

**ENVIRONMENTAL IMPACT ASSESSMENT
FOR Eskom'S NORTHERN KWAZULU-NATAL
STRENGTHENING PROJECT**

IPHIVA SUBSTATION

REFERENCE NUMBER 14/12/16/3/3/2/1037

FINAL SCOPING REPORT – OCTOBER 2017



**ESKOM'S NORTHERN KWAZULU-NATAL STRENGTHENING PROJECT:
IPHIVA SUBSTATION**

ENVIRONMENTAL IMPACT ASSESSMENT

FINAL SCOPING REPORT

Title: Final Scoping Report for Eskom's Northern KwaZulu-Natal Strengthening Project: Iphiva Substation

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Status of report: Final

NAKO ILISO Project Number 1600048

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NAKO ILISO
Approved for NAKO ILISO by:

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Chief Executive Officer

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PREFACE

Eskom Holdings SOC Limited (Eskom) has commissioned an Environmental Impact Assessment to investigate the potential environmental impacts of the proposed project to strengthening the supply of electricity to northern KwaZulu-Natal (KZN). The proposed project consists of the new Iphiva 400/132 kV Main Transmission Substation (MTS) (Iphiva Substation) near the town of Mkhuze in KZN, which will be integrated into the 400 kV Transmission network by two 400 kV Transmission powerlines, namely the approximately 150 km Normandie-Iphiva, the approximately 130 km Iphiva-Duma 400 kV Transmission powerlines and approximately 165 km of 132 kV Distribution powerlines that will link into the Iphiva Substation. The Environmental Impact Assessment (EIA) is being undertaken by NAKO ILISO as an independent Environmental Assessment Practitioner (EAP), and is being done in terms of the National Environmental Management Act (No 107 of 1998) (as amended), in particular Regulations GN. R982, R983, R984 and R985 promulgated in December 2014, as amended.

This Final Scoping Report deals with the proposed new Iphiva Substation. Separate applications and reports have been prepared for the new powerlines.

The environmental studies are required to address the potential impacts associated with the proposed project, 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 Environmental Affairs (DEA)) and the proponent (i.e. Eskom) in making decisions regarding the future of the project.

An important phase of an Environmental Impact Assessment is Scoping. This is the phase during which issues and concerns are identified in order to focus the specialist studies and to provide a framework within which the assessment is to be undertaken.

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 identification of issues and review of reports. Accordingly, interested and affected parties (I&APs) have had opportunity to review the Draft Scoping Report. All comments received during the Draft Scoping Report public comment period have been considered and incorporated into this document.

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**APPRECIATION TO INTERESTED AND AFFECTED PARTIES
FOR THEIR PARTICIPATION**

The Environmental Impact Assessment Team would like to express its sincere thanks and appreciation to all stakeholders that have registered as Interested and Affected Parties, attended meetings and provided input and comments by other means.

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ENVIRONMENTAL IMPACT ASSESSMENT

FINAL SCOPING REPORT

EXECUTIVE SUMMARY

Background

ESKOM Holdings SOC Ltd (Eskom) has commissioned a project to strengthen the supply of electricity in northern KwaZulu-Natal (KZN). NAKO ILISO has been appointed to undertake an Environmental Impact Assessment (EIA) to support applications for Environmental Authorisation.

The project has been divided into the following four components, each of which has an application:

- Iphiva 400/132 kV Substation;
- Normandie-Iphiva 400 kV Transmission Powerline;
- Iphiva-Duma 400 kV Transmission Powerline; and
- 132 kV Distribution Powerlines.

This report documents the process and findings of the scoping phase of the EIA for the proposed new Iphiva 400/132 kV Substation, and presents a Plan of Study (PoS) for the Impact Assessment phase of the project.

Need for the project

The northern KZN network is currently fed at 132 kV by Normandie and Impala Main Transmission Substations. The major load centres are Pongola and the Makhatini Flats. The Normandie Substation is situated approximately 80 km north-west of Pongola and the Impala Substation is situated approximately 180 km south of Makhatini Flats. High voltage drops are experienced in the 132 kV network and the voltages are approaching unacceptable low voltage levels as the demand increases. Contingencies on the main 132 kV supplies also lead to thermal overloading of the remaining network.

Project Description

In order to strengthen and alleviate current and future network constraints in northern KZN, it is proposed that the Iphiva 400/132 kV Substation be introduced in the area, which will de-load the main sub-transmission network and improve the voltage regulation in the area. The Iphiva Substation will be integrated with the existing electricity network by 400 kV Transmission powerlines to the Normandie and Duma Substations, and approximately 165 km of 132 kV Distribution powerlines.

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Listed Activities

The proposed project triggers several activities listed in the National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, as requiring environmental authorisation before they can commence. 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.

Receiving Environment

The project is located in the KZN Province. The description below refers to the larger study area that encompasses the powerlines associated with the proposed substation that are subjects of separate Scoping Reports.

The climate of the area is typified by warm to hot summers, high evaporation, dry warm winters and a mean annual rainfall between 495 and 1 560 mm. Average rainfall is higher in the west and decreases gradually to the east. The dominant landscape features are valley slopes to undulating hills and flat plains with a network of trailing rivers and smaller streams. The northern and central parts of the study area are more mountainous and have extreme topographical features.

The region is well known for its large wetlands, river systems, grassland hills, bushveld and diverse micro-habitats. The study area falls within the Maputaland-Pondoland-Albany hotspot, which is rich in floral diversity and is part of the Maputaland Centre of Plant Endemism. 58 of Southern Africa's endemic and near endemic avifaunal species are found within the project area.

There are only a few large towns, namely Mhuzo and Pongola, in the area. The rest of the area consist of settlements in areas under traditional leadership, commercial farms as well as game reserves. The land under traditional management belongs to the Ingonyama Trust. Settlement patterns are scattered. Dwellings consist mostly of brick structures or traditional structures. Most people have isiZulu as home language.

Basic and social infrastructure is limited and does not meet the needs of the entire population in the area. Municipalities in the area are faced with challenges that urban municipalities do not have. The settlement patterns make it extremely challenging to provide infrastructure such as piped water and sanitation. Road infrastructure in general needs some upgrading and the conditions of the roads make it challenging to reach the communities that need to be served. As there are few employment opportunities in these areas, many males have migrated to urban areas in search of employment, resulting in a community that stays behind with more females than males, as well as a very young population group. Other challenges include poverty, unemployment, illiteracy and skills levels and crime. Subsistence farming is a very important livelihood strategy and informal trading plays a much greater role in survival than in urban areas.

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Most of the municipal areas have shown an increase both in the number of people as well as the number of households. In most areas the household sizes have decreased. This can be due to children leaving their parents' house to stay on their own and start families of their own.

In terms of commercial farming, sugar cane and forestry are concerns when it comes to the presence of powerlines. Sugar cane need to be burnt, and as such cannot always be planted below powerlines. Although there are other methods to harvest sugar cane under powerlines, these are more expensive and labour intensive. Fire is a risk for forestry, and a spark or a snapped power line could cause extensive damage.

Alternatives

Eskom and the Environmental Assessment Practitioner (EAP) undertook a desktop assessment followed by site visits to identify possible sites for the construction of the proposed Iphiva Substation. Thirteen (13) potential sites were evaluated for technical feasibility. Environmental aspects were then identified to comparatively assess the technical feasible sites, in consultation with the specialists and Interested and Affected Parties (I&APs).

The EAP recommends that sites Iphiva 3 and 6 be further assessed in specialist studies and the Impact Assessment Phase fo the project.

The relative impacts of the alternative substation sites are affected by the various 400 kV and 132 kV powerlines that will connect with the Iphiva 400/132 kV Substation. In order to consider the interactions between these components, the EIAs for the substation site, 400 kV powerlines and 132 kV powerlines have been undertaken concurrently and in an integrated manner.

Public Participation in the Scoping Phase

Public participation is an important aspect of any EIA, with the objective to assist stakeholders to table issues of concern, suggestions for enhanced benefits and to comment on the findings of the EIA. The PPP is designed to provide sufficient and accessible information to I&APs in an objective manner.

An 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 their opportunities to participate. A Background Information Document was compiled and distributed to all registered I&APs and at meetings. Newspaper advertisements were placed in three newspapers in English and isiZulu. Onsite notices were erected at 17 locations in the study area. Meetings were held with Key Stakeholder and Authorities at four venues in the study area, in order to present the proposed project to them, and give them an opportunity to raise any concerns thatthey might have. Similar meetings, in isiZulu, took place with each of the 31 Traditional Councils in the study area. Focus Group Meetings with Ezemvelo KZN Wildlife and the landowners of the substation site alternatives also took place. All comments made have been captured in a Comments and Responses Report.

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Key Issues

The following key issues have been identified:

- Impacts on areas protected by National and Provincial legislation resulting in loss of plants and animals of conservation value and a loss in the income from and value of the facilities, primarily due to visual impacts;
- Impacts on the rich and diverse fauna and flora (specifically large birds);
- Impacts on landuse, particularly for sugar cane farmers;
- Impacts on Heritage Resources;
- Social impacts;
- Economic impacts,
- Impacts on the biophysical environment resulting from access roads;
- Construction Impacts; and
- Cumulative impacts.

Plan of Study for Environmental Impact Assessment

The approach of this study is to avoid environmental impacts by identifying a substation site and associated corridors for each powerline within which the powerline can be constructed that will have the least impacts on the environment (biophysical, socio-economic and heritage).

The EIA phase will build on the Scoping Report and, with input from specialists, will focus on assessing the key impacts, determining their significance, and recommending appropriate measures to mitigate negative impacts and enhance benefits. The contents of the EIA Report will be as prescribed in the EIA Regulations, 2014, as amended.

Some of the key issues identified during the Scoping Phase will require further investigation by appropriately qualified and experienced specialists. The specialist studies to be undertaken during the EIA phase are summarised below. These studies will be synthesised and integrated into the overall impact assessment (full reports will be included as appendices to the EIR), and recommendations for mitigation will be included in the Environmental Management Programme (EMPr). The contents of all specialist reports will include information as prescribed in the EIA Regulations, 2014, as amended.

An ecological assessment of the local **flora and fauna** communities associated with the proposed substation sites will be undertaken to determine the current state. Information generated from this survey will be used to assess the impacts that the construction, operational and decommissioning activities will have on this environment. The vegetation/habitat types will be delineated and their sensitivity described. Any flora and fauna species or assemblages that will be directly impacted upon by the project will be identified. This includes flora and fauna communities present, the state of these communities and the identification of possible Red Data species in accordance with the International Union for the Conservation of Nature (IUCN), National and Provincial criteria. An assessment of the impacts associated with various activities on the health of the flora and fauna

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species or assemblages will be undertaken; and measures that should be included in the EMP to prevent or limit impacts to flora and fauna species or assemblages will be recommended.

Impacts on **birds** that could be associated with a project of this nature include: collision of birds with the overhead cables; electrocution; destruction of habitat; and disturbance of birds. Collisions are the biggest potential risk to avifauna, while habitat destruction is also expected to be an important impact of this project.

In the **avi-fauna** specialist study, data from a desktop level will be examined to determine the location and abundance of power line sensitive Red Data Listed species as well as potentially “power line sensitive” species in the study area. A desk top examination, using Google Earth imagery will be done to compare the alternatives. The area will be visited in the summer months, and traversed by vehicle and on foot to obtain a first-hand understanding of the proposed substation sites and powerline routes, habitat and avifauna, and to determine which bird micro-habitats are present and relevant to the study. This will involve driving the study area, taking photographs, and walking certain accessible areas, to see as much as possible of the proposed substation sites and routes for the power line. The impacts of the proposed substation and powerlines on avifauna will be predicted on the basis of experience in gathering and analysing data on avifaunal impacts with power lines. Recommended mitigation measures for significant impacts will be proposed.

A thorough assessment of **wetlands** associated with the substation sites will be undertaken, while only a preliminary desktop assessment of wetlands associated with the powerlines will be done. The objectives of the Wetlands Impact Assessment include Delineation of wetland boundaries; Assessment of wetland baseline integrity and functionality; Assessment of the potential impacts of the proposed development on wetlands; Guidance on placement of infrastructure to ensure a no-net-loss of wetlands; and to prescribe mitigation and management measures.

The **soil** specialist will undertake soil observations on a 150 x150 m grid for the alternative substation sites to determine the soil form, as well as the depth to limiting layer (e.g. clay layers, hard rock, hard and soft plinthite) and general soil physical properties like finger feel clay content. Chemical characteristics will be done per laboratory analysis. Land capability and land use will also be assessed. Sensitive sites like wetlands will be demarcated by soil auger. Agricultural activities (like crop, pasture, or natural field) will be noted. Google Earth images will be used as bases for selection of sampling points, especially to determine fields with agricultural activities. GPS co-ordinates of each sample point will be recorded. Interpretations will be based on field survey data and site specific requirements. The classic concepts of land capability, as established by Klingebiel and Montgomery (1961) will be used as far as possible.

Geotechnical Investigations will be undertaken at the Iphiva Substation Site alternatives to confirm that conditions are suitable for the construction of the proposed substation.

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The **Heritage Impact Assessment** will comply with Section 38(3) of the National Heritage Resources Act (No 25 of 1999). The Heritage Resources Agencies will be furnished with information on identified heritage resources; assessments of the cultural significance of identified heritage resources; assessment of identified heritage impacts; evaluation of heritage impacts relative to the socio-economic benefits of the project; consideration of alternatives; recommended management or mitigation measures; any limitations or conditions of the development; and the general protection applicable in terms of the National Heritage Resources Agency (NHRA) and the KwaZulu-Natal Heritage Agency (KZNHA). The Heritage Impact Assessment (HIA) will consider archaeology, palaeontology, meteorites, battlefields, rock art, historic fortifications, battlefield sites, public monuments and memorials, burial grounds and graves, heritage landmarks, provincial landmarks and structures.

The **visual specialist study** will define the spatial context of influence of the proposed project in terms of the visibility of the overhead powerlines and the substation, and to identify potential sensitive receptor locations. The development is expected to result in moderate to high visual impacts, which will require a Level 4 visual assessment as described in the Guideline for Involving Visual and Aesthetic Specialist on EIA Processes (Oberholzer, 2005). A site visit will be undertaken. The landscape will be mapped using Geographic Information System (GIS) technology. The physical and technical characteristics of the project components will be described and illustrated. The visual resource (landscape character, landscape quality, sense of place and visual receptors) will be described; and the information will be depicted by maps. Critical areas will be highlighted. Analysis of the proposed development in terms of the criteria such as visual intrusion, visibility, visual exposure, visual absorption capacity and viewer sensitivity to determine the intensity of the impact will be undertaken. A 3D GIS terrain model will be used to assess the visibility of the infrastructure as a whole, or parts thereof, from significant viewpoints within the viewshed. Emphasis will be placed on potential visual receptors and critical views towards the proposed development. Photographs and a GPS will be used to record relevant geographical locations within the vicinity of the corridors. Unique viewpoints will be selected according to land uses and different landscape characteristics. The impact significance will be determined by synthesising the assessment criteria. Recommend mitigation measures to reduce the potential negative impacts; and photomontages will be used to compare the existing views with the probable effect of the proposed infrastructure.

Demographic, economic, geographic, institutional, legal, emancipatory, empowerment, and socio-cultural processes will be investigated in the **Social Impact Assessment**: Health and social well-being, quality of the living environment, material well-being, cultural impact, family and community impacts, institutional, legal, political and equity impacts, and gender impacts will also be investigated. Fieldwork will be conducted to obtain information and communicate with key stakeholders. Methodologies will include in-depth interviews, participatory rural appraisal, in-the-moment discussion groups, focus groups and immersions. Field notes will be kept of all interviews and focus groups. The final report will focus on current conditions, providing baseline data. Each category will discuss the current state of affairs, but also investigate the possible impacts that might occur in future. The impacts identified in this scoping report will be revisited and rated

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accordingly. New impacts that have not been identified will be added to the report. Recommendations for mitigation will be made at the end of the report.

One of the key issues that landowners affected by the proposed project have raised is the impact on the eco-tourism activities and knock-on effects including decline in property values, loss of jobs, reduced budgets for conservation of animals. The socio-economic specialist study only allowed for this to be assessed on a qualitative level. Interaction with the landowners has highlighted that the project could be opposed should this aspect not be adequately addressed. The inclusion of a more detailed **economic assessment** has therefore been commissioned. The assessment will consider area of influence for a specific impact as well as a regional / national impact. The site specific analysis will have a strong focus on the site and immediate surroundings which depends on existing land uses, sense of place aspects and local development opportunities. The regional / national impact is quantified through the use of econometric modelling and multipliers and indicate the value of the investment through gross value added (GVA), employment creation business sales, etc. as a result of the project.

Conclusion and Recommendation

The EAP recommends that this Scoping Report be accepted by the competent authority and that the Impact Assessment Phase of the EIA proceeds according to the Plan of Study presented.

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Ezemvelo KZN Wildlife – 9 September 2016

Iphiva alternatives landowners – 25 October 2016

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LIST OF ACCRONYMS

AIDs	Acquired Immunodeficiency Syndrome
APM	Archaeology, Palaeontology and Meteorites
ASAPA	Association of Southern African Professional Archaeologists
BID	Background Information Document
BPA	Biodiversity Priority Areas
COGTA	Cooperative Governance and Traditional Affairs
C-Plan	Conservation Plan
CRM	Cultural Resources Management
CRR	Comments and Responses Report
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fishers
DARD	Department of Agriculture and Rural Development
DEA	Department of Environmental Affairs
DEDTEA	KZN Department of Economic Development, Tourism and Environmental Affairs
DLGTA	Department of Local Government and Traditional Affairs
DPLG	Department of Provincial and Local Government
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIS	Ecological Importance and Sensitivity
ELA	Environmental Law Association
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EO	Environmental Officer
Eskom	ESKOM Holdings SOC Ltd
FGM	Focus Group Meetings
GIS	Geographic Information System
HGM	Hydro-geomorphic
HIA`	Heritage Impact Assessment
HIV	Human Immunodeficiency Virus
HRA	Heritage Resources Authority
I&AP	Interested and Affected Party
IAIA	International Association of Impact Assessment

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IAIAsa	South African Affiliate of the International Association of Impact Assessment
IAP2	International Association of Public Participation
IBAs	Important Birds Areas
ICB	Interim Certification Board
ICOMOS	International Council on Monuments and Sites
IDP	Integrated Development Plan
IFC	International Finance Corporations
IUCN	International Union for the Conservation of Nature
KZN	KwaZulu-Natal
KZN PSDS	KwaZulu-Natal Provincial Spatial Development Strategy
KZNHA	KwaZulu-Natal Heritage Agency
MDG	Millennium Development Goal
MEGDP	Mpumalanga Economic Growth and Development Path
MinMec	Ministers and Members of Executive Council
MPGR	Manyoni Private Game Reserve
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MTS	Main Transmission Substation
N2	National Route 2
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 36 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
NPC	National Planning Commission
PES	Present Ecological State
PGDS	Provincial Growth and Development Strategies
PICC	Presidential Infrastructure Coordinating Committee
PoS	Plan of Study
PPP	Public Participation Process
SABAP2	South African Bird Atlas Project data
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SAMRA	Southern African Marketing Research Association
SANBI	South African National Biodiversity Institute
SANCOLD	South African Committee on Large Dams
SANS	South African National Standards
SDF	Strategic Development Frameworks
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
SIPs	Strategic Integrated Projects
SSC	Species of Special Concern

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UN	United Nation
UNEP	United Nations Environmental Programme
VEC	Value Environmental Component

LIST OF UNITS

km	Kilometer
m	Meter
kV	kilo Volts

GLOSSARY OF TERMS

- No-go area:** An area in which the Substation or Powerlines cannot be routed due to resulting significant environmental, technical and social impacts.
- Corridor:** A corridor, approximately 2 km wide for 400 kV powerlines and 500 m wide for 132 kV powerlines, that is feasible for the routing of the proposed powerline which will be authorised by DEA. Within this approved corridor a final servitude will be negotiated by Eskom with individual landowners.
- 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.
- Socio-economic Impact Assessment:** The processes of analysing, monitoring and managing the intended and unintended socio-economic consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any socio-economic change processes invoked by these interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.
- Social license to operate:** The acceptance and belief by society, and specifically local communities, in the value creation of activities.
- Social risk:** Risk resulting from a social or socio-economic source. Social risk comprises both the objective threat of harm and the subjective perception of risk for harm.

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Study area: The area that has been covered by the EIA process within which possible substation and corridors for 132 kV and 400 kV powerlines have been investigated.

Substation: A collection of equipment for the purpose of raising, lowering and regulating the voltage of electricity.

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ESKOM'S NORTHERN KWAZULU-NATAL STRENGTHENING PROJECT: IPHIVA SUBSTATION

ENVIRONMENTAL IMPACT ASSESSMENT

FINAL SCOPING REPORT

1. INTRODUCTION

1.1 BACKGROUND

ESKOM Holdings SOC Ltd (Eskom) has commissioned a project to strengthen the supply of electricity in northern KwaZulu-Natal (KZN). The northern KZN network is currently fed at 132 kV by Normandie Substation and Impala Substation. The major load centres are Pongola and the Makhatini Flats. Normandie Substation is situated approximately 80 km north-west of Pongola and Impala Substation is situated approximately 180 km south of Makhatini Flats. High voltage drops are experienced in the 132 kV network and the voltages are approaching unacceptable levels as the demand increases. Contingencies on the main 132 kV supplies also lead to thermal overloading of the remaining network.

In order to alleviate current and future network constraints in northern KZN, it is proposed that the Iphiva 400/132 kV Substation be introduced in the area, which will de-load the main sub-transmission network and improve the voltage regulation in the area. The Iphiva 400/132kV Substation will be integrated with the existing electricity network by 400 kV Transmission powerlines to Normandie and Duma, and approximately 165 km of 132 kV Distribution powerlines. Each of these four components of the overall scheme will be handled separately as individual projects, requiring separate environmental authorisation.

This Final Scoping Report (FSR) is specifically for the Iphiva 400/132 kV Substation.

1.2 PURPOSE OF THE STUDY

The proposed project triggers several activities listed in the National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, as requiring environmental authorisation before they can commence. The purpose of this study is to undertake an Environmental Impact Assessment (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.

1.3 OBJECTIVES OF THIS REPORT

This report documents the process and findings of the scoping phase of the EIA, and presents a Plan of Study (PoS) for the Impact Assessment phase of the project.

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1.4 DETAILS OF THE APPLICANT

The applicant is **Eskom Holdings SOC Ltd.**

1.5 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

The Environmental Assessment Practitioner (EAP) undertaking this EIA is **Terry Calmeyer** (see CV in **Appendix A**) from MDT Environmental (Pty) Ltd. Eskom has contracted NAKO ILISO who have sub-contracted MDT Environmental as the EAP.

Terry is certified with the Interim Certification Board (ICB) as an EAP (No. 0067/05), has a MA (Environment and Society) from the University of Pretoria and over 20 years of EIA experience. She is the Past President of the South African Affiliation of the International Association of Impact Assessment (IAIAsa), serves on the Training and Professional Committee of IAIA (international) and is a member of SANCOLD, the ELA and IAP2. She has been involved in a variety of different types of EIAs including for transmission lines, substations, water supply projects, dams, roads, railways, waste water treatment works and airports, in South Africa, Uganda, Lesotho, Botswana, Namibia and Mozambique. She has led public participation programmes on a number of projects, and has provided strategic environmental input on transportation planning projects. Terry has also been responsible for compiling and updating Environmental Management Programmes (EMPrs), the management of Environmental Control Officers (ECOs) and Environmental Officers (EOs) and providing environmental project implementation advice. Terry has co-ordinated, lectured for and moderated examinations for several tertiary education courses and presented at external workshops and conferences.

1.6 STRUCTURE OF THIS REPORT

The location of the project is presented in **Chapter 2** of this report. A description of the project in **Chapter 3**. The policy and legislation context is summarised in **Chapter 4** and the need and desirability for the project in **Chapter 5**. The alternatives considered in the Scoping Phase are described in **Chapter 6**, and public participation during the Scoping Phase is detailed in **Chapter 7**. The issues raised during the Scoping Phase PPP are summarised in **Chapter 8**. The receiving environment is described in **Chapter 9**, and Plan of Study for the Impact Assessment is presented in **Chapter 10**. **Chapter 11** presents conclusions and recommendations and **Chapter 12** a list of references.

1.7 COMPLIANCE WITH THE EIA REGULATIONS

Section 2 of Appendix 2 of GN R982, as amended by GN R326 gazetted on 7 April 2017, specifies the content requirements for a Scoping Report. **Table 1.1** indicates how this document complies with these requirements.

