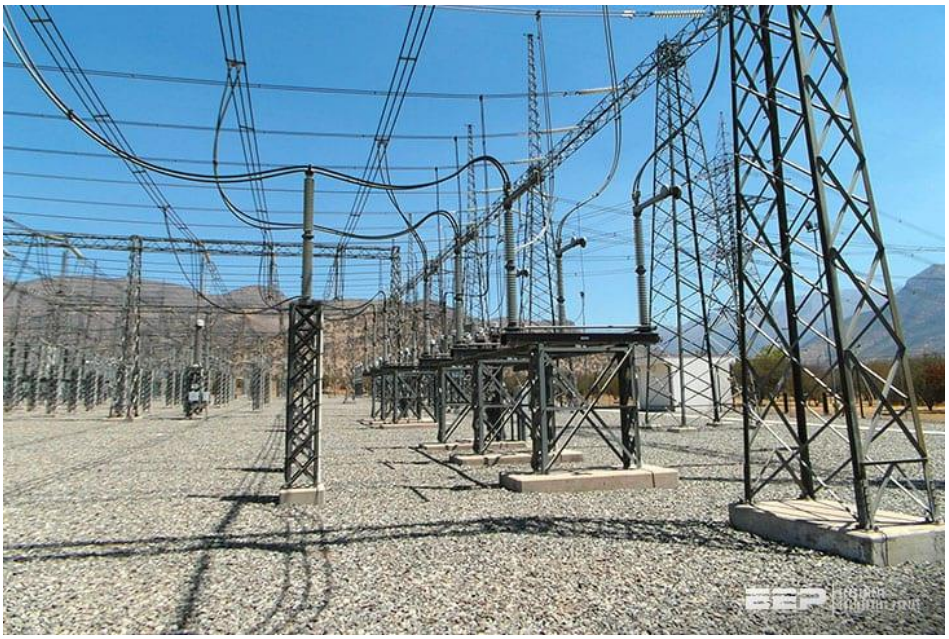
PROPOSED ELECTRICAL LINE 0F 2 X 400 kV WHICH RUNS FROM ARIES SUBSTATION NEAR KENHARDT TO UPINGTON SUBSTATION NEAR UPINGTON, IN THE KAI GARIB AND KHARA HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.



FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

DFFE REFERENCE: 2021-07-0024

PREPARED FOR: ESKOM HOLDINGS (SOC) LTD

PREPARED BY: VOMBE ENVIRONMNETAL CONSULTING

MAY 2022

GENERAL INFORMATION

Project Name:	**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.**
Report Name	**ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)**
Authority Reference	**2021-07-0024**
Report Status	**Final**
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Report Date:	**17 May 2022**
Status:	**Final Report**

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LIST OF ABBREVIATIONS

CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GA	General Authorisation
GN	Government Notice
IAP	Interested and Affected Party
Km	Kilometre
LM	Local Municipality
NEMA	National Environmental Management Act
NWA	National Water Act
NWPHRA	North West Provincial Heritage Resources Authority
OHS	Occupational Health and Safety
SAHRA	South African Heritage Resources Agency

DEFINITIONS

Auditing	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis.
EBA	Environmental Basic Assessment is the level of environmental assessment applied to activities listed in Listing 1 and Listing 2. These are smaller scale activities, the impacts of these activities are generally known and can be easily managed.
Environment	The surroundings in which humans exist and which comprise: • The land, water and atmosphere of the earth. • Micro-organisms, plant and animal life. • Any part or combination of a) and b) and the interrelationships among and between them. • The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that can influence human health and well-being.
Environmental Aspect	Those components of the company's activities, products and services that are likely to interact with the environment.
Environmental Authorisation	The written statement from the relevant environmental authority in terms of the National Environmental Management Act (Act 107 of 1998), with or without conditions, that records its approval of a planned activity and the implementation thereof and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Environmental Feature	Elements and attributes of the biophysical, economic and social environment.
Environmental Impact	The change to the environment resulting from an environmental aspect, whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.
Environmental Impact Assessment (EIA	The process of examining the environmental effects of a development in terms of the National Environmental Management Act (Act 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations.
Environmental Management Programme (EMPr)	A detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the life cycle of a project.
Environmental Objective	Overall environmental goal pertaining to the management of environmental features.
Environmental Target	Performance requirement that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Groundwater	Sub-surface water in the zone in which permeable rocks, and often the overlying soil, are saturated.
Hazardous waste	Waste that are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or classified as such in legal terms.
Heritage Resource	Any place or object of cultural significance including buildings, structures, landscapes, graves and geological, archaeological and palaeontological sites.

Landscape	Land modified for human use and occupation, embracing both the natural (wilderness) environment and the urban.
Management Actions	Practical actions aimed at achieving management objectives and targets.
Management Objectives	Desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources).
Monitoring	A systematic and objective observation of an organization's activities and services conducted and reported on regularly.
Natural Vegetation	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Pollution	Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future. Furthermore, pollution can also be regarded as an undesirable state of the natural environment being contaminated with harmful substances as a consequence of human activities.
Protected Plants	Plant species officially listed on the Protected Plants List (each province has one), and which may not be removed or

	transported without a permit to do so from the relevant provincial authority.
Reinstatement	Reinstatement is defined as the return of a disturbed area to a state, which approximates the state (where possible), which it was before disruption.
Runoff	The total water yield from a catchment including surface and subsurface flow.
Riparian Habitat	The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.
Sensitive Environmental Features	Environmental features protected by legislation (e.g. heritage resources), or identified during the EIA as sensitive through specialists' findings and input received from Interested and Affected Parties.
Subsoil	The soil horizons between the topsoil horizon and the underlying parent rock.
Topsoil	Topsoil can be regarded as the fertile upper part or surface of the soil.
Transplanting	The removal of plant material and replanting the same plants in another designated position.
Wastewater	Means water contaminated by the project activities.
Watercourse	A geomorphological feature characterized by the presence of a streamflow channel, a floodplain and a transitional upland fringe seasonally or permanently conveying surface water.

Weeds and Invader Plants	Weeds and invader plants are defined as undesirable plant growth that shall include, but not be limited to all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (No 43 of 1983) regulations. Other vegetation deemed to be invasive should be those plant species that show the potential to occupy in number, any area within the defined construction area.
Wetland	Land where a surplus of water (i.e. waterlogging) is the key factor determining the nature of the soil development as well as the types of plants and animals living at the soil surface.

1. DOCUMENT ROADMAP

This document serves as the Draft Environmental Management Programme (EMPr) for the pre-construction, construction and operational phases for the proposed electrical line of 2X 400 KV 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.

In order to provide clarity to the reader, a document roadmap is provided in Table 1 below. The document roadmap provides information on the requirements of the 2014 Environmental Impact Assessment (EIA) Regulations, as amended (07 April 2017), as stipulated in Appendix 4 of Government Notice (GN) No. R. 982, as promulgated in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) as well as a guide on the content of each chapter.

Table 1-1: Document Roadmap

CHAPTER	TITLE	CORRELATION WITH APPENDIX 4 OF G.N. NO. R982	
1	Documents Roadmap	N/A	
2	Purpose of the Document	N/A	
3	Project Overview	N/A	
4	Environmental Assessment Practitioner/s	1(a)	Details of – i. the EAP who prepared the EMPr; and ii. the expertise of that EAP to prepare an EMPr, including curriculum vitae.
5	Legislation and Guidelines Considered	N/A	
6	Roles & Responsibilities	1(i)	An indication of the persons who will be responsible for the implementation of the impact management actions.
7	Monitoring	1(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).
		1(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).

		1(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).
		1(l)	A programme for reporting on compliance, taking into account the requirements as prescribed by the Regulations.
8	Environmental Training & Awareness Creation	1(m)	An environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.
9	Environmental Activities, Aspects and Impacts	1(b)	A detailed description of the aspects of the activity that are covered by the final environmental management plan.
10	Sensitive Environmental Features	1(c)	A map at an appropriate scale that 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.
11	Impact Management	1(d)	A description of 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 – (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities.
		1(f)	A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;

			(ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.
		1(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.
		1(l)	A programme for reporting on compliance, taking into account the requirements as prescribed by the Regulations.
N/A		1(n)	Any specific information that may be required by the competent authority
N/A		2	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.

2. PURPOSE OF THIS DOCUMENT

The EMPr contains suitable mitigation measures to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts of the project. The EMPr is to be implemented during various phases of the project. The EMPr will be continuously updated throughout the EIA phase.

An EMPr represents a detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the lifecycle of a project. The Department of Environmental Affairs (DEA) has requested that the EMPr must be clear on the commitments made on which mitigation measures will be implemented in a document that is to be enforced as part of a legal requirement during the lifespan of the proposed project.

The scope of 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 EMPr is as follows:

- Establish management objectives during the project lifecycle in order to enhance benefits and minimise adverse environmental impacts;
- Provide targets for management objectives, in terms of desired performance;

- Describe actions required to achieve management objectives;
- Outline institutional structures and roles required to implement the EMPr;
- Provide legislative framework; and
- Description of requirements for record keeping, reporting, review, auditing and updating of the EMPr.

The primary objectives of the EMPr are to:

- Provide mitigation measures to limit environmental impacts and improve management of activities thereby reducing the probability of impacts occurring; and
- Define organisational and administrative arrangements for environmental management and monitoring of the work contract, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures.

