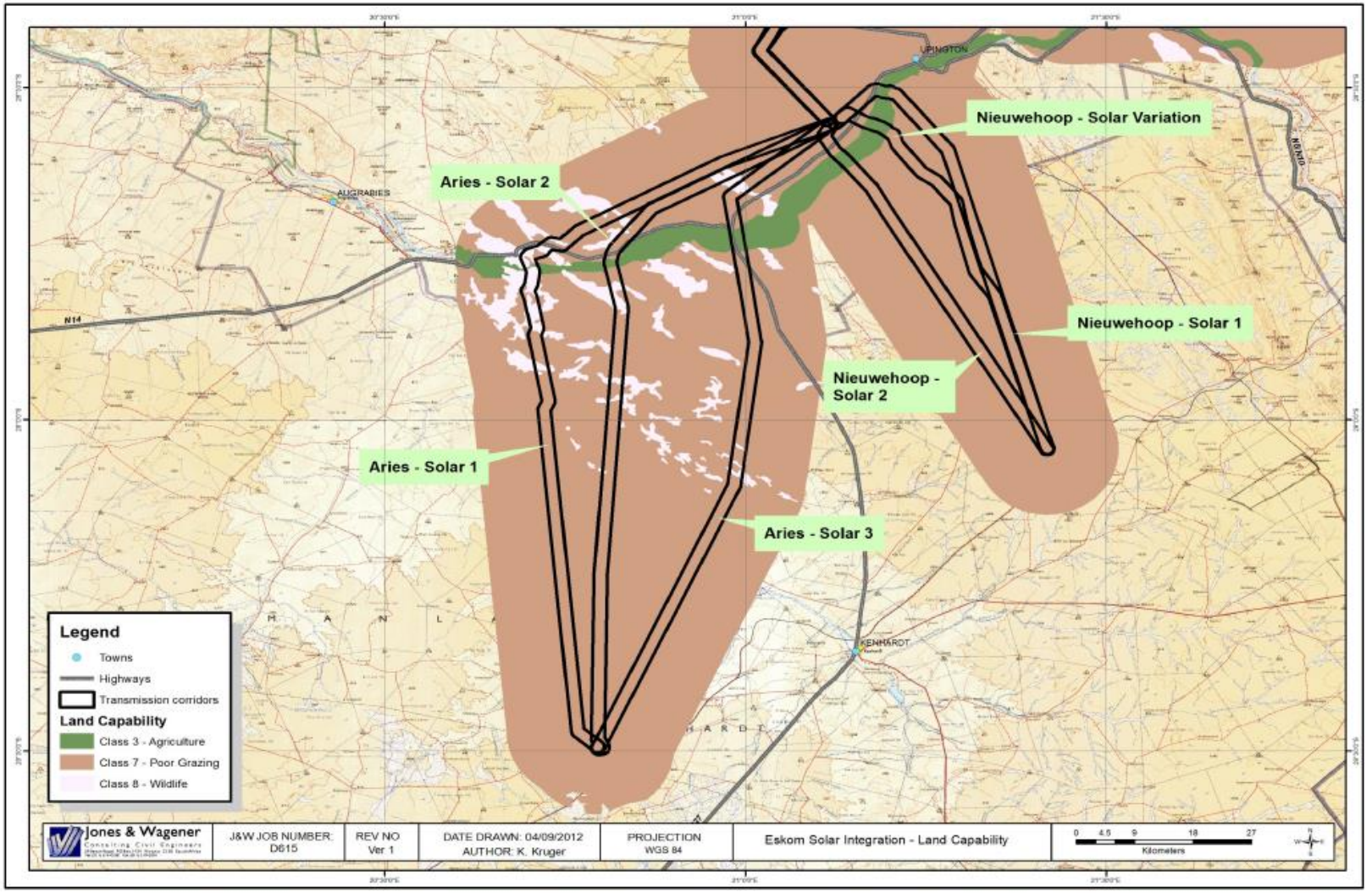


Figure 10-7: Agricultural potential for the study area (DEA Reference Number: 12/12/20/2606)

10.8 IDENTIFICATION OF ENVIRONMENTAL SENSITIVITIES

In terms of ecological sensitivity, the following features are assessed to determine how sensitive the habitat identified within the transmission line corridors is:

- Presence or absence of Red Data or protected plant and animal species;
- Presence or absence of exceptional species diversity;
- Extent of intact habitat in good ecological condition in the absence of disturbance; and
- Presence or absence of important ecosystems such as Protected Areas, areas demarcated for future protected area status (NPAES) and wetlands.

The most important of these are the Northern Cape Conservation Plan (2016) and the National Protected Area Expansion Strategy for South Africa (2018). These maps below indicate biodiversity priority areas required to maintain species richness and ecological processes in the first instance and areas that should be targeted for formal conservation expansion in the second.

10.8.1 Critical Biodiversity Areas including Centres of Endemism

The two above-mentioned plans are not entirely independent of one another as all areas demarcated as Conservation Expansion Focus Areas, are classified as Tier 1 or Tier 2 CBAs and some of the CBAs are demarcated with the specific purpose in mind of maintaining development-free corridors between existing conservation areas to facilitate future expansion of conservation areas into these corridors.

The location of Priority Focus Areas is designed so as to ensure the minimum land requirement to meet conservation targets but also to avoid isolated target areas and append these onto existing conservation areas where possible. The relevant section of the Northern Cape Conservation Plan which maps CBAs for the Northern Cape is illustrated below.

The map illustrates those different deviations with their biodiversity classifications. There are no Protected Area Expansion Strategy Focus Areas within or near the site, indicating that the site and adjacent areas have not been identified as important current priorities for conservation expansion. It is however worth noting that the site falls within an area that remains severely under-protected. The impact of the development on NPAES Focus Areas and CBAs is not considered sufficient to warrant the implementation of an offset in their own right (**Figure 10-8**). Refer to the Sensitivity Maps on **Appendix A1-A4**.