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Table 1.1: Regulatory content requirements for a Scoping Report

Section of GN R.982	Section in Scoping Report
(a) details of- (i) the EAP who prepared the report;	Chapter 1.5 and Appendix G
(ii) the expertise of the EAP, including a curriculum vitae;	Chapter 1.5 and Appendix A
(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;	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;	Figure 2.1
(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 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;	Chapter 4
(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 5
(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including - (i) details of all the alternatives considered;	Chapter 6
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 7
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Chapter 8
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 9
(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 6
(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 6

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Section of GN R.982	Section in Scoping Report
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 6
(ix) the outcome of the site selection matrix;	Chapter 6
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Chapter 6
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Chapter 6
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including-	Chapter 10
(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	Chapter 10
(iii) aspects to be assessed by specialists;	Chapter 10
(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Chapter 10
(v) a description of the proposed method of assessing duration and significance;	Chapter 10
(vi) an indication of the stages at which the competent authority will be consulted;	Chapter 10
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Chapter 10
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Chapter 10
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Chapter 10
(i) an undertaking under oath or affirmation by the EAP in relation to-	Page (v)
(i) the correctness of the information provided in the report;	
(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties;	
and	
(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Page (V)
(k) where applicable, any specific information required by the competent authority; and	None
(l) any other matter required in terms of section 24(4)(a) and (b) of the Act.*	

*Where NEMA 24 (4) (a) and (b) states that:

- (4) Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment -

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- (a) must ensure, with respect to every application for an environmental authorisation-
- (i) coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
 - (ii) that the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in [section 2](#) are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, process, plan or project;
 - (iii) that a description of the environment likely to be significantly affected by the proposed activity is contained in such application;
 - (iv) investigation of the potential consequences for or impacts on the environment of the activity and assessment of the significance of those potential consequences or impacts; and
 - v) public information and participation procedures which provide all interested and affected parties, 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; and
- (b) must include, with respect to every application for an environmental authorisation and where applicable-
- (i) investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity;
 - (ii) investigation of mitigation measures to keep adverse consequences or impacts to a minimum;
 - (iii) investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in [section 3\(2\)](#) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate contemplated in [section 3\(2\)\(i\)\(vi\)](#) and (vii) of that Act;
 - (iv) reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;
 - (v) investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation;
 - (vi) consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3); and
 - (vii) provision for the adherence to requirements that are prescribed in a specific environmental management Act relevant to the listed or specified activity in question.

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2. LOCATION OF THE PROJECT

GN 982 Appendix 2:

- (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;

The proposed project consists of the new Iphiva Substation near the town of Mkuze in KZN, which will be integrated into the 400 kV network by two 400 kV lines, namely the approximately 150 km Normandie-Iphiva, the approximately 120 km Iphiva-Duma 400 kV powerlines, and the approximately 165 km of 132 kV distribution powerlines that will link into the Iphiva Substation (**Figure 2.1**).

The proposed substation sites are located in KZN. The uPhongola Local Municipality (LM) and Nongoma LM in the Zululand District Municipality (DM) and the Jozini LM in the Umkhanyakude DM are potentially affected by the sites, with Pongola and Mkuze being the main towns in the study area. The surveyor general codes are presented in **Appendix B**.

Land use varies across the study area with sugar cane farming, areas formally protected for conservation, private game farms and linear peri-urban development adjacent to the National Route 2 (N2).

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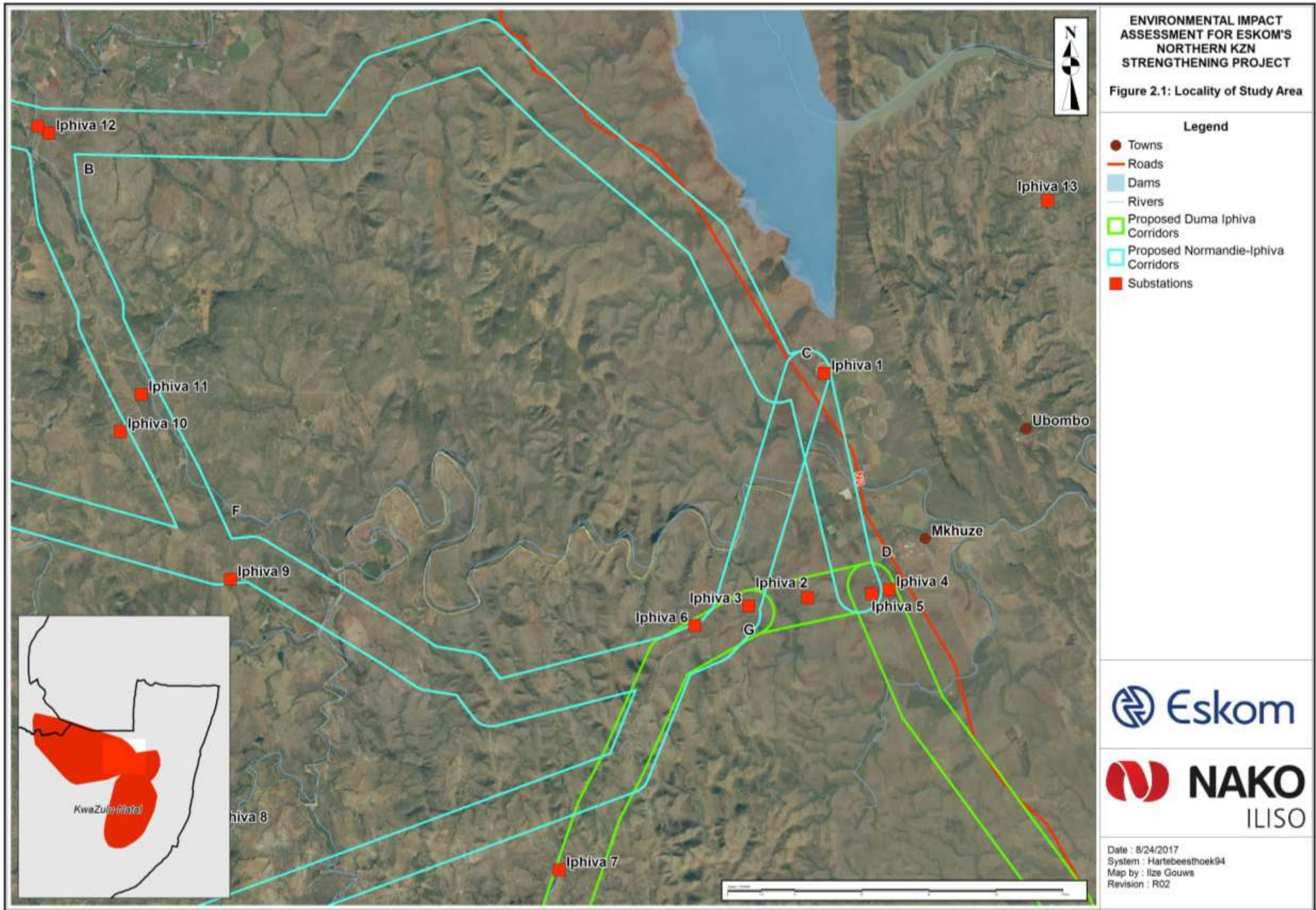


Figure 2.1: Locality of Study Area

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3. PROJECT DESCRIPTION

GN 982 Appendix 2:

- (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;

This section describes the proposed project and activities listed in the EIA Regulations 2014, as amended, that will be triggered by the project. Photographs in this section are courtesy of Bruce Burger (Eskom).

3.1 OVERVIEW OF THE ELECTRICAL NETWORK

Power is generated at a power station (which could be coal fired, nuclear, solar, wind, hydro or other). From the power station a Transmission powerline, which could be 765 kV, 400 kV, 275 kV or 220 kV, transports the electricity to the area where it is needed. If this is a very long distance, then Transmission substations may be required along the route. Once the electricity is in the area that it is required, it is transformed to 132 kV, 88 kV, 66 kV, 44 kV or 33 kV for distribution to the end user. At Distribution substations, the electricity is stepped down to 22 kV or 11 kV and ultimately to 400 or 240 V before connecting to the end user (**Figure 3.1**). The project assessed in this EIA consists of a proposed new Transmission substation, two 400 kV Transmission powerlines and 65 km of 132 Distribution powerlines.

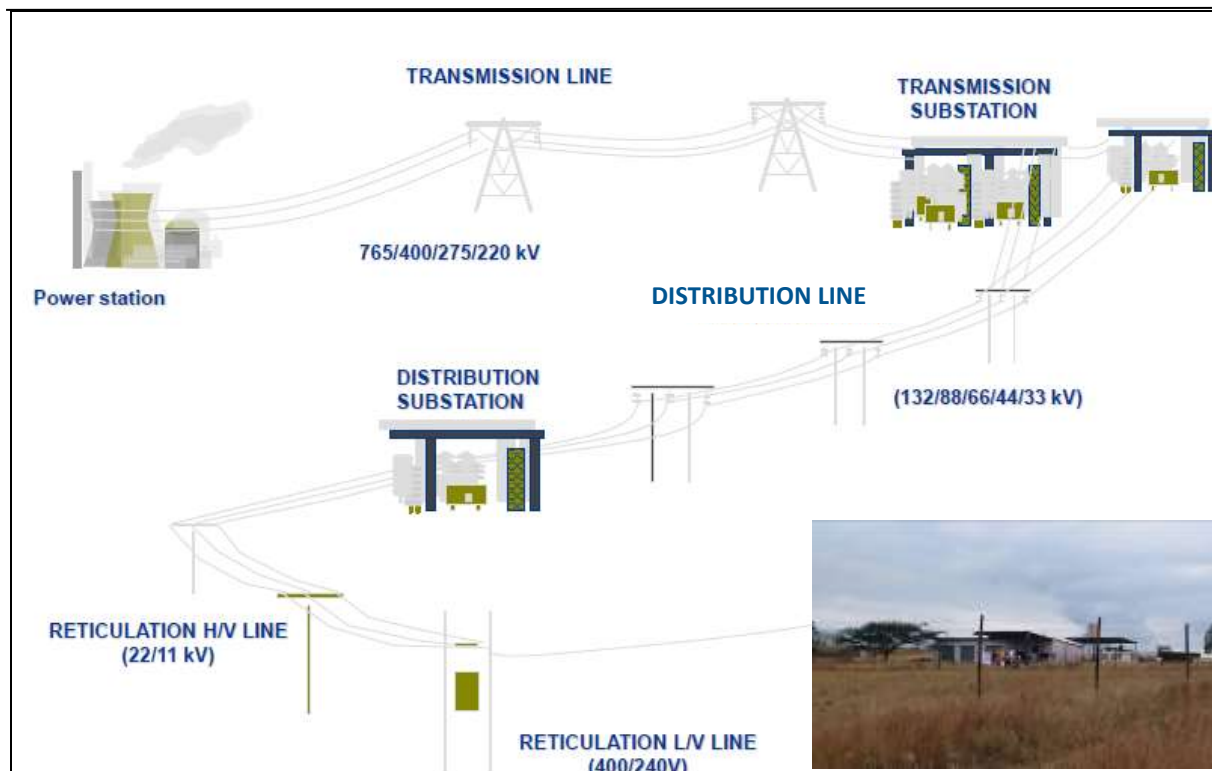


Figure 3.1: Electrical Networks

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3.2 LISTED ACTIVITIES

Listed Activities Triggered by the proposed Iphiva Substation are presented in **Table 3.1**.

Table 3.1: Listed Activities triggered by the proposed Iphiva Substation

Listed activity as described in GN R 983, 984 and 985, as amended	Description of project activity that triggers listed activity
GN R. 983 (11) as amended by GN R. 327 (11) : The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kV,	The substation is infrastructure that is part of the system for the distribution of 132 kV of electricity outside of urban areas and industrial complexes.
GN R. 983 (14) as amended by GN R. 327 (14) : Development and related operation facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic meters or more but not exceeding 500 cubic meters.	The project entails the construction of a new sub-station, including one transformer now (i.e.125 000 litres). The final state of Iphiva can have a maximum of 4 Transformers (500 000 litres). Based on initial concept designs, storage facilities may have a capacity of $\geq 30 \text{ m}^3$ but $\leq 80 \text{ m}^3$.
GN R. 983 (24) : The development of a road (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.	Access roads for the construction and operation of the substation will be required.
GN R. 983 (28) as amended by GN R. 327 (28) : Institutional developments wherever such land was used for agriculture, game farming, equestrian purposes or afforestation after 1 April 1998, outside an urban area where the total land is bigger than 1 ha.	The construction of the substation will require the use of some land that is currently being used for agriculture and/or game farming.
GN R 984 (9) as amended by GN R. 325 (9) : The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kV or more, outside an urban area or industrial complex.	The Substation is infrastructure that is part of the system for the distribution of 132 kV and transmission of 400kV of electricity outside of urban areas and industrial complexes.
GN R. 985 (3) : The development of masts or towers of any type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 meters in height – but excluding attachments to existing buildings and masts on rooftops. (d) In KwaZulu-Natal (ii) Community Conservation Areas; (iii) Biodiversity Stewardship Programme Biodiversity Agreement areas; (iv) A protected area identified in terms of NEMPAA, excluding conservancies; (vi) Sites or areas identified in terms of an International Convention; (vii) Critical Biodiversity areas as identified in systemic biodiversity plans adopted by the competent authority or bioregional plans; (viii) Core areas in Biosphere Reserves; (ix) Areas designated for conservation use in Spatial Development Frameworks adopted by competent authority or zoned for conservation purpose; (xi) Sensitive areas as identified in an environmental management framework as contemplated in	The substation will have a 70 m microwave radio communication mast. This will be located on a site outside of urban areas on a site not previously used for this purpose, and could be a Community Conservation Area, Biodiversity Stewardship Programme Biodiversity Agreement area, a protected area identified in terms of NEMPAA, a sites or area identified in terms of an International Convention, a Critical Biodiversity areas as identified in systemic biodiversity plans adopted by the competent authority or bioregional plans, a core areas in a Biosphere Reserves, an areas designated for conservation use in a Spatial Development Framework adopted by a competent authority or zoned for conservation purpose, a sensitive area as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority, within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area

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Listed activity as described in GN R 983, 984 and 985, as amended	Description of project activity that triggers listed activity	
Chapter 5 of the Act and as adopted by the competent authority; (xii) Outside urban areas (bb) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	identified in terms of NEMPAA or from the core areas of a biosphere reserve.	
GN R. 985 (4) as amended by GN R. 324 (12) : Development of a road wider than 4 m with a reserve less than 13,5 metres. (d) In KwaZulu-Natal (iii) Community Conservation Areas; (v) Biodiversity Stewardship Programme Biodiversity Agreement areas; (vi) A protected area identified in terms of NEMPAA, excluding conservancies; (vii) Sites or areas identified in terms of an International Convention; (viii) Critical Biodiversity areas as identified in systemic biodiversity plans adopted by the competent authority or bioregional plans; (ix) Core areas in Biosphere Reserves; (x) Areas designated for conservation use in Spatial Development Frameworks adopted by competent authority or zoned for conservation purpose; (xi) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (xii) Outside urban areas (i) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	An access road to the substation will be constructed or upgraded. This will be located on a site outside of urban areas on a site not previously used for this purpose, and could be a Community Conservation Area, Biodiversity Stewardship Programme Biodiversity Agreement area, a protected area identified in terms of NEMPAA, a sites or area identified in terms of an International Convention, a Critical Biodiversity areas as identified in systemic biodiversity plans adopted by the competent authority or bioregional plans, a core areas in a Biosphere Reserves, an areas designated for conservation use in a Spatial Development Framework adopted by a competent authority or zoned for conservation purpose, a sensitive area as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority, within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	
GN R. 985 (12) as amended by GN R. 324 (12) : Clearance of an area of 300 m ² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan. In (d) KwaZulu-Natal: (ii) community conservation areas; (iv) 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 areas that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (v) Critical biodiversity areas as identified is systemic biodiversity plans adopted by the competent authority or in bioregional plans; (vii) 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; (viii) A protected area identified in terms of NEMPAA, excluding conservancies; (xi) Areas designated for conservation use in Spatial Development Frameworks adopted by competent authority or zoned for a conservation purpose;	Approximately 12 ha will be cleared at the substation site. Some of these areas are in KwaZulu-Natal and in community conservation areas; 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 areas that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; Critical biodiversity areas as identified is systemic biodiversity plans adopted by the competent authority or in bioregional plans; 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; A protected area identified in terms of NEMPAA, excluding conservancies; Areas designated for conservation use in Spatial Development Frameworks adopted by competent authority or zoned for a conservation purpose; or Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.	
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Listed activity as described in GN R 983, 984 and 985, as amended	Description of project activity that triggers listed activity
(xii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.	

3.3 DESCRIPTION OF THE PROPOSED IPHIVA SUBSTATION

The proposed Iphiva sSubstation will have a 400 m x 400 m footprint, within an approximately 1 km x 1 km site. The substation is composed of standard electrical equipment such as transformers, reactors, busbars and isolators (**Figure 3.2** and **Plate 1**). The substation will have a microwave radio communication mast that could be up to 80 m high. Oil and fuel storage facilities will be bunded and there will be an oil bund to contain any transformer oil spills.



Figure 3.2: Side view of typical substation site

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Plate 1: Typical substation

The substation needs to be close to the load centre and existing 132 kV powerline network. The site has to be levelled before construction can commence, and a flat site is therefore preferable. Good existing road access and a low density of dwellings is an advantage and will reduce environmental impacts. The current use of the site will no longer be possible.

The substation needs to be lit at night for safety and security reasons. The security lighting will be around the substation fence, the luminaire height is 4 m, and will be operated with a trigger from the non-lethal fence.

Two 400 kV powerlines and seven 132 kV powerlines will enter/leave the substation in various directions, depending on the final location. The landuse on surrounding properties and any barriers to access should therefore also be considered. This is being done by undertaking the environmental assessments for those lines concurrently and in an integrated manner with this application.

3.4 CONSTRUCTION PROCESS

No staff will be accommodated on site during the construction or operation of the substation or powerlines, but will transported to site each day.

Construction of the substation will consist of the following activities:

- Vegetation clearing, which will result in a loss of flora;

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- Upgrade/construction of access roads to accommodate heavy loads;
- Watercourse crossing may need to be upgraded;
- Levelling and terracing of the surface;
- Construction of foundations and concrete works, including storm water drainage pipes, slabs, bund walls, a control room and a small building and storage area;
- All open areas between the transformer plinths and other switchgear foundations will be covered with about a 100 mm layer of 25 – 38 mm crushed stone. Before laying the crushed stone, the ground surface is intensively treated to strict specification with insecticide and herbicide to prevent insect activity and the growth of weeds and other plants in the high voltage yard;
- Erection of steelworks; and
- Delivery and installation of transformers.

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4. POLICY AND LEGISLATIVE CONTEXT

GN 982 Appendix 2:

(e) 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;

This EIA is being undertaken in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), as amended. The following Regulations promulgated in terms of NEMA in 2014, and subsequent amendments to them, apply:

- GN 982 – specifies the process that must be undertaken to obtain an Environmental Authorisation;
- GN 983 – Listing Notice 1 which identifies activities that would require environmental authorisations prior to commencement of that activity for which a Basic Assessment is required;
- GN 984 – Listing Notice 2 which identifies activities that would require environmental authorisations prior to commencement of that activity for which a Scoping and EIA is required; and
- GN 985 - Listing Notice 3 which identifies activities that would require environmental authorisations prior to commencement of that activity in specific identified geographical areas only.

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4.1 LEGISLATION APPLICABLE TO THIS EIA

Table 4.1: Legislation of relevance to the EIA

Legislation	Applicable Legislative Requirements	Implications for the Applicant
<p>Constitution of the Republic of South Africa Act, 1996 (Act 108 of 1996)</p> <p>Constitution of the Republic of South Africa Amendment Act, 1997 (Act 35 of 1997)</p>	<p>Section 24 – Environmental Rights</p>	<p>Everyone has the right to –</p> <p>An environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –</p> <ul style="list-style-type: none"> • Prevent pollution and ecological degradation, • Promote conservation, • Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. <p>The Constitution sets in place all laws of the country and the Applicant should note the protection of the environment in the Bill of Rights, especially in relation to justifiable economic and social development.</p>
	<p>Section 33 – Access to Information</p>	<p>Everyone has the right to administrative action that is lawful, reasonable and procedurally fair.</p> <p>Everyone whose rights have been adversely affected by administrative action has the right to be given written reasons.</p> <p>The provisions of NEMA and its Regulations dictate the manner in which environmental authorisation processes are undertaken, decisions made, and the appeal process; all of which are applicable to the current application.</p>
	<p>Section 32 – Administrative Justice</p>	<p>Everyone has the right of access to:</p> <ul style="list-style-type: none"> • Any information held by the state (unless it is information that is explicitly excluded by the Promotion of Access to Information Act, 2000 (Act 2 of 2000), • Any information held by another person and that is required for the exercise or protection of any rights. <p>The Applicant will need to make information available to the public if requested.</p>
	<p>Section 38 Enforcement of Rights and Administrative Review</p>	<p>Section 38 of the Constitution guarantees the right to approach a court of law and to seek legal relief in the case where any of the rights that are entrenched in the Bill of Rights are infringed or threatened.</p>
<p>National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA)</p>	<p>Section 2</p> <p>Chapter 1</p>	<p>NEMA states that the State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the needs of previously disadvantaged communities. It states further that sustainable development requires the integration of social, economic and environmental factors in the planning, evaluation and implementation of decisions to ensure that development serves present and future generations.</p>

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Legislation	Applicable Legislative Requirements	Implications for the Applicant
		obtain sustainable development and achieve effective management of the biophysical environment.
National Environmental Management: Air Quality Act (Act 39 of 2004)	Sections 21 and 37	<p>National Ambient Air Quality Standards GNR 1210 dated 24 December 2009.</p> <p>GNR 893 in Government Gazette 37054 dated 22 November 2013, listing activities and associated minimum emission standards identified in terms of section 21 of the Air Quality Act.</p> <p>Declaration of temporary Asphalt Plants as controlled emitters and establishment of emission standards, in GNR 201 in Government Gazette No 37461 dated 28 March 2014.</p> <p>National Dust Control Regulations, in GNR 827 in Government Gazette 36974 dated 1 November 2013.</p> <p>Activities include Macadam preparation (the mixing of aggregate and tar or bitumen to produce road surfacing in permanent facilities and mobile plants). These activities require an Atmospheric Emission Licence in terms of Section 37 of the Act.</p>
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)		<p>NEMBA expresses the commitments that South Africa made in approving the Convention on Biological Diversity. The Act aims at resolving the fragmented nature of biodiversity-related legislation that occurred at national and provincial levels by combining different laws and giving effect to the principle of co-operative governance, and at the same time responding to commitments made under the Convention on Biological Diversity (DEA (LGS)).</p> <p>In line with the objectives of the Convention on Biological Diversity, NEMBA provides for:</p> <ul style="list-style-type: none"> • Management and conservation of South Africa's biodiversity within NEMA's framework; • Usage of indigenous biological resources in a sustainable manner; • Fair and equitable sharing among stakeholders of the benefits arising from bio-prospecting involving indigenous biodiversity; • Protection of species and ecosystems that warrant national protection; and • Establishment and functions of the South African National Biodiversity Institute (SANBI). <p>NEMBA restricts activities involving listed threatened or protected species.</p> <p>In addition, the Alien and Invasive Species Regulations (GNR 506 of 2013), promulgated in terms of Section 97(1) of NEMBA apply, as well as the Alien Invasive Regulations (2014) and Alien and Invasive Species Lists (2016).</p>
National Environmental Management Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA)	Section 50(5)	No development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority.
National Water Act No 36 of 1998 (NWA)	Section 21 GN R. 509 of 2016	The construction of the proposed substation and powerlines and associated activities involves a number of water uses listed in terms of the NWA, and therefore requires a Water Use Licence.

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Legislation	Applicable Legislative Requirements	Implications for the Applicant
		<p>The General Authorisation gazette in GN R. 509 in August 2016 says that 6 (2) “All State Owned Companies (SOC’s), and other institutions specified in Appendix D2 having lawful access to that property or land may on that property use water in terms of section 21 (c) or (i) of the Act as specified under each of the relevant SOC’s and other institution (Appendix D2)”.</p> <p>Appendix D2 says that ESKOM may undertake the construction of new transmission and distribution power lines, and minor maintenance of roads, river crossings, towers and substations where the footprint will remain the same.</p> <p>If the construction of the substation triggers a water use then it is not covered by the GA.</p> <p>The following water uses could apply: s21 (a): taking water from a water resource; s21 (b): storing of water; s21 (c): impeding or diverting the flow of water in a water course; s21 (e): engaging in a controlled activity (i.e. the generation of hydropower); s21 (i): altering the bed, banks, course or characteristics of a water course, s21 (f): discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; and s21 (g): disposing of waste in a manner which may detrimentally impact on a water resource.</p> <p>Registration of water use and the application for any water use licences are not included in the EIA.</p>
National Heritage Resources Act 25 of 1999 (NHRA)	<p>Section 5. General principles for Heritage Resources Management</p> <p>Section 6. Principles for management of heritage resources</p> <p>Section 7. Heritage assessment criteria and grading</p> <p>Section 38. Heritage resources management</p>	<p>The Act requires that Heritage Resources Authorities (HRAs), in this case the South African Heritage Resources Agency (SAHRA), Kwazulu-Natal Provincial Heritage Resources Authority, <i>Amafa aKwaZulu Natali</i> (Amafa), and Mpumalanga Provincial Heritage Resources Authority (MPRHA) be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.</p> <p>The activities that apply to the proposed project include: 38(1)(a) - The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length; 38(1)(c) - Any development or other activity which will change the character of a site exceeding 5 000 m² in extent; or Involving three or more existing erven or sub-divisions thereof; or involving three or more erven or sub-divisions thereof which have been consolidated within the past five years; and 38(1)(d) - The rezoning of a site exceeding 10 000 m² in extent.</p> <p>A Needs and Desirability Application (NDA) and Notification of Intent to Develop (NID) will be submitted, as part of this HRM process, to Amafa and SAHRA and MPRHA respectively. A Heritage Impact Assessment (HIA) will be compiled to comply with subsection 3(3)(a) and (b) of the NHRA.</p>
KwaZulu-Natal Heritage Act, 2008 (Act		The KZNHA provides for the protection and management of heritage resources within KZN. These heritage resources take

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Legislation	Applicable Legislative Requirements	Implications for the Applicant
no. 4 of 2008) (KZNHA)		<p>account of those under general protection and special protection, including:</p> <ul style="list-style-type: none"> • General protection: <ul style="list-style-type: none"> • Structures under Section 33; • Graves of victims of conflict under Section 34; • Traditional burial places under Section 35; and • Battlefields, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites under Section 36. • Special Protection: <ul style="list-style-type: none"> • Heritage Landmark under Section38; • Provincial Landmark under Section39; • Graves of members of the Royal Family under Section 40; • Battlefield sites, public monuments and memorials under Section 41; and • Heritage Objects under Section 43. <p>In terms of the KZNHA, a permit is required to carry out certain listed activities. To accomplish this, a NDA form must be completed for any proposed development. This form is submitted to Amafa for processing after which Amafa will issue comments for further heritage studies, if necessary.</p> <p>A NDA will be submitted, as part of the HRM process, to Amafa and SAHRA. An HIA will be compiled to comply with subsection 3(3)(a) and (b) of the NHRA. The NDA was compiled to comply with the KZNHA and subsection 38(1) of the NHRA.</p>
National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)	GN 921	<p>GN 921 lists Waste Management Activities in respect of which a Waste Management Licence (WML) is required. These include various activities associated with the storage of waste, reuse, recycling and recovery of waste, treatment of waste (which includes the remediation of contaminated land) and disposal of waste. The Schedule to the Notice distinguishes between two categories of waste management activities which require licensing and for which a basic assessment process (for Category A Waste Management Activities) or an Environmental Impact Assessment process (for Category B Waste Management Activities) must be conducted. A third category (Category C) refers to activities for which norms and standards have been set.</p> <p>Construction activities usually result in general as well as hazardous waste.</p> <p>WMLs are required for, amongst others:</p> <ul style="list-style-type: none"> • The storage of general or hazardous waste in lagoons; • The disposal of inert waste to land in excess of 25 tons; • The disposal of any hazardous waste to land; • The disposal of general waste to land covering an area of more than 50 m2 and • The disposal of domestic waste generated on premises in areas not serviced by the municipal service where the waste disposed exceeds 500 kg per month.