3. ENVIRONMNETAL ASSESSMENT PRACTITIONER

Vombe Environmental consulting was appointed by Eskom Holding (SOC) Ltd as the independent Environmental Assessment Practitioner (EAP) to undertake the EBA for the proposed 400KV powerline from Aries Substation to Upington Substation, Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province.

The core members of Vombe Environmental Consulting that are involved in the Environmental Basic Assessment (EBA) for the proposed project are captured in Table 3-1 below, and their respective Curricula Vitae are contained in Appendix 1of the EBA Report.

Table 3-1: EBA Core Team Members

Name	Qualification	Responsibility
Edzisani Siphugu	Master of Environmental Management and Analysis (NWU)	Lead Environmental Assessment Practitioner

4. PROJECT OVERVIEW

4.1 Project Description

Eskom Holding SOC Limited is proposing to construct a 2X 400kV transmission powerline infrastructure from Aries substation near Kenhardt to Upington substation near Upington. The proposed powerline length is 145 km.

4.2 Project Location

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 4-1). The route for the proposed powerline deviation extending from Aries substation near Kenhardt to Upington substation near Upington, is an approximate distance of 145 km.

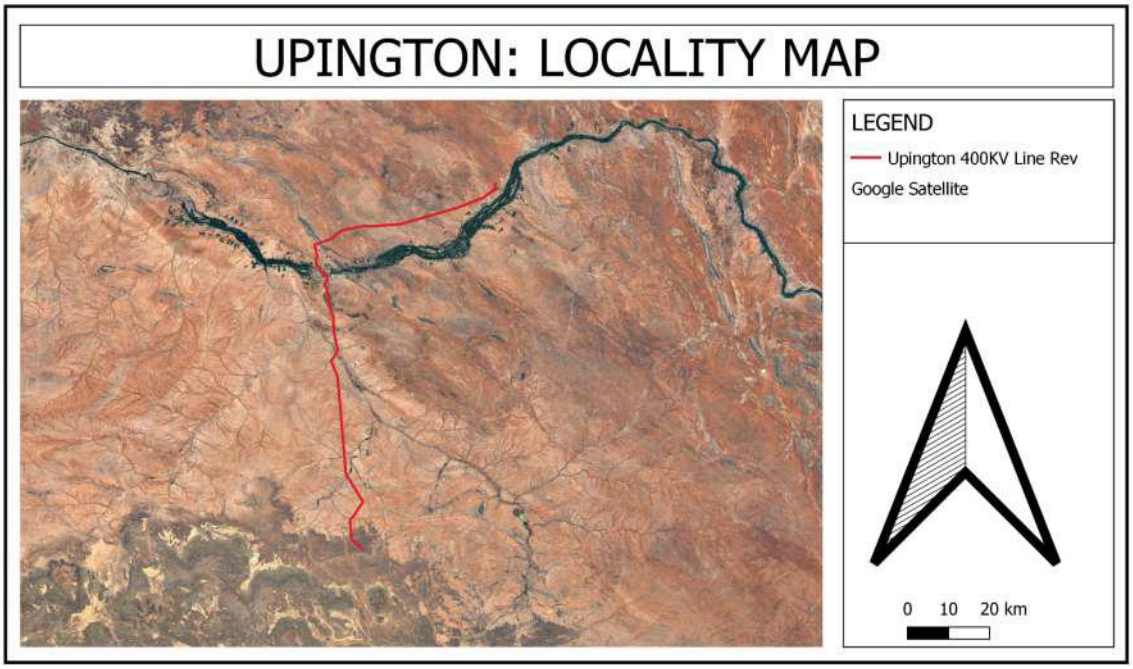

Figure 4-1: Proposed project area

5. LEGISLATION AND GUIDELINES CONSIDERED

5.1 Overview of legislation

Some of the pertinent environmental legislation that has bearing on the proposed development is captured in Table 5-1 below. A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

Table 5-1: Environmental legislative framework

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
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

LEGISLATION	SECTION	RELATES TO
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 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

5.2National Environmental Management Act (Act No. 107 of 1998

The proposed 2x 400kv powerlines from Aries substation to Upington substation requires authorisation in terms of NEMA, and the EIA will be undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017). Important aspects of NEMA are sustainability principles such as the “Polluter Pays” and the “Precautionary Principle” which will also be taken into account in the assessment of the impacts of the proposed development.

The proposed 2x 400kv powerlines from Aries substation to Upington substation triggered activities under Listing Notice 2. The Listed Activities are explained in the context of the project in Table 5-2.

Table 5-2: EIA Listed Activities for the proposed 400kv powerline from Aries substation to Upington substation.

LISTING NOTICE	ACTIVITY	DESCRIPTION
Listing Notice: 2	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 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 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. 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;

5.3National Water Act (Act No. 36 of 1998)

The National Water Act (Act No. 36 of 1998) (NWA) regulates water resources of South Africa. Water is considered a scarce commodity and must therefore be adequately protected. Amongst others, the act deals with the protection of water sources, water uses, water management strategies and catchment management, dam safety and general powers and functions. The purpose of the act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled. The NWA includes the definition of a Water Resource.

The NWA definition for a Water Resource includes:

1. A Watercourse;
2. Surface Water
3. An Estuary; and
4. An Aquifer.

The NWA defines a watercourse as follows:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse include, where relevant, its bed and banks.

The Act also specifies that a wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil. Section 21 of the NWA provides information on what water uses require approval, i.e. a Water Use License (WUL). These include:

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

The abovementioned water uses that apply to the proposed 2X 400kv powerlines from Aries substation to Upington substation include: 21 (c) and (i).

Any development within the riparian habitat or 1:100-year floodline (whichever is the greatest distance from the watercourse), will require an authorisation from the Department of Water and Sanitation (DWS). However, the only way to determine the riparian area is through a riparian habitat delineation.

A General Authorisation (GA) in terms of Section 39 of the NWA (GN No 40229 published in Government Gazette No. 509, dated 27 July 2016) states that a regulated area of a watercourse includes: "A 500 m radius from the delineated boundary (extent) of any wetland or pan". A GA can be applied if the use of water in terms of section 21(c) or (i) of NWA within the regulated area of a watercourse has a Risk Class that is Low, as determined by the Risk Matrix.

6. ROLES AND RESPONSIBILITIES

6.1 Department of Forestry, Fisheries and the Environment (DFFE)

DFFE are the mandated authority in terms of NEMA that determine whether authorisation can be issued for the project, following a decision-making process. DFFE also fulfils a compliance and enforcement role with regards to the authorisation. The Department may perform random inspections to checks compliance. DFFE will review the monitoring and auditing reports compiled by the Environmental Control Officer (ECO).

6.2 Project Proponent

Eskom Holdings SOC Limited is the applicant in terms of NEMA. Eskom is also the Project Proponent for all components of the work related to the development and is ultimately responsible for the development and implementation of the EMPr and ensuring that the conditions in the EA are satisfied. The liability associated with environmental non-compliance rests with the Project Proponent.

6.3 Project Manager

The Project Manager has overall responsibility for managing the project and for ensuring that the environmental management requirements are met with regards to the EMPr, EA, and other environmental licenses or permits. During the operational phase, it is expected that this role will be fulfilled by the Operations Manager.

The Project Manager's responsibilities will include the following (amongst others):

- The Project Manager's responsibilities will include the following (amongst others):
- Management of the project team including the ECO, the Contractor and the other project role players.

6.4 Environmental Controller Officer (ECO)

The ECO is a competent and independent representative. The ECO will undertake inspections of the site and full compliance auditing against the EMPr and EA. The audit reports will be submitted to the project manager and also be made available to the relevant authorities, on their request.

The ECO will check the following:

- The record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken;
- The public complaints register in which all complaints are recorded, as well as actions taken; and
- Results from the environmental monitoring programme (air, noise, water quality).

Further duties of the ECO will be the following:

- Monitoring of compliance with the EA, EMPr and the Project Specification.
- Make recommendations on how to best apply the environmental requirements on site and advise the Contractor on the site instructions required to facilitate effective environmental compliance.
- Participate in the quality management system by issuing non-conformances when there are areas of the project environmental requirements that are not being met.

6.5 Environmental Site Agent

The Environmental Site Agent (ESA) should:

- Be fully conversant with the content of the Environmental Management Programme;

- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;

Compile the Method Statements together with the Contractor that will specify how potential environmental impacts in line with the requirements of the EMPr will be managed and how they will practically ensure that the objectives of the EMPr are achieved;

- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMPr;
- Ensuring that the list of transgressions issued by the ECO is available on request;
- Maintain the following documents on site:
    - ✓ EMPr;
    - ✓ Method Statements;
    - ✓ A site diary;
    - ✓ I & AP's complaints register;
    - ✓ Environmental incidents register; and
    - ✓ Update Material Safety Data Sheets (MSDS).

6.6 Contractor's Environmental Officer (EO)

The primary role of the competent EO is to implement the EMPr and EA during the construction phase. Specific responsibilities of the EO will be fulltime on site, will include the following:

- Aiding the Contractor to comply with all the project's environmental management requirements;
- Assisting the Contractor in compiling Method Statements;
- Facilitating environmental activities and environmental awareness training of relevant persons on site;
- Exercise an internal compliance management system on behalf of the Contractor;

- Inspect the site as required to ensure adherence to the management actions of the Preconstruction and Construction EMPr and the Method Statements;
- Provide inputs to the regular environment report to be prepared by the ECO (as required);
- Liaise with the construction team on issues related to implementation of, and compliance with, the Pre-construction and Construction EMPr;
- Maintain a record of environmental incidents (such as spills, impacts, legal transgressions) as well as corrective and preventive actions taken; and
- Maintain a public complaint register in which all complaints are recorded, as well as action taken.