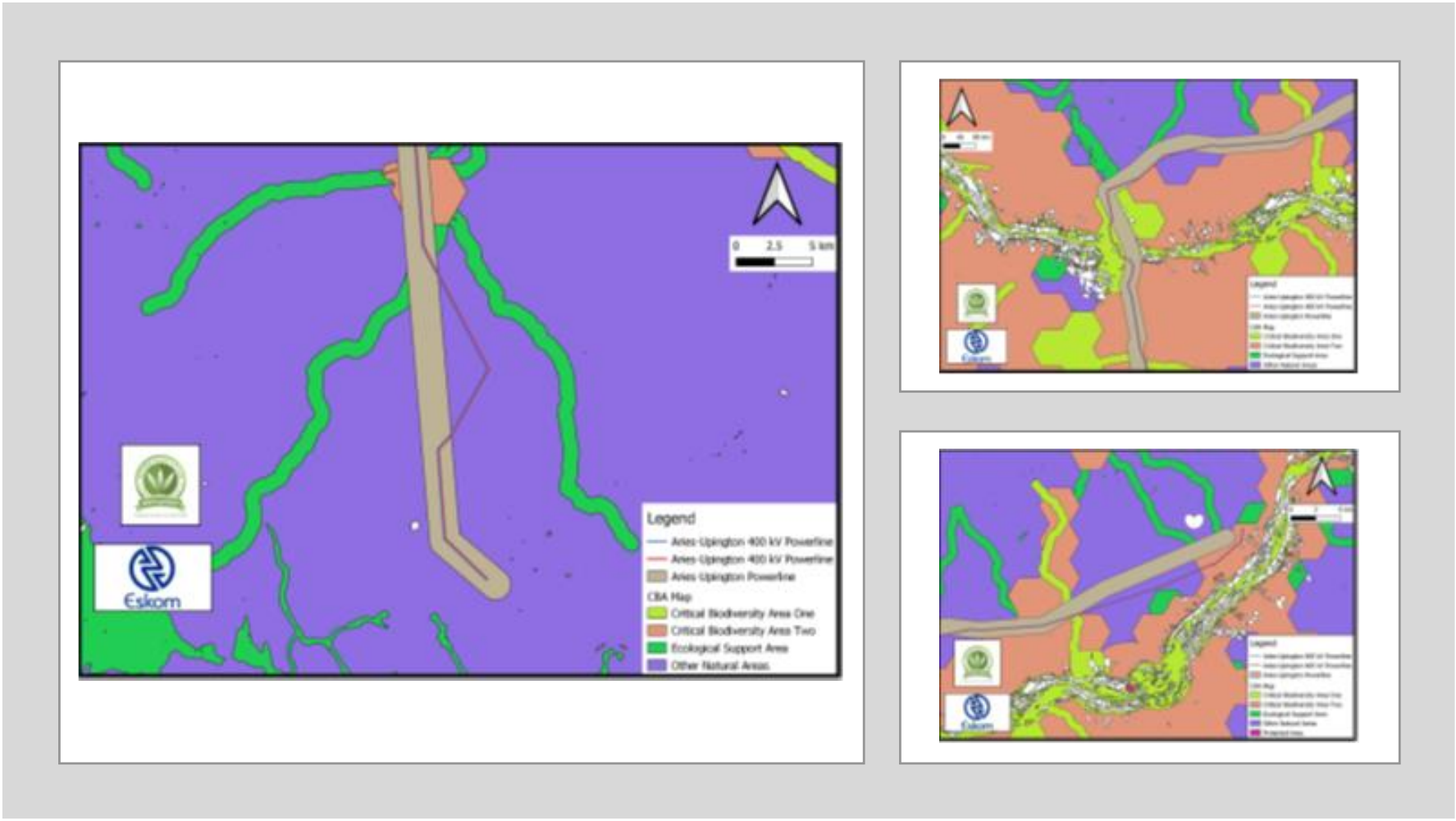


Figure 10-8: Critical Biodiversity area in relation to the alternative deviations

10.9 HERITAGE

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky et al 2001). This case is true for the entire project area, which may host palaeontological, archaeological, historical, natural, and contemporary heritage resources (**Refer to Appendix G4**).

The literature review and field surveys confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. In terms of the archaeology and heritage in respect of the proposed powerline deviations, the are no 'Fatal Flaws' or 'No-Go' areas. The section where modified rock shelters were recorded is already altered by prospecting activities, the tower position at the section b. However, the potential for chance finds, remains and the applicant and contractors are advised to watch out for accidental exposure of significant archaeological remains should construction activities commence along the proposed powerline deviations The procedure for reporting chance finds has clearly been laid out. This report concludes that the proposed powerline may be approved by SAHRA to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the EMP (also see Appendices). The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA, Act 25 of 1999.

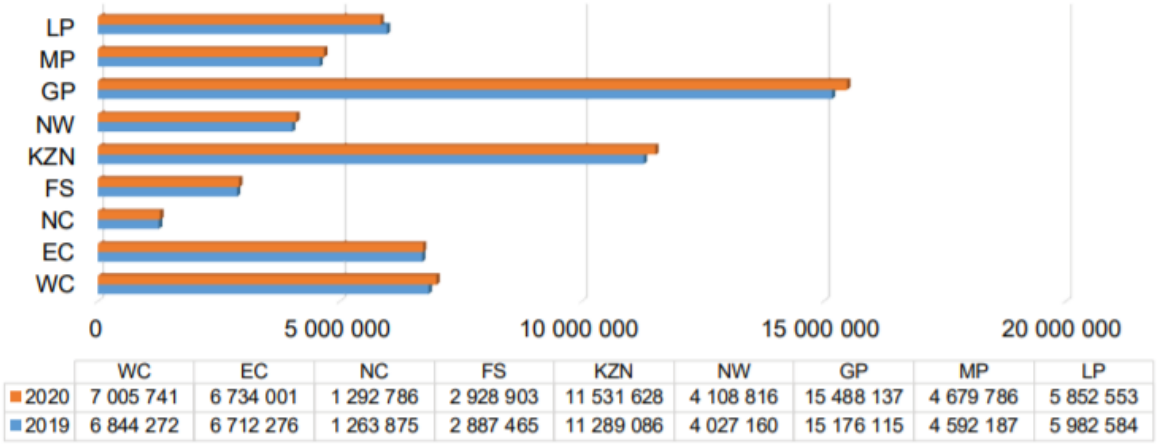
10.10 LAND USE

The Northern Cape is the largest but most sparsely populated province. The 1995 census recorded only about 742 000 people living in an area of 361 800 km^2 . In most of the province, population densities are 0–5 people/km^2.Overall, 58,6% of the population lives in poverty. Because the Northern Cape is very arid, only 2% of the province is used for crop farming. For example, export grapes are grown under irrigation along the Orange River. 96% of the land is used for stock farming, including beef cattle in the savanna biome and sheep or goats elsewhere. Game farming is also popular. The environment is unsuitable for commercial forestry and only 1% of land is set aside for conservation. Although about 98% of land in the Northern Cape is used for agriculture, mining is the prime income earner.

10.11 SOCIO-ECONOMIC CHARACTERISTICS

10.11.1 Population

The South African population increased from one year to the other, which is the same for most of the provinces, including the Northern Cape. Some of the factors that can contribute to an increase in the population size are increased fertility, migration and a decline in mortality. The graph below depicts the mid-year population estimates for the nine provinces in the country for 2019 and 2020[2] (**Figure 10-9**).



	WC	EC	NC	FS	KZN	NW	GP	MP	LP
2020	7 005 741	6 734 001	1 292 786	2 928 903	11 531 628	4 108 816	15 488 137	4 679 786	5 852 553
2019	6 844 272	6 712 276	1 263 875	2 887 465	11 289 086	4 027 160	15 176 115	4 592 187	5 982 584

Figure 10-9: Mid-Year Population Estimates by Province, 2019 and 2020. (Source: Stats SA, Mid-Year Population Estimates 2019 & 2020).

It is also of great importance to have knowledge of how the province's population is distributed across its districts. In **Table 10-3**, the number of people in each district as well as its share of the population of the province is presented for 2019.

Table 10-3: Total Population by District in Northern Cape 2019

	NUMBER	SHARE (%)
NAMAKWA	139 381	10.4
PIXLEY KA SEME	220 842	16.4
ZF MGCAWU	284 391	21.1
FRANCES BAARD	438 901	32.6
JOHN TAOLO GAETSEWE	261 363	19.4

Source: IHS Markit, 2021 [Regional eXplorer, Version 2070 (2.6p)] and own calculations

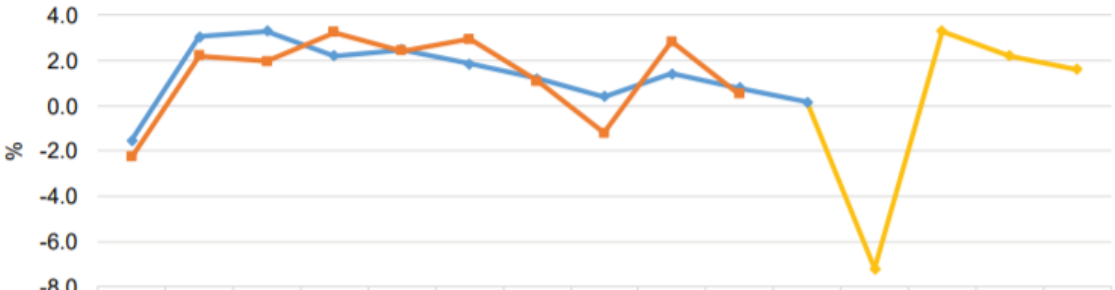
South Africa and Northern Cape's population has been increasing from one year to the other for the period under study, with the number of households also increasing annually. Provincially, the number of households increased from 247 000 in 2002 to 350 000 in 2019,

[2] Northern Cape Socio-Economic Review and Outlook 2021

which is an increase of 103 000. On a national level, the number of households increased by 5.969 million from 11.194 million in 2002 to 17.163 million in 2019.

10.11.2 Provincial Economy

Figure 2.2 illustrates the GDP growth rates of South Africa and the Northern Cape. Growth figures for the Northern Cape are provided for 2009 to 2018 and for South Africa for 2009 to 2023 (**Figure10-10**).



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
SA	-1.5	3.0	3.3	2.2	2.5	1.8	1.2	0.4	1.4	0.8	0.2	-7.2	3.3	2.2	1.6
NC	- 2.3	2.2	2.0	3.2	2.4	3.0	1.1	- 1.2	2.8	0.5					

Figure 10-10: GDP Growth Rates of South Africa and Northern Cape, 2009-2023[3]

Figure 10-11 illustrates the contributions that the districts made to the province's economy in 2019.