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Legislation	Applicable Legislative Requirements	Implications for the Applicant
		<p>Schedule 3 of the NEMWA, as amended, defines "general waste" as waste that does not pose an immediate hazard or threat to health or to the environment, and includes:</p> <ul style="list-style-type: none"> (a) domestic waste; (b) building and demolition waste; (c) business waste; and (d) inert waste; or (e) any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes as outlined in Schedule 3 of the Act. <p>Where</p> <p>"building and demolition waste" means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition; and includes discarded concrete, bricks, tiles and ceramics, discarded wood, glass and plastic, discarded metals, discarded soil, stones and dredging spoil and "other" discarded building or demolition wastes.</p> <p>"inert waste" means waste that—</p> <ul style="list-style-type: none"> (a) does not undergo any significant physical, chemical or biological transformation after disposal; (b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and (c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant and which include discarded concrete, bricks, tiles and ceramics, discarded glass and discarded soil, stones and dredging spoil, as listed in Schedule 3 of the Act. <p>A WML may be required for the settling ponds that will be used to capture runoff from the batching and crusher plants (Activity (1) of Category A: Storage of general waste in lagoons).</p> <p>No WML Applications are included in this EIA process and if applications are required, they will have to be applied for separately.</p>
National Forest Act, 1998 (Act 84 of 1998)		Trees may have to be disturbed, damaged or destroyed/removed to make way for the new infrastructure. If those trees are protected a licence must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF).
KwaZulu-Natal Nature Conservation Ordinance , 1974 (Act No. 15 of 1974)		Certain indigenous plant and animal species in KwaZulu-Natal are provided with special protection under the KwaZulu-Natal Nature Conservation Ordinance and permits are required from Ezemvelo KZN Wildlife (EKZNW) for their removal, destruction or translocation.

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		<p>The proposed project may affect some indigenous species which are protected. This will only be confirmed on the sub-station site once the layout is finalised and during the walk-down of the transmission and distribution line routes by the specialists.</p>
<p>The Infrastructure Development Act (Act no. 23 of 2014)</p>		<p>The Infrastructure Development Act provides for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic; to ensure that infrastructure development in the Republic is given priority in planning, approval and implementation; to ensure that the development goals of the State are promoted through infrastructure development; to improve the management of such infrastructure during all life-cycle phases, including planning, approval, implementation and operations. The Act commenced on 10 July 2014.</p> <p>The Presidential Infrastructure Coordinating Commission (PICC) and structures of the Commission are established in terms of this Act. Strategic integrated projects (SIPs), which are projects of significant economic or social importance to the country or a region in the country, or which facilitate regional economic integration on the African continent, are identified and implemented in terms of this Act.</p> <p>Section 15 states that when the Steering Committee of a SIP has identified the approvals, authorisations, licences, permissions and exemptions required to enable the implementation of the SIP, it shall inform, without any delay, the applicant to submit all applications simultaneously to allow for concurrent consideration by the persons authorised by the relevant laws to take the applicable decisions. A member of the Steering Committee must monitor the processing of the application and report to the Steering Committee any undue delays and regulatory concerns emerging for exploration or consideration of solutions thereto.</p> <p>Section 18 concerns environmental assessments specifically and states that whenever an environmental assessment is required in respect of a SIP, such assessment must be done in terms of the NEMA, with specific reference to Chapter 5.</p> <p>Time frames are stipulated in Schedule 2 and may not be exceeded without written approval. Schedule 2 refers to “project plans”, “applications” and “mitigation plans” that are not defined in the Act. It is not clear how these apply to the EIA process.</p>
<p>KwaZulu-Natal Planning and Development Act, 2008 (Act 6 of 2008) (SPLUMA)</p>		<p>The SPLUMA came into force on 1 July 2015 and replaces the KwaZulu-Natal Planning and Development Act, 2008. However, the two will run in parallel until each Local Municipality has set up the structures required by SPLUMA.</p> <p>In terms of the current KwaZulu-Natal Planning and Development Act, 2008, Eskom will need to submit a Planning and</p>

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Legislation	Applicable Legislative Requirements	Implications for the Applicant
		<p>Development Application (PDA) to the Local Municipalities. This application will need to meet all the requirements of legislation. Important aspects will include planning considerations, and compliance with the municipality's Integrated Development Plan and Spatial Development Framework.</p> <p>The exact requirements will depend on the timing of Eskom's application to the Municipalities and the status of the legislation and by-laws currently applicable at the time in the local municipality.</p>
Promotion of Administrative Justice Act 3 of 2000		<p>The Bill of Rights in the Constitution of the Republic of South Africa 1996 states that everyone has the right to administrative action that is legally recognised, reasonable and procedurally just. The Promotion of Administrative Justice Act (PAJA) 3 of 2000 gives effect to this right. The PAJA applies to all decisions of all State organisations exercising public power or performing a public function in terms of any legislation that negatively affects the rights of any person. The Act prescribes what procedures an organ of State must follow when it takes decisions. If an organ of State implements a decision that impacts on an individual or community without giving them an opportunity to comment, the final decision will be illegal and may be set aside. PAJA also forces State organisations to explain and give reasons for the manner in which they have arrived at their decisions and, if social issues were involved, how these issues were considered in the decision-making process.</p> <p>PAJA therefore protects the rights of communities and individuals to participate in decision-making processes, especially if these processes affect their daily lives.</p>
Bylaws		All bylaws of the local and district municipalities traversed will apply to the project.

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4.2 GUIDELINES CONSIDERED

- DEAT Integrated Environmental Management Information Series 1-5 and 12-15
- NEMA draft Implementation Guideline
- Western Cape Department of Environmental Affairs and Development Planning NEMA Environmental Impact Assessment Regulations Guideline and Information Document Series – Guideline on Public Participation (2007)
- IAIA guidelines
- DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (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 environmental impact assessment 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.
- South African Heritage Resources Agency (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).
- Guidelines for Biodiversity Impact Assessments in KZN, 2003 (February 2013, Ezemvelo KZN Wildlife).
- International Union for the Conservation of Nature (IUCN) Red List (IUCNRedList.org 2016-2).
- Department KwaZulu-Natal Biodiversity Conservation Plan (C-Plan) (Updated 2011).

4.3 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.

4.3.1 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

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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.

ISO 26000 is discussed in the Social Scoping Report (**Appendix C**).

4.3.2 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).

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5. NEED AND DESIRABILITY

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(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;

5.1 GENERAL PURPOSE AND REQUIREMENT FOR THE PROJECT

Various Distribution substations being fed from the Normandie Substation are experiencing low voltages on the 132kV busbars which are well below acceptable limits (0.95 p.u). These Distribution Substations include: Candover, Makhathini, Nondabuya, Ndumo and Mkuze. With the current electrification load growth in the areas around the listed substations and Gezisa Substation establishment, the busbar voltages will further drop below minimal acceptable limits until the system collapses. The Normandie Substation is not completely backfeedable. A loss of either the Normandie-Vergenoeg 132 kV line or the Normandie-Pongola 132 kV line will result in load being shed.

Currently the Impala-Nseleni 132 kV Line is loaded to beyond 90 % of its capacity with Mtubatuba and Hluhluwe experiencing low HV Busbar voltages in the year 2019 and beyond due to an increase in both electrification and industrial load. The Impala Substation is not backfeedable. A loss of the Impala-Nseleni 132 kV poweline will result in load being shed (approximately 44 000 customers will be affected).

With the establishment of Iphiva Substation together with the seven 132 kV lines evacuating power from the substation. The following benefits will be experienced:

- Increases in all SS HV Busbar Voltage Levels to above 1 p.u.
- Transformer Taps Reduce throughout the system (Fewer Lockouts)
- Accommodates Load Growth for both electrification and industrial loads.
- 100% Back-feeding possible during the loss of Normandie-Pongola, Normandie-Vergenoeg and Impala-Nseleni 132 kV Lines.

5.2 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.

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Considering the merits of a specific application in terms of the need and desirability consideration, it must be decided which alternative represents “the most practicable environmental option, which in terms of the definition in NEMA and the purpose of the EIA Regulations are that option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long-term as well as the short-term. This is the ultimate goal of the EIA process, and will only be fully addressed after the specialist studies have been undertaken and Environmental Impact Report and Environmental Management Programme have been compiled.

The DEA 2017 Guideline on Need and Desirability says that during Scoping the questions presented in the guideline document should be used to identify issues to be addressed in the EIA process and alternatives that should be considered.

Table 5.1: 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?	Requires further assessment in specialist studies in the EIA phase of the project.
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, 2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated or segregated communities, need to upgrade informal settlements, need for densification, etc.), 2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and 2.1.4. Municipal Economic Development Strategy (“LED Strategy”).	See Section 9.12.
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) initiatives), or skills development programs?	See Section 8.5.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	See Section 5.1.
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 substation. Limited job opportunities will

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	Question in guideline document	Response
	<p>2.5.2. reduce the need for transport of people and goods,</p> <p>2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),</p> <p>2.5.4. compliment other uses in the area,</p> <p>2.5.5. be in line with the planning for the area,</p> <p>2.5.6. for urban related development, make use of underutilised land available with the urban edge,</p> <p>2.5.7. optimise the use of existing resources and infrastructure,</p> <p>2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),</p> <p>2.5.9. discourage "urban sprawl" and contribute to compaction/densification,</p> <p>2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</p> <p>2.5.11. encourage environmentally sustainable land development practices and processes,</p> <p>2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),</p> <p>2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),</p> <p>2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and</p> <p>2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</p>	<p>be created during the construction phase and very limited during the operational phase. This will be addressed in the Social and Economic Specialist studies to be undertaken in the EIA phase of the project.</p> <p>There will be no impact on public transport in the vicinity of the proposed new substation.</p> <p>The project will benefit the recipients of electricity in the entire region.</p>
2.6	<p>How were a risk-averse and cautious approach applied in terms of socio-economic impacts?</p>	<p>The information used in die socio-economic reports are based on the official data received from the municipalities. Given that municipalities are subject to public consultation processes, the assumption is made that the data is correct. A conservative approach was taken to the identification of impacts in the scoping phase. 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</p>

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	Question in guideline document	Response
		includes vulnerable communities, and the socio-economic studies will use appropriate methods to ensure that these communities are included in the impact assessment process. This process commenced in the scoping 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	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following: 2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts? 2.7.2. Positive impacts. What measures were taken to enhance positive impacts ?	Will be addressed in the Social Specialist Study in the EIA phase of the project.
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Will be addressed in the Social Specialist Study in the EIA phase of the project.
2.9	What measures were taken to pursue the selection of the " best practicable environmental option " in terms of socio-economic considerations?	Will be addressed in the Social Specialist Study in the EIA phase of the project.
2.10	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 is the general population of the region, as described in Section 9.12 .

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	Question in guideline document	Response
2.11	What measures were taken to pursue equitable access to environmental 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?	This project aims to provide services in the form of reliable electricity supply to the population of the region.
2.12	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.
2.13	What measures were taken to: 2.13.1. ensure the participation of all interested and affected parties, 2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, 2.13.3. ensure participation by vulnerable and disadvantaged persons, 2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, 2.13.5. ensure openness and transparency, and access to information in terms of the process, 2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and 2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?	Please see Section 7 of this report.
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	This project aims to provide services in the form of reliable electricity supply to the population of the region.
2.15	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Standard Eskom procedures address these issues.
2.16	Describe how the development will impact on job creation.	Will be addressed in the Social Specialist Study in the EIA phase of the project
2.17	What measures were taken to ensure: 2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to	No specific intergovernmental coordination and

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	Question in guideline document	Response
	the environment, and 2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	harmonisation of policies, legislation and actions relating to the environment took place as a result of this specific project. No conflicts of interests have arisen as a result of this project.
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	No special measures have been taken.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	This will be addressed in the EIA phase of the project.
2.10	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The applicant is responsible for implementing the Environmental Management Programme.
2.11	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	This will be addressed in the EIA phase of the project.
2.12	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	This will be addressed in the EIA phase of the project.

5.2.1 National Development Plan

On 11 November 2011 the National Planning Commission released the National Development Plan: Vision for 2030 (NPC, 2012) for South Africa and it was adopted as government policy in August 2012. The National Development Plan (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. The report is discussed in the Social Scoping Report (**Appendix C**).

5.2.2 Sustainable Development Goals

All 189 Members States of the United Nations, including South Africa, adopted the United Nations 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 United Nations 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

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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).

5.2.3 Strategic Environmental Assessment for Electricity Grid Infrastructure

In order to facilitate the efficient roll out of Strategic Integrated Projects (SIPs) lead by the Presidential Infrastructure Coordinating Committee (PICC) and detailed in the National Infrastructure Plan, the Department of Environmental Affairs (DEA), mandated by Ministers and Members of the Executive Council (MinMec), 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 South African National Biodiversity Institute (SANBI) to deliver on project outputs (<https://egi.csir.co.za/> accessed on 6 January 2017). The corridors being assessed in this EIA do not fall in any of 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 5.1**). This is, however, not a problem as the SEA did not prioritise the load centre served by this project on the national level. The need for the project, on a regional level, is still justified.

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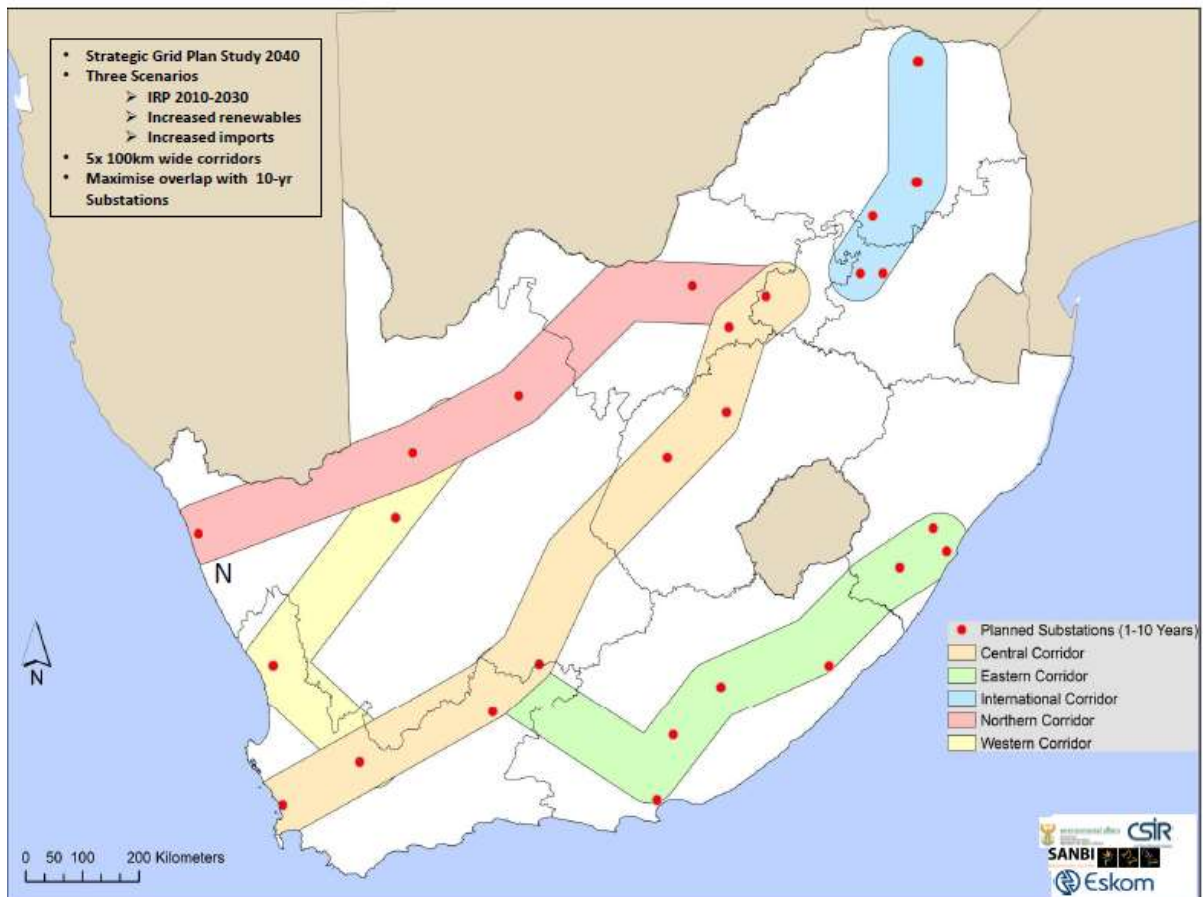


Figure 5.1: SEA suitable electricity routing corridors

Source: (<https://egi.csir.co.za/> accessed on 6 January 2017)

5.2.4 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). The Mpumalanga Economic Growth and Development Path (MEGDP, 2011), and KwaZulu Natal Provincial Spatial Development Strategy (KZN PGDS, 2011) are discussed in the Social Scoping Report (**Appendix C**).

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5.2.5 Integrated Development Plans

The South African government operates on three spheres, namely local (municipal), provincial and national. Integrated Development Plans (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.

For the purpose of this project IDP documents of the following municipalities need to be considered:

KwaZulu-Natal Province

- Zululand District Municipality
 - Uphongolo Local Municipality
 - Nongoma Local Municipality
- Umkhanyakude District Municipality
 - Jozini Local Municipality.

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6. ALTERNATIVES

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- (h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including -
 - (i) details of all the alternatives considered
 - (v) 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-
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated;
 - (vi) 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;
 - (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
 - (viii) possible mitigation measures that could be applied and level of residual risk
 - (ix) the outcome of the site selection matrix;
 - (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and
 - (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;

6.1 NO PROJECT ALTERNATIVE

The major load centres in northern KZN, specifically Pongola and the Makhatini Flats, currently experience high voltage drops in the 132 kV network that services them, and the voltages are approaching unacceptable levels as the demand increases. Contingencies on the main 132 kV supplies also lead to thermal overloading of the remaining network. The objective of the applications for this project are to alleviate current and future network constraints in the area. The Iphiva Ssubstation will also de-load the main sub-transmission network and improve the voltage regulation in the area.

If the projects do not go ahead, then the existing electricity supply to the area as well as future economic development will be limited and compromised. Eskom will then not be fulfilling its mandate, making it an unacceptable scenario.

The EAP therefore recommends that the no-go alternative be rejected and not assessment of the no project alternative in the Impact Assessment Phase of the project.

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6.2 SITE ALTERNATIVES

Eskom and the EAP undertook a desktop assessment followed by site visits to identify possible sites for the construction of the proposed Iphiva Substation. Potential sites were evaluated for technical feasibility (**Section 6.3**). Environmental aspects were then identified to comparatively assess the technical feasible sites (**Section 6.4**), in consultation with the specialists and I&APs, specifically potentially affected landowners (**Section 7**).

The site for the proposed Iphiva Substation need to fulfil the following technical requirements:

- Close to the load centre and exiting 132 kV powerline network (see preferred area in **Figure 6.1**);
- A large flat area (+- 36 ha);
- Good existing access roads;
- Low density of houses and other structures; and
- Consideration of impacts on surrounding land use.

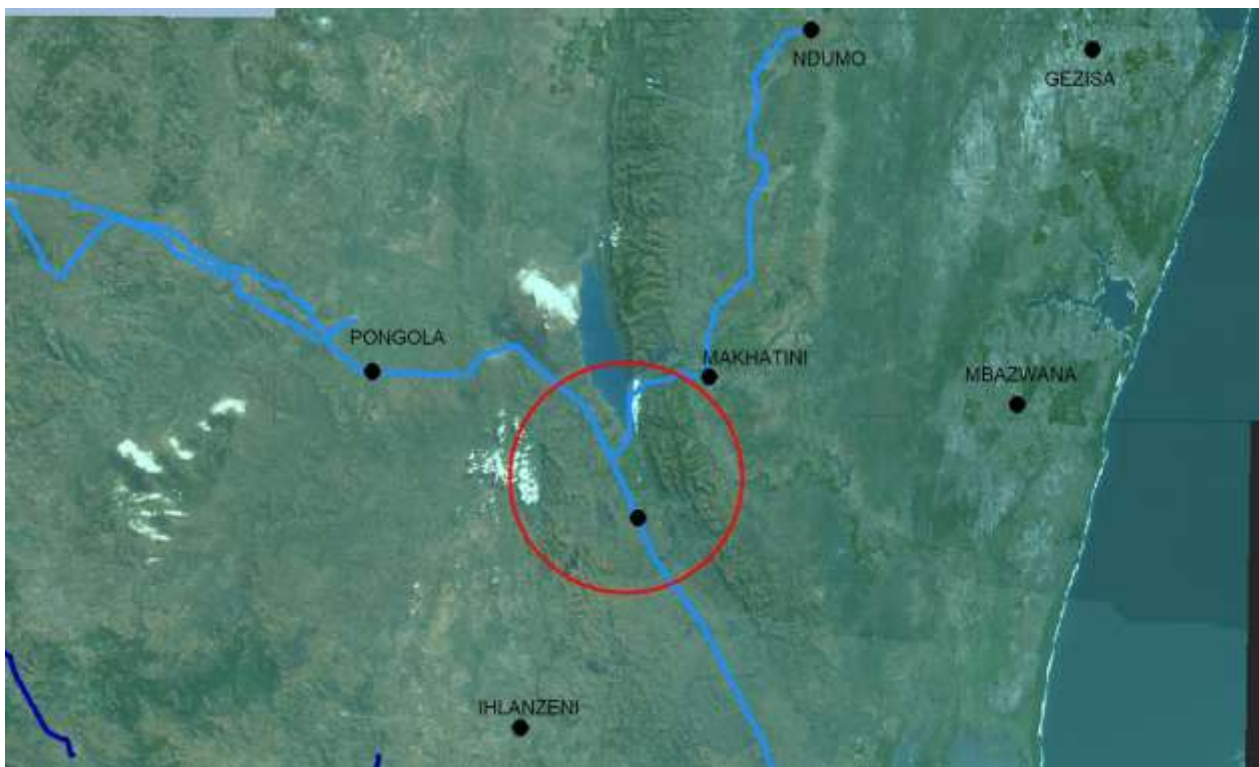


Figure 6.1: Preferred location for Iphiva substation in terms of proximity to load center

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Thirteen (13) possible sites were identified by Eskom and EAP in consultation with I&APs (Figure 2.1).

6.3 TECHNICAL SCREENING

The first criteria considered was technical suitability. This includes assessment of the proximity to the load centre, the terrain, a flood analysis, accessibility, proximity to the proposed transmission powerline corridors, and the amount of cut and fill that would be required to make the site flat. Proximity to the load centre relates to the substation being located close enough to the end users of the power being transported. The Distribution powerlines lose electricity over distance. The closer the site to the end user the less the electricity loss. The results of this assessment are summarised in **Table 6.1**. Red entries refer to circumstances that are technically unacceptable, orange to circumstances that impact on the feasibility, but could be managed, and green to circumstances that are technically feasible.

Table 6.1: Site Suitability Screening of possible Iphiva Substation Sites

Site	Terrain	Accessibility	Proximity to load centre	Cut and Fill Volumes	Proximity to Transmission corridors	Flood analysis	Feasibility
1	Flat	√	√	Acceptable	√	X	Considered
2	Flat	√	√	Acceptable	√	X	Considered
3	Flat	√	√	Acceptable	√	X	Considered
4	Flat	√	√	Acceptable	√	X	Considered
5	Flat	√	√	Acceptable	√	X	Considered
6	Mountainous	√	√	Acceptable	√	√	Considered
7	Mountainous	√	√	Excessive	√	X	Not considered
8	Too far from load centre.						Not considered
9	Too far from load centre.						Not considered
10	Too far from load centre.						Not considered
11	Too far from load centre.						Not considered
12	Too far from load centre.						Not considered
13	Mountainous	Not considered	√	Acceptable	X	X	Not considered

Source: Adapted from Eskom Substation Engineering Site Visit Report, 1 November 2016

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Sites 8, 9, 10, 11 and 12 are discarded because they are too far from the load centre. Site 7 will require excessive quantities of cut and fill to flatten then sufficiently, which will increase the cost of their construction significantly rendering it non-viable. Site 13 is located too far away from the Transmission corridors with physical barriers (the dam and a mountain range) between it and the Transmission corridors.