7. MONITORIING

Monitoring is required to ensure that the receiving environment at the study area is suitably safeguarded against the identified potential impacts, and to ensure that the environmental management requirements are adequately implemented and adhered to during the execution of the project. The project is to be implemented in accordance with Eskom's Environmental Management Policy and ISO 14001 based Environmental Management System (EMS).

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be made available for monitoring purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legal. Regular monitoring of site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the Site Supervisor shall keep abreast of all works to ensure no problems arise.

Weekly environmental compliance reports shall be forwarded to the Eskom PM with all information relating to environmental matters. The following Key Performance Indicators must be reported on a two-weekly basis by the ECO:

- Environmental incidents (e.g. fuel spills) and actions taken;
- Incidents that can lead to legal contraventions and litigation;
- Complaints from Interested and Affected Parties, which must be recorded and kept on file; and
- Environmental damage that needs rehabilitation.

The following documentation shall be kept on site:

- Access negotiations and physical access plan;
- Complaints register;
- Site daily diary;
- Records of all remediation / rehabilitation activities;
- Copies of two-weekly reports to the Environmental Advisor;
- Copy of the EMPr and EA; and
- Minutes of site meetings (including discussions related to environmental matters).

Environmental Audits will be carried out during and upon completion of construction.

A document handling system must be established to ensure accurate updating of the EMPr documents, and availability of all documents required for the effective functioning of the EMPr. Supplementary EMPr documentation could include:

- Method Statements;
- Site instructions;
- Emergency preparedness and response procedures;
- Record of environmental incidents;
- Non-conformance register
- Training records;
- Site inspection reports;
- Monitoring reports;
- Auditing reports; and

Public complaints register (single register for maintained for overall site).

8. ENVIRONMENTAL TRAINING AND AWARENESS CREATION

Training aims to create an understanding of environmental management obligations and prescriptive measures governing the execution of the project. It is generally geared towards project team members that require a higher-level of appreciation of the environmental management context and implementation framework for the project.

Awareness creation strives to foster a general attentiveness amongst the construction workforce to sensitive environmental features and an understanding of implementing environmental best practices. The various means of creating environmental awareness during the construction phase of the project may include:

- Induction course for all workers before commencing work on site;
- Refresher courses (as and when required);
- Toolbox talks, focusing on particular environmental issues (task- and area specific);
- Courses must be provided by suitably qualified persons and in a language and medium understood by the workers;
- Erect signage and barricading (where necessary) at appropriate points in the construction domain, highlighting sensitive environmental features (e.g. grave sites, protected trees); and
- Place posters containing environmental information at areas frequented by the construction workers (e.g. eating facilities).

Training and awareness creation will be tailored to the audience, based on their designated roles and responsibilities. Records will be kept of the type of training and awareness creation provided, as well as containing the details of the attendees.

9. ENVIRONMNETAL ACTIVITIES, ASPECTS AND IMPACTS

9.1 Project Lifecycle Approach

The entire lifecycle for the proposed project includes the following phases:

- Feasibility phase – This includes selecting a suitable corridor for the route of the proposed powerline following the execution of an EIA Process. Servitude negotiations are also initiated during this phase;
- Planning and design phase – This phase, which is only undertaken should environmental authorisation be obtained, includes the following –
    - Aerial survey of the route;
    - Selection of the most appropriate structures;
    - Eskom and environmental specialists (e.g. ecologist, avifauna and heritage) conduct a walk-down survey to determine the exact locations of the towers, based on sensitive environmental features and technical criteria; and
    - Preparation of relevant planning documentation, including technical and design documentation.
- Construction phase – During the implementation of the project, the construction activities related to the installation of the necessary infrastructure and equipment is undertaken;
- Operational phase – This includes operational activities associated with the maintenance and control of the powerline; and

- Decommissioning – This phase will include measures for complying with regulatory requirements, rehabilitation and managing environmental impacts in order to render the affected area suitable for future desirable use.

This EMPr focusses on the pre-construction, construction and operation phases of the project.

In order to establish best management practices and prescribe mitigation measures, the following project-related information needs to be adequately understood:

- Activities associated with the proposed project;
- Environmental aspects associated with the project activities;
- Environmental impacts resulting from the environmental aspects; and
- The nature of the surrounding receiving environment.

9.2 Environmental Activities

The main project component includes the installation of the proposed powerline (including concrete foundations, towers, conductors and anchors). For the purposes of effective and efficient monitoring, the aspects of construction are outlined separately for pre-construction and construction phases. In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project lifecycle, as shown below (Table 9-1, 9-2 and 9-3):

Table 9-1: Activities associated with Pre-construction Phase

PRE-CONSTRUCTION PHASE
PROJECT ACTIVITIES
1. Obtain EA, Water Use License (WUL) and other relevant permits if required
2. Applicant to appoint an ECO
3. Negotiations and agreements with the affected landowners, stakeholders and authorities
4. Initiate legal process required for powerline servitude
5. Detailed engineering design
6. Detailed geotechnical investigations, if applicable
7. Survey and mark construction servitude
8. Survey and map topography for determination of post-construction landscape, rehabilitation and shaping (where necessary)
9. Pre-construction photographic records

10. Development and approval of method statements
11. Development of employment strategy
12. Development and approval of construction plans
ENVIRONMENTAL ACTIVITIES
13. Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation
14. Undertake a walk-down survey of the project footprint by the relevant environmental specialists to identify sensitive environmental features
15. Develop Search, Rescue and Relocation Management Plan, based on findings of walk-down survey
16. Barricading and installing barriers around buffer areas as identified in the Specialist Studies
17. Ongoing consultation with Interested and Affected Parties (IAPs)
18. Establish baseline water quality data for river crossings based on aquatic and wetland studies

Table 9-2: Activities associated with Construction Phase

CONSTRUCTION PHASE
PROJECT ACTIVITIES
1. Site establishment
2. Pegging of central line and overall footprint
3. Grading of site (where necessary)
4. Construct new access road (where necessary)
5. Delivery of construction material
6. Transportation of equipment, materials and personnel
7. Storage and handling of material
8. Construction employment
9. Stormwater control mechanisms
10. Site clearing
11. Excavations for foundations and anchors of towers
12. Position premade foundation structures into excavations
13. Erection of steel structures
14. Construction works for the powerline
15. Stringing of cables
16. Management of topsoil and spoil

17. Concrete works (filling of foundations)
18. Traffic control measures
19. Mechanical and electrical works
20. Electrical Supply
21. Cut and cover activities
22. Stockpiling
23. Waste and wastewater management
24. Site security
25. Construction of powerlines and towers
26. Landscaping
27. Signing off by landowners
28. Handing over the servitude
ENVIRONMENTAL ACTIVITIES
29. Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation
30. Ongoing search, rescue and relocation of red data, protected and endangered species, medicinal plants, heritage resources (based on area of influence of the construction activities) – permits to be in place.
31. Control of invasive plant species
CONSTRUCTION PHASE
32. Conduct environmental awareness training
33. Implement EMPr
34. Reinstatement and rehabilitation of construction domain
35. On-going consultation with IAPs

Table 9-3: Activities associated with Operation Phase

OPERATION PHASE
PROJECT ACTIVITIES
1. Maintenance of powerline infrastructure
2. Routine maintenance inspections
3. Servitude access arrangements and requirements
ENVIRONMENTAL ACTIVITIES

4. Stormwater management
5. Pollution control measures
6. Maintenance of servitude
7. Management of vegetation clearance
8. Management of sensitive areas or buffered areas
9. On-going consultation with IAPs

9.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact. The following environmental aspects have been identified for the proposed project, which are linked to the project activities (note that only high-level aspects are provided) (Table 9-4, 9-5 and 9-6):

Table 9-4: Environmental aspects associated with Pre-construction Phase

ENVIRONMENTAL ASPECTS
PRE-CONSTRUCTION PHASE
1. Insufficient construction site planning and layout
2. Poor consultation with landowners, affected parties, stakeholders and authorities
3. Site-specific environmental issues not fully understood
4. Inadequate environmental and compliance monitoring
5. Absence of relevant permits
6. Lack of barricading of sensitive environmental features
7. Poor waste management
8. Absence of ablution facilities

Table 9-5: Environmental aspects associated with the Construction Phase

Environmental Aspects
Construction
1. Poor consultation with landowners and affected parties
2. Inaccurate walk-down survey
3. Inadequate environmental and compliance monitoring
4. Lack of environmental awareness creation
5. Construction starting without or inadequate search and rescue
6. Indiscriminate site clearing
7. Poor site establishment
8. Poor management of access and use of access roads
9. Inadequate provisions for working on steep slopes
10. Poor transportation practices
11. Poor traffic management
12. Disturbance of topsoil
13. Disruptions to existing services

14. Inadequate storage and handling of material
15. Inadequate storage and handling of hazardous material
16. Erosion
17. Poor maintenance of equipment and plant
18. Poor management of labour force
19. Pollution from ablution facilities
20. Inadequate management of construction camp
21. Poor waste management practices – hazardous and general solid, liquid
22. Poor management of pollution generation potential
23. Poor management of water
24. Damage to significant fauna and flora
25. Environmental damage of sensitive areas
26. Disruption of archaeological and culturally significant features (if encountered)
27. Dust and emissions
28. Noise nuisance due to construction activities
29. Influence to resource quality of the affected rivers from river diversions
30. Poor reinstatement and rehabilitation

Table 9-6: Environmental aspects associated with the Operational Phase

OPERATIONAL PHASE
1. Poor consultation with landowners, affected parties, stakeholders and authorities
2. Poor implementation of Eskom standards.
3. Inadequate environmental and compliance monitoring
4. Inadequate management of access, routine maintenance and maintenance works

9.4 Potential Significant Environmental Impacts

Environmental impacts are the change to the environment resulting from an environmental aspect, whether desirable or undesirable. Refer to **Tables 9-7** and **9-8** for the potential significant impacts associated with the preceding activities and environmental aspects for the construction and operation phase.