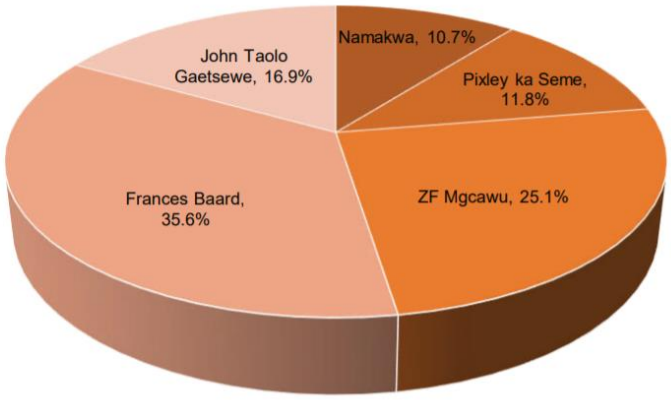


Figure 10-11: Contributions by District Municipalities to Provincial GDP, 2019[4]

Sector Contributions

[3] Source: Stats SA GDP, 4th Quarter 2019 (SA 2009-2019, NC 2009-2018), National Treasury Budget Review 2021 (SA 2020-2023)

[4] Current prices Source: IHS Markit, 2021 [Regional eXplorer Version 2070 (2.6p)] and own calculations

Table 10-4 includes the Northern Cape economic sectors' growth and contributions to GDP for 2017 and 2018.

Table 10-4: Provincial Sectoral Growth and Contributions to GDP, 2017 and 2018[5]

Sector	Growth Rate (%)		Contributions to GDP (%)	
	2017	2018	2017	2018
Primary sector	**8.1**	**-0.3**	**27.3**	**26.9**
Agriculture, forestry and fishing	12.4	-5.9	7.1	6.4
Mining and quarrying	7.1	1.1	20.2	20.5
Secondary sector	**-0.4**	**-0.3**	**9.2**	**9.8**
Manufacturing	-0.7	0.4	3.1	3.2
Electricity, gas and water	0.2	0.3	3.5	3.9
Construction	-0.9	-1.8	2.7	2.7
Tertiary sector	**0.5**	**0.9**	**53.7**	**53.4**
Trade, catering and accommodation	-0.8	0.2	10.7	9.5
Transport, storage and communication	0.6	0.7	10.8	10.3
Finance, real estate and business services	1.5	1.2	11.9	12.4
Personal services	1.8	0.8	4.8	5.0
General government services	0.0	1.3	15.5	16.1
All industries at basic prices	**3.0**	**0.3**	**90.2**	**90.0**
Taxes less subsidies on products	0.9	2.1	9.8	10.0
GDPR at market prices	**2.8**	**0.5**	**100.0**	**100.0**

World output is projected to grow by 5.5 per cent in 2021, following the estimated contraction of 3.5 per cent in 2020 due to the economic crisis brought about by the global Covid-19 pandemic. According to National Treasury, the national economy is estimated to have contracted by a significant 7.2 per cent in 2020 but is expected to show some recovery in 2021 with the economy projected to grow by 3.3 per cent. Before the start of the pandemic, South Africa was already in a recession. Gauteng made the largest contribution to the national economy in 2018, while the Northern Cape made the smallest. The provincial economy recorded low economic growth of 0.5 per cent in 2018 after growing at a higher rate in 2017 at 2.8 per cent. Provincially, Mining and quarrying remained the largest contributor to the provincial GDP. The district that made the largest contribution to the economy of the province, was Frances Baard. The largest industry in Frances Baard and Pixley ka Seme was Community services in 2019, while in Namakwa, ZF Mgcawu and John Taolo Gaetsewe, Mining was the largest[6]

[5] Growth rate at constant 2010 prices, Contributions to GDP at current prices Source: Stats SA GDP 4th Quarter 2019

[6] Northern Cape Socio-Economic Review and Outlook 2021

CHAPTER 11

11. IMPACT AND RISK ASSESSMENT

GN 982 Appendix 1:

(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including—

(i) a description of all environmental issues and risks that were identified during the EIA process; and

(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;

(j) an assessment of each identified potentially significant impact and risk, including—

(i) cumulative impacts;

(ii) the nature, significance and consequences of the impact and risk;

(iii) the extent and duration of the impact and risk;

(iv) the probability of the impact and risk occurring;

(v) the degree to which the impact and risk can be reversed;

(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and

(vii) the degree to which the impact and risk can be avoided, managed or mitigated;

11.1 APPROACH

The acquisition of the servitudes and identification of the tower positions is done, the proposed development requires Environmental Authorisation (EA) to proceed with the construction phase. DFFE is expected to issue the authorisation with the detailed studies (walk-down) to be done during implementation as conditions.

11.1.1 Regulated activities and the scope of Impact Assessment

The NEMA 2014 EIA Regulations require authorisation for specific listed activities only. The EMPr, however, required in terms of these Regulations, however, requires the management of a broader set of aspects. The impact assessment, therefore, needs to extend beyond these activities.

11.1.2 Activities, Aspects and Impacts

Environmental impacts occur as a result of an activity, that through the associated aspects bring about changes in the environment. The significance of such changes is a direct

function of the intensity of the aspects in combination with the sensitivity or vulnerability of the receiving environment. Environmental impacts are defined as 'changes' in the environment, where the requirement of an EIA process is to characterise the changes and the significance of the changes for decision-making.

The Regulations (GN 982 Appendix 2 item 2 (i) (ii) to (v), as amended by Appendix 2 item 2(h)(ii), (iii), (iv) of GN 326 of 7 April 2017) require that aspects be described and assessed in the impact assessment. Environmental aspects can be understood as resource use, such as land, water, fuels etc., waste and pollution such as dust, noise, solid waste, spills etc., and social aspects such as jobs and spending (**Figure 11-1 and Table 11-1**).

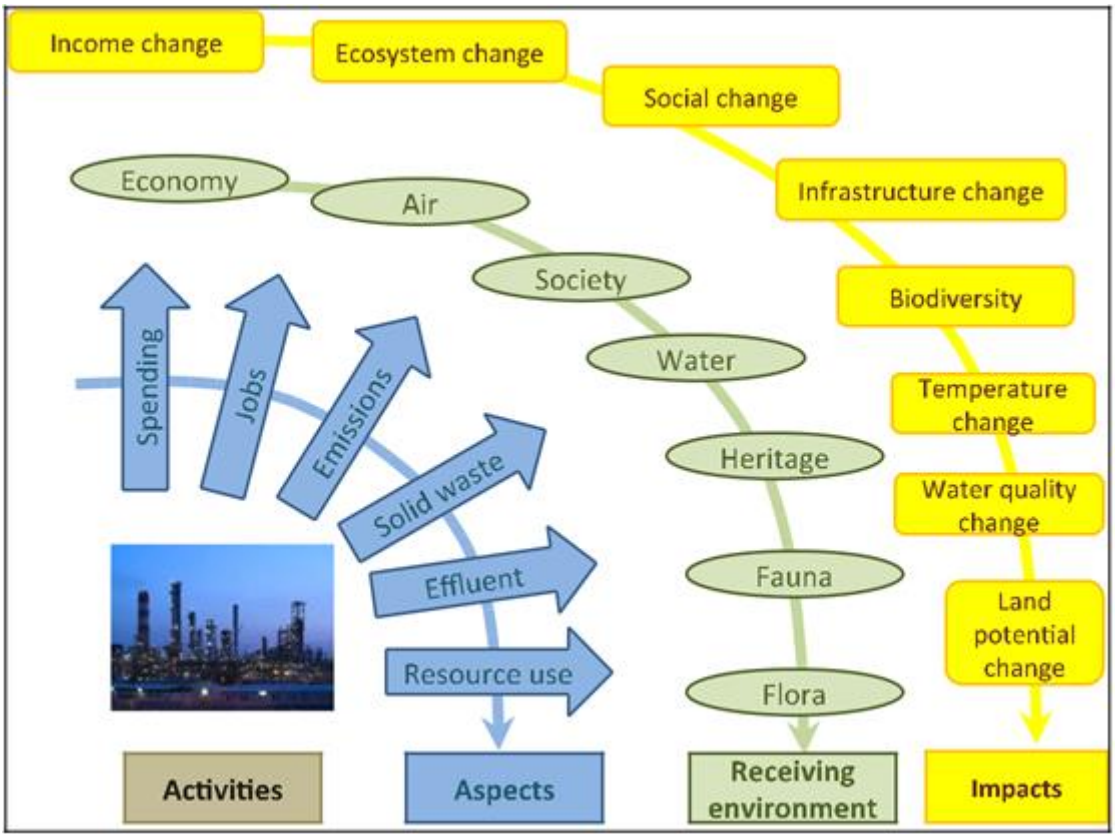


Figure 11-1: Schematic presentation of how activities bring about environmental and social aspects, which result in changes to the receiving environment, which are defined as impacts[7]