Sites 1, 2, 3, 4, 5, and 6 were therefore shortlisted for further investigation. Some technical aspects make a site technically not feasible at all. Those sites have been discarded and not assessed further. Technical aspects may, however, still impact on the preferability of the site and are still considered in the comparative assessment, even though they were not motivation for discarding the site.

6.4 MULTI-CRITERIA COMPARATIVE ASSESSMENT OF TECHNICALLY FEASIBLE SITES

The shortlisted sites are briefly described below, highlighting any aspects that could affect the significance of their impact on the environment. The following criteria have been considered (Summarised in **Tables 6.2** and **6.3**):

- In addition to the transformation of the actual substation site, the servitudes for the powerlines that will connect the substation to the electricity grid also have impacts. The area surrounding the sites that could be impacted by these powerlines is therefore considered;
- Initial feedback from landowners and potentially affected parties;
- Ecological sensitivity (fauna, flora and birds);
- Soils and Agricultural potential;
- Accessibility;
- Visual impacts;
- Impacts on Protected Areas;
- Heritage Resources;
- Sugar cane; and
- Forestry.

Iphiva Site 1

Iphiva 1 is located across the gravel road from the existing Candover Switching Station, close to the Jozini Dam, approximately 11 km from Mkhuze (**Figure 6.2**). It is easily accessible by road. The proximity of this site to the dam limits the number of lines that can be established north east of the substation. The site is adjacent to the N2 road and a railway line that further restrict the placement of powerlines. The landowner, Mr Senekal, is strongly opposed to this site, and has suggested an alternative that he supports (Iphiva Site 4) which is also on one of his properties. His opposition to Iphiva 1 is supported by the successful appeal of a previous Eskom powerline project on that property.

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This site is not recommended for further investigation.



Figure 6.2: Location of Iphiva 1 and 2

Iphiva 2 (**Figure 6.2**) is located approximately 2.6 km south west of the town of Mkhuze, just north of the P234 road, on a private game farm. This site, and the associated powerlines, potentially has significant visual impacts on some of the lodges and game drive routes in the MPGR located across the road. The landowner, Mr Senekal is also opposed to this site stating visual impacts on his operations at the Zimanga Game Reserve.

Iphiva 2 site is therefore not recommended for further investigation.

Iphiva Site 3

Iphiva 3 is located approximately 7 km west of the N2 and P234 intersection, immediately north of the P234 (**Figure 6.3**). The P234 and particularly watercourse crossings may require upgrading for the large vehicles with the substation equipment to gain access.

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Iphiva 3 is recommended for further assessment.



Figure 6.3: Location of Iphiva 3

Iphiva Site 4

Iphiva 4 (**Figure 6.4**) is located on Mr Senekal’s farm in Mkhuze, south of the P234, across a local road from the existing powerline that needs to loop into the substation. Mr Senekal proposed this site as an alternative to Iphiva 1. The site is flat and easily accessible from existing roads. This site has soils with a high natural fertility and intermediate suitability for arable agriculture, and transformation of the land could be viewed as a loss of an agricultural resource.

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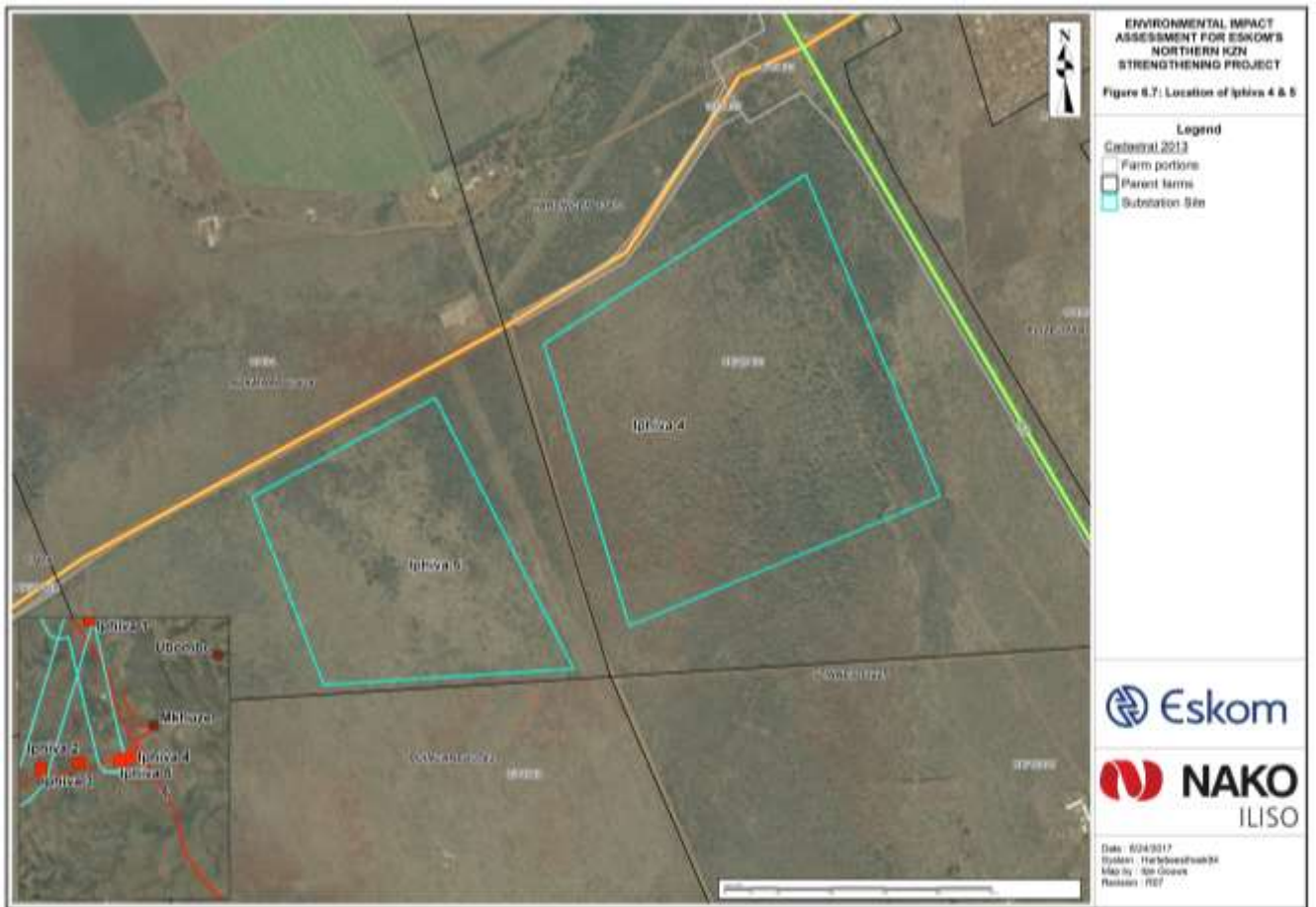


Figure 6.4: Location of Iphiva 4 and 5

There is a biomass project that already has environmental authorisation located north of the P234 road (**Figure 6.5**) next to the existing Mkhuze Substation that would complicate the integration of in and out-going powerlines from Iphiva 2. Mr Senekal has indicated that there is no intention to implement the biogas project at this stage.

Iphiva 4 is not recommended for further assessment.

Iphiva Site 5

Iphiva 5 is across the road from Iphiva 4 (**Figure 6.4**), and is also on Mr Senekal's farm in Mkhuze. This site has soils with a high natural fertility and intermediate suitability for arable agriculture, and transformation of the land could be viewed as a loss of an agricultural resource. This site is adjacent to the Manyoni Private Game Reserve (MPGR) and falls in a Critical Biodiversity Area. Eskom is concerned about impacts from the possible biomass plant.

Iphiva 5 is not recommended for further assessment.

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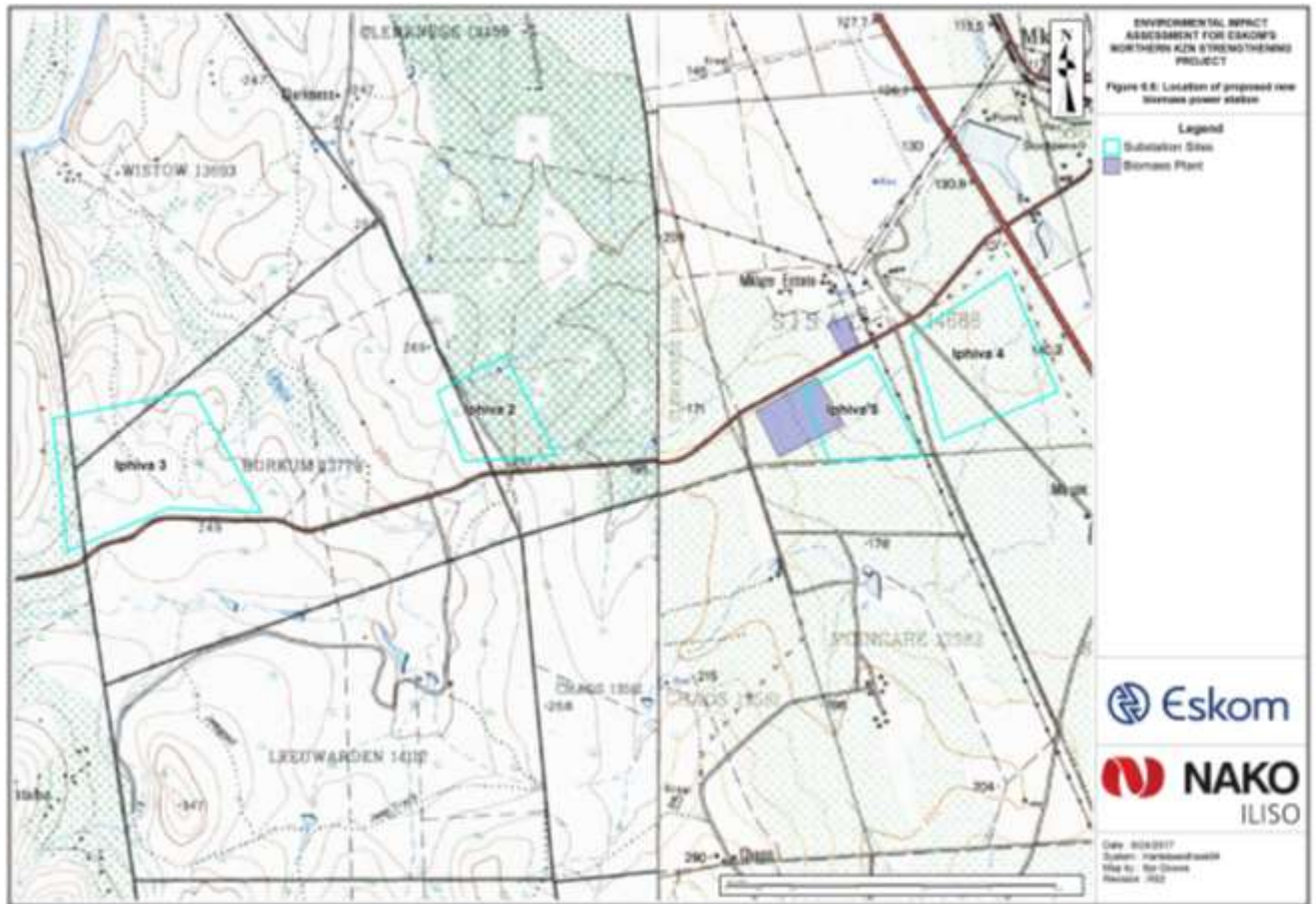


Figure 6.5: Location of proposed new biomass power station

Iphiva Site 6

Although Iphiva 6 (**Figure 6.6**) is on a mountainous terrace, initial assessments found that acceptable quantities of cut and fill will be required to prepare the site. Accessibility to this site is more difficult than 1, 2, 3, 4 or 5. The relocation of several dwellings will also be required, which makes it not preferable. This site has soils which may be shallow, have high erodibility and a low natural fertility and intermediate suitability for arable agriculture. There is therefore a risk of erosion, but it will not be a significant loss of an agricultural resource if transformed.

Iphiva 6 is recommended for further assessment.

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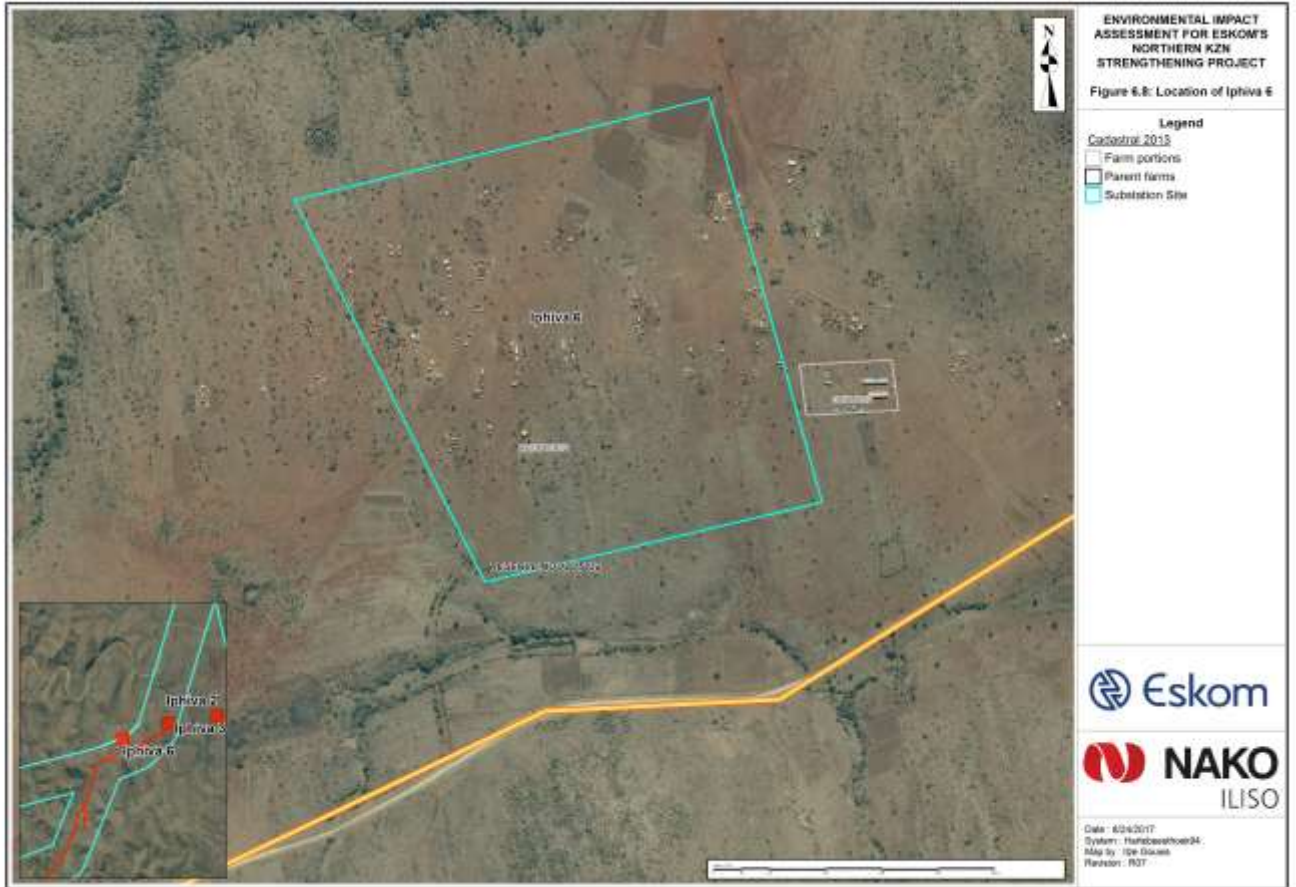


Figure 6.6: Location of Iphiva 6

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Table 6.2: Comparison of shortlisted substation site alternatives

Site Aspect	Iphiva 1	Iphiva 2	Iphiva 3	Iphiva 4	Iphiva 5	Iphiva 6
Associated impacts resulting from the in and out-going powerlines that will connect the substation to the electricity grid	The proximity of this site to the dam limits the number of lines that can be established north east of the substation. The site is adjacent to the N2 road and a railway line that further restrict the placement of powerlines.	It is feasible to integrate this site with the electricity grid.	It is feasible to integrate this site with the electricity grid.	It is feasible to integrate this site with the electricity grid. The location of a planned new biomass powerplant with associated storage area very close to the site limits accessibility of in and out-going lines, and poses a air quality risk concern.	It is feasible to integrate this site with the electricity grid. The location of a planned new biomass powerplant with associated storage area very close to the site limits accessibility of in and out-going lines, and poses a air quality risk concern.	It is feasible to integrate this site with the electricity grid
landowners and potentially affected parties	The landowner, Mr Senekal, is strongly opposed to this site, and has suggested alternatives (Site 4). His opposition is supported by the successful appeal of a previous Eskom powerline project on the property.	The landowner, Mr Senekal, is strongly opposed to this site, and has suggested alternatives (Site 4). His opposition is supported by the successful appeal of a previous Eskom powerline project on the property.	The MPGR have expressed concern about this site being visible from some of their lodges, drives or lookout points.	Iphiva 4 is located on Mr Senekal's farm in Mkhuze. Mr Senekal proposed this site as an alternative to Iphiva 1.	Iphiva 5 is across the road from Iphiva 4, and is also on Mr Senekal's farm in Mkhuze.	The relocation of several dwellings will be required, which makes it not preferable.
Ecological Sensitivity	C-Plan – High sensitivity (Total footprint of development fall with	C-Plan – High sensitivity Protected Areas - Low Threatened Ecosystems -	C-Plan – High sensitivity Protected Areas - Low Threatened Ecosystems	C-Plan – High sensitivity Protected Areas -	C-Plan – High sensitivity Protected Areas -	C-Plan – High sensitivity Protected Areas -

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Aspect	Site	Iphiva 1	Iphiva 2	Iphiva 3	Iphiva 4	Iphiva 5	Iphiva 6
		<p>an Irreplaceable Critical Biodiversity Area)</p> <p>Protected Areas – Low (Total footprint of development fall outside of the protected areas)</p> <p>Threatened Ecosystems – High (Total footprint of development falls within the Black Rhino Range)</p> <p>NPAES – Low (More than 10 km away from any focus area)</p>	<p>High NPAES - Low</p>	<p>– Moderate (Less than 10% of the development footprint falls within Black Rhino Range)</p> <p>NPAES - Low</p> <p>The site is relatively flat and does not encroach on the critical biodiversity area.</p>	<p>Low Threatened Ecosystems - High NPAES - Low</p>	<p>Low Threatened Ecosystems - High NPAES - Low</p>	<p>Low Threatened Ecosystems - Moderate NPAES - Low</p>
Soils and Agricultural potential		<p>Iphiva 1 is situated on soil with vertic, melanic or red structured diagnostic horizons. This means that the soil has swelling and shrinking and sticky properties and will have special needs for foundations and planning during construction. These kinds of soils are not high potential agricultural</p>	<p>Iphiva 2 is situated on soil with vertic, melanic or red structured diagnostic horizons. This means that the soil has swelling and shrinking and sticky properties and will have special needs for foundations and planning during construction. These kinds of soils are not high potential agricultural soils.</p>	<p>The soil is expected to be less than 450 mm deep. The eastern quarter has > 35% clay content resulting in a high swell-shrink potential and possibility of plastic sticky soil conditions with high erodibility and a low natural fertility. The Eastern quarter has a high natural fertility. The</p>	<p>This site has > 35% clay content resulting in a high swell-shrink potential and possibility of plastic sticky soil conditions. This site has soils with a high natural fertility and intermediate suitability for arable agriculture.</p>	<p>This site has > 35% clay content resulting in a high swell-shrink potential and possibility of plastic sticky soil conditions. This site has soils with a high natural fertility and intermediate suitability for arable agriculture.</p>	<p>This site has soils which may be shallow, have high erodibility and a low natural fertility and intermediate suitability for arable agriculture.</p>

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Aspect	Site	Iphiva 1	Iphiva 2	Iphiva 3	Iphiva 4	Iphiva 5	Iphiva 6
		soils.		site has soils of intermediate suitability for arable agriculture			
Topography and Accessibility		It is easily accessible by road.	It is easily accessible by road.	The site is flat and easily accessible from existing roads.	It is easily accessible by road.	It is easily accessible by road.	Although Iphiva 6 is on a mountainous terrace, initial assessments found that acceptable quantities of cut and fill will be required to prepare the site. Accessibility to this site is more difficult than 1, 2, 3, 4 or 5, and there is a risk of flooding.
Visual		Highly visible site.	The site, and the associated powerlines, also potentially has significant visual impacts on some of the lodges and game drive routes in the Zululand Rhino Reserve located across the road.	Iphiva 3 will be visible from some points in the MPGR.	Less visual impact than site 3, but concerns about the visual impacts of associated powerlines have been raised.	Less visual impact than site 3, but concerns about the visual impacts of associated powerlines have been raised.	Less visual impacts on sensitive receptors, particularly game farms, than other sites.
Heritage Resources		Medium heritage sensitivity	Medium heritage sensitivity	Medium Heritage sensitivity	Medium Heritage sensitivity	Medium Heritage sensitivity	Medium Heritage sensitivity
Sugar cane		Currently under irrigated sugar cane.	These sites are not affected by sugar cane.				
Forestry	No forestry take place on any of the proposed substation sites.						

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Iphiva 1 is discarded due to the cumulative impacts resulting from the in and out-going powerlines that will connect the substation to the electricity grid, the impact on irrigated sugar cane, and the opposition of the landowner, who proposed Iphiva 4 on his property as an alternative to Iphiva 1.

Iphiva 2 and the associated powerlines, potentially has significant visual impacts on some of the lodges and game drive routes in the MPGR located across the road. There is strong opposition from I&APs to this site.

Iphiva 4 and Iphiva 5 fall in an irreplaceable critical biodiversity area, are adjacent and within the buffer area of the MPGR and access to them is limited due to the location of the biomass power plant and associated storage area that have already received environmental authorisation, but have not yet been constructed. Eskom also expressed concern about the potential air quality impacts of the biomass plant on the Iphiva Substation, if located so close to each other.

The two sites that are recommended for further assessment are Iphiva 3 and 6. Both of these sites do, however, fall in an **irreplaceable critical biodiversity area (Figure 6.7)** according to the Conservation Plan. This aspect will require further assessment by specialist studies. No other sites that meet the technical requirements that are not in protected areas or irreplaceable critical biodiversity areas have been found.

In a pre-application consultation with the competent authority on 7 March 2017, it was agreed that more than one substation site and more than one alternative corridor could be assessed in the specialist studies and impact assessment phase of the project (**Appendix F**).

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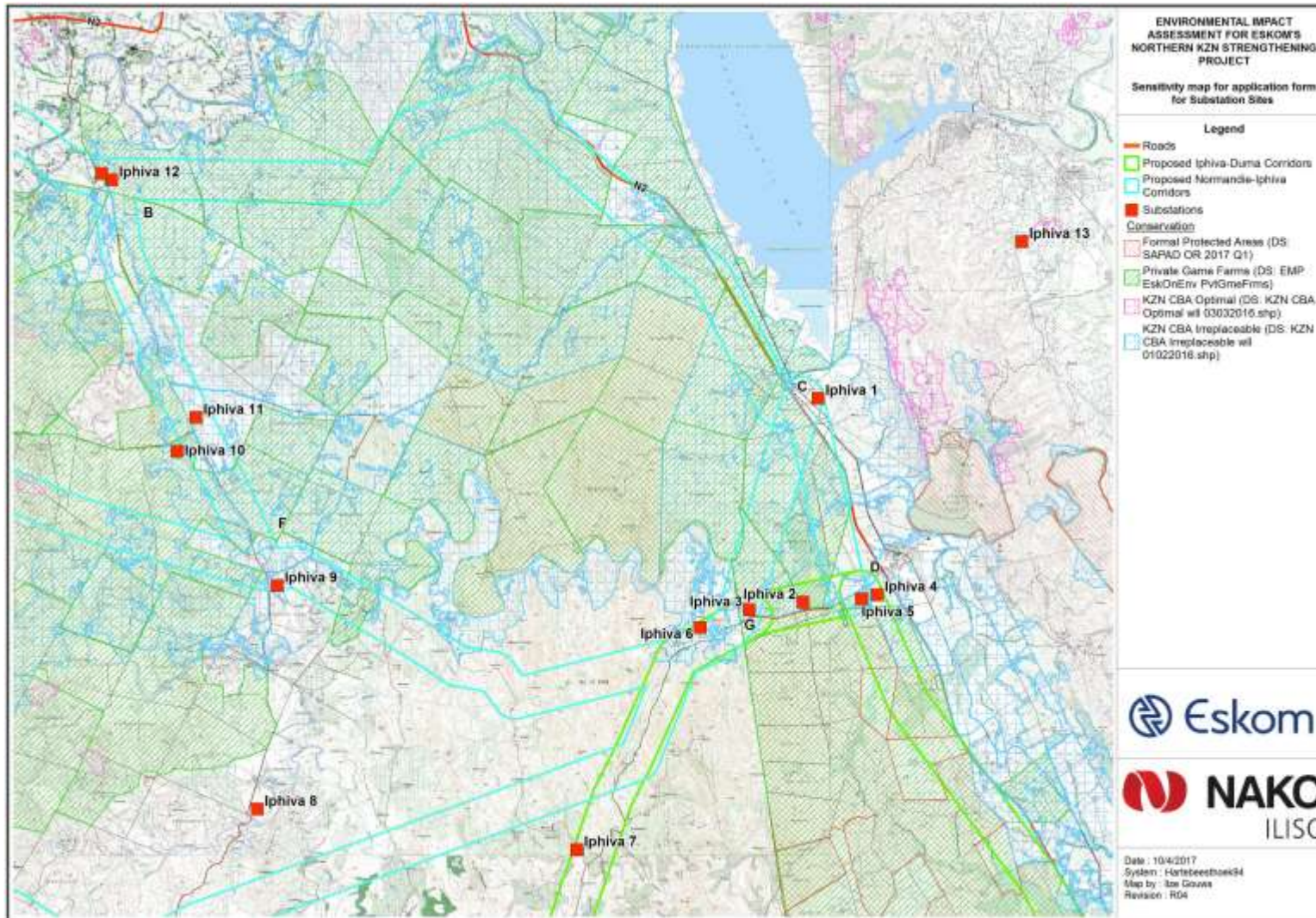


Figure 6.7: Critical Biodiversity areas and protected areas in the vicinity of the possible substation sites

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7. PUBLIC PARTICIPATION

GN 982 Appendix 2:

(ii) details of the public participation process 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 KZN Strengthening Project (the substation, two 400 kV powerlines and 165 km of 132 kV powerlines) a combined PPP is being undertaken. The PPP therefore cover the greater study area that include the powerline corridors.