Table 9-7: Potential significant environmental impacts during Construction Phase

ENVIRONMENTAL FEATURE	POTENTIAL IMPACTS/IMPLICATIONS
Geology	• Unsuitable geological conditions

ENVIRONMENTAL FEATURE	POTENTIAL IMPACTS/IMPLICATIONS
	• Blasting (if required)
Soil	• Soil erosion • Soil contamination
Topography	• Visual impact • Crossing topographic features (watercourses) • Erosion of affected areas on steep slopes
Surface Water	• Surface water pollution due to spillages and poor construction practices • Encroachment of construction activities into riparian zones / wetlands • Impacts where the powerline crosses watercourses, such as: o Loss of riparian and instream vegetation within construction domain o Destabilisation of banks of watercourses o Sedimentation
Terrestrial Ecology	• Impacts to sensitive terrestrial ecological features • Potential loss of significant flora and fauna species • Damage / clearance of habitat of conservation importance in construction domain • Proliferation of exotic vegetation
Land Capability	• Loss of cultivated land within construction domain • Loss of grazing land within construction domain • Risk to livestock and game from construction activities • Disruptions to farming operations • Loss of fertile soil through land clearance
Land Use	• Loss of land used for agriculture • Servitude restrictions
Heritage	• Possible disturbance and destruction of heritage resources
Air Quality	• Excessive dust levels • Greenhouse gas emissions
Noise	• Localised increase in the noise levels during construction
Existing Infrastructure	• Crossing of existing infrastructure by powerline (including roads and railway line) • Relocation of structures
Traffic	• Increase in traffic on the local road network • Risks to road users
Visual Quality	• Visual quality and sense of place to be adversely affected by construction activities
Socio-Economic Environment	• Loss of land within construction domain (affects landowners future plans to develop their property) • Risk to livestock and game from construction activities • Nuisance from dust and noise • Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts,

ENVIRONMENTAL FEATURE	POTENTIAL IMPACTS/IMPLICATIONS
	squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS) • Safety and security • Use of local road network

Table 9-8: Potential Significant Environmental Impacts during Operation Phase

ENVIRONMENTAL FEATURE	POTENTIAL IMPACTS/IMPLICATIONS
Geology	• Unsuitable geological conditions – risks to structural integrity of towers
Soil	• Soil erosion at areas that were not suitably reinstated and rehabilitated
Topography	• Visual impact • Crossing topographic features (watercourses) • Erosion of affected areas on steep slopes
Surface Water	• Damage to towers from major flood events • Impacts to characteristics of riparian zones and wetlands at areas where they are encroached upon by the project footprint
Terrestrial Ecology	• Encroachment by exotic species through inadequate eradication programme • Clearing of vegetation along servitude and maintenance road • Risk to birds from collision with infrastructure and from electrocution
Land Capability	• Permanent loss of cultivated and grazing land within servitude • Loss of livestock and game though improper access control
Land Use	• Loss of land used for agriculture • Servitude restrictions
Heritage	• Possible disturbance and destruction of heritage resources
Traffic	• Use of permanent access and • maintenance roads
Visual Quality	• High visibility of transmission lines / towers • Inadequate reinstatement and rehabilitation of construction footprint
Socio-Economic Environment	• Use of local road network for operation and maintenance purposes • Safety and security issues through improper access control during inspections and maintenance activities • Threats to human and animal health from Electromagnetic Field (EMF)

10. SENSITIVE ENVIRONMENTAL FEATURES

Figure 10-1,10-2, 10-3 and 10-4 shows a zoomed in sensitivity maps. The following sensitive environmental features were identified. The sensitivity map must be made available to the implementation team (including the Applicant, ECO and Contractor's Environmental Officer) to allow for further consideration and adequate interpretation at an appropriate scale (**Figure 10-5**).

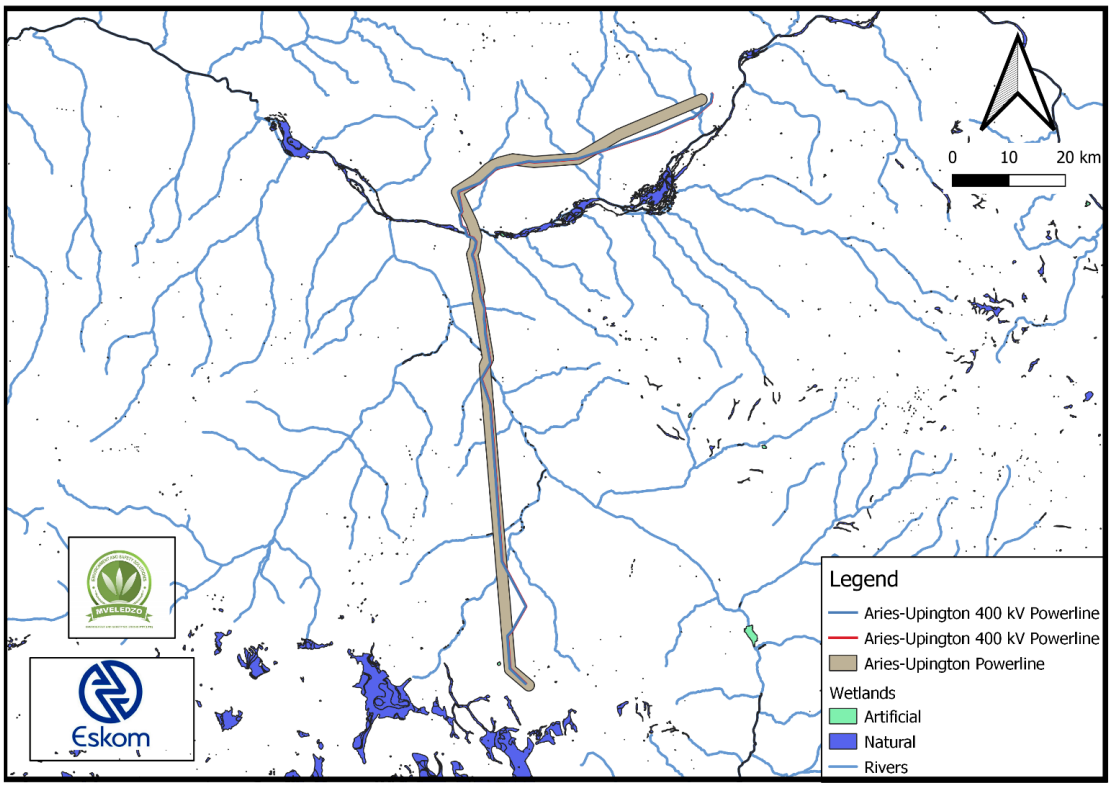

Figure 10-1: Satellite map of the project site with specific boundaries.