[7] Source: O'Beirn, S: Draft Good Practice Manual, prepared for IAIAsa, 2017

Table 11-1: Aspects to be assessed by specialists

ASPECT CATEGORY	ASPECT	SPECIALIST STUDY THAT WILL ADDRESS THIS ASPECT
Resource use	Water	Floodline Assessment
	Energy	None
	Land (land transformation)	Ecological Impact Assessment, Heritage, Avifauna and Floodline
	Raw Materials	None
Waste and Pollution	Atmosphere emissions	None
	Effluent	None
	Solid/liquid Wastes	None
	Energy emitted (noise, light)	None
Socio-Economic	Jobs	None
	Skills	None

11.2 ASPECTS TO BE ASSESSED BY SPECIALISTS

On 5 July 2019, the Minister of Environment, Forestry and Fisheries signed a notice of requirement for all applications submitted as per Regulation 16(1)(b)(v) of the Environmental Impact Assessment Regulations, 2014, as amended. This notice requires a screening report as generated by the National Web Based Environmental Screening Tool in terms of Section 24(5)(h) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) to be submitted along with the application, effective from October 2019.

The results of the the National Web Based Environmental Screening Tool in terms of Section 24(5)(h) are summarized on **Table 11-2**, Refer to appendix I for the full screening Report:

Table 11-2: Screening Tool Results

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Agriculture Theme			X	
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Civil Aviation Theme		X		
Paleontology Theme			X	
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

The studies that were conducted in support of this environmental Impact Assessment were informed by the screening tool. The studies are outlined on **Table 11-3**:

Table 11-3: Sensitivity of the environmental themes and studies to be undertake in terms of these sensitivities.

Environmental Theme	Sensitivity	Required Investigation	Discussion/Compliance
Agriculture Theme	Medium	Compliance Statement	This forms part of the Ecological Impact Assessment attached in **Appendix G1**.
Animal Species Theme	High	Animal Species Impact Assessment	This forms part of the Ecological Impact Assessment attached in **Appendix G1**. It is also covered by the Avifaunal Impact Assessment attached on **Appendix G2**.
Aquatic Biodiversity Theme	Very High	Aquatic Biodiversity Impact Assessment	This forms part of the Floodline Assessment attached in **Appendix G3**.
Archaeological and Cultural Heritage Theme	Very High	Archaeological and Cultural	The Archaeological and Cultural Heritage Impact

		Heritage Impact Assessment	Assessment attached in **Appendix G4**.
Civil Aviation Theme	High	Compliance Statement	The South African Civil Aviation Authority was engaged for a compliance statement as per the Civil Aviation Protocol. The application process Is ongoing. Refer to the Public Participation report for more information on **Appendix E**.
Paleontology Theme	Medium	Compliance Statement	The Archaeological and Cultural Heritage Impact Assessment attached in **Appendix G4**.
Plant Species Theme	Medium	Compliance Statement	This forms part of the Ecological Impact Assessment attached in **Appendix G1**.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Impact Assessment	This forms part of the Ecological Impact Assessment attached in **Appendix G1**.

- Ecological Impact Assessment (**Covers the Terrestrial Biodiversity and Animal Species Themes**) (see **Section 12.1** for a summary):
- Avifauna (see **Section 12.2** for a summary)
- Floodline (**Due to the nature of the proposed development, it is advisable to determine Floodline in order to guide the process of placing towers away from floodlines**) (see **Section 12.3** for a summary)
- Heritage (**Covers Archaeological and Cultural Heritage Theme**) (see **Section 12.4** for a summary).

- **Agriculture Theme**- Based on the Site inspection the proposed development will have minimal impact on the Agriculture sensitivity Theme

11.3 ASSESSMENT METHODOLOGY

The key issues identified informed the terms of reference of the specialist studies. Each issue consists of components that on their own or in combination with each other give rise to potential impacts, either positive or negative, from the project onto the environment or from the environment onto the project. The significance of the potential impacts has been considered before and after identified mitigation is implemented, for direct, indirect, and cumulative impacts, in the short and long term.

A description of the nature of the impact, any specific legal requirements and the stage (construction or operation) have been detailed in the specialist studies given. A separate Environmental Basic Impact Assessment will be required at a later stage for decommissioning.

The following criteria have been used to evaluate significance:

- Nature: This is an appraisal of the type of effect the activity is likely to have on the affected environment. The description includes what is being affected and how. The nature of the impact will be classified as positive or negative, and direct or indirect.
- Extent: This indicates the spatial area that may be affected (**Table 11-4**).

Table 11-4: Geographical extent of impact

RATING	EXTENT	DESCRIPTION
1	Site	Impacted area is only at the site – the actual extent of the activity.
2	Local	Impacted area is limited to the site and its immediate surrounding area
3	Regional	Impacted area extends to the surrounding area, the immediate and the neighbouring properties.
4	Provincial	Impact considered of provincial importance
5	National	Impact considered of national importance – will affect entire country.

- Duration: This measures the lifetime of the impact (**Table 11-5**).

Table 11-5:Duration of Impact

RATING	DURATION	DESCRIPTION
1	Short Term	0 – 3 years, or length of construction period
2	Medium Term	3 – 10 years
3	Long Term	> 10 years, or entire operational life of project.
4	Permanent-Mitigated	Mitigation measures of natural process will reduce impact- impact will remain after operational life of project.
5	Permanent-no mitigation	No mitigation measures of natural process will reduce impact after implementation-impact will remain after operational life of project.

- Intensity / severity: This is the degree to which the project affects or changes the environment; it includes a measure of the reversibility of impacts (**Table 11-6**).

Table 11-6:Intensity of Impact

RATING	INTENSITY	DESCRIPTION
1	Negligible	Change is slight, often not noticeable, natural functioning of environment not affected.
2	Low	Natural functioning of environment is minimally affected. Natural, cultural and social functions and processes can be reversed to their original state.
3	Medium	Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.
4	High	Cultural and social functions and processes disturbed – potentially ceasing to function temporarily.
5	Very high	Natural, cultural and social functions and processes permanently cease, and valued, important, sensitive vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.

- **Potential for irreplaceable loss of resources**: This is the degree to which the project will cause loss of resources that are irreplaceable (**Table 11-7**).

Table 11-7: Potential for irreplaceable loss of resources

RATING	POTENTIAL FOR IRREPLACEABLE LOSS OF RESOURCES	DESCRIPTION
1	Low	No irreplaceable resources will be impacted.
3	Medium	Resources can be replaced, with effort.
5	High	There is no potential for replacing a particular vulnerable resource that will be impacted.

- Probability: This is the likelihood or the chances that the impact will occur (**Table 11-8**).

Table 11-8: Probability of Impact

RATING	PROBABILITY	DESCRIPTION
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur design or historic experience.
3	Medium	There is a distinct probability of the impact occurring.
4	High	It is most likely that the impact will occur.
5	Definite	The impact will occur regardless of any prevention measures.

- Confidence: This is the level of knowledge or information available, the environmental impact practitioner or a specialist had in his/her judgement (**Table 11-9**).

Table 11-9: Confidence in level of knowledge or information

RATING	CONFIDENCE	DESCRIPTION
1	Low	Judgement based on intuition, not knowledge/ information.
2	Medium	Common sense and general knowledge informs decision.
3	High	Scientific / proven information informs decision.

- **Consequence:** This is calculated as extent + duration + intensity + potential impact on irreplaceable resources.
- **Significance:** The significance will be rated by combining the consequence of the impact and the probability of occurrence (i.e. consequence x probability = significance). The maximum value which can be obtained is 100 significance points (**Table 11-10**).

Table 11-10: Significance of issues (based on parameters)

Rating	Significance	Description
1-14	Very Low	No action required.
15-29	Low	Impacts are within the acceptable range.
30-44	Medium-low	Impacts are within the acceptable range but should be mitigated to lower significance levels wherever possible.
	Medium-high	Impacts are important and require attention; mitigation is required to reduce the negative impacts to acceptable levels.
	High	Impacts are of great importance, mitigation is crucial.
81-100	Very high	Impacts are unacceptable.