7.1 LEGAL REQUIREMENTS

Public participation is a legal requirement for an application for environmental authorisation and is defined in the NEMA, No. 107 of 1998 (as amended) as the “*process by which potential interested and affected parties 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 interested and affected parties, 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 public participation processes required are prescribed in Chapter 6 of GN No. R982 of December 2014 (the “2006 EIA Regulations”) and are also guided by relevant principles contained in Chapter 2 of NEMA. The PPP for the EIA of the proposed Eskom’s KZN Strengthening is designed to satisfy the requirements laid down in the above legislation. The International Association for Impact Assessment (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 Power Lines are linear activities, but the Substations require written consent);
- 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

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- 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.

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—

1) (a) by delivering it by hand;
 (b) by sending it by registered mail—
 (i) to that person’s business or residential address; or
 in the case of a juristic person, to its registered address or principal place of (ii) business;
 by faxing a copy of the notice or other document to the person, if the person has a fax
 bA) number;
 by e-mailing a copy of the notice or other document to the person, if the person has
 bB) an e-mail address; or
 by posting a copy of the notice or other document to the person by ordinary mail, if
 bC) the person has a postal address;
 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
 (c) known residential or business address.
 [Subsection 1 amended by section 23(a) of Act No. 30 of 2013]

A notice or other document issued in terms of subsection (1)(b), (bA), (bB), (bC) or (2) is proved.
 [Subsection 2 amended by section 23(b) of Act No. 30 of 2013]. “

The PPP will give all registered I&APs a period of at least 30 days to submit comment on each of the documents that form part of the EIA as they are completed, i.e.the scoping report, the environmental impact report and environmental management programme, and all information that reasonably has or may have the potential to influence the decision with regard to the application.

7.2 PUBLIC PARTICIPATION TASK LEADER

The PPP Task Leader, **Bongi Shinga**, has 15 years of experience in communications management, stakeholder engagement and public participation processes, in support of environmental management and development processes. She has extensive experience in running complex yet successful communication programmes, particularly in the bulk water and energy sectors. She has been involved in various water resources development assignments for the Department of Water and Sanitation (DWS) and infrastructural development projects for Eskom. She also has actively managed public participation

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processes for the review of policies and management plans in the conservation sector. Her ability to communicate and interact with all levels of stakeholders (local, provincial and national), in both rural and urban settings has contributed to effective approaches for monitoring and maintaining stakeholder relationships. She is well-versed in the requirements of public participation as applied in environmental assessments in South Africa. Her role includes facilitation of the public, focus group and key stakeholder meetings.

7.3 THE EIA PROCESS AND LINKS TO THE PUBLIC PARTICIPATION PROCESS

An EIA 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 EIA findings will also inform further technical and financial investigations and decisions. The EIA is undertaken in terms of section 24C of the NEMA.

Public participation is an important aspect of any EIA, with the objective to assist stakeholders to table issues of concern, suggestions for enhanced benefits and to comment on the findings of the EIA. 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. **Scoping Phase** – During the Scoping Phase I&APs will have an opportunity to provide written comment on the Draft Scoping Report. During this phase they should check that the issues they have raised have been accurately captured and will be addressed by the specialist studies.
3. **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 Impact Assessment Report.
4. **Decision making phase** – I&APs will be notified of DEA’s decision regarding the project and of their opportunity to appeal.

One of the approaches of the PPP in this EIA is to limit the amount of printing as much as possible, without compromising the effectiveness of the process. Digital methods of making information available (e-mail, webpages and CDs) are therefore used wherever possible.

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7.4 PUBLIC PARTICIPATION ACTIVITIES IN THE ANNOUNCEMENT AND SCOPING PHASES

7.4.1 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. There are currently 1500 I&APs registered on the database for the Eskom Northern KZN Strengthening Project.

An effort was made to ensure that individuals and/or organisations were identified from an institutional and geographic point of view. The KZN Department of Cooperative Governance and Traditional Affairs (COGTA) assisted the Public Participation Team in identifying stakeholders within the uMkhanyakude and Zululand Districts.

I&APs identified and notified included the following:

- National and Provincial government departments:
 - Department of Water and Sanitation,
 - Department of Agriculture, Forestry and Fisheries,
 - Department of Local Government and Traditional Affairs,
 - AMAFA/Heritage KwaZulu-Natal,
 - Ezemvelo KZN Wildlife,
 - Department of Agriculture and Rural Development (DARD),
 - KZN Department of Economic Development, Tourism and Environmental Affairs (DEDTEA),
 - KZN Department of Cooperative Governance and Traditional Affairs (COGTA),
- Organs of state which have jurisdiction in respect of the activity to which the application relates:
 - Eskom Holdings SOC Limited
- District Municipalities:
 - uMkhanyakude District Municipality – Mkuze (Iphiva Substation)
 - uMkhanyakude District Municipality (Iphiva – Duma 400kV line)
 - Zululand District Municipality – Ulundi (Duma Substation)
 - Gert Sibande District Municipality – Piet Retief (Normandie Substation)
 - Zululand District Municipality (Normandie – Iphiva 400kV line)
- The Local Municipalities:
 - Ulundi Local Municipality – Ulundi - (Duma Substation)
 - Mkhondo Local Municipality – Piet Retief - (Normandie Substation)
 - Hlabisa Local Municipality (Iphiva – Duma 400kV line)
 - uPhongolo Local Municipality (Normandie – Iphiva 400kV line)
 - The Big 5 False Bay Local Municipality (Iphiva – Duma 400kV line)
 - Jozini Local Municipality (Normandie – Iphiva 400kV line)

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- Abaqulusi Local Municipality (Normandie – Iphiva 400kV line)
- Nongoma Local Municipality (Iphiva – Duma 400kV line)
- eDumbe Local Municipality (Normandie – Iphiva 400kV line)
- Landowners/Land Occupiers.
 - Private Landowners
 - Game Reserves and Tourism Establishment Operators
 - Community Trusts
- Traditional Councils within uMkhanyakude District
 - Qwabe/Makhasa Traditional Council
 - Nibela Traditional Council
 - AbakwaHlabisa Traditional Council
 - Mdletshe Traditional Council
 - Mpembeni Traditional Council
 - Myeni/Ntsinde Traditional Council
 - Myeni/Ngwenya Traditional Council
- Traditional Councils within Zululand District
 - Ndlangamandla Traditional Council
 - Sibiya Traditional Council
 - Msibi Traditional Council
 - Simelane Traditional Council
 - Gumbi Traditional Council
 - Emgazini Traditional Council
 - Ntshangase Traditional Council
 - Mavuso Traditional Council
 - Klwana Traditional Council
 - Msiyane Traditional Council
 - Empangisweni Traditional Council
 - Khambi Traditional Council
 - Emathongeni Traditional Council
 - Hlahlindlela Traditional Council
 - Othaka Traditional Council
 - Mandlakazi Traditional Council
 - Usuthu Traditional Council
 - Dlamini Traditional Council
 - Ndlela Traditional Council
 - Mthethwa Traditional Council

A GIS map of the study area (**Appendix E1**) has been developed with all properties shown and where landowners/traditional authorities have been notified or registered on the database shaded in. This gives a visual representation of the extent of landowner consultation.

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7.4.2 I&AP Database

A Microsoft Access database that 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 E2**).

7.4.3 Newspaper Adverts

Advertisements announcing the project were drafted, translated into Zulu and placed in the newspapers listed in **Table 2.2**. Copies are included in **Appendix E3**.

Table 7.1: Newspapers where advertisements have been published

Newspaper	Language	Geographic area covered	Date of publication
Mercury Regional newspaper	English	Mkhuze, Pongola, Paulpietersburg, Duma and Vryheid	11 August 2016
Excelsior News	English	Piet Retief	11 August 2016
Isolezwe	Zulu	Mkhuze, Pongola, Paulpietersburg, Duma and Vryheid	11 August 2016

7.4.4 Onsite Notices

Seventeen on-site notices were erected at the locations indicated on **Figure 7.1**. Notices have complied with GN 982 Regulation 41 (2), (3) and (4). Additional notices were erected at Iphiva sites 8 to 13 during the public comment period.



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Plate 28: Examples of onsite notice

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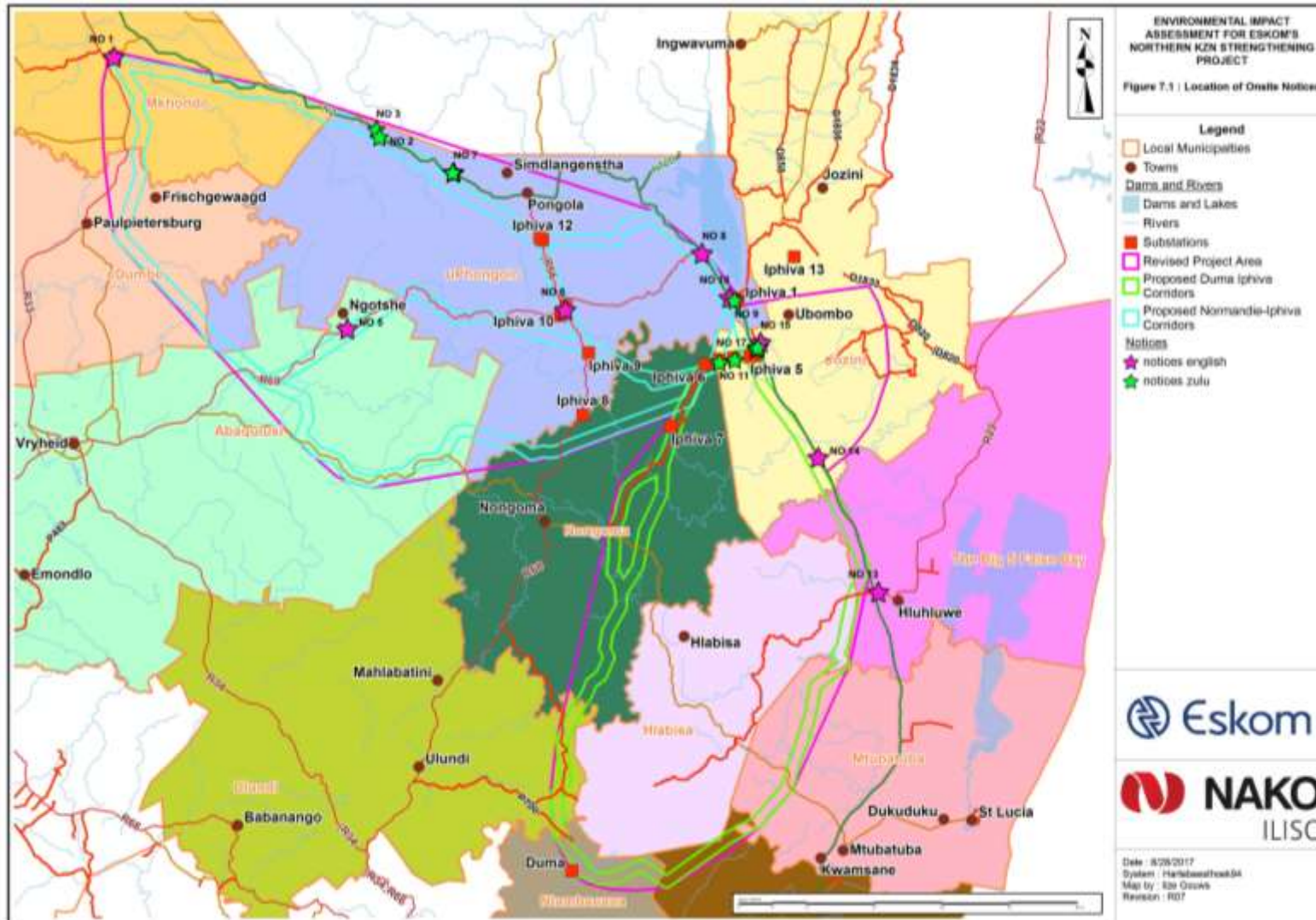


Figure 7.1: Location of onsite notices

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7.4.5 Written Notice

Notification letters (**Appendix E4**) have been given to the municipal councilors of the wards affected by the project, the district and local municipalities and organs of state indicated in **Section 7.4.1**. Notices were e-mailed with a copy of the Background Information Document (**Appendix E5**) and I&AP registration form.

7.4.6 Background Information Document

A 6 page x A4 Background Information Document (BID) was compiled in English, translated into Zulu and distributed with the notification letters. Additional copies were made available at the first round of key stakeholder and authorities' meetings, focus group meetings and traditional council meetings (**Appendix E5**).

7.4.7 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 first comment period was for the draft Scoping Report.

Availability of the documents and invitations to the public meetings were advertised in the following newspapers:

Newspaper	Geographics	Language	Areas covered	Insertion Date
The Mercury	Regional	English	Mkhuze, Pongola, Paulpietersburg, Duma and Vryheid	04 September 2017
Excelsior News	Local	English	Piet Retief	01 September 2017
Isolezwe	Regional	Zulu	Northern KwaZulu-Natal	04 September 2017
Ilanga	Regional	Zulu	Northern KwaZulu-Natal	05 September 2017

A notification letter was emailed to all registered I&APs on 31 August 2017 (**Appendix E4**). Hard copies of the letter, translated into isiZulu have been delivered to the Traditional Councils with a copy of the isiZulu translation of a Summary of each of the Scoping Reports.

Copies of the Draft Scoping Reports have been delivered to the following parties.

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No	AREA	VENUE AND ADDRESS	CONTACT DETAILS	NO OF COPIES	FORMAT (HARD/ELECTRONIC)
NATIONAL AND PROVINCIAL AUTHORITIES					
5	Department of Environmental Affairs (National)	<p>Department of Environmental Affairs Attention: Director: Integrated Environmental Authorisations Private Bag X447 Pretoria 0001</p> <p>Physical address: Department of Environmental Affairs Attention: Director: Integrated Environmental Authorisations Environment House 473 Steve Biko Road Arcadia Pretoria</p>	<p>Tel: 012 399 9372 E-mail: EIAAdmin@environment.gov.za</p>	1 x 3 reports + Appendices	Hard and electronic + Application Forms

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No	AREA	VENUE AND ADDRESS	CONTACT DETAILS	NO OF COPIES	FORMAT (HARD/ELECTRONIC)
6	Ezemvelo KZN Wildlife	Contact Person: Ms Dinesree Thambu Principal Conservation Planner <u>Address:</u> Ezemvelo KZN Wildlife 1 Peter Brown Street Montrose Pietermaritzburg 3202	Tel: 033 - 845 1425 Email: dinesree.thambu@kznwildlife.com	1 x 3 reports	Hard and electronic
7	KZN Department of Economic Development, Tourism and Environmental Affairs	Contact Person: <u>Address:</u>	Tel: Email:	1 x 3 reports	Electronic ONLY + Application Forms
8	Mpumalanga Department of Environmental Affairs	Contact Person: <u>Address:</u>	Tel: Email:	1 x 1 report plus executive summary	Normandie-Iphiva report only Electronic only + Application Forms
TRADITIONAL COUNCILS					
11	Traditional Councils x 29	Various across study area Deliver at each TC Office	Secretaries and Inkosi	Zulu Executive Summaries (20 copies per Traditional Council)	Hard copies

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Hard copies of the draft documents were available at four (4) public places in the study area, as indicated in **Table 7.2**. Pdf versions of the documents were uploaded to the ILISO website (www.iliso.com). CDs were also available at key stakeholder and authorities and focus group meetings, and posted to I&APs on request.

Table 7.2: Placing of draft documents at public venues

Area	Venue	Address	Contact Details
Piet Retief	Piet Retief Public Library	Piet Retief, 2380	Tel: 017 826 8153
Pongola	Pongola Public Library	61 Martin St, Pongola, 3170	Tel: 034 413 1540
Mkhuze	Ghost Mountain Inn	Fish Eagle Street, Mkuze	Tel: 035 573 1025
Hluhluwe	Hluhluwe Public Library	163 Zebra Street, Hluhluwe	Tel: 035 562 0040

All comments received have been recorded in the Comments and Responses Report for the DSR review period (**Appendix E9**).

7.4.8 Key Stakeholder and Authorities Meetings

The first round of Key Stakeholder and Authorities' Meetings took place in September 2016 (**Table 7.3**).

Table 7.3: Venues for Key Stakeholder Meetings

AREA	DATE	VENUES	TIME	ATTENDEES
Piet Retief	Monday, 05 Sept 2016	Piet Retief Country Club West End Street, Piet Retief	10H00 – 12H30	9
Pongola	Tuesday, 06 Sept 2016	Pongola Country Lodge 14 Jan Mielie Street Pongola	10H00 – 12H30	13
Mkhuze	Wednesday, 07 Sept 2016	Ghost Mountain Inn Fish Eagle Road, Mkhuze	10H00 – 12H30	14
Hluhluwe	Thursday, 08 Sept 2016	Protea Hotel 104 Main Road, Hluhluwe	10H00 – 12H30	9

Invitations (**Appendix E4**) were sent to all registered I&APs. Minutes were prepared and distributed to all attendees with the opportunity to provide corrections within 14 days. Final minutes are included in **Appendix E6**.

A second round of Key Stakeholder and Authorities meetings took place in September 2017. Due to the poor turnout at the first round of meetings, the second round of meetings were only arranged for Pongola and Mkhuze.

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The public and focus group meeting that took place during September 2017 to present the draft Scoping Reports and project description for the Distribution powerlines are listed in **Table 7.4**.

Table 7.4: Public and Focus Group Meetings during the Draft Scoping Report Comment Period

AREA	DATE	VENUES	TIME	Attendnace
Paulpieterburg Farmers	Monday, 18 September 2017	Mrb Mr Eckard Hiestermann's farm	14:00 – 15:00	8
Pongola	Tuesday, 19 Sept 2017	Pongola Country Lodge	10H00 – 12H30	15
Mkhuze	Wednesday, 20 Sept 2017	Ghost Mountain Inn	10H00 – 12H30	22

7.4.9 Focus Group Meetings

Two (2) Focus Group Meetings were held during announcement phase and one during the Draft Scoping Report Comment Period the as follows:

No	Date	Group/Target Audience	Venue	Time
1	09 September 2016	Ezemvelo KZN Wildlife	Queen Elizabeth Park, 1 Peter Brown Drive; Pietermaritzburg	10h00 – 11h30
2	25 October 2016	Landowners potentially affected by Iphiva Substation Sites	Ghost Mountain Inn	09h00 – 11h30
2	18 September 2017	Farmers in the Paulpietersburg area	Mr Hiestermann's Farm	14h00 – 15h00

Minutes of Focus Group Meetings were compiled and distributed to attendees. (**Appendix E7**).

7.4.10 Meetings with traditional councils

32 Traditional Councils within the uMkhanyakude and Zululand Districts that could be affected by the project have been identified. Meetings have taken place with each of these councils as shown in **Table 7.4**. Minutes are presented in **Appendix D8**.

Table 7.5: Focus Group Meetings with Traditional Councils that have taken place

NO	MEETING WITH	VENUE	DATE
1	Makhasa Traditional Council	Makhasa Tribal Court (Hluhluwe)	12 Sept 2016
2	Nibela Traditional Council	Nibela Tribal Court (Hluhluwe)	13 Sept 2016

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NO	MEETING WITH	VENUE	DATE
3	AbakwaHlabisa Traditional Council	AbakwaHlabisa Tribal Court (Hlabisa)	14 Sept 2016
4	Mdletshe Traditional Council	Mdletshe Tribal Court (Hlabisa)	14 Sept 2016
5	Mpembeni Traditional Council	Mpembeni Tribal Court (Hlabisa)	15 Sept 2016
6	Myeni/Ntsinde Traditional Council	Myeni Tribal Court (Obonjeni)	20 Sept 2016
7	Ngwenya/Ntsinde Traditional Council	Ngwenya Tribal Court (Mkuze)	20 Sept 2016
8	Ndlangamandla Traditional Council	Ndlangamandla Tribal Court (Pongola)	21 Sept 2016
9	Sibiya Traditional Council	Sibiya Tribal Court (Pongola)	22 Sept 2016
10	Msibi Traditional Council	Msibi Tribal Court (Emgulatshani)	23 Sept 2016
11	Simelane Traditional Council	Simelane Tribal Court (Pongola)	26 Sept 2016
12	Gumbi Traditional Council	Gumbi Tribal Court (Pongola)	27 Sept 2016
13	Emgazini Traditional Council	Emgazini Tribal Court (Pongola)	28 Sept 2016
14	Ntshangase Traditional Council	Ntshangase Tribal Court (Pongola)	29 Sept 2016
15	Mavuso Traditional Council	Mavuso Tribal Court (Pongola)	03 Oct 2016
16	Klwana Traditional Council	Klwana Tribal Court (Piet Retief)	03 Oct 2016
17	Msiyane Traditional Council	Msiyane Tribal Court (Louwsberg)	04 Oct 2016
18	Empangisweni Traditional Council	Empangisweni Tribal Court (Langkraans)	05 Oct 2016
19	Khambi Traditional Council	Khambi Tribal Court (Gluckstadt)	06 Oct 2016
20	Emathongeni Traditional Council	Emathongeni Tribal Court (Vryheid)	07 Oct 2016
21	Hlahlindlela Traditional Council	Hlahlindlela Tribal Court (Swart Umfolozi)	12 Oct 2016
22	Othaka Traditional Council	Othaka Tribal Court (Nqutu)	12 Oct 2016
23	Mandlakazi Traditional Council	Mandlakazi Tribal Court (Emondlo)	13 Oct 2016
24	Usuthu Traditional Council	Usuthu Tribal Court (Nongoma)	13 Oct 2016
25	Dlamini Traditional Council	Dlamini Tribal Court (Nongoma)	18 Oct 2016
26	Ndlela Traditional Council	Ndlela Tribal Court (Paulpietersberg)	18 Oct 2016
27	Bhovungane Traditional Council	Bhovungane Tribal Court (Paulpietersburg)	19 Oct 2016
28	Mthethwa Traditional Council	Mthethwa Tribal Court (Paulpietersburg)	20 Oct 2016
29	Mpukunyoni Traditional Council	Mpukunyoni Tribal Court (Paulpietersburg)	21 Oct 2016
30	Usuthu Traditional Council	Usuthu Tribal Court (Mtubatuba)	25 Oct 2016
31	Gumbi Traditional Council	Gumbi Tribal Court (Nongoma)	26 Oct 2016
32	Mandlakazi Traditional Council	Mandlakazi Tribal Court (Pongola)	28 Oct 2016

All Traditional Council meetings were conducted in Zulu. Zulu BIDs were also distributed at all meetings. Additional copies were also provided to the Councilors, Izinduna and AmaKhosi. All comments received at these meetings have been incorporated into the Comments and Responses Report.

7.4.11 Comments and Responses Report

The issues raised in meetings, telephone calls or emails during the announcement phase have been recorded in a Comments and Responses Report (CRR) for the announcement phase (**Appendix E9**). A copy of the Comments and Responses Report with comments received up until that point, was available to stakeholders for review as part of the DSR public comment period for them to confirm that their issues have been accurately captured and understood.

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All comments received during the Draft Scoping Report Comment Period have been captured in the CRR for the DSR (**Appendix E9**).

7.5 PUBLIC PARTICIPATION IN THE IMPACT ASSESSMENT PHASE

Public Participation planned for the Impact Assessment Phase is detailed in the Plan of Study presented in **Section 10.6**.

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8. ISSUES RAISED

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

As a combined Public Participation Process is being undertaken the Northern KZN Strengthening Project (the Main Transmission Substation, two 400 kV powerlines and 165 km of 132 kV powerlines), the issues discussed below cover the greater study area that include the powerline corridors.

An issue is a point of concern around which debate can be held. These have been identified during this phase (Scoping Phase) of the project. An impact is how the natural, social or economic environment will be affected by a specific activity. This will be assessed in the Impact Assessment Phase of the project. The following key issues have been identified by the EAP in consultation with I&APs, the applicant and specialists:

- Protected areas;
- Fauna and Flora (including birds);
- Landuse;
- Heritage;
- Social;
- Access;
- Construction Impacts; and
- Cumulative impacts.

8.1 PROTECTED AREAS

How will the Northern KZN Strengthening Project impact on protected areas and associated biodiversity, tourism and investment value?