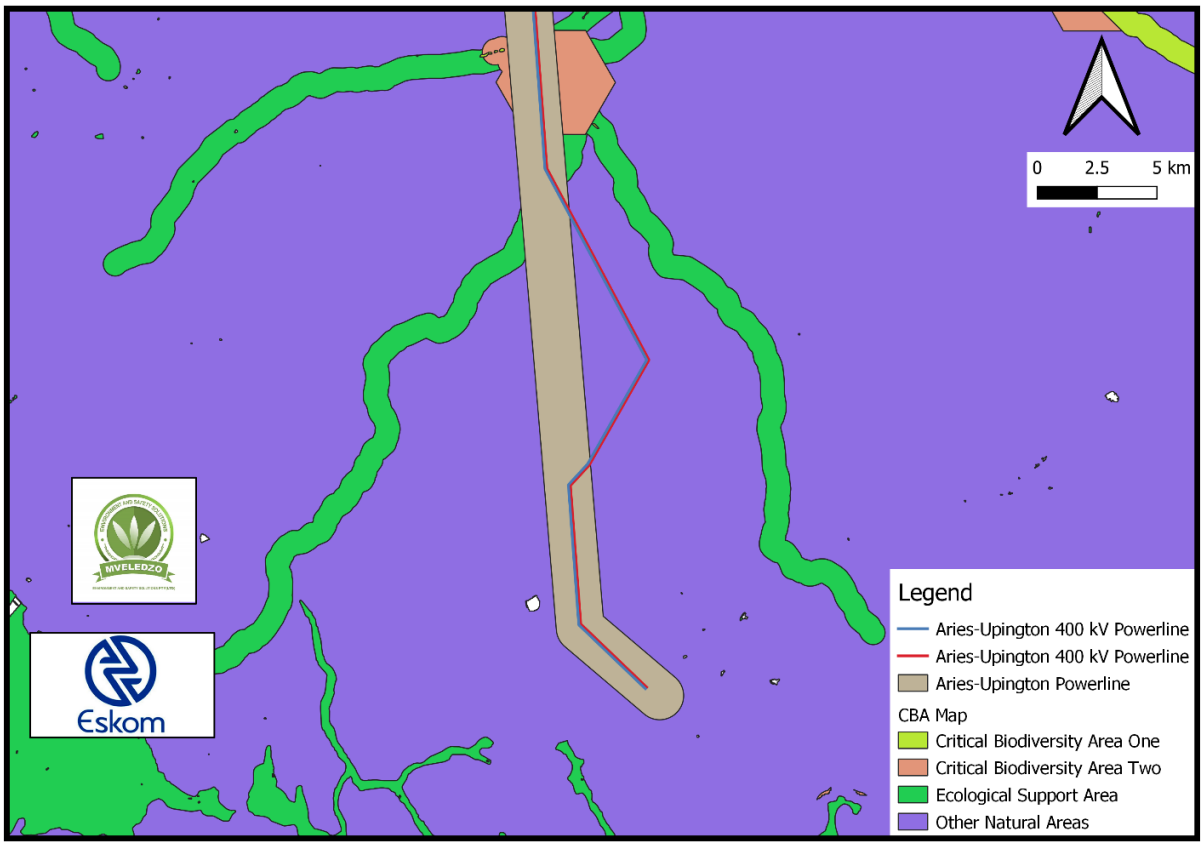

Figure 10-2: Critical Biodiversity area first deviation

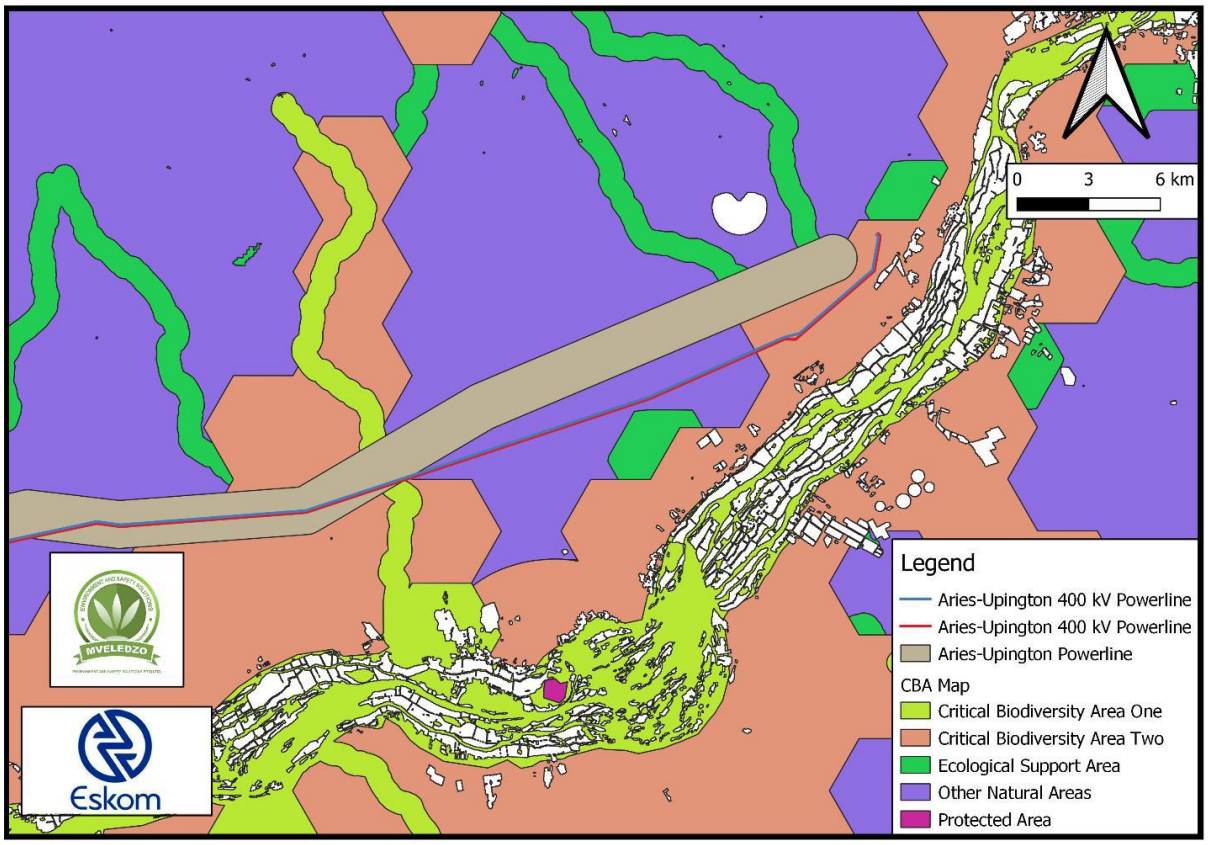

Figure 10-3: Critical Biodiversity area second deviation

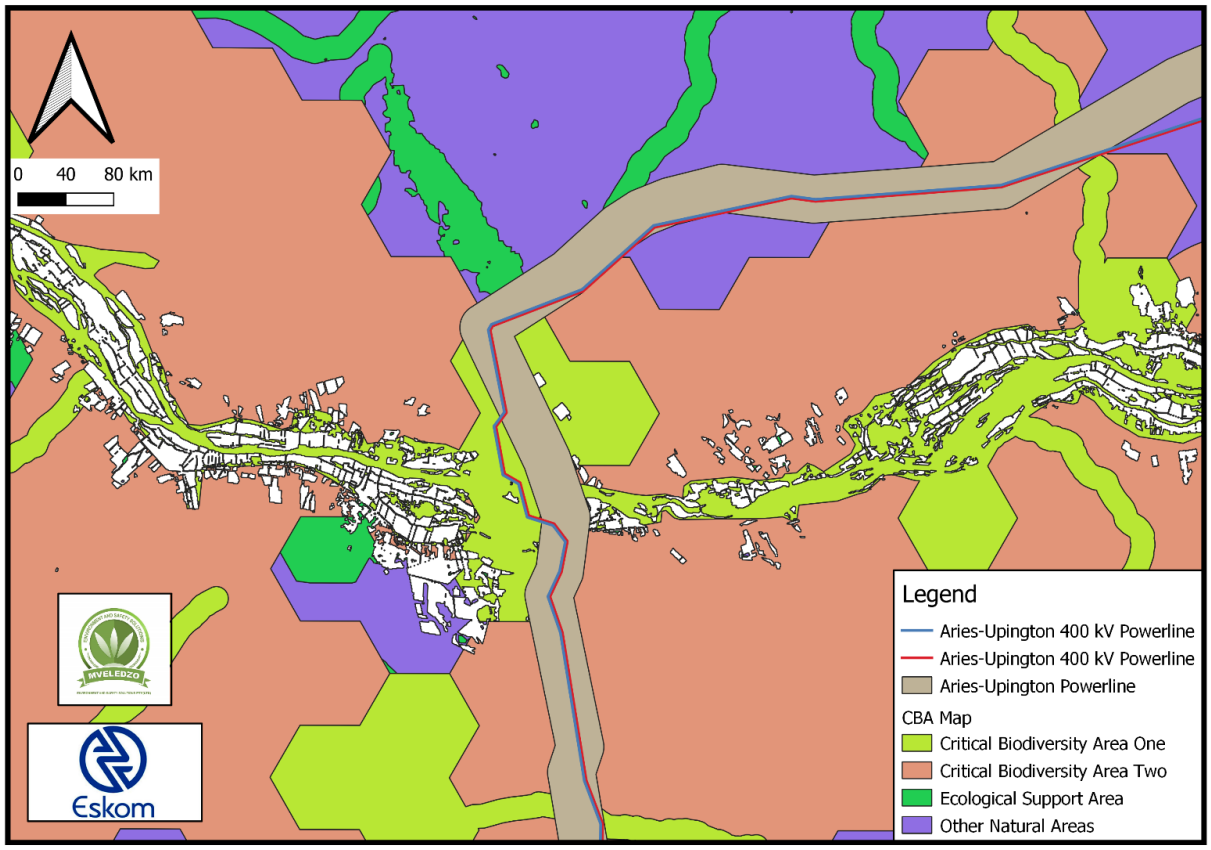

Figure 10-4: Critical Biodiversity area third deviation

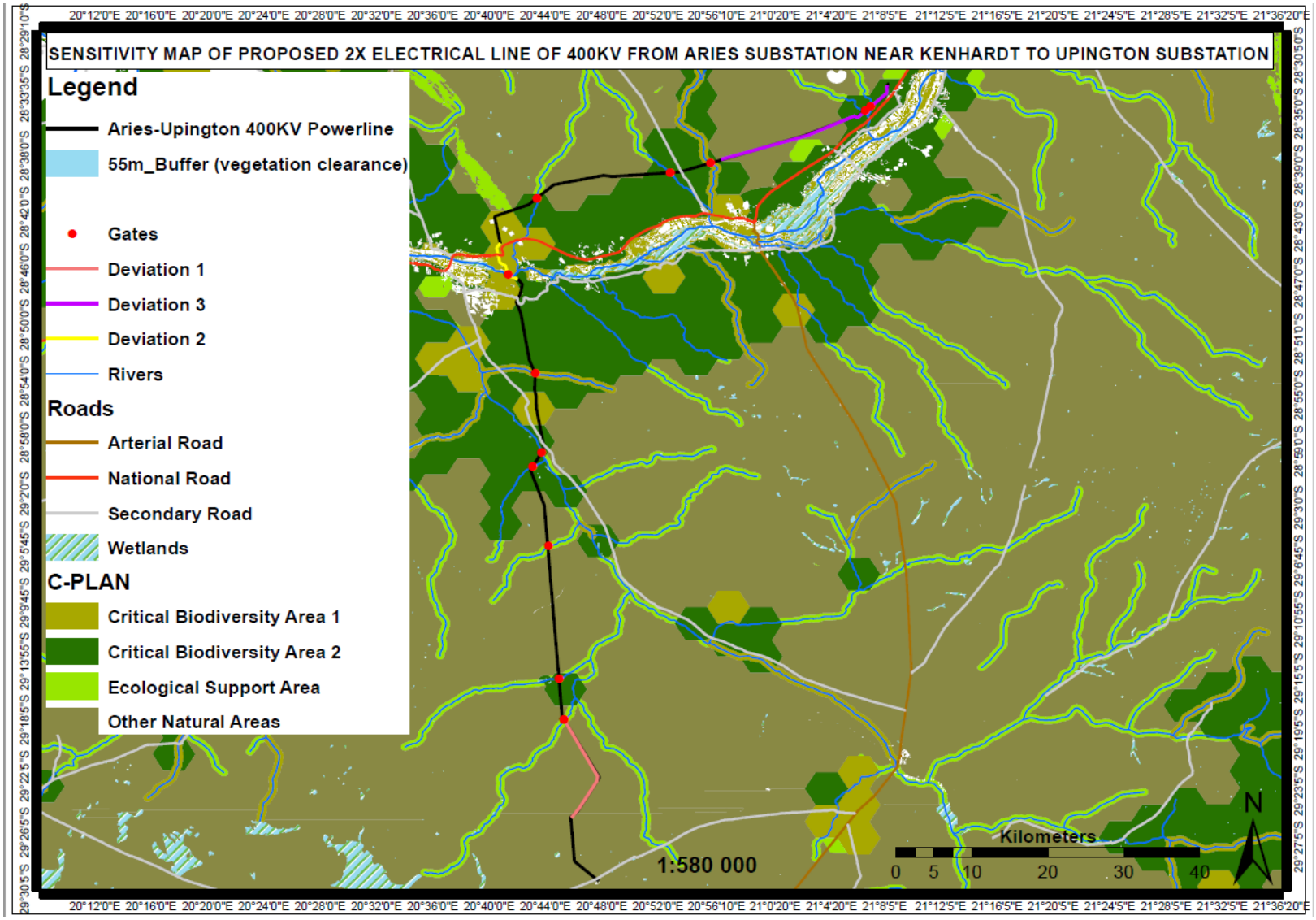

Figure 10-5: Sensitivity Map of the Entire corridor including the deviations.

11. IMAPCT MANAGEMENT

The impact assessment carried out for each environmental impact that may result from the proposed project, forms the basis for determining which management measures are required to prevent or minimise these impacts. The management measures are furthermore a means by which the mitigation measures, determined in the impact assessment are translated to action items required to prevent or keep those impacts that cannot be prevented within acceptable levels.

Mitigation should strive to abide by the following hierarchy (1) prevent; (2) reduce; (3) rehabilitate; and/or (4) compensate for the environmental impacts (Figure 11-1).

Figure 11-1: Mitigation hierarchy

The basis for the management measures which follow below comprise of the following:

- **Management objectives** – i.e. desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources);
- **Targets** – i.e. level of performance to accomplish management objectives; and
- **Management actions**– i.e. practical actions aimed at achieving management objectives and targets;
- **Responsibilities**; and
- **Monitoring requirements**.

11.1 Environmental Principles

The following principles must be considered at all times during the construction and operational phase activities.

The environment is considered to be composed of both biophysical and social components.

- Construction is a disruptive activity, and all due consideration must be given to the environment, including the social environment, during the execution of a project to minimise the impact on affected parties;
- Minimisation of areas disturbed by construction activities (i.e. the footprint of the construction area) must minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs;
- As minimum requirements, all relevant standards relating to international, national, provincial and local legislation, as applicable, shall be adhered to. This includes requirements relating to waste emissions (e.g. hazardous, airborne, liquid and solid), waste disposal practices, noise regulations, road traffic ordinances, etc; and
- Every effort must be made to minimise, reclaim and/or recycle "waste" material.

11.2 Pre-construction Phase

The planning or pre-construction phase largely entailed conducting the necessary specialist studies, determining the site layout and carrying out the requisite environmental processes to obtain authorisation.

General requirements during the pre-construction phase include the following:

- Design to consider and incorporate environmental requirements.
- Define and communicate roles and responsibilities for the implementation of the EMPr.
- Develop and implement an environmental awareness programme.
- Compile and implement an employment strategy for construction labour.

11.2.1 Environmental Investigations

Management Objective:

- Identify sensitive features in addition to those that have been identified as part of the EIA Process.

Target:

- Implement findings of Search, Rescue and Relocation Plan for species of conservation concern.
- Obtain approval prior to relocation of any sensitive fauna and flora species.
- Obtain permits if any Protected Trees are to be cut or disturbed.

- All heritage sites must be demarcated.
- Obtain permits if any heritage sites are to be disturbed.

Management Actions:

- Suitable specialist(s) to identify sensitive environmental features where special care needs to be taken and implement suitable mitigation measures to safeguard these features (e.g. Barricading, signage and awareness creation).
- Any heritage resources found close to the construction site must be protected by a 20m buffer in which no construction can take place. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews.
- Avifaunal utilise watercourses as navigation aids during cyclic migrational movements.
- The identification of these main migratory routes associated with the proposed alignment routes has been undertaken. The powerlines that run through these areas must be fitted with bird flapper devices on the earth wire to increase the visibility of the line. This may be done at least at 10 m intervals.
- Prior to construction, the protected plant species recorded along the servitude must be searched and rescued and then following construction activities, they can be re-established at the site or along the route.
- Avifaunal utilise watercourses as navigation aids during cyclic migrational movements.
- The identification of these main migratory routes associated with the proposed alignment routes has been undertaken. The powerlines that run through these areas must be fitted with bird flapper devices on the earth wire to increase the visibility of the line. This may be done at least at 10 m intervals.
- The appointed terrestrial ecologist, avifaunal, heritage and aquatic specialist shall perform a final walkthrough within the proposed study area to identify sensitive fauna and flora species, as well as sensitive heritage resources, and identify areas that require protection.