- **Cumulative Impacts:** This refers to the combined, incremental effects of the impact, taking other past, present and future developments in the same area into account. The possible cumulative impacts will also be considered.
- **Mitigation:** Mitigation for significant issues will be incorporated into the EMPr.

Mora Ecological Services (Pty) Ltd conducted the Avifaunal Impact Assessment, Mveledzo Environmental and Safety Solution Pty (Ltd) conducted the Ecological Impact Assessment and the Floodline Study. Integrated Specialist Services (Pty) Ltd conducted the heritage impact assessment for the proposed development.

11.4 FINDINGS OF IMPACT ASSESSMENTS

The potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts. Detailed assessment tables have been included in each specialist study are summarised in **Table 11-11**:

Table 11-11:Construction Phase Impact Assessment

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
1. Impacts on flora fauna • Construction activities will disturb the fauna in the area. • The clearing of vegetation will result in the loss of habitat, habitat fragmentation and possibly a loss of species on the site. • The noises and vibrations resulting from machinery and blasting could impact on faunal species outside the site. • Pollution resulting from the construction site such as litter, solid waste, sewerage and spills of oil, lubricants and fuel could reduce the quality of the habitats in the surrounding area and directly impact on the health and welfare of the fauna and flora surrounding the site.	Medium (Negative)	• Educate workers on minimizing • damage to vegetation during construction • Only vegetation should be removed for the construction of proposed development and the footprint must be kept as small as possible. • Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention. • No burning of stockpiled vegetation is permitted.	Low Negative

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
• Use to the disturbance of the site alien plants will be able to establish and could become a problem by infesting neighbouring land.		• Alien vegetation must be cleared (if any) from the footprint of the development prior to construction.	
2. Soil erosion Construction earthworks may cause soil erosion	Medium (Negative)	• Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels, oils and lubricants. • All cement mixing must occur on impervious surfaces and within controlled areas. • Oil residue must be treated with oil absorbent spill kits and this material removed to a licensed waste disposal site. • Contractor/s must provide regularly serviced portable chemical toilets for construction workers at a distance no more than 200 m from the place of construction.	Low (Negative)

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
		• During operation, regular maintenance of the storage tanks is required to prevent fuel leaks. • No materials may be discharged from the construction camps.	
3. Impacts on storm water: The accumulation of storm water.	Medium	• The wetland must be kept with low water levels or be empty in the rainy season in order to have the capacity to handle a storm event.	Low Negative
4. Impacts on dust and air quality The influx of pollutants will occur due to the establishment of the construction camp and movement of people and vehicles on site.	High Negative	• Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • All vehicles transporting friable materials such a sand, rubble etc. must be covered by a tarpaulin or wet down.	Medium (Negative)

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
		• Speed restriction of 20km/h must be implemented for all construction vehicles.	
5. Water Pollution Groundwater contamination due to fuel leakages.	High Negative	• Regular monitoring of storage tanks must be done	Low Negative
6. Impact on aesthetic quality • Impact on the sense of place • Workforce and construction sites	Medium Negative	• Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders waste generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council. • No waste may be kept on the construction site for more than two weeks.	Low Negative

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
		• Supply sufficient garbage bins throughout the site and empty regularly. • Ensure good housekeeping is implemented always. • Keep the property neat and litter free always and maintain the landscaped areas.	
7. Impact on Socio-economics Impact on nearby residential areas.	Medium Negative Low	• All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent landowners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages.	Low Negative
8. Traffic Increase in traffic	High (Negative)	• Construction vehicle movement to and from site must be outside peak hour traffic (07:00am - 09:00am, & 16:00pm – 18:00pm.)	Medium (Negative)

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
		• Construction activities must not interfere with the flow of traffic or cause blockages. • Should road or lane closures be required, prior notice must be given, and permission requested from the responsible bodies (Authorities and landowners).	
9. Safety and Security: Workforce and construction sites.	Medium (Negative)	• Ensure all construction vehicles and machinery is under the control of competent personnel. • Limit access to the construction site to the workforce only. Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). • The above will apply when maintenance is required.	Low Negative
10. Economic Opportunities: • Job and business opportunities creation. • Improve economic activity of the area	High (Positive)	• There are no mitigation measures as the impact is positive.	High Positive

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
11. Cultural Sites and Historical and Pre-Historical Sites or Features The impact of the proposed development on heritage sites is insignificant as there are no known heritage sites on the development site or near the project.	Low Negative	There are no cultural or historical features on site or in the near vicinity. However, the provisions of the National Heritage Resources Act will apply. If any sign of a heritage or cultural site is unearthed during excavations, then all activity must cease until the Heritage Specialist has had an opportunity to investigate such finds.	Low Negative
12. Loss of land for farming The Agricultural Potential for the proposed development site has been classified as low according to the GDARD Conservation Plan (Version 3). However, the proposed development is a linear project that permit the continuation of farming underneath.	Low Negative	No relevant mitigation measures exist.	Low Negative
13. Visual Impact Construction activities that, without mitigation, could give rise to visual impacts. The following temporary activities are included: • Presence of storage and stockpile areas	Low to Moderate Negative	The visual impacts of construction activities will be temporary.	Low Negative

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
• Movements of construction machinery.			
14. Traffic Construction activities will require the movement of heavy vehicles and machinery on local road networks to access the development site. The movement of vehicles related to the proposed development may impact on local traffic movements.	Low Negative	Movement of construction vehicles on the local road network should be minimized as far as possible.	Low Negative
15. Safety During the construction phase, heavy machinery will be employed. The potential for accidents among operators exists if machinery is not handled properly. This is likely to have a negative impact on the health of the workers. The lack of enforcement of health and safety regulations could impact negatively on the construction workers.	Low Negative	To limit the risk of accidents, safety procedures must be put in place and enforced by the foremen to ensure that vehicles and machinery only drive in designated places and are only driven by authorized personnel. Occupational Health and Safety Requirements as determined by the Department of Health must be enforced during the construction phase of the proposed activities. Firefighting, containment of hazardous materials and First Aid are covered in the EMP.	Low Negative

POTENTIAL IMPACTS:	SIGNIFICANCE RATING OF IMPACTS:	PROPOSED MITIGATION:	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
16. Hydrocarbon Spills Potential oil and petroleum spills from construction vehicles and equipment may occur during the construction phase of the development. Such spills will also be possible during the operational phase of the development and may pollute the soil and nearby/underground water bodies.	Low Negative	The following measures may prevent or reduce the likelihood of hydrocarbon spills: • Use of drip pans where petroleum products are dispensed. • Storage of potential pollutants such as fuel and oil should be done on sealed surfaces to prevent soil and water contamination. Petroleum storage tanks should have bund walls around and should be high enough to contain any potential spillage;	Low Negative
17. Impact on Services Sufficient capacity in terms of water, sewage and electricity must be established to accommodate the proposed development.	Low to Moderate Negative	All stipulations and conditions provided by the local municipality in terms of installation of services should be adhered to.	Low Negative

Table 11-12: Potential Impacts of the Operational Phase

Impact Description: Disturbance of topsoil with construction of roads and footprint of towers	**Mitigation**
	Avoid:
	Minimise: Dust generation
	Restore/Rehabilitation: Revegetate disturbed areas with natural vegetation. Install surface water drainage structures to minimise erosion
	Compensate/Offset:

	Nature	Extent	Duration	Intensity	Potential for irreplaceable	Probability	Confidence	Consequence	Significance
1. 400 kV powerline									
Without Mitigation	1	1	1	1	1	2	3	4	8
With Mitigation	1	1	1	1	1	2	3	4	8

11.5 IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

Deviation 1

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
THE PROPOSED IMPACTS WILL BE THE SAME AS THAT FOR THE AUTHORISED CORRIDOR				

Deviation 2

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
THE PROPOSED IMPACTS WILL BE THE SAME AS THAT FOR THE AUTHORISED CORRIDOR				

Deviation 3

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
THE PROPOSED IMPACTS WILL BE THE SAME AS THAT FOR THE AUTHORISED CORRIDOR				

11.6 CUMULATIVE IMPACTS

Cumulative Impacts:

(a) **Changes in water flow regime**

Construction activities throughout the proposed power line alignment may result in cumulative impact to the water courses within the local catchments and beyond. It is very important that protective measures should be put into place and monitored. A rehabilitation plan should be put into action should any degradation be observed as a result from storm water or sediment input.