The study area is characterised by large number of protected and conservation areas (varying from provincially proclaimed reserves to private game farms) (**Figure 9.3**), including (South African Protected Areas Database (2016):

- Bendor Private Nature Reserve;
- Corridor Game Reserve;
- Hluhluwe Game Reserve;
- iSimangaliso Wetland Park;
- Itala Nature Reserve;
- Mandlakazi Community Nature Reserve;
- Mduna Royal Game Reserve;
- Mkuzi Game Reserve;
- Ntendeka Wilderness Area;

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- Obuka Community Nature Reserve;
- Skaapkraal Private Nature Reserve;
- Somkhanda Game Reserve;
- Somopho Community Nature Reserve;
- Thanda Private Game Reserve;
- Ubombo Mountain Nature Reserve;
- Umfolozi Game Reserve;
- Umkoonyan No1 Private Nature Reserve;
- Umkoonyan No2 Private Nature Reserve;
- Welkom Private Nature Reserve;
- Witbad Nature Reserve; and
- Manyoni Private Game Reserve (MPGR).

Private game reserves, such as the MPGR, which is owned by a consortium of owners, and Zimanga Private Game Park (owned by Charl Senekal) develop facilities in the reserve for their own and tourist use. These reserves rely on income from tourists that make use of the facilities to fund their operations. The owners are concerned that **visual** impacts from the Iphiva Substation and/or any above-ground powerlines will reduce the number of visitors to lodges in the private game reserve, or the price that visitors are prepared to pay for the experience. This could impact on the **economic viability** of the existing lodges and potential **future developments and investors**.

If this happens, then it will reduce the **job opportunities** provided by the Reserves, as well as additional **income to the region** from tourists visiting the facilities, negatively impacting the **livelihoods of local communities**. Less income to the Reserves will also result in less funds available for looking after (e.g. supplementary feeding) and protecting important **Red Data species** such as rhinos and wild dogs.

If there is any construction inside a protected area, the Reserve management will have to provide additional **security** to protect the construction workers from the wild animals during construction, which will have a **cost**.

Construction will require the **clearing of vegetation** impacting on the biodiversity of the area. Removing some of the vegetation below the lines may have an impact on the **carrying capacity** of the Reserves that could financially impact the Reserve and its shareholders.

Construction workers in the park increases the risk of **poaching**.

The overhead Transmission lines from Iphiva through the Eastern boundary of the MPGR are expected to have the above-mentioned impacts. Powerlines in the Iphiva-Duma

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Western corridors could, similarly be visible with similar impacts from the elevated Western boundary of the Rhino Reserve.

Response

The EAP recommends that any new substations or powerlines in existing protected areas should be completely avoided, and believes that this will be possible. It will, however, not be possible to completely avoid having sight of the substation and powerlines from all protected areas, although this will be minimised as far as is possible.

The concern from the landowners is based on **sense of place**, and the value the owners and tourists place on the sense of place (which is subjective and will differ from person to person). It can be difficult to prove that any losses are specifically due to powerlines, as there are numerous factors that could impact on tourism, such as economic conditions, tourism trends, environmental aspects such as droughts etc.

The construction phase is specifically vulnerable phase, as it is the phase with most activities. Landowners have expressed concern that access to the properties required for construction will increase the risk of poaching.

These impacts will be assessed by a number of specialists including using existing studies for comparative purposes.

A viewshed analysis can be undertaken for the lodges that are particularly close to potential impacts to test the impact.

The assessment will be undertaken qualitatively as visual impact is a perception, and by nature, differs from person to person.

8.2 FAUNA AND FLORA

What impacts will the construction and operation of the Northern KZN Strengthening Project have on the natural environment (flora and fauna) of the region?

The construction of surface infrastructure will entail the removal/clearing of vegetation, which will affect the current vegetation types present in the study areas. Habitat utilised by mammals, amphibians, reptiles and birds species will also be lost. Open areas will facilitate the establishment of alien invasive plant species. This can be controlled with compilation and implementation and regular monitoring of an Invasive Species management plan. Protected plant and animal species will also be affected by construction activities. This must be addressed through a species of special concern management plan. Impacts can be addressed through avoidance, mitigation, rehabilitation, compensation and offsets.

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The potential impacts on Red Data Species and Birds were raised by I&APs. Birds are impacted by Electrocutions, Collisions, Habitat Destruction and Disturbance.

Electrocutions

The electrocution of birds on overhead lines is a significant cause of unnatural mortality of a number of different bird species in Southern African. The larger terrestrial dwelling species and birds of prey are the most susceptible. The electrocution can occur when a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (Van Rooyen 2004). Electrocution is possible on 400/132kV powerlines, especially where large raptors and vultures feature prevalently. It is very likely that vultures will occur in the study area as well as numerous large eagles, ibises and buzzards, so the risk of electrocution is high across the proposed power line routes.

Collisions

Collisions are the biggest single threat posed by over-head powerlines to birds in Southern Africa (Van Rooyen 2004). In general, large lines with earth wires that are not always visible to birds, can have the largest impact in terms of these collisions. Most heavily impacted upon are korhaans, bustards, storks, cranes and various species of water birds. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines (Van Rooyen 2004). Unfortunately, many of the collision sensitive species are considered threatened in Southern Africa. The Red Data, rare and endemic (Species of Special Concern – SSC) species vulnerable to power line collisions are generally long living, slow reproducing species. There are a few exceptions to this with the likes of some of the smaller lark and pipit species which generally are unaffected. Some of the larger terrestrial dwelling species like bustards and cranes require very specific conditions for breeding, resulting in very few successful breeding attempts, or breeding might be restricted to very small areas. These species have not evolved to cope with high adult mortality, with the results that consistent high adult mortality over an extensive period could have a serious effect on a population’s ability to sustain itself in the long or even medium term. The project area has a number of these species that are susceptible to power line collisions.

Many of the anthropogenic threats to these species including habitat destruction, disturbance and power lines all contribute to adult mortality of these larger SSC and it is not known what the cumulative effect of these impacts could be over the long term. Collisions of certain large flying bird species such as Great White Pelican (*Pelecanus onocrotalus*), Pink-backed Pelican (*Pelecanus rufescens*), Saddle-billed Stork (*Ephippiorhynchus senegalensis*), Yellow-billed Stork (*Mycteria ibis*), Woolly-necked Stork (*Ciconia episcopus*), Lesser Flamingo (*Phoenicopterus minor*), Black-bellied Bustard (*Lissotis melanogaster*), Secretarybird (*Sagittarius serpentarius*) and the three crane species, are all a possibility within the project area.

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A number of new SSC are now regarded as being of high collision threat. These include African Pygmy Goose (*Nettapus auritus*), Southern Ground Hornbill (*Bucorvus leadbeateri*), Hooded Vulture (*Necrosyrtes monachus*), Bateleur (*Terathopius ecaudatus*), African Marsh Harrier (*Circus ranivorus*) and Black Harrier (*Circus maurus*).

Habitat destruction

Habitat clearing and alteration inevitably takes place during the construction of the powerlines. This happens with the construction of access roads, and the clearing of servitudes, as well as clearing vegetation at the substation sites. Servitudes also have to be cleared of excess vegetation at regular intervals during the operational phase. These activities impact on breeding, foraging and roosting in or in close proximity of the servitude through modification of habitat (Van Rooyen, 2004).

Disturbance

Similarly, the above mentioned construction and maintenance activities impact on birds through disturbance, particularly during ground breeding activities within species. Uncontrolled vehicle access results in unnecessary loss of indigenous and riparian vegetation and preferred habitat for breeding bird species such as lark, pipit, lapwing, courser and bustard species.

Response

These impacts will be assessed in the fauna and flora and avifauna speciality studies.

Impacts as a result of power lines lies in the risk that they present of bird collisions and mortality and to a lesser extent the limitations on flora in the servitude. As such, the impacts are potentially more significant for the substations and roads during **construction**, whereas for power lines during **operations**.

8.3 COMMERCIAL FARMING

What impacts will the construction and operation of the Northern KZN Strengthening Project have on commercial farming in the region?

In terms of commercial farming, sugar cane and forestry are concerns when it comes to the presence of power lines (**Figure 8.1**). Sugar cane need to be burnt, and as such cannot be planted below power lines because the smoke provides a conductor and creates arcs to the ground resulting in the risk of lines tripping. Although there are other methods to harvest sugar cane, those are more expensive and labour intensive. Fire is a great risk in terms of forestry, and a spark or a snapped power line could cause extensive damage. Fire is often used as a retribution measure in some areas, and this might also cause damage to power lines (**Appendix C**).

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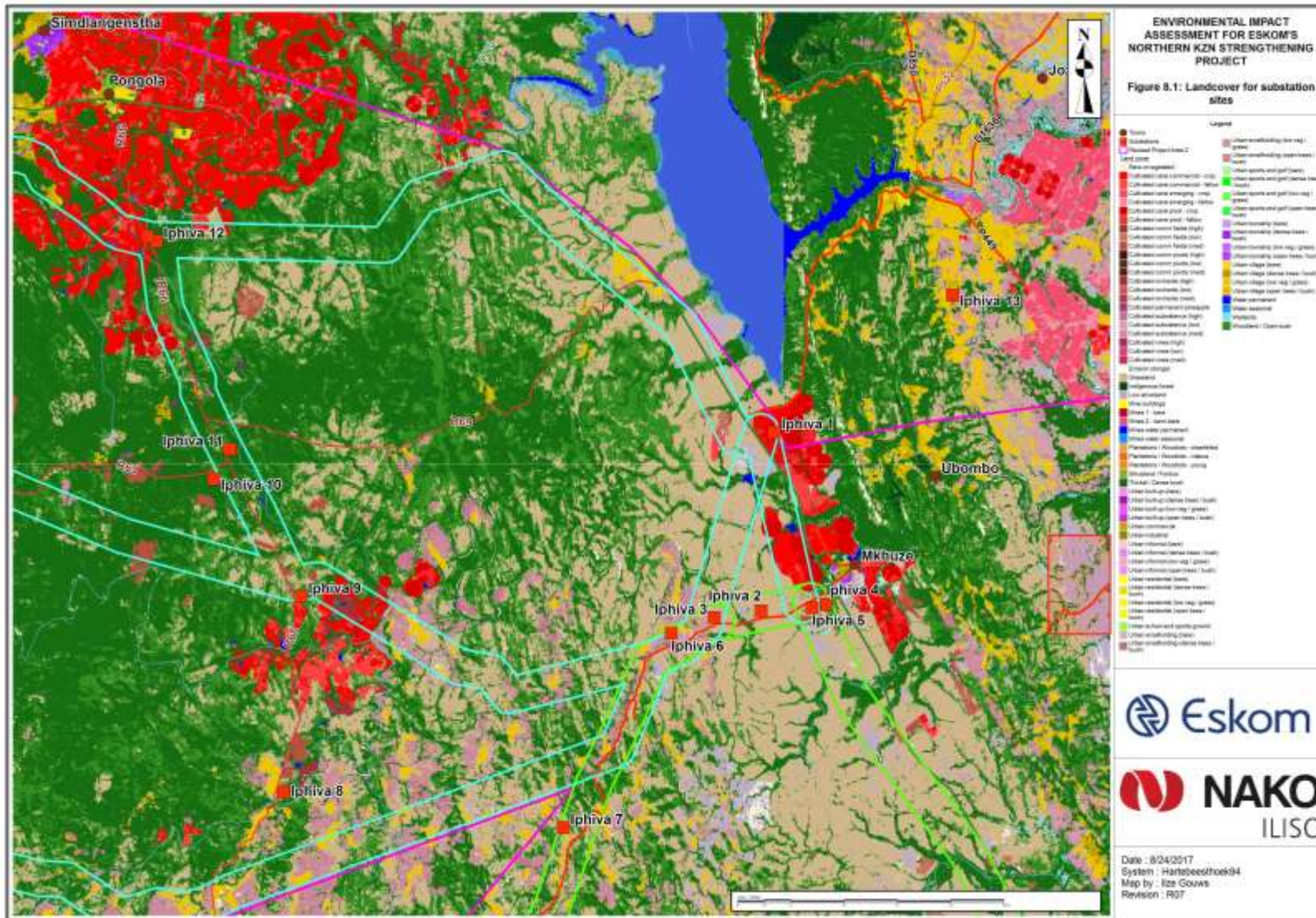


Figure 8.1: Landcover

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8.4 HERITAGE

What effects will the construction of the Iphiva Sub-station have on cultural heritage resources?

Different heritage impacts may manifest in different geographical areas and diverse communities. An impact to a heritage resource from a project related activity may manifest in several ways. These impacts are not always comparable in scale. In addition, project activities can influence the Cultural Significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can therefore generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example, destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking; and
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.

Through the review of available information, and an understanding of the cultural heritage baseline, various heritage resources are known to occur within the study area (**Table 8.1**). These include at least the following previously recorded heritage resources:

Table 8.1: Identified heritage resources in study area under consideration

Heritage Resource Type	Number Identified
Archaeological – Middle Stone Age	24
Archaeological – Late Stone Age	5
Archaeological – Late Farming Community	28
Battlefield	2
Historical Built Environment	99
Burial Grounds & Graves	47
Monuments & Memorials	1
Grand Total	206

The identified potential impacts to heritage resources are presented in **Table 10.14**. These consider the potential direct and indirect impacts on heritage resources by project related activities during the various phases of the Project.

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8.5 SOCIAL

What are the potential social impacts associated with the construction and operation of the proposed sub-station and powerlines?

This section is based on the Social Scoping Report (**Appendix C**).

A social impact is 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. Therefore, two types of social impacts can be distinguished:

- Objective social impacts – i.e. impacts that can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety.
- Subjective social impacts – i.e. impacts that occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life.

It is important to include subjective social impacts, as these can have far-reaching consequences in the form of opposition to, and social mobilisation against the project (Du Preez & Perold, 2005).

It is very likely that a number of social change processes will be set in motion by the project. Whether these processes cause social impacts will depend on the successful implementation of suggested mitigation measures. Having said that, it must be considered that the social environment is dynamic and constantly changing, making it difficult to predict exact impacts. External processes not related to the project, like political changes or global economic changes can alter the social environment in a short period of time, and therefore alter the predicted impacts.

Sources of social impacts are often not as clear-cut as those in the biophysical environment. Social impacts are not site-specific, but occur in the communities surrounding the proposed site – where the people are. **Table 8.2** shows impacts that can occur in the different phases of the project and suggests possible mitigation measures. The list is not exhaustive and will be expanded on in the EIA phase when further consultation with stakeholders will take place to inform the socio-economic specialist study. Mitigation measures are context specific, should be viewed as guidelines, and will be refined once consultation with stakeholders has taken place.

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Table 8.2: Preliminary social and economic impacts in the different phases of the project

Possible impacts	Possible mitigation measures
PLANNING AND DESIGN PHASE	
Expectations regarding social and economic benefits (e.g. that community will get access to electricity)	Eskom must put a community relations programme in place through which it communicates with the public as well as stakeholders, and through which the public and stakeholders can communicate with them. Information should be shared openly and honestly, even if it is negative. Even something like a delay in a milestone would be important for some stakeholders to know.
Expectations regarding creation of opportunities (Jobs etc.)	Eskom must put a communication strategy in place that will communicate in an open and honest way what kind of jobs will be created, who will qualify and how the recruitment process will work.
CONSTRUCTION PHASE	
Impacts of traffic on people – dust, noise, safety – from a social and nuisance perspective.	Heavy vehicles should travel during off peak times and should be clearly marked. Relevant mitigation proposed in the biophysical studies should be adhered to.
Impacts on livelihoods – of landowners.	Where possible, try to avoid productive land. Forestry and sugar cane have limitations in terms of overhead power lines. Where unavoidable, the landowners should be compensated for their land as well as their business activities depending on the land that they will be losing. A compensation plan should be compiled with their input.
Relocation of people currently living on the proposed route. (This impact will only occur if relocation has to take place).	Currently relocation of people is not envisaged, but should this become an option this impact should be dealt with according to international good practise.
Safety of community – possible increase in crime due to increased number of strangers in community.	Contractors should wear some form of identification that will make them easily recognizable as representatives from Eskom. Eskom should liaise with the communities to draft an action plan against potential crime.
Negative community relations due to conduct of contractors / representatives from Eskom.	A protocol must be put in place that stipulates how contractors / Eskom representatives should conduct themselves when they move around in the area, especially when they need to perform tasks on private property. This would include finding out what the community will expect of them, for example making appointments, being clearly identifiable, etc. The protocol should also state the consequences of not adhering to the rules.
Impacts of construction camp – HIV/AIDS, movement of people etc. (This impact would only occur if there is a construction camp).	The construction camp must be established in accordance to the IFC guidelines for Workers' Accommodation. The location of the construction camp must be agreed on with surrounding neighbours. Life skills education should be presented to all Eskom employees and at local schools and community centres close to construction camps. This should include HIV/AIDS, prostitution, teen pregnancy, etc.

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Possible impacts	Possible mitigation measures
Influx of people – also possible social disintegration and cultural differentiation, increase in HIV/AIDS etc.	Develop and implement an Influx Management Strategy as per IFC Guidelines on Influx Management.
Creation of jobs and other economic opportunities.	Contractors should be required to make use of a certain proportion of local labour – it is acknowledged that not all skills will be available locally. Jobs should be advertised in a way that is accessible to all members of society and labour desks should be established in accessible areas.
For some stakeholders their sense of place may change.	It is mostly not possible to mitigate impacts on the sense of place. Doing a Visual Impact Assessment and implementing its recommendations can assist in lessening the impact on the sense of place. Input should be obtained from current landowners.
Visual – the landscape will look different.	<p>There are many game reserves and game farms in the area. The visual landscape is a key aspect of their sense of place as well as earning their livelihoods. The mitigation in the visual impact assessment must be adhered to.</p> <p>It is furthermore suggested that professional land valuers establish the current land values of the directly affected properties to establish a baseline for future references.</p>
OPERATIONAL PHASE	
Negative community relations due to conduct of contractors / representatives from Eskom.	A protocol must be put in place that stipulates how contractors / Eskom representatives should conduct themselves when they move around in the area, especially when they need to perform tasks on private property. This would include finding out what the community will expect of them, for example making appointments, being clearly identifiable, etc. The protocol should also state the consequences of not adhering to the rules.
Creation of jobs and other economic opportunities	Preference should be given to local labour that is within easy travelling distance from the site of work. It may be necessary to put skills development programmes in place to develop local skills. Jobs should be advertised in a way that is accessible to all members of society and labour desks should be established in accessible areas.
Fire hazards (caused by people) – high risk area due to forestry activities	Fires should not be needed for this project under any circumstances, and should therefore be banned.
For some stakeholders the sense of place will change	Sense of place cannot be mitigated. Social change is a natural process that will occur over time regardless of whether the powerlines are built or not and the presence of the powerlines will just accelerate this process.
Visual – the landscape will look different.	<p>It is mostly not possible to mitigate impacts on the sense of place. Doing a Visual Impact Assessment and implementing its recommendations can assist in lessening the impact on the sense of place. Input should be obtained from current landowners.</p> <p>It is furthermore suggested that professional land valuers establish the current land values of the directly affected properties to establish a baseline for future references.</p>

Response

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The following categories of social impacts will be investigated in the SIA in the Impact Assessment Phase:

- Health and social well-being;
- Quality of the living environment;
- Economic impacts and material well-being;
- Cultural impacts;
- Family and community impacts;
- Institutional, legal, political and equity impacts;
- Gender impacts.

8.6 ACCESS

In order to implement the proposed substation and powerline, Eskom and its contractors will require access to substation site, tower positions and servitudes. The access road to the substation needs to be able to accommodate the extraordinary loads when large heavy equipment is delivered. Access requirements to the tower positions and servitude are less arduous.

Existing roads will be used, and upgraded if necessary, wherever possible. In some cases, new temporary or permanent access roads may need to be constructed within the corridors assessed. Access roads are therefore included in the application, project description, assessment and Environmental Management Programme.

Initial field work has revealed that some areas of the study area already have significant erosion resulting from other activities.

Response

The comparative assessment of the initial alternatives considered access roads (**Section 6**). The soils and agricultural potential specialist study will also consider erosion in the EIA phase. Mitigation measures and monitoring requirements will be included in the Environmental Management Programme.

8.7 CONSTRUCTION IMPACTS

What impacts will the common construction activities of the proposed Iphiva Substation and powerlines have?

Construction activities cause a well-known suite of impacts and risks. These include dust, noise, visual intrusion, increased traffic, erosion, pollution, waste generation and social impacts as a result of an influx of construction workers.

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A real potential exists for surface and groundwater pollution as well as impacting on the volume and flow patterns of surface and groundwater. Furthermore, surface and groundwater users could be negatively impacted during the construction and operational phases of such a substation.

Response

These impacts will be addressed in the Environmental Management Programme, which will include mitigation measures recommended by specialists in their studies.

Although no specialist studies on the impacts on surface and groundwater have been commissioned mitigation measures will still be prescribed.

8.8 CUMULATIVE IMPACTS

What cumulative effects will the proposed Iphiva Sub-station and powerlines contribute to?

GN 982 defines a cumulative impact in relation to an activity as *“the past, current or reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities”*.

The most significant cumulative impacts of the proposed Iphiva Substation will be caused by all of the future powerlines that could loop in to the substation. No other reasonably foreseeable future activities that will result in cumulative impacts have been identified.

Response

The substation sites have not been assessed based on their footprint only, but the number and direction of the powerlines emanating from the substation in the foreseeable future has been taken into account, in both the Scoping comparative assessment (**Chapter 6**) and will be considered in the EIA phase. This is also the main reason that the four applications are being assessed together in one process.

Impacts from past and current activities have been taken into account in description of the receiving environment (**Chapter 9**).

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9. ENVIRONMENTAL ATTRIBUTES

GN 982 Appendix 2:

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

As components of the Northern KZN Strengthening Project (the substation, two 400 kV powerlines and 165 km of 132 kV powerlines) impact on each other and are being assessed concurrently, the environmental attributes discussed below generally cover the greater study area that include the powerline corridors.

9.1 CLIMATE

The climate of the area is typified by warm to hot summers, high evaporation and dry warm winters with a mean annual rainfall between 495 and 1560 mm. Average rainfall is higher in the west and decreases gradually to the east.

9.2 GEOLOGY

The geological parent material is presented in **Figure 9.1**. This region of KZN is underlain by lithostratigraphic units associated with the Karoo Supergroup (Main Karoo Basin), ranging in age from Late Carboniferous to Middle Jurassic. The bulk of the Karoo strata occur in the main basin, covering an area of approximately 700 000 km², which was much more extensive during the Permian Period. The Karoo Supergroup is famously known for its terrestrial vertebrate fossils, distinctive plant assemblages, thick glacial deposits and extensive dolerite dykes and sills. Identified lithostratigraphy underlying the proposed transmission line routing options include units of the Dwyka, Ecca (*Volkstrust* and *Vryheid Formations*) and Beaufort Groups (*Emakwezini*, *Ntabene* and *Nyoka Formations*), as well as the Durban-Lebombo Belt (Johanson, et al., 2006).

The *Emakwezini Formation* comprises alternating blue-grey, grey-green and black mudrocks and subordinate fine to coarse grained feldspathic sandstones. This formation is associated with 11 low-grade coal seams, and plant fossils, primarily *Glossopteris*, are thought to be fairly common (Johanson, et al., 2006; SAHRA, 2016).

The *Ntabene Formation* comprises medium- to coarse-grained, cross bedded sandstones and subordinate grey to green shales deposited by braided rivers (Johanson, et al., 2006). This formation is commonly associated with *Dicroidium* ferns and most diverse plant and insect assemblages in the Gondwana Geological Terrain (SAHRA, 2016).