    - **Ecological Impact Assessment Report** (2021) **Recommendations**:
        - 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.

- **Archaeological And Heritage Impact Assessment Report (2021) Recommendations:**
  - The identified site with modified rock shelters must not be disturbed without a permit from SAHRA. The proposed powerline designers must shift the powerline route further south or further north to avoid the rock shelters. Alternatively, they must provide for long spans between towers to avoid the cluster of rock shelters.
  - Professional archaeologist must be appointed to conduct a heritage walk down survey once the tower positions have been pegged.
  - If the already known sites cannot be protected, then they should be mitigated prior to approval of proposed powerline
  - Should chance archaeological materials or human burial remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations.
- **Avifaunal Impact Assessment (2021) Recommendations:**
  - "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.

- **Floodline Report (2021) Recommendations:**
  - 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.

- Mitigation measures shall be provided by each of the specialists in the Specialist Walk-Down Survey to address the potential impacts of the construction of the proposed project.
- Observation of the ecological sensitivity map and inclusion of the sensitive areas into planning of access routes, etc will reduce this impact.
- Place the line to avoid cultivated land.

Responsibilities:

- Applicant to appoint suitably qualified specialists.
- Specialists to execute the management actions.

Monitoring Requirements

- Approval by relevant environmental authorities.

11.2.2 ENVIRONMENTAL EDUCATION AND TRAINING

Table 11-1 Environmental Education and Training

IMPACT	ENVIRONMENTAL EDUCATION AND TRAINING (This section deals with the environmental training of employees)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Monthly
TRAINING ASPECT	1.The Environmental Site Agent (ESA) must ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; • What is meant by "Environment" • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions • Social responsibility during the construction of the road 2. Environmental Training should be provided to the staff members through toolbox talks. These should be relevant a specific days work or activity. 3. Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. Proof of training to be kept on file. 4. The Environmental Site Agent must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.		

11.2.3 SITE CAMP

Table 11-2: Site Camp

IMPACT	SITE CAMP (This section deals with the impacts relating to the site camp)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	weekly
Mitigation Statement	1. Site camp locations must be approved by the ECO. The location must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the ECO and project manager for approval. 2. The site camp may not be situated within the 1:20 year flood line or on slopes greater that 1:3. 3. If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the project manager and the landowner. 4. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion by installing diversion berms where needed. 5. Shade cloth must be used to conceal and minimise the visual impact of contractor camps, lay down and storage areas. 6. No development, or activity of any sort associated with camp, is allowed below the 1:100-year flood line of any water system. **Storage of materials (including hazardous materials)** 7. Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by unauthorised persons. 8. Fire prevention facilities must be present at all storage facilities. 9. Hazardous Material Storage facilities (diesel & oil) should be sited away from drainage lines and have bund walls high walls high enough to contain 110% of stored volume. 10. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding		

	areas in order to ensure that accidental spillage does not pollute local soil or water resources. 11. Clear signage must be placed at all storage areas containing hazardous substances / materials. 12. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. 13. Oil spill kits must be kept at these storage facilities to treated and manage spills. **Drainage of construction camp** 14. Run-off from the site camp must NOT discharge into neighbours' properties or into adjacent wetlands, rivers or streams. **Batching Sites** 15. Should the use of an asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Forestry, Fisheries and the Environment (DFFE). 16. Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere. 17. Site camp locations must be approved by the ECO. The location must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the ECO and project manager for approval. 18. The site camp may not be situated within the 1:20 year flood line or on slopes greater that 1:3. 19. If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the project manager and the landowner. 20. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion by installing diversion berms where needed. 21. Shade cloth must be used to conceal and minimise the visual impact of contractor camps, lay down and storage areas. 22. No development, or activity of any sort associated with camp, is allowed below the 1:100-year flood line of any water system.		