(b) Changes in sediment entering and exiting the system

Changes in sediment entering and exiting the system are expected to have moderate significance. Should mitigation measure not be implemented, and changes made to the bed or banks of watercourse unstable channel conditions may result causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place

(c) Alien Species Invasion

The introduction of alien species is expected to have moderate to high significance. Construction areas within the watercourses along the proposed servitude can experience

an increased invasion if mitigation is not implemented or implemented correctly. Regular monitoring should be implemented during construction, rehabilitation including for a period after rehabilitation is completed.

General cumulative Impacts:

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

(d) Waste generation

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

Aspect	Corrective measures	Impact rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	2	2	8	5	60=Medium
	Yes	Negative	1	2	4	4	28+Low
	• No waste will be buried on site or incorporated into the foundation trenches; • The work force must be encouraged to sort waste into recyclable and non-recyclable waste; • No burning of waste will be allowed on site; and • Waste must be regularly removed from site and disposed of at a registered waste disposal facility.						

(e) Socio-economic impact

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

Aspect	Corrective measures	Impact rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	

Socio-economic	No	Positive	3	2	8	5	65=Medium
	• For minimal jobs, the appointed contractor should by all means consider the local residents for jobs that do not need any skill transfer. • Property owners or occupiers must be treated with respect and courtesy at all times; • The culture and lifestyles of the communities living in close proximity to the proposed development must be respected; • No firewood is to be collected except with the written consent of the landowner; and • A register must be maintained of all complaints or queries received as well as action taken.						

(f) Traffic Impact

During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction.

Aspect	Corrective measures	Impact rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Traffic	No	Negative	2	2	8	3	39=Medium
	Yes	Negative	2	2	6	2	20=Low
	• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads; • Access roads must be clearly marked; and • Delivery vehicles must comply with all traffic laws and bylaws.						

11.7 ENVIRONMENTAL IMPACT STATEMENT

Summary of the potential impacts after management and mitigation have been taken into account are as follows:

Loss of habitat/biodiversity and impact on fauna and flora

It is expected that most of the current vegetation in the proposed area will be lost to construction activities. However, it has been proposed that indigenous vegetation be used for all landscaping activities. A rescue operation will be conducted to relocate the medicinal plants spotted on site. Considering the initial condition of the site, the resultant significance of the impact on habit and biodiversity loss will be low.

Noise

Construction activities will be responsible for noise pollution due to the presence of heavy vehicles and machinery, as well as the associated construction activity itself. The construction activity will be temporary in nature and standard methods can be employed to ensure that machinery and vehicular noise are kept to a minimal. Therefore, the resultant significance of the noise impact after mitigation measures is expected to be very low. Noise nuisance related to the operational phase of the development will result largely from vehicle movement. Noise impacts will be low taking into account the nature and size of the properties in the area for the operational phase.

Water, soil and air pollution

Various construction activities, if not properly managed, may result in pollution of soil, air and water resources. Best management practices should be applied in terms of fuel usage, dust suppression and general waste management Should such measures be implemented, the significance of impact on soil, air and water are expected to be low.

Property Values

The operational phase of the site should include good housekeeping measures to ensure that the development does not contribute to area neglect, and screening of the property by indigenous plants, these mitigation measures will bring the impact down to low.

Traffic

Traffic hindrances during the construction phase of the project will be temporary. The impact on traffic during the operational phase is expected to return to normal flow during the operational phase.

Impact on existing services

Civil services such as sewage, water and electricity must be established and made available at the site of the proposed development. Sufficient capacity must also be established to fully service the proposed development. Service installation must be

undertaken by qualified engineers and contractors. The resultant impact of the development on services in the area is therefore expected to be moderate.

Socio Economic Impact

The proposed activities will supply employment opportunities for locals and working there supplies them with skills development. Construction of powerlines will require more employees thereby expanding employment opportunities and uplifting the rural community thereby contributing to a Moderate Positive Impact.

Heritage impact

In terms of the archaeology and heritage with respect to the proposed development site there are no obvious 'Fatal Flaws' or 'No-Go' areas. No archaeological sites were recorded within the proposed development site. The field survey also established that the affected project area is degraded by existing infrastructure, landscaping, previous agriculture activities and associated infrastructure. This report concludes that the proposed development may be approved by SAHRA to proceed as planned subject to recommendations herein made which include a heritage monitoring plan being incorporated into the construction EMP (**refer to Appendix H**)

DEVIATION 1, DEVIATION 2 AND DEVIATION 3
THE PROPOSED IMPACTS WILL BE THE SAME AS THAT FOR THE AUTHORISED CORRIDOR
DEVIATION 1, DEVIATION 2 AND DEVIATION 3
THE PROPOSED IMPACTS WILL BE THE SAME AS THAT FOR THE AUTHORISED CORRIDOR

No-go (compulsory)

In accordance with GN R982, consideration must be given to the option not to act. This option is usually considered when the proposed development is envisaged to have significant negative environmental impacts that mitigation measures cannot ameliorate the identified impacts effectively. The no-go alternative would be the option of not undertaking the development of the proposed project. It would imply that the current

electricity supply network is not strengthened, industrial development in the area will be hindered and the integration of potential renewable energy in the area will not be possible.

CHAPTER 12

12. SUMMARY OF FINDINGS AND RECOMMENDATION OF THE SPECIALISTS STUDIES

GN 982 Appendix 1:

(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;

12.1 Ecological Impact Assessment

The motivations for this Powerline project include the cumulative impact of the development on habitat loss, fragmentation and the loss of individuals of protected tree species. However, given the scale of development at the site and combined impact on ecological function and biodiversity at the site, exceptional mitigation beyond standard avoidance and minimising of impacts is warranted. In order to address these concerns, the developer must only develop and clear only areas that are to be developed. However, this should not be accepted without critical evaluation and the current analysis provides an examination of the potential of the site to be used to reduce the residual impacts of the development. This investigation reveals the following outcomes and conclusions regarding the site and its potential value and limitations:

From a terrestrial biodiversity perspective, the Very High sensitivity areas are most commonly associated with CBA 1, CBA 2 and Ecological support area. The High sensitivity areas are most commonly associated with protected areas, Mountain and Catchment Areas. Given the length of the power line on the diverting options and the diverse nature of the receiving environment, it is not surprising that some impact on these higher sensitivity areas is unavoidable but can rather be minimised through measure stated in this report and other measures that have been identified in all specialist reports Including EMPr. New scientific evidence suggests that conservation and sustainable development go hand-in-hand (Heywood and Iriondo, 2003; Pool-Stanvliet, 2013; Tshisikhawe, 2016; and Pool-Stanvliet et al., 2018).

Search and rescue must be conducted prior to the construction phase to search and relocate the animals and plants of conservation concern. The conservation statuses and high distributional range of almost all the plant species found within the proposed area of development including all the sensitive environment must be considered. All areas with

the river and the streams must be avoided with a buffer that will be determined by the specialist always maintained. This will aid in reaching the goal of the South African National Development Plan 2030 to "[ensure] environmental sustainability and measurable economic growth" (National Planning Commission, 2012).

Further investigation and assessments may be required to inform future rehabilitation. Failure to conduct such investigations and assessments may have a detrimental impact on closure planning and rehabilitation. Concurrent rehabilitation of affected areas is suggested to blend the developed site actively during all project stages. **(Refer to Appendix G1: Ecological Impact Assessment).**

12.2 Avifauna

While electricity supply is an essential service for the country, it important that it does not negatively impact our ecological resources (plants, birds and other animals). Conservation of these resources should be prioritized. Impacts such as collisions, electrocutions, avifaunal displacement, and loss of habitats especially nesting site are expected during developments of this nature. Bird mortalities caused by transmission infrastructures have been documented worldwide and applicable methods to prevent such mortalities have been developed. Some of the listed mitigation measures will also protect other collision prone species, which include non-threatened large terrestrial and waterbird species. The following recommendations are applicable for the proposed transmission powerlines and associated infrastructures:

- A "Bird Friendly" structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower infrastructure.
- All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents (Hunting, 2002).
- Installation of artificial bird space perches and nesting platforms, at a safe distance from energised components (Goudie, 2006; Prinsen et al., 2012).
- Bird Flight Diverters should be placed from tower/pylon to tower/pylon instead of 60% placement along the collision risk areas. The relevant sections of power line requiring this mitigation should be confirmed by an avifaunal walk down once the exact route and tower positions are confirmed just prior to construction.
- Shaw (2013) found that collision still occurred near the towers/pylons. As a result, they recommended a 100% marking of a powerline on high collision risk sections.