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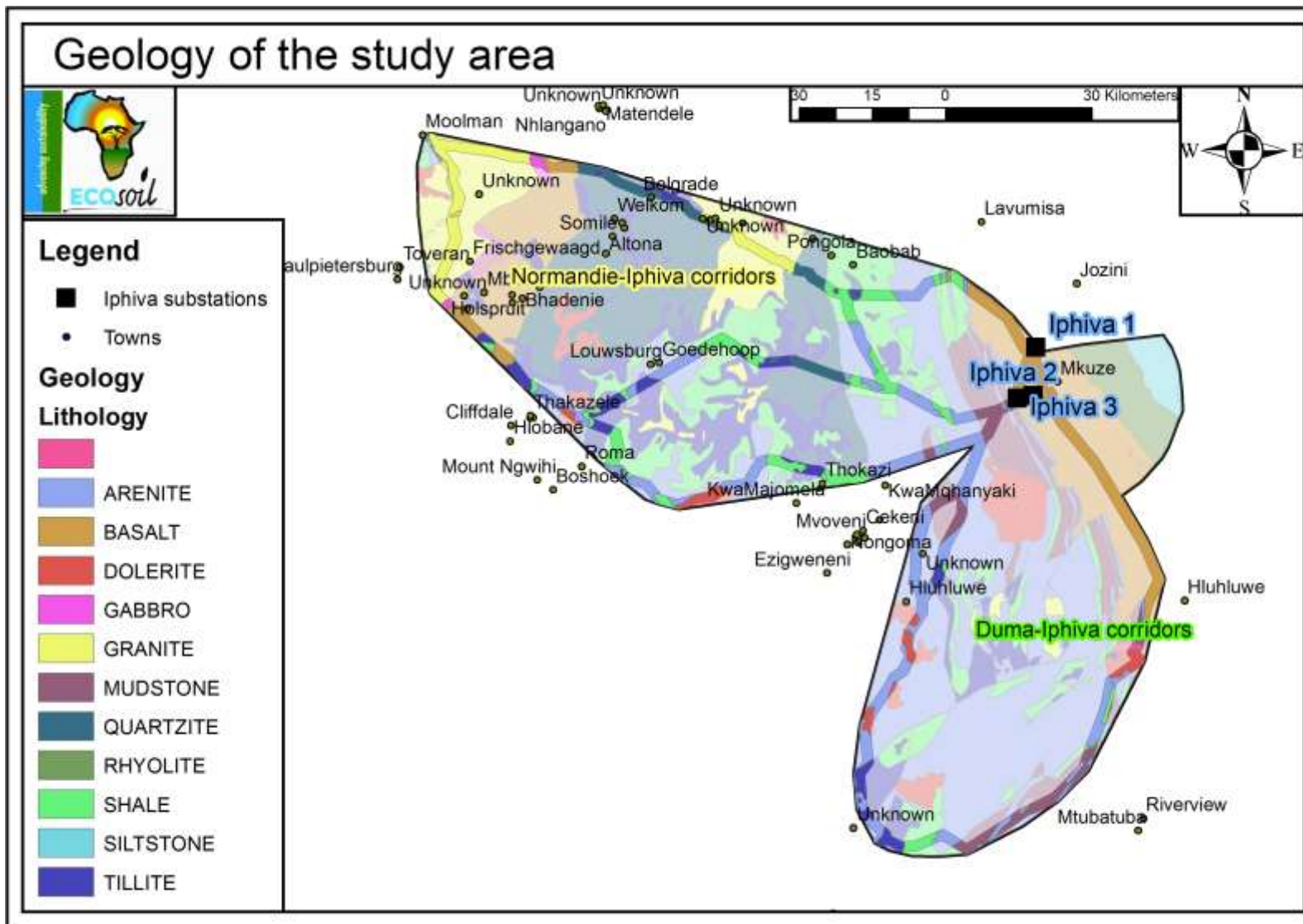


Figure 9.1: Geology

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The *Nyoka Formation* comprises primarily red or purple mudstone with calcareous concretions. Grey, blue-grey or greenish shale and siltstone, as well as thin beds of fine- to coarse grained sandstone are also present, though to have been deposited on the floodplains of slow-flowing meandering rivers under arid conditions (Johanson, et al., 2006). The fossil heritage includes reptilian, mainly dinosaur of lower *Euskelosaurus* range zone¹ and upper *Massospondylus* range zone, consisting of *Ornithishia* and *Saurischia*, *Thecodontia* and *Crocodylia* (SAHRA, 2016).

The *Volksrust Formation* is a predominantly argillaceous unit that interfingers with the overlying Beaufort Group. The formation consists of grey to black silty shale with thin, usually bioturbated siltstone and sandstone lenses and beds. The substantial thickness, fine grained lithology and great lateral extent suggest it represents a transgressive, open “shelf” sequence (Johanson, et al., 2006). Palaeontologically, the *Volksrust Formation* is associated with a low diversity of marine and non-marine trace fossil assemblages including rare *Temnospondyl* amphibian remains, invertebrates (bivalves, insects), minor coals with plant remains, petrified wood, and organic microfossils (SAHRA, 2016).

The *Vryheid Formation* rests directly on pre-Karoo rocks or the Dwyka Group based on regional expressions, its lithofacies mainly arranged in upward-coarsening cycle essentially deltaic in origin (Johanson, et al., 2006). This formation consists of sandstone, shale, mudstone and coal (Wilson & Anhaeusser, 1998). The *Vryheid Formation* has a high potential to contain fossil heritage inclusive of Permian *Glossopteris* flora, diverse palynomorphs, rare insects and fossil woods, and non-marine bivalves (SAHRA, 2016).

9.3 LANDSCAPE AND TOPOGRAPHY

The dominant landscape features are valley slopes to undulating hills and flat plains with a network of trailing rivers and smaller streams (**Figure 9.2**).

The northern and central parts of the study area are more mountainous and have extreme topographical features. Two extreme areas where topographical features are observed is in the north along the Pongola River and east, close to the N2.

Mean elevation ranges from 0 m above mean sea level (mamsl) to 2,000 mamsl above sea level. The typical height increases as one moves further away from the coast. Eastern areas ranges from 0 – 910 mamsl, while areas in the west ranges from 655 – 1,559 mamsl

¹ The range zone is defined by the geological range (total time of existence) of a particular fossil group or species

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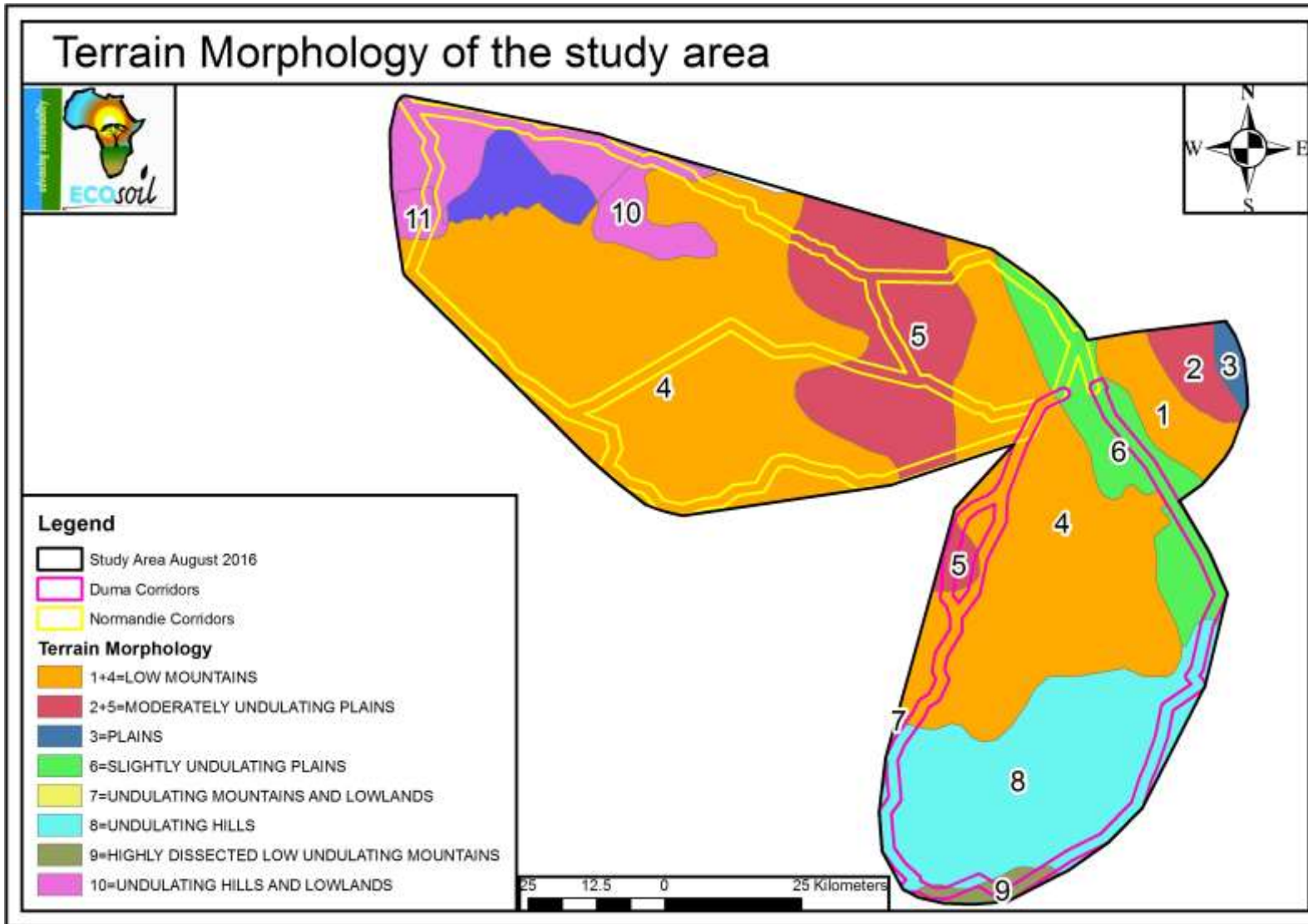


Figure 9.2: Terrain Morphology

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9.4 SOILS

This section is taken from Hattingh and Botha (2016). The Fb soil group occupies a large percentage (42.6 %) of land in the Normadie-Iphiva corridors. These Fb group of soils are shallow and of low agricultural potential and have rock or weathered rock as underlying material.

Relatively very small numbers of hectares have deep soils (>750 mm) in the corridors and soil depth is more likely to be between 450 to 750 mm. Clay contents is generally between 15 and 35 % in both corridors. Almost 10.2 % of the soils in the Normandie-Iphiva corridors have clay contents more than 35 % and may therefore be susceptible to water erosion. Soils should always be kept covered with plants or crops to prevent erosion.

The soils of the corridors have high percentages with a restricted soil depth associated with rockiness (31.6 %).

9.5 AGRICULTURE POTENTIAL

This section is taken from Hattingh and Botha (2016).

Arable crop production is not restricted by the climate of the area, but may become risky in the areas with lower and irregular rainfall patterns.

The profile (plant) available water content also indicates soils of low potential in the entire project area. Almost 35 % of the soils have favourable soil physical properties.

The area can be classed in five land capability classes, namely:

- Soils of intermediate suitability for arable agriculture;
- Soils not suitable for arable agriculture, but suitable for forestry or grazing;
- Soils of poor suitability for arable agriculture;
- No dominant class; and
- Water bodies.

According to the desk study the percentage of soils not suitable for arable agriculture, but suitable for forestry or grazing covers the highest percentage of the proposed corridors, namely 52.2 %.

According to the desktop study of the soils of the project area, there are no areas identified with high potential agricultural value, although small patches of high potential soils may be present in restricted areas if the survey was done on a much smaller scale. If no restrictions from other reports are found within the corridors, it might be advisable to distinguish between the sites on the hand of the soil physical properties, like swell and shrinking soil properties,

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and soil with a higher erosion potential. Such soils need special attention regarding management during construction and erection of foundations, but can be managed.

9.6 WATER RESOURCES

9.6.1 Drainage and Quaternary Catchments

The proposed powerline routes will directly traverse a total of 33 quaternary catchments, as listed in **Table 9.1 (Figure 9.3)**.

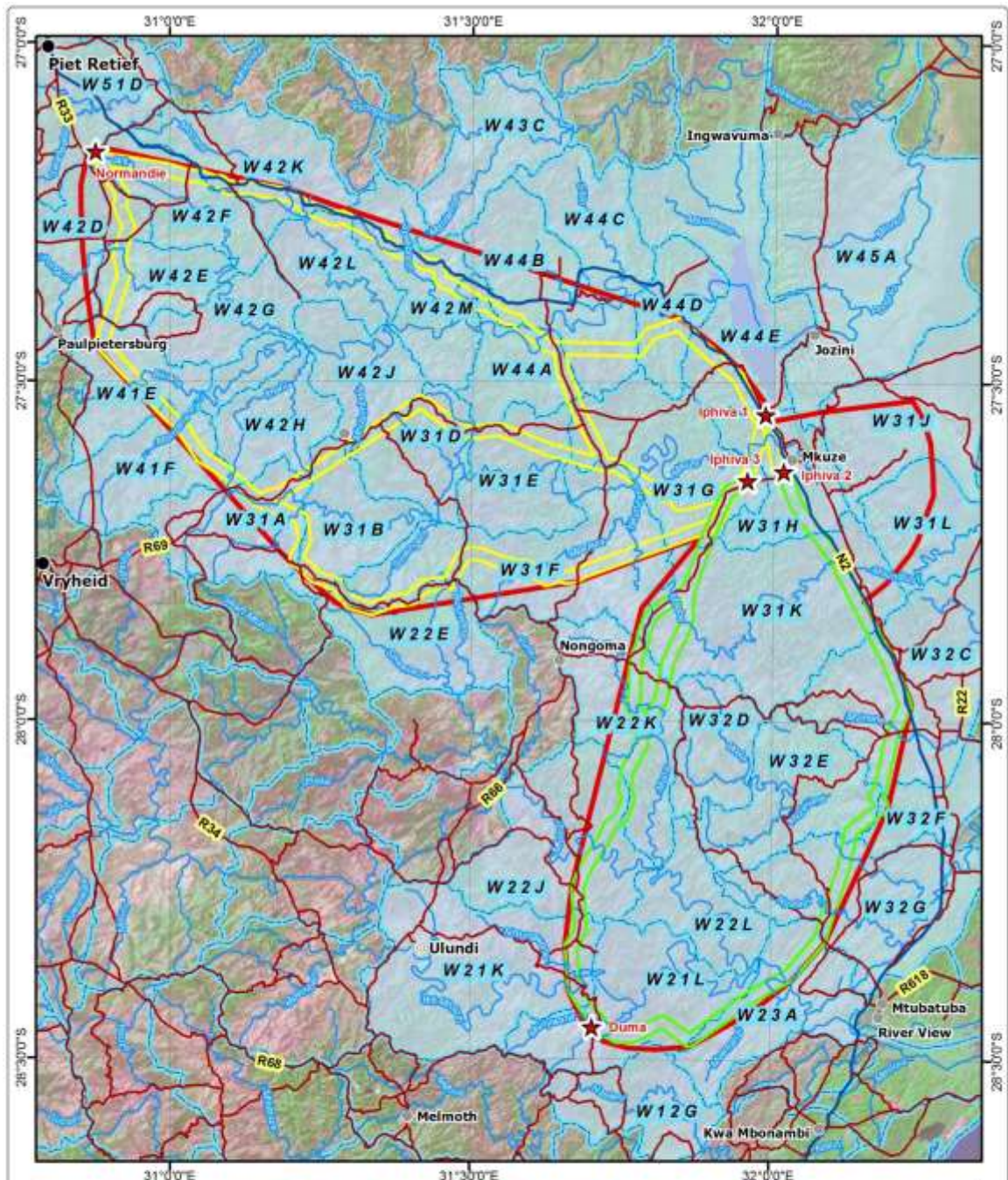
Of these, 23 will be traversed by the Duma-Iphiva corridors and 13 by the Normandie-Iphiva corridors (quaternary catchments: W31F, W31G and W31H are crossed by both proposed powerline corridors). The major rivers associated with wetland and riparian habitat along the powerline routes include: the Mfolozi River and its tributaries traversed by the Duma-Iphiva corridors, the Pongola River and its tributaries traversed by the Normandie-Iphiva corridors, as well as the Mkuze and Hluhluwe Rivers.

Table 9.1: Quaternary catchments

Quaternary Catchment	Major watercourse
W21K	White Mfolozi River; Nhlungwane ¹ ; and Mbilane tributary ¹ .
W21L	White Mfolozi River; Munywana tributary ¹ ; and Mayayeni tributary ¹ .
W22J	Black Mfolozi River.
W22K	Wela tributary ² ; and Mvalo tributary ² .
W23A	Mfolozi River; Mvamanzi tributary ³ ; Nkatha tributary ³ ; and Mbukwini tributary ³ .
W31F	Nkuzana tributary ⁴ ; and Mpuphisi tributary ⁴ .
W31G	Mkuze River; and Mtiki tributary ⁴ .
W31H	Mkuze River; and Kwasekane tributary ⁴ .
W31K	Msunduzi tributary ⁴ ; Ntweni tributary ⁴ ; Msebe tributary ⁴ ; and Mduna tributary ⁴ .
W32C	Mzinene tributary ⁵ ; Mhlosinga tributary ⁵ ; Ngweni tributary ⁵ ; and Munywana tributary ⁵ .
W32E	Hluhluwe River ⁵ .
W32F	Nzimane tributary ⁶ ; Manyisa tributary ⁶ ; and Manzabomvu tributary ⁶ .
W32G	Nyalazi River ⁵ ; Hlazane tributary ⁵ ; Sikhathula tributary ⁵ ; Mnyaba tributary ⁵ ; and Nsane tributary ⁵ .

Key: ¹ denotes tributaries of the White Mfolozi River; ² denotes tributaries of the Black Mfolozi River; ³ denotes tributaries of the Mfolozi River; ⁴ denotes tributaries of the Mkuze River; ⁵ denotes tributaries of the St Lucia estuary; ⁶ denotes tributaries of the Hluhluwe River.

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Northern KZN Strengthening Project: Quaternary Catchments

<p>Legend</p> <ul style="list-style-type: none"> ▭ Project Area ▭ Proposed Duma Iphiva Corridors ▭ Proposed Normandie Iphiva Corridors ★ Substations ● Major Town ⊙ Secondary Town ○ Other Town — Main Road — National Route — River ▭ Affected Quaternary Catchments ▭ Quaternary Catchments 	<p>Projection: Transverse Mercator Central Meridian: 31°E Datum: WGS 1984 Date: 13/09/2016 Ref #: kam_IL13664.201609.057</p> <div style="text-align: center;"> <p>0 5 10 20 30 Kilometres</p> </div>	<p>DIGBY WELLS ENVIRONMENTAL</p> <p>www.digbywells.com</p>
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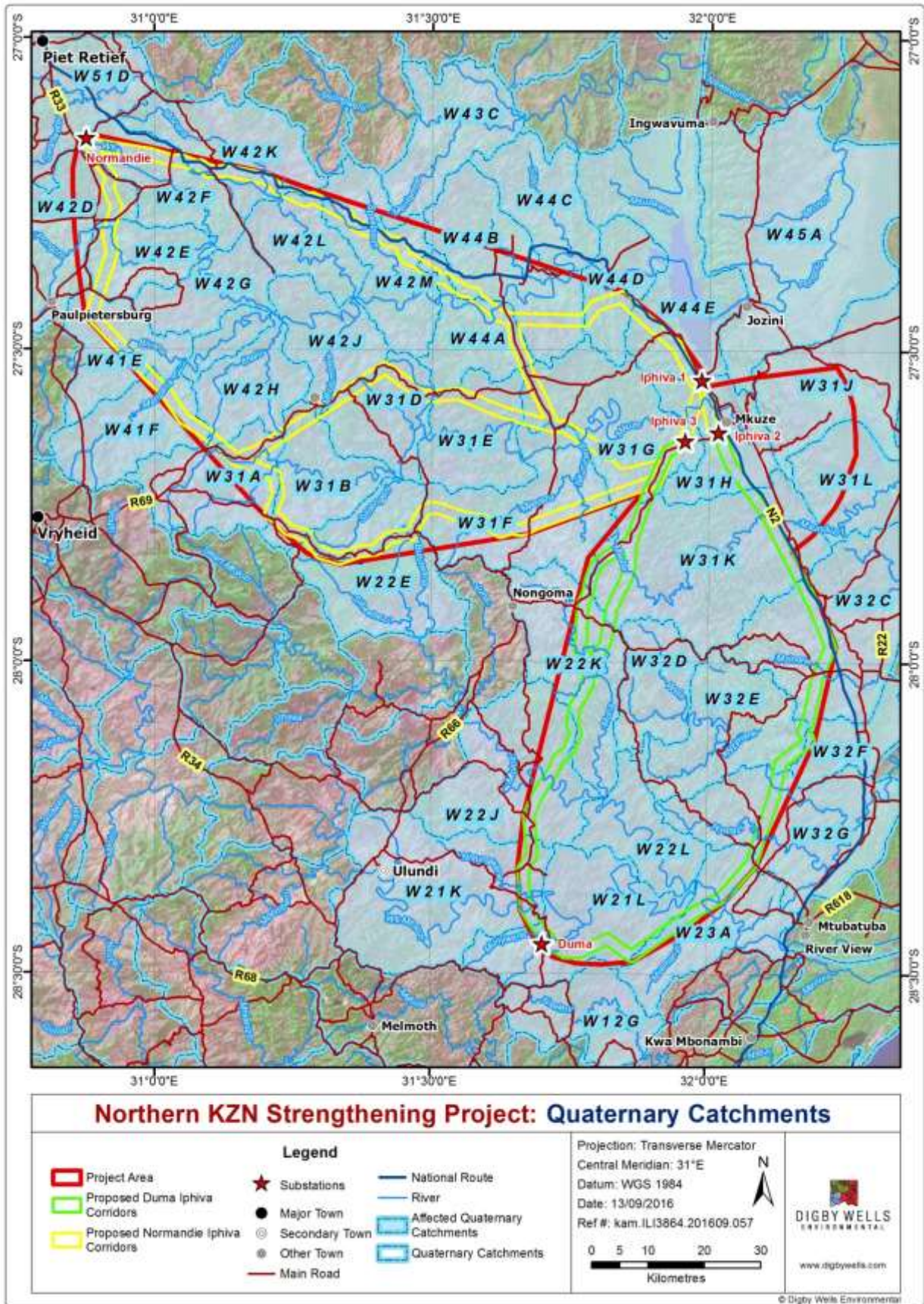


Figure 9.3: Quaternary catchments

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9.6.2 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) (Nel *et. al.*; 2011) strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources were considered to evaluate the importance of the wetland areas located within the project area (Nel *et. al.*; 2011). **Table 9.2** indicates the criteria which were considered for the ranking of wetland areas and **Figure 9.4** shows the distribution of NFEPA wetlands associated with the study area.

Table 9.2: NFEPA wetland classification ranking criteria

Criteria	Rank	Applicable in project area
Wetlands that intersect with a RAMSAR site.	1	x
Wetlands within 500 m of an IUCN threatened frog point locality; Wetlands within 500 m of a threatened waterbird point locality; Wetlands (excluding dams) with the majority of their area within a sub-quaternary catchment that has sightings or breeding areas for threatened Wattled Cranes, Grey Crowned Cranes and Blue Cranes; Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of exceptional Biodiversity importance, with valid reasons documented; and Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands that are good, intact examples from which to choose.	2	x
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of biodiversity importance, but with no valid reasons documented.	3	
Wetlands (excluding dams) in A or B condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion); and Wetlands in C condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion).	4	x
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing Impacted Working for Wetland sites.	5	x
Any other wetland (excluding dams).	6	x

Section A-B of the Normandie-Iphiva route traverses a large valley flat wetland of rank 2 (important for the maintenance of biodiversity), as well as numerous rank 4 (wetlands in good ecological condition) and 5 (wetlands identified for future rehabilitation efforts) wetlands.

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Route B-C traverses numerous 4 and 5 ranked systems. The Mkuze River, traversed by the C-D route, is of particular significance, as this system is extensive and has been highlighted for its importance for the maintenance of biodiversity.

The National Freshwater Ecosystem Priority Areas (NFEPA) strategic spatial priorities for conserving the country’s freshwater ecosystems and supporting sustainable use of water resources were considered to evaluate the importance of the wetland areas located within the project area (Nel *et al.* 2011). **Table 9.2** indicates the criteria which were considered for the ranking of wetland areas and **Figure 9.4** shows the distribution of NFEPA wetlands associated with the study site.

Section A-B of the Normandie-Iphiva route traverses a large valley flat wetland of rank 2 (important for the maintenance of biodiversity), as well as numerous rank 4 (wetlands in good ecological condition) and 5 (wetlands identified for future rehabilitation efforts) wetlands. Route B-C traverses numerous 4 and 5 ranked systems. The Mkuze River, traversed by the C-D route, is of particular significance, as this system is extensive and has been highlighted for its importance for the maintenance of biodiversity.

A rank 1 wetland has been identified by NFEPA, which is attributable to the presence of a Ramsar wetland associated with the study site (found 2 km from the study area). The St Lucia Ramsar site consists of a complex arrangement of coastal dune forest, marine, estuarine and fresh water wetlands and hygrophilous grassland to the east of the study area. As a consequence, any wetlands linked to the adjacent Ramsar site should be conserved. The Duma – Iphiva route traverses major rivers systems (primarily rank 4) for both the eastern and western routes.