	Storage of materials (including hazardous materials) 23. Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by unauthorised persons. 24. Fire prevention facilities must be present at all storage facilities. 25. Hazardous Material Storage facilities (diesel & oil) should be sited away from drainage lines and have bund walls high walls high enough to contain 110% of stored volume. 26. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources. 27. Clear signage must be placed at all storage areas containing hazardous substances / materials. 28. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. 29. Oil spill kits must be kept at these storage facilities to treated and manage spills. **Drainage of construction camp** 30. Run-off from the site camp must NOT discharge into neighbours' properties or into adjacent wetlands, rivers or streams. **Batching Sites** 31. Should the use of an asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Environment, Forestry and Fisheries. 32. Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere.		

11.2.4 CONSTRUCTION TRAFFIC AND ACCESS

Table 11-3: Construction Traffic and Access

IMPACT	CONSTRUCTION TRAFFIC AND ACCESS (This section deals with the impacts on traffic and access roads)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. Access of construction material delivery vehicles should be strictly controlled especially during wet weather to avoid compaction and damage to the topsoil structure. 2. Planning of temporal access route to the site shall be discussed and agreed between the ECO Contractor and Project Manager. 3. The access routes on the private land shall be negotiated with the landowner in advance. 4. The condition of exiting access roads should be documented with photographs. 5. Temporary access roads that might be required shall be rehabilitated prior to the contractor leaving the site. 6. Strategic positioning of entry and exit points to ensure as little impact/ effect as possible on the traffic flow. 7. Unnecessary traversing of agricultural and natural open land is not permitted. 8. Where required, speed limits shall be indicated on the roads (30km). All speed limits shall be strictly adhered to at all times.		

11.2.5 SOIL MANAGAMENT

Table 11-4: Soil Management

IMPACT	SOIL MANAGEMENT (This section deals with the environmental training of employees)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	DAILY
MITIGATION STATEMENT	1. Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. 2. The areas to be cleared of topsoil shall include the storage areas. 3. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. 4. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. 5. Stockpiles of topsoil shall not exceed a height of 2m. 6. The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. 7. Areas to be top-soiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. 8. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence. 9. The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for construction purposes. 10. Topsoil shall be reused where possible to rehabilitate disturbed areas.		

	11. Care shall be taken not to mix topsoil and subsoil during stripping. 12. Polluted topsoil shall be disposed of at a licensed landfill site. **Soil Stripping** 13. No soil stripping shall take place on areas within the site that the contractor does not require for works, or on areas of retained vegetation. 14. Subsoil and overburden should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 15. Construction vehicles shall only be allowed to utilise existing tracks or pre-planned access routes. **Stockpiles** 16. Stockpiles should not be situated such that they obstruct natural water pathways and drainage channels. 17. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or cloth. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 18. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 19. Measures should be taken to avoid/minimise soil contamination on site. 20. Where soil is contaminated, it should be treated with absorbents and disposed at a hazardous landfill site. 21. Topsoil and subsoil to be protected from contamination. 22. Fuel and material storage shall be away from stockpiles. **Earthworks** 23. Soils compacted during construction work should be deeply ripped to loosened compacted layers and re-graded to even running levels and should be re-vegetated upon completion of construction activities. Erosion 24. Wind screening and stormwater control should be undertaken to prevent soil loss from the site by the installation of diversion berms, sandbags and silt traps. 25. All erosion control mechanisms need to be regularly maintained. 26. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.		

	27. Re-vegetation of disturbed surfaces should occur immediately after the construction activities are completed. 28. No impediment to the natural water flow other than approved erosion control works is permitted.		

11.2.6 AIR QUALITY

Table 11-5: **Air Quality**

IMPACT	CONSTRUCTION TRAFFIC AND ACCESS (This section deals with the impacts on traffic and access roads)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	Dust Control 1. Damping down of un-surfaced access roads, road shoulders and un-vegetated areas during dusty periods is required. 2. Excavations and other clearing activities shall only be done during agreed working times to avoid drifting of sand and dust into neighbouring areas. 3. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the Landowner or neighbouring Communities. 4. A speed limit of 30km/h shall not be exceeded on dirt roads. 5. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. Emissions Control 6. Regular servicing of vehicles and machinery in order to limit gaseous emissions (to be done off-site). Rehabilitation		

	7. The contractor should commence with rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. Fire Prevention 8. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment shall be assessed and evaluated thorough a typical risk assessment process. It may be required to increase the level of protection, especially during the winter months. 9. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 10. No fires shall be allowed at active construction areas and stop and go stations.		

11.2.7 GROUND AND SURFACE WATER POLLUTION

Table 11-6: Ground and Surface Water Pollution

IMPACT	CONSTRUCTION TRAFFIC AND ACCESS (This section deals with the impacts on traffic and access roads)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	Sanitation 1. Chemical toilet facilities shall be regularly serviced to reduce the risk of surface or groundwater pollution. Hazardous Materials 2. Use and /or storage of materials, fuels and chemicals which could potentially leak into the ground shall be controlled in a manner that prevents such occurrences.		

	3. All storage tanks containing hazardous materials shall be placed in bunded containment areas with sealed surfaces. 4. Any hazardous substances shall be stored at least 100m from any of the water bodies on site. The bund wall shall be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events. 5. Contaminated wastewater shall be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility. 6. Temporary cut-off drains and berms may be required to capture storm water and promote infiltration. 7. Used oil must either be collect by a registered oil collector or disposed of to a registered processing facility. Receipts must be kept on file. Cement Mixing 8. Cement contaminated water shall not be allowed enter the water system as this disturbs the natural acidity of the soil and affects plant growth. Public Areas 9. Food preparation areas should be provided at the construction camp with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis. 10. The contractor should take steps to ensure that littering by workers does not occur and no washing or servicing of vehicles on site. 11. Should the needed arise to wash machinery on site, a suitable area must be established and approved by the ECO. Water Resources 12. Site staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of washing of clothing or for any construction or related activities. 13. Municipality water should instead be used for activities such as washing of equipments and dust suppression measures. 14. Any accidental spillages that occur on site or entering the water body must be reported to the ESA for remediation.		

	15. Repair and servicing of equipment should be performed 50m from the water body to prevent contamination of soil and run-off. 16. Stormwater runoff should be channelled through natural grass and sedges surrounding the borrow pits.		

11.2.8 WETLANDS/WATERCOURSES

Table 11-7: Wetlands/Watercourses

IMPACT	WETLANDS (This section deals with the impacts on wetlands)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. A buffer zone of at least 32m should therefore be adopted for all identified “Elands/Komati Tributaries”. Furthermore, all wetlands associated with the Elands River catchment found along the proposed development corridor must not be developed. 2. Runoff from the construction site is proposed to be prevented from directly entering wetlands and associated water features. 3. Wetland buffer areas should be maintained to reduce the impact of runoff from the developed site’s activities after the construction phases of the development. 4. The hydrological impacts on the wetland, is negated if constructing outside of floodlines. 5. The construction of the development must not utilise heavy construction vehicles where possible in proximity to the wetlands. 6. All alien vegetation should be cleared off the development belt and landscaping using the closest representative reserves plant species is encouraged.		

	7. It is believed that this area will naturally recover from the direct (dust, pollution) and indirect (change in passive infiltration of the vicinity) disturbances. 8. The trimming of bulrush and reeds should be allowed if densities are too high.		

11.2.9 FLORA

Table 11-8: Flora

IMPACT	FLORA (This section deals with the impacts on flora)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. During the construction phase workers must be limited to areas under construction and access to the undeveloped areas, especially the surrounding open grassland and valley bottom wetland areas must be strictly regulated ("no-go" areas during construction activities). 2. Close site supervision must be maintained during construction of the powerline. 3. Minimal disturbance to vegetation where such vegetation does not interfere with construction and operation of the line. 4. No unnecessary destruction to surrounding vegetation. 5. Protection of or endangered plant species. 6. Remaining indigenous bulbous geophytes and Aloes should be retained or replanted wherever possible. 7. Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. 8. General spraying should be prohibited.		

	9. No dumping of any materials in undeveloped open areas and neighbouring properties. 10. Activities in the surrounding open undeveloped areas (especially open grasslands) must be strictly regulated and managed.		