- Overall, the impacts associated with this proposed transmission powerline are considered Low-Medium with the exception of collisions with powerlines and habitat loss resulting from establishment of servitudes.

It is the opinion of the specialist that the proposed construction of 2x 400kV transmission powerline namely, Aries to Upington be considered favourably, provided that the mitigations and recommendations are adhered to. **(Refer to Appendix G2: Avifaunal Impact Assessment).**

12.3 FLOODLINE REPORT

The floodline delineations are based on a DEM with a 30-meter resolution which was converted to the TIN Raster for data extraction by QRAS. The 1:100-year return period design flood peak discharge values were calculated using SDF Method. The extents of the corresponding floodline were determined through hydraulic modelling using the HEC-RAS model. This model provided highest water levels for different return periods. The resultant floodline where plotted using QGIS.

The study demarcated the 1:100-year return period flood located on the west side of the river. The floodline as demarcated by the dashed blue line represent the area that could be affected by a 1 in 100 years flood event, the east side of the river won't be affected by flood because it is located on the high elevation, and it protected by the Hill which is on the south side of the proposed powerline (refer to Figure 7). **(Refer to Appendix G3: Floodline Study).**

12.4 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT

The literature review and field surveys confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. In terms of the archaeology and heritage in respect of the proposed powerline deviations, the are no 'Fatal Flaws' or 'No-Go' areas. The section where modified rock shelters were recorded is already altered by prospecting activities, the tower position at the section b. However, the potential for chance finds, remains and the applicant and contractors are advised to watch out for accidental exposure of significant archaeological remains should construction activities commence along the proposed powerline deviations The procedure for reporting chance finds has clearly been laid out (see Appendix 3). This report concludes that the proposed powerline may be approved by SAHRA to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the EMP (also see Appendices). The mitigation measures are informed

by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA, Act 25 of 1999**. (Refer to Appendix G4: Archaeological and Heritage Impact Assessment).**

CHAPTER 13

13. ASPECTS TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

GN 982 Appendix 1:

(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;

None of the adverse impacts that were identified are regarded as impacts that cannot be mitigated to acceptable levels and therefore it is our opinion that there are no "fatal flaws" associated with the proposed development. The following aspects are recommended conditions of the Environmental Authorisation:

The powerlines should be constructed on identified servitude. Towers should be placed outside of riparian areas (Orange River) and their associated 32 m zones of regulation as far as is possible. Where powerlines are constructed in parallel, towers should preferably be positioned so as to alternate with those of the existing powerline (i.e. out- of-step) and not be placed opposite one another (in-step). This mitigation will increase the visibility of both sets of powerlines to flying large raptors and the birds may then be in a better position to take timely collision avoidance action. Lattice towers with visually intrusive footing designs should be avoided to reduce visual impacts, except for situations where strain towers are required or stability/geotechnical aspects play a role. Servitudes should avoid ridge, follow existing infrastructure corridors and avoid visually sensitive areas and receptors where practical.

Water Use Licences/Registrations must be obtained for any construction in an area regulated by the National Water Act (below 1:100-year floodline or 100 m from a watercourse and 500 m from a wetland).

A walk-down of the servitude once the tower positions have been determined, prior to any construction activities, must be undertaken by suitably qualified heritage, ecology and bird specialists. The specialist should recommend feasible design changes (i.e. moving tower positions within the approved corridor, preferably within the servitude if already negotiated) to further reduce impacts and identify any heritage resources that may be impacted upon, plants or animals that require rescue and sections of the powerlines that require bird diverters and towers that require bird guards. Areas with a high ecological sensitivity, wetlands and watercourses should be designated as "No-Go" areas and be off

limits to all unauthorised vehicles and personnel. These findings must be documented on powerline profiles and incorporated into the EMPr.

The footprint area of towers must be limited to what is essential in order to minimise impacts as a result of vegetation clearing and compaction of soils. Removal of plants should be restricted to only those trees that pose a risk to the powerline. Protected trees within the servitude will necessitate that appropriate permit are applied for before these trees are damaged or removed. Physical damage to natural vegetation on the periphery of the servitude, in all riparian areas and areas with steep slopes must be avoided. No hunting is permitted by Eskom employees or contractors. No incision and canalisation of the wetland features should take place. No material may be dumped or stockpiled in any "No-Go areas. All vehicles must remain on demarcated roads and within the project area footprint. All land disturbed by Eskom should be vegetated and left in the condition it was before the construction of the powerlines and no disturbed areas should be left uncovered during construction to prevent erosion.

The social mitigation and management measures include appointing a Community Liaison Officer, compiling and implementing policies for employment, conduct of employees and contractors, road use, access control specifically for protected and game reserve areas, a relocation and compensation in accordance with international best practice, strategies for community relations, communication, Corporate Social Investment, safety and security, HIV and life skills, and a grievance mechanism. A relocation specialist should be appointed should relocation be required. Construction camps should be established in accordance with international best practice, and Eskom must join local fire protection agencies and have and implement a firefighting strategy.

CHAPTER 14

14. CONCLUSION AND RECOMMENDATIONS

The proposed power lines and associated auxiliary developments will take place in an area, which was previously disturbed by other developments. No major or radical natural or human environmental impacts are anticipated during the construction and operational phases of the project if the mitigation measures outlined within the environmental management programme are followed.

The EAP recommends that the corridors within which servitudes for the construction and operation of the 2X 400kv Transmission lines be granted environmental authorisation. The project will address the following Eskom strategic objectives:

- reduce the impact on the environment through identifying, implementing and/or supporting internal and external options for low carbon emitting generation and transportation and opportunities.

This project will be an enabler to the country's drive to achieve energy diversification into the future. This is a strategic project to enable connection to IPP's in the future. EA needs to be obtained and servitudes acquired to reduce time to integrate IPP's after receiving preferred bidder status.

15. REFERENCES

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16. APPENDICES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers).

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix G1: Ecological Impact Assessment

Appendix G2: Avifaunal Specialist Study

Appendix G3: Floodline Study

Appendix G4: Archaeological and Heritage Impact Assessment

Appendix H: EMPr

Appendix I: Other information

17. EAP CV

CURRICULUM VITAE OF EDZISANI EUGINE SIPHUGU
118 Hollard Street, Eduan Park, Polokwane, 0699
☎ **(Cell)** 076 396 5177 / 011 468 1488
E-mail: esiphugu@gmail.com

PERSONAL INFORMATION

Surname : Siphugu
First names : Edzisani Eugine
Identity number : 850825 5951 083
Date of birth : 1985-08-25
Gender : Male
Nationality : South African
Marital status : Single
Home language : Tshivenda
Driver's License : Code 08 (EB)

Key Qualifications:

Siphugu Edzisani Eugine holds a degree in Environmental Science from the University of Venda. He further graduated an Honours degree in Environmental Management and Analysis from the University of Pretoria. Currently (2013) registered for a Masters degree in Environmental management and Analysis with the University of the North-West (Potchefstroom Campus). My past work experience includes RadRas Construction as an Environmental Control Officer (Compliance), Natural Resource (NRM) Consulting as an Environmental Practitioner and Transnet Capital Project as an Environmental Officer. My total work experience within the Environmental discipline sums to 5 years.

Specialist Area(s)

Environmental Law Compliance Monitoring, ISO1400 Series Application/ Auditing, Environmental Law Compliance Enforcement, Health & Safety, Waste Management, Public Participation Process & Environmental Capacity Building , Application of Environmental Laws for Authorizations (NEMA & Regulation), SDF, Environmental Management Plan, Environmental Management Systems & Review , Strategic Environmental Project Risk Assessment, Remote Sensing Application in Resource Assessment; GIS Application in Natural Resource Assessment; Site Surveys & Land Use Planning etc.