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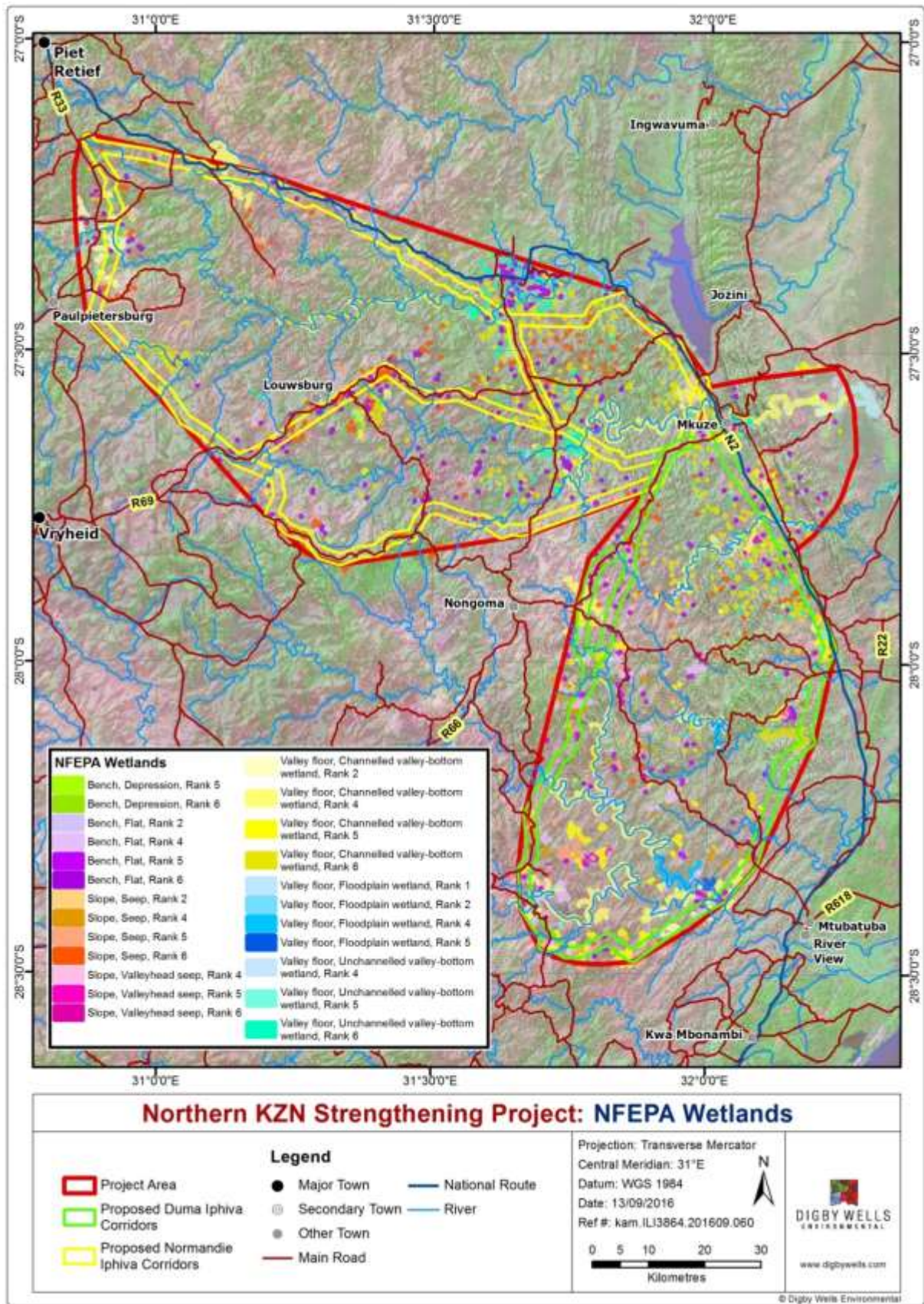


Figure 9.4: National Freshwater Ecosystems Priority Areas

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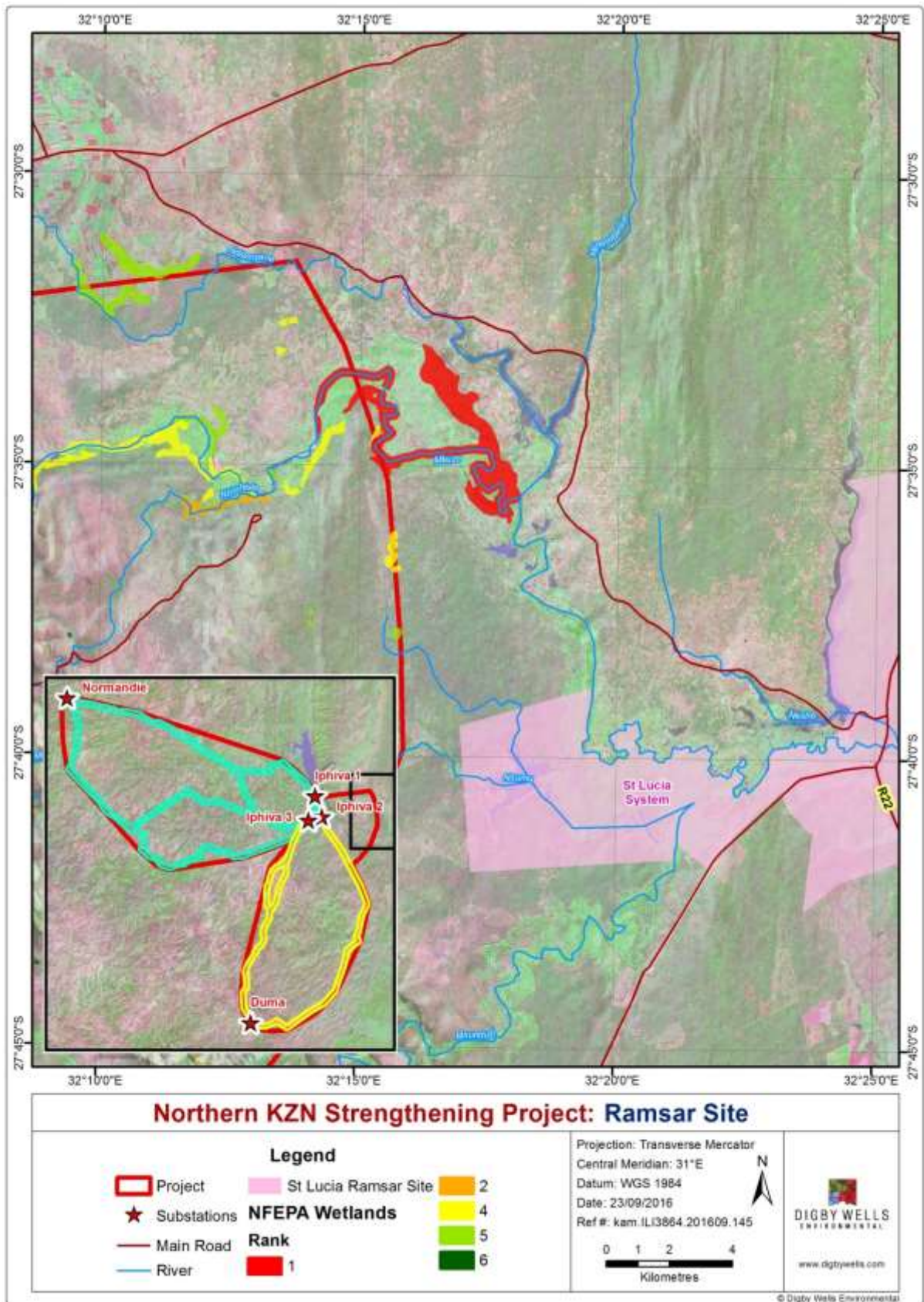


Figure 9.5: NFEPA in relation to the St Lucia Ramsar site

Preliminary Delineation

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The majority of the study area was identified as channelled valley bottom, as depicted in **Table 9.3**. **Figure 9.6** represents the preliminary wetland delineation completed on desktop level for the Normandie-Iphiva route so that the alternatives can be compared. The number of wetland crossings encountered along the routes is listed in **Table 9.4** for each alternative. Routes A-E; D-E and E-F showed the highest number of crossings.

Table 9.3: HGM units recorded on desktop level

HGM Units	Areas (ha)
Channelled Valley Bottom	6722.3
Dam	32.5
Floodplain	2373.3
Pan	1
Seep	111.8
Unchannelled Valley Bottom	909.2
Total	10150.1

Table 9.4: Number of wetland crossings

Intersections	Desktop Wetlands
A – B	161
A – E	216
B – C	96
B – F	57
C – D	145
D – E	322
D – F	185
E – F	250
Total	1432

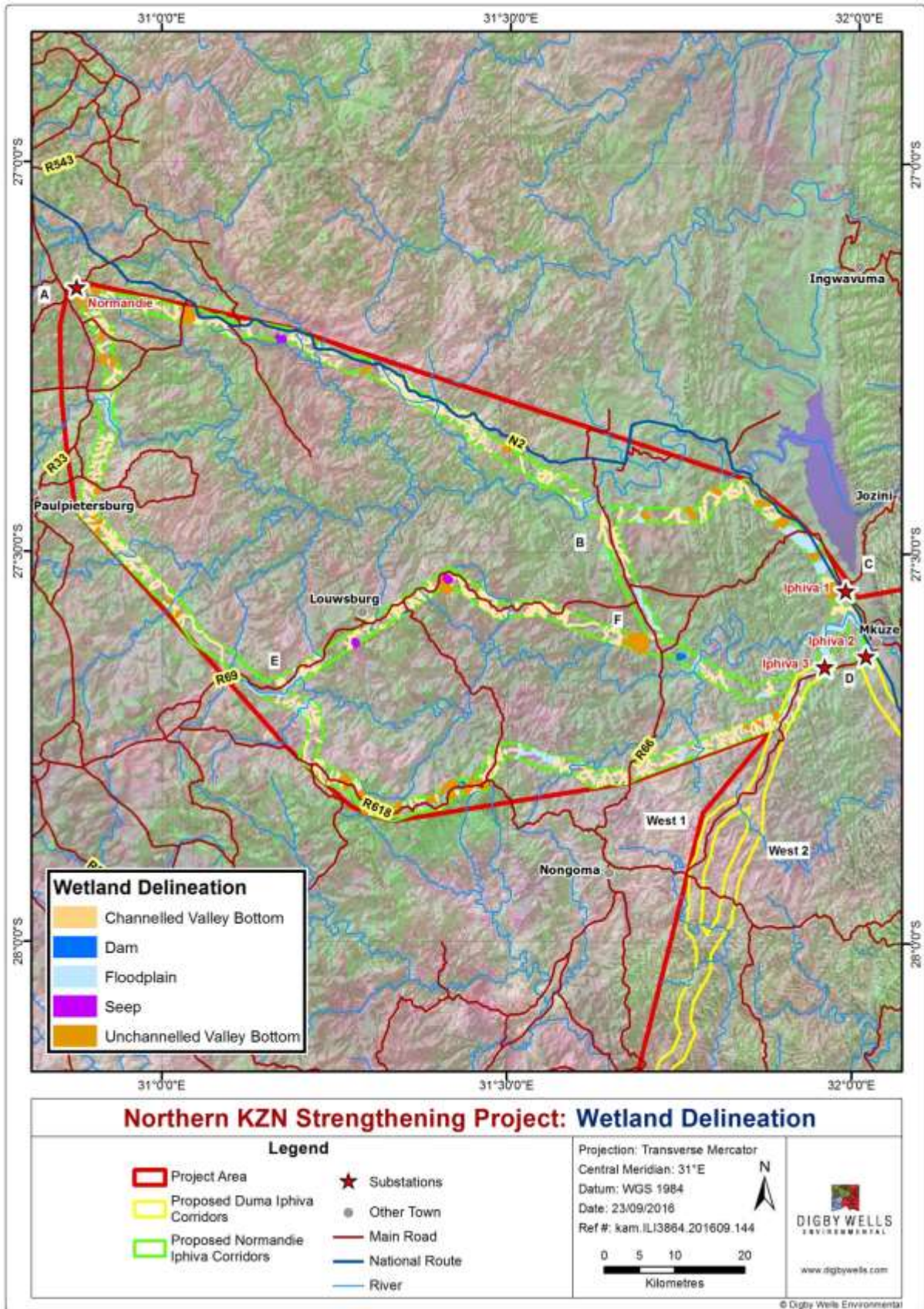


Figure 9.6: Preliminary Wetland Delineation

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9.7 VEGETATION

The study area mostly falls within the Savanna biome, gradually moving into the grassland biome towards the west in the vicinity of the Normandie substation. According to Mucina and Rutherford this main biome type have an herbaceous layer usually dominated by grass species and a discontinuous, open tree layer. Tree canopies are often an irregular series of interlocking (often low) canopies with openings and sometimes little distinction between tall shrubs and small trees.

In lower lying areas, such as river gorges, *Acacia* and *Combretum* is the dominant tree species whereas higher lying areas are mostly covered by open, tall grasslands, often dotted with bushes and solitary Savanna trees. Extensive flat plains or areas of moderate undulating landscapes support various units ranging from sparsely scattered solitary trees and shrubs to a mosaic with typical savanna thornveld, bushveld and thicket patches (**Figure 9.7**).

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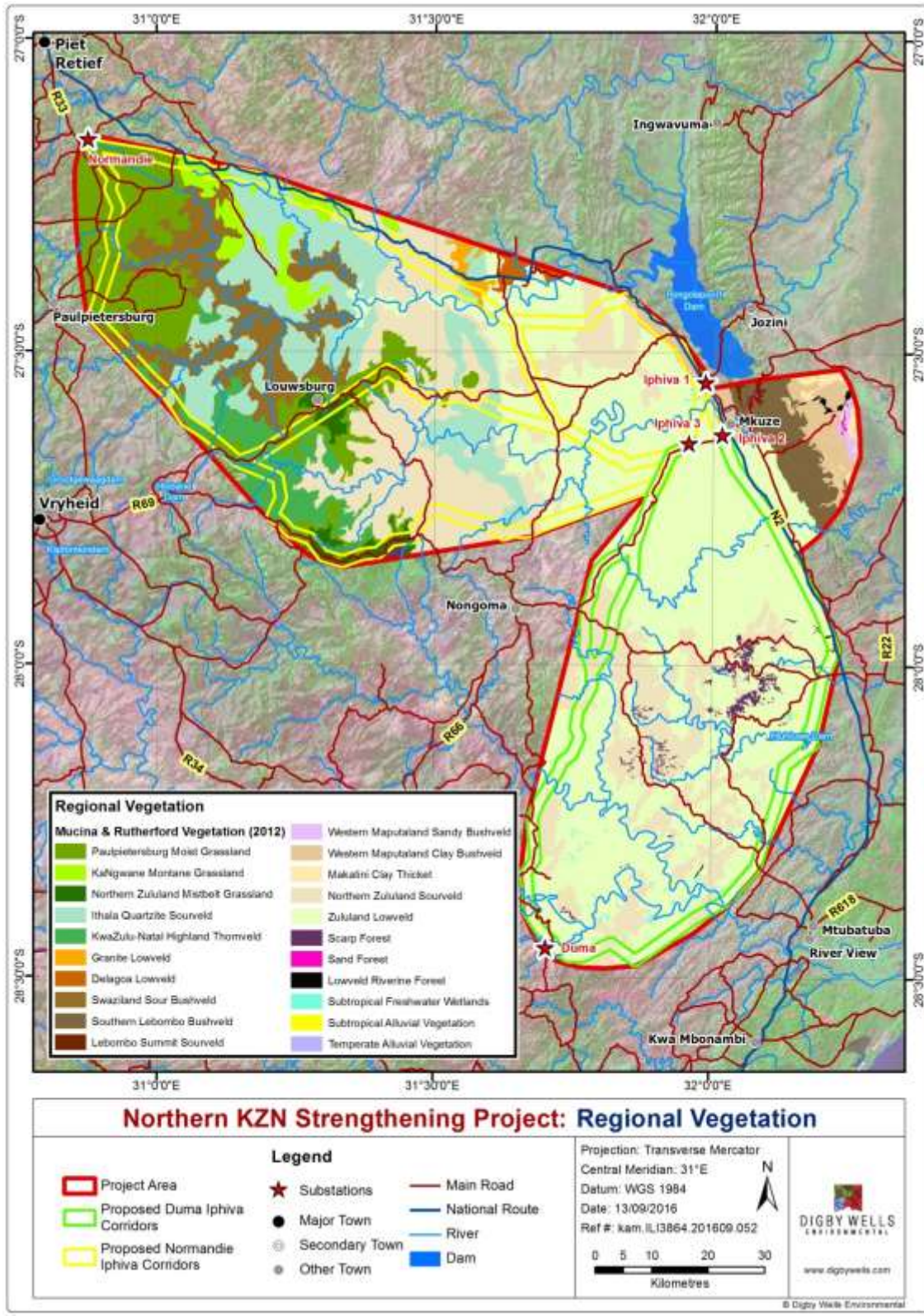


Figure 9.7: Regional Vegetation Types (Mucina and Rutherford 2012)

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9.8 FAUNA

9.8.1 Species of Special Concern

The Red Data listed species that have been recorded previously in the relevant 26 QDS grids are listed in **Appendix D**. Of this list one species is designated as Critically Endangered, 15 species as Declining, seven species as Endangered, 11 species as Near Threatened, five species as Rare, one species as Threatened and 12 species as Vulnerable. No champion trees occur in the study area.

9.8.2 Mammals

Mammal species expected to occur in the area of interest include eight Vulnerable species, two Near Threatened, one Critically Endangered species and two Endangered, as indicated **Appendix D**. The variety of vegetation types occurring in the area of interest ensures an ecologically diverse assemblage of plant species which in turn could support a variety of mammal species, therefore the current expected species list could be more extensive than is currently.

Twenty-one bat species of conservation concern can possibly be present in the area of interest (**Appendix D**).

9.8.3 Reptiles

According the Animal demography unit's virtual museum a total of 60 species have been recorded in the relevant QDS grids in the past (<http://sarca.adu.org.za/>). Only three protected species are expected to occur within the transmission line corridors and sub-stations (**Appendix D**).

9.8.4 Amphibians

Amphibians are viewed be good indicators of changes to the whole ecosystem because they are sensitive to changes in the aquatic and terrestrial environments (Waddle, 2006). Most species of amphibians are dependent on the aquatic environment for reproduction (Duellman and Trueb 1986). Additionally, amphibians are sensitive to water quality and ultra violet radiation because of their permeable skin (Gerlanc and Kaufman 2005). Activities such as feeding and dispersal are spent in terrestrial environments (Waddle, 2006). According to Carruthers (2009), a number of factors influence the distribution of amphibians, but because amphibians have porous skin they generally prosper in warm and damp habitats. The presence of suitable habitat within the study area should provide a number of different species of amphibians.

According to Carruthers (2009), frogs occur throughout southern Africa. A number of factors influence their distribution, and they are generally restricted to the habitat type they prefer, especially in their choice of breeding site. The choices available of these habitats coincide with different biomes, these biomes in turn, are distinguished by means of biotic and abiotic features prevalent within them. Therefore a collection of amphibians associated with the

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Grassland and Bushveld biome will all choose to breed under the prevailing biotic and abiotic features present. Further niche differentiation is encountered by means of geographic location within the biome, this differentiation includes, banks of pans, open water, inundated grasses, reed beds, trees, rivers and open ground, all of which are present within the area of interest. Amphibians expected to occur on site are listed in the **Appendix D** (<http://sarca.adu.org.za/>). No protected amphibian species are expected to occur on site as per this information, no NEMBA protected species are expected to occur.

9.8.5 Invertebrates

Butterflies are a good indication of the habitats available in a specific area (Woodhall 2005). Although many species are eurytopes (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.

9.8.6 Birds

The project area falls within the northern section of KwaZulu-Natal and the region is well known for its large wetlands, river systems, grassland hills, bushveld and diverse micro-habitats. 58 of Southern Africa's endemic and near endemic avifaunal species are found within the project area, many of them confined to the grassland, riparian and wetland systems. Although the summer months are more productive for the diversity of species due to the arrival of breeding migrants, winter provides large congregations of water birds around some of the nationally important wetlands found within or close to the project area.

The site falls within the Maputaland-Pondoland Centre of Endemism, which is a biodiversity hotspot. There are four Important Bird Areas (IBAs) within the current proposed project area, namely; the Ithala Game Reserve, the Hlulhuwe–Umfolozi National Park, the Pongola Nature Reserve and the Mkuze Game Reserve which forms part of the greater Isimangaliso Wetland Park (Refer to **Figure 9.8**).

Collectively these IBA's would constitute some of the most avifaunal rich and diverse areas in South Africa. Many of the areas outside these IBAs will have similar habitat and species will therefore not be restricted to the protected areas.

The Ithala Game Reserve is located 15 km from the town of Louwsburg south of the Pongola River. This IBA is known to support more than 300 bird species, a diversity that can be attributed to its variety of habitat it supports including Ithala Quartzite Sourveld Grassland vegetation (Mucina and Rutherford, 2006). In the higher altitude areas the vulnerable Southern Bald Ibis (*Geronticus calvus*), Blue Crane (*Anthropoides paradiseus*) and several large bird of prey species including the endangered White-backed Vulture (*Gyps africanus*), Lappet-faced Vulture (*Torgos tracheliotos*), Martial Eagle (*Polemaetus bellicosus*), Bateleur

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(*Terathopius ecaudatus*) and Tawny Eagle (*Aquila rapax*) occur. African Grass Owl (*Tyto capensis*) occurs in the grassland areas. (Birdlife.org.za)

The Pongola Nature Reserve IBA is located 30 km south-east of Pongola town. The Pongola River flows in from the north-west and only a small section of the river lies inside the reserve. The vegetation predominantly consists of Zululand Lowveld (Mucina and Rutherford, 2006). The associated wetlands are important for wetland-dependent birds such as the Pink-backed Pelican (*Pelecanus rufescens*) which has bred in the past, making this one of only two sites in South Africa where it does so.

Globally threatened species include the endangered vulture species such as Lappet-faced Vulture (*Torgos tracheliotos*), White-headed Vulture (*Trigonoceps occipitalis*), White-backed Vulture (*Gyps africanus*) and Martial Eagle (*Polemaetus bellicosus*). Regionally threatened species are Marabou Stork (*Leptoptilos crumeniferus*), African Marsh Harrier (*Circus ranivorus*), African Grass Owl (*Tyto capensis*) and Tawny Eagle (*Aquila rapax*). Biome-restricted species include White-throated Robin-Chat (*Irania gutturalis*), Gorgeous Bush-Shrike (*Telophorus viridis*) and Rudd's Apalis (*Apalis ruddi*).

The Mkuze IBA is located on the western edge of the Isimangaliso Wetland Park which is both a Ramsar Site and a World Heritage Site. Here a number of large pan systems exist and therefore the IBA is home to a number of Red Data Listed wetland and aquatic species. There are important water courses and wetlands that are associated with the river systems in the central and southern region of the study area, as well as in the east within the Mkuze Game Reserve. These wetlands may well be seasonal but occasionally inundated with water and associated with the “Subtropical Alluvial Vegetation” vegetation type (Mucina & Rutherford 2006). The larger rivers and associated sandbanks provide habitat for various wading species including, Lapwings, Plovers, Stilts and Sandpipers.

Rivers and drainage lines also represent important flight paths for many species. These areas will be very important for assorted water bird species, and construction of the new power line in close proximity to these areas should be avoided.

The Hlulhuwe–Umfolozi IBA is located 20 km north-west of the town Mtubatuba, at the junction of the coastal plain and the foothills of the KwaZulu-Natal interior. The local vegetation is classified as Zululand Lowveld and Northern Zululand Thornveld (Mucina and Rutherford, 2006). This region to the south of the proposed project area is known to support more than 400 bird species, about 46% of the species found in the southern African sub-region (birdlife.org.za). The bird diversity within the region can be attributed to the variety of habitats in this area. This diversity includes a number of important populations of large, widespread Red Data Listed birds of prey that have suffered outside the protected areas.

Large terrestrial species found here and are susceptible to power line collisions include Black Stork (*Ciconia nigra*), Woolly-necked Stork (*C. episcopus*), African Openbill

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(*Anastomus lamelligerus*) and Saddle-billed Stork (*Ephippiorhynchus senegalensis*). Several endangered vulture species that are rare outside South Africa's large parks are locally common here.

Various sensitivity zones have been identified on a desk top level, associated with protected areas and IBAs, including potentially pristine or secondary grassland, bushveld/thornveld and sand forest, wetlands, pans and rivers. Avifaunal input into the Environmental Management Plan (EMP) will be compiled via a screening site visit with a focus on these sensitivity zones. This will help to identify the areas for marking and areas to install deflectors to mitigate for bird collisions, once the final route is chosen.

The desktop specialist study shows bird sensitive areas to be widespread throughout the study area, but with greater density in the southern and eastern areas. A list of the potential species associated with the entire region is presented in Appendix A (Patton and SABAP2). During the site visit this species list will be fine-tuned depending on infield observations and confirmation of the habitats associated with the proposed project area.

The South African Bird Atlas Project data (SABAP2) has recorded a total of 29 Red Data species according to the International Union for Conservation of Nature (IUCN, 2016), these comprise 3 Endangered species, 11 Vulnerable species and 13 Near-threatened species and are presented in **Table 9.5**.

Table 9.5: Potential Red Data Bird Species associated with the project area

Common Name	Scientific name	IUCN Status	NEMBA Status
Maccoa Duck	<i>Oxyura maccoa</i>	Near-threatened	Near-threatened
Lesser Flamingo	<i>Phoeniconaias minor</i>	Near-threatened	Near-threatened
Grey Crowned Crane	<i>Balearica regulorum</i>	Endangered	Endangered
Wattled Crane	<i>Grus carunculata</i>	Vulnerable	Vulnerable
Blue Crane	<i>Grus paradisea</i>	Vulnerable	Vulnerable
Kori Bustard	<i>Ardeotis kori</i>	Near-threatened	Near-threatened
Southern Bald Ibis	<i>Geronticus calvus</i>	Vulnerable	Vulnerable
Slaty Egret	<i>Egretta vinaceigula</i>	Vulnerable	Vulnerable
Chestnut-banded Plover	<i>Charadrius pallidus</i>	Near-threatened	Near-threatened
Black-winged Pratincole	<i>Glareola nordmanni</i>	Near-threatened	Near-threatened
African Skimmer	<i>Rynchops flavirostris</i>	Near-threatened	Near-threatened
Bateleur	<i>Terathopius ecaudatus</i>	Near-threatened	Least Concern
Southern Banded Snake Eagle	<i>Circaetus fasciolatus</i>	Near-threatened	Near-threatened
White-headed Vulture	<i>Trigonoceps occipitalis</i>	Vulnerable	Vulnerable
Hooded Vulture	<i>Necrosyrtes monachus</i>	Endangered	Endangered
White-backed Vulture	<i>Gyps africanus</i>	Endangered	Endangered
Cape Vulture	<i>Gyps coprotheres</i>	Vulnerable	Vulnerable
Black Harrier	<i>Circus maurus</i>	Vulnerable	Near-threatened

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Common Name	Scientific name	IUCN Status	NEMBA Status
Pallid Harrier	<i>Circus macrourus</i>	Near-threatened	Near-threatened
Secretarybird	<i>Sagittarius serpentarius</i>	Vulnerable	Vulnerable
Southern Ground Hornbill	<i>Bucorvus leadbeateri</i>	Vulnerable	Vulnerable
European Roller	<i>Coracias garrulus</i>	Near-threatened	Least Concern
Red-footed Falcon	<i>Falco tinnunculus</i>	Near-threatened	Near-threatened
Sooty Falcon	<i>Falco concolor</i>	Near-threatened	Near-threatened
Neergaard's Sunbird	<i>Cinnyris neergaardi</i>	Near-threatened	Least Concern
Yellow-breasted