11.2.10 FAUNA

Table 11-9: Fauna

IMPACT	FAUNA (This section deals with the impacts on fauna)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. No animals should be intentionally killed or destroyed. 2. Minimise disturbance of fauna. 3. Minimise interruption of breeding patterns of fauna. 4. During the construction phase care must be taken not to destroy any trap-door or baboon spider burrows. 5. Care should be taken when removing stumps, logs or rock material. 6. Any scorpions encountered on the site should be left alone and allowed free access away from the activity or safely removed from the area. 7. No scorpions should be intentionally killed. 8. Stings from mildly venomous scorpions cause localised pain and swelling, with little systematic reaction. The affected limb should be immobilized and an ice pack should be applied, if possible, to the site of the sting. The site of the sting should be cleaned and never cut open. 9. Eskom, contractor and the ECO should be made aware of the possible presence of certain threatened animal species (Highveld Golden Mole, Rough Haired Golden Mole) prior to the commencement of construction activities.		

	In the event that any of the above-mentioned species are discovered relevant conservation authorities should be informed and activities surrounding the site suspended until further investigations have been conducted. Fire Preventions: 10. No open fires shall be allowed on site under any circumstance. 11. The Contractor shall have fire-fighting equipment available on all vehicles working on site, especially during the winter months.		

11.2.11 AVIFUANA

Table 11-10: Avifauna

IMPACT	AVIFAUNA (This section deals with the impacts on avifauna)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. To mitigate against collision impacts, it is recommended that the identified sections of line be marked with anti-collision devices on the earth wire to increase the visibility of the line and reduce likelihood of collisions. 2. Marking devices should be spaced 10m apart. The sections of line that pose a concern and require marking should be finalised in a site "walkthrough" by EWT once final route is decided and towers/pylons pegged. 3. A "Bird Friendly" steel lattice structure (248 series type) should be used for the tower structures. 4. Strict control should be maintained over all activities during construction. 5. If any of the "Focal Species" identified in this report are observed to be roosting and/or breeding in the vicinity, the EWT is to be contacted for further instruction.		

11.2.12 NOISE

Table 11-11: Noise

IMPACT	NOISE (This section deals with the impacts on noise)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. Noise levels shall be kept within acceptable limits. All noise and sounds generated shall adhere to SABS 0103 specifications for maximum allowable noise levels for residential areas. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies. 2. With regard to unavoidable very noisy activities in the vicinity of noise sensitive areas, the contractor and ESA should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities. 3. Noisy activities to take place during allocated hours which 07H00- 17H00.		

11.2.13 WASTE MANAGEMENT

Table 11-12: Waste Management

IMPACT	WASTE (This section deals with the impacts on waste)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily

Mitigation Statement	Rubble 1. Rubble shall be disposed of in pre – agreed, demarcated spoil dumps that have been approved by the local Municipality. Litter Management 2. Sufficient waste bins shall be provided on site for different types of waste disposal and for recycling purposes. 3. Refuse bins shall be placed at strategic positions to ensure that litter does not accumulate on site. 4. The ESA shall monitor the neatness of the work sites as well as the Contractor campsite. 5. All waste shall be removed from the site and transported to a landfill site as approved by the Department of Water Affairs and Local Municipality. 6. Littering by the employees of the Contractor shall not be allowed under any circumstances. 7. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected weekly from the site by the local municipality. Hazardous Waste 8. All hazardous waste materials shall either be stored in a bunded or lined area or then disposed off at a licensed landfill site. Hazardous waste may not be stored on site in excess of a 90 calendar day period. 9. Contaminants are to be stored safely to avoid spillage. 10. Machinery shall be properly maintained to keep oil leaks in check. 11. Labelled containers shall be provided to store used oils, as well as hazardous waste containers for oily rags; oil filters etc. and shall be disposed of at a suitable approved register dumpsite. Sanitation 12. The Contractor shall install mobile chemical toilets on the site. 13. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 14. Ablution facilities shall be within 100m from workplaces but not closer than 100m from any natural water bodies. 15. Toilets shall be serviced regularly, and the ESA shall inspect toilets regularly. Remedial actions		

	16. Depending on the nature and extent of the spill, contaminated soil shall be either excavated or treated on-site. 17. Spillages on site should be contained immediately. 18. Excavation of contaminated soil shall involve careful removal of soil using appropriate tools/machinery to storage containers untiltreated or disposed of at a licensed hazardous landfill site. 19. The ESA shall determine the precise method of treatment of polluted soil. This could involve the application of soil absorbent materials or oil-digestive powders to the contaminated soil. 20. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill shall be contained using oil absorbent materials. 21. Contaminated remediation materials shall be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.		

11.2.14 HEALTH AND SAFETY

Table 11-13: Health And Safety

IMPACT	HEALTH AND SAFETY (This section deals with the impacts on health and safety)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	Worker safety 1. Implementation of safety measures, work procedures and first aid shall be implemented on site. 2. A health and safety plan in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) shall be drawn up to ensure worker safety.		

	3. Contractors shall ensure that all equipment is maintained in a safe operating condition. 4. A record of health and safety incidents shall be kept on site. 5. Any health and safety incidents shall be reported to the project manager immediately. 6. First aid facilities shall be available on site at all times. 7. Workers have the right to refuse work in unsafe conditions. 8. Material stockpiles or stacks shall be stable and well secured to avoid collapse and possible injury to site workers. Protective Gear 9. Personal Protective Equipment (PPE) shall be made available to all workers and the wearing and use of PPE shall be compulsory. Hard hats and safety shoes shall be worn at all times and other PPE worn where necessary i.e. dust masks, ear plugs, hard hat, safety boots and overalls etc. 10. No person is to enter the site without the necessary PPE. Site Safety 11. The site shall remain fenced all the time. 12. Potentially hazardous areas such as trenches are to be demarcated and clearly marked. 13. Adequate warning signs of hazardous working areas shall be erected in suitable locations. 14. Uncovered manholes and excavations shall be clearly demarcated. 15. Emergency numbers for local police, fire department and the local municipality shall be placed in a prominent area. 16. Firefighting equipment shall be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank. 17. All flammable substances shall be stored in dry areas which do not pose an ignition risk to the said substances. 18. Smoking may only be conducted in demarcated areas as agreed upon by the ESA and the contractor. 19. A speed limit of 30km/h shall be adhered to by all vehicles and machinery.		

11.2.15 SOCIAL ENVIRONMENT

Table 11-14: Social Environment

IMPACT	SOCIAL ENVIRONMENT (This section deals with the impacts on social environment)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	1. All contact with affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times. 2. A complaints register should be kept on site. Details of complaints should be incorporated into the audits as part of the monitoring process. This register is to be tabled during monthly site meetings. 3. No interruptions other than those negotiated shall be allowed to any essential services. Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. 4. A record of all damage and remedial actions shall be kept on site. 5. Where possible unskilled job opportunities should be afforded to local community members.		

11.2.16 CULTURAL AND HERITAGE ARTIFACTS

Table 11-15: Cultural and Heritage Artefacts

IMPACT	CULTURAL AND HERITAGE ARTIFACTS (This section deals with the impacts on cultural and heritage artefacts)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily

Mitigation Statement	1. It is recommended that the construction workers should not disturb the archaeological features identified on site during the survey that are occurring next to the preferred route of the powerlines. 2. Should additional archaeological and heritages features be identified during the construction process, the following actions should apply: • Construction activities to cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported to the nearest museum; for further investigation; • The Environmental Control Officer shall notify the contractor of the findings and necessary actions to be taken; • Under no circumstances shall any artefacts be removed; destroyed or interfered with by anyone on site. 3. Contractors and workers shall be advised of the penalty associated with unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in Section 51 the National Heritage Resources Act (Act 25 of 1999). The penalties are described below: • Fine or imprisonment for a period not exceeding five years or to both such fine and imprisonment. • Fine or imprisonment for a period not exceeding three years or to both such fine and imprisonment. • Fine or imprisonment for a period not exceeding two years or to both such fine and imprisonment. • Fine or imprisonment for a period not exceeding one year or to both such fine and imprisonment. • Fine or imprisonment for a period not exceeding three months or to both such fine and imprisonment.		

11.2.17 REHABILITATION

Table 11-16: Rehabilitation

IMPACT	REHABILITATION (This section deals with the rehabilitation of construction sites)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Construction	Contractor, ECO & ESA	Daily
Mitigation Statement	**Removal of equipment** 1. The construction camp is to be checked for spills of substances such as oil, paint, etc, and these shall be cleaned up. **Temporary services** 2. The Contractor must arrange the cancellation of all temporary services, e.g. chemical toilets. 3. A copy of all waste disposal certificates is to be presented to the ECO. 4. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO. 5. Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the Eskom. 6. All surfaces hardened due to construction activities are to be ripped and imported material thereon removed. 7. All rubble is to be removed from the site to an approved disposal site as approved by the ECO. Burying of rubble on site is prohibited. 8. The site is to be cleared of all litter. 9. The main contractor and site agent are to check that all watercourses are free from building rubble, spoil materials and waste materials. 10. Fences, barriers and demarcations associated with the construction are to be removed from the site. 11. All residual stockpiles must be removed to spoil or spread on site.		

	12. All leftover building materials must be returned to the construction camp where they will be disposed of appropriately. 13. The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management.		

12. OPERATIONAL PHASE

Table 12-1: Operational Phase

IMPACT	OPERATIONAL PHASE IMPACTS (This section deals with the impacts at operational phase)	RESPONSIBILITY	FREQUENCY / MONITORING REQUIREMENTS
PHASE	Operational Phase	Contractor, ECO & ESA	Daily
Mitigation Statement	1. The powerline servitude must be regularly inspected during the operational phase and alien vegetation that re-emerges must be removed. 2. Care must be taken to avoid disturbance of vegetation and animals that are not interfering with the maintenance activities.		