EDUCATION

Degree	Field	Institution	Year
Masters Degree	Environmental Management and Analysis • Introduction to Environmental Management • Introduction to Environmental law • Corporate Environmental Governance • Environmental management Systems • Water Management, Integrated Waste Management, Air quality Management, and Energy Management	University of North-West (Potchefstroom campus)	2017

	• Biodiversity, land management and planning • Mining and Environmental Management • Dissertation - The value of wetlands to human society: A study of how these values are affected by land use activities in Gauteng		
Honours Degree	Environmental Management and Analysis • Industrial Environmental Enforcement • Environmental Compliance • Environmental Impact Assessment and Auditing • Environmental Change • Environmental Principles • Land Reform • Research Methodologies and Presentation Skills	University of Pretoria	2008
Bachelor Degree	Environmental Science • Geographical Information Science (GIS), Remote Sensing and Biogeography (GIS Principles) • Environmental impact Assessment & Modelling • Planning Environmental Law & Policies • Urban and Regional Planning • Pollution and Environmental Quality • Rural Development Geography • Biogeography (Waste Disposal Management) • Principles of Resource Management	University of Venda	2007
Computer Certificate	Word, Excel, Power Point, Access, Internet and Publisher	University of Venda	2007
Short course	Advanced Environmental Law, Environmental Risk Assessment and Management based on ISO 31000, Implementing Environmental Management Systems (ISO 14001)	Centre of Environmental Management (Potchefstroom University)	2012; 2013; 2014
Short course	Fundamentals to project management (Project Life Cycle)	PM Ideas	2012
Short course	Wildlife Management • Biodiversity off-set	Endangered Wildlife Trust (EWT)	2012, and 2013
Short course	Project Management	University of Stellenbosch	2014
Management Course	Advanced Management Course (MAP)	Wits Business School	2016

PROFESSIONAL REGISTRATION

SACNASP (South African Council of Natural Scientific Professionals) – Registration in progress

EMPLOYMENT HISTORY

Current Employer : Vombe Consulting
Period : 01 October 2012 - Current
Position : Environmental Specialist

Duties and responsibilities;

- Support all company initiatives as directed by environmental planning, governance and assurance.
- Attend all committee meetings within the delivery stream.
- Arrange, chair and minute regular project environmental progress meetings with ECO consultants, and facilitate execution of projects.
- Participate in all the mega projects and EIA planning processes.
- Ensure quality control of all environmental services and products delivered in the stream
- Oversee environmental handover to Operating Division at time of commissioning of MEGA and MAJOR projects.
- Compile or obtain legal opinions on interpretation of environmental legislation where required.
- Facilitate communication and engagement with internal and external stakeholders during construction phase.
- Ensure treatment of environmental risks in the stream as per risk register and provide feedback for departmental report.
- Plan, monitor and control the project stream environmental budget.
- Provide the necessary input to support systems and required reporting, and ensure implementation of all systems on all projects in the region.
- Liaison with the regulatory authorities.
- Tender evaluation, development of environmental criteria and adjudication thereof
- Review all reports from the Environmental Officer, including sign off on monthly inspections and Method Statements.
- Conduct any environmental incident investigation.
- Ensure induction material includes project appropriate environmental issues.
- Develop training programmes and other awareness initiatives within the stream.
- Coordinate or facilitate internal and external environmental audits or authority inspection on all projects under execution.

Current Employer : Transnet Capital Projects, a division of Transnet SOC Limited
Period : 02 May 2010 – September 2015
Position : Environmental Officer
Directorate : Project Development and Execution Department (Mega Projects)

Duties and responsibilities;

- Assessment of ecological attributes of project sites as a baseline for construction and rehabilitation
- Monitor and facilitate the implementation of integrated environmental management policies and legal compliance
- Tender evaluations and adjudication – Determining prospective contractors' environmental performance
- Environmental auditing
- Liaison with the regulatory authorities
- Preparation of project environmental education material (Awareness)
- Compilation, review, revision and implementation of environmental management plans
- Preparation of project environmental design criteria
- Project environmental risk assessments
- Environmental reporting and data analysis
- Development of standard operating procedures for construction activities

Employer's Environmental Officer (for outsourced construction projects)

- Environmental Awareness Training (Posters, Toolbox Talks, Signage etc.)
- Monthly observation and environmental auditing of Contractors' work areas
- Monitor Contractors' Compliance with Environmental Authorisations, Permits, Licenses and Management Plans
- Ensuring that all environmental monitoring programmes (sampling, measuring, recording etc when specified) are carried out according to protocols and schedules
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc)
- Maintain site documentation related to environmental management (permits, EMP's, method statements, authorisations, reports, audits, monitoring results, receipts for waste disposal etc)
- Attendance at scheduled Safety, Health, Environmental and Project Coordination meetings
- Inspect and report on environmental incidents and check corrective action
- Keep a regular photographic record of all environmental incidents
- Implementation of environmental-related actions arising out of minutes from scheduled meetings
- Management of complaints
- Review and sign off method statements prepared by Contractors
- Audit Environmental Method Statements
- Collate information received, including monitoring results into a monthly report to the Construction Manager showing progress against environmental performance targets
- Compilation of the Project Environmental File

Contractor's Environmental Officer (for in-house construction projects)

- Daily, weekly and monthly inspections of work area(s) as per Employer EO's schedule
- Preparation of activity-based Environmental Method Statements
- On-going Environmental Awareness Training of the Contractor's site personnel
- Reporting and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities
- Close out of environmental incidents

- Attendance at all SHE meetings, toolbox talks and induction programmes
- Waste Management
- Ensuring that environmental signage and barriers are correctly placed
- Taking required corrective action within specified time frame

Previous Employer : NRM Consulting

Period : 02 February 2009 – 31 April 2010

Position : Environmental Practitioner

Directorate : GIS and Environmental Resource Management

Reason for leaving : Career Advancement

Duties and responsibilities;

- Conducting Feasibility Studies
- Facilitating stakeholder engagement and public participation
- Conduct environmental audits
- Provide project management support
- Compile audit and ECO reports
- Conduct environmental monitoring in urban and rural areas
- Compile environmental management plans and programmes
- Participate in generating feasibility and screening studies
- Assist with drafting project proposals, compilation of Basic Assessments and EIA reports and drafting of water use license applications and related documents

Institution : RadRas Construction

Period : May 2007 – January 2009

Position : Environmental Control Officer

Reason for Leaving : Career Advancement

Duties and responsibilities;

- Drive, co-ordinate and implement all aspects of the Environmental Control Programme to ensure compliance on construction projects.
- Liaise and provide feedback to all relevant disciplines in terms of progress, risks compliance and delays experienced on projects
- Assisting in ensuring necessary environmental authorizations and permits are maintained
- Monitoring and verifying that the EMP is adhered to and taking action for non-compliance.
- Assist in corresponding with interested & affected parties and relevant authorities
- Project Management Administration.
- Safe keeping of all documents throughout project life cycle.
- Compliance with OHS Act and legislative requirements

KNOWLEDGE

- NEMA 107 of 1998

- Air Quality Act 39 of 2004
- National Water Act 36 of 1998
- Pollution Prevention Act of 1965
- Occupational Health and Safety (OHSACT)
- ISO 14001
- Environmental Conservation Act no 73 of 1989
- Polluter pays principles
- Risk Management (Risk Identification, Risk Evaluation and Risk Control)
- Project Life Cycle process (PLP)
- New Engineering Contract (NEC3)
- CURA

SKILLS AND COMPETENCIES

Inter-personal skills: Eager to perform under pressure, Strong interpersonal relations, excellent attitude for learning new skills, Good communication and writing skills and Good Presentation skills

Computer skills: Micro soft Word, Power point, Excel, Access, Internet, SPSS & Outlook

Business skills: Marketing, Negotiation and advisory skills, Report writing, Time management, People management and Leadership

LANGUAGE

Language	English	Tshivenda	Tsonga	Pedi	Sotho	Zulu
Status	Excellent	Excellent	Excellent	Excellent	Excellent	Moderate

REFERENCES

Name : Mr S Ncube
Institution : NRM (Natural Resource Management) consulting
Position : Manager
Contact No : Tel: 011 318 0895/ Cell: 078 365 4230

Name : Mr R Radebe
Institution : RadRas Construction
Position : Managing Director
Contact No : Tel: 072 2010 200 / 076 010 1997

Name : Mr K. E Tshipala
Institution : Transnet Capital Project
Position : Senior Environmental Manager
Contact No : Tel: 011 308 4705/ Cell: 073 200 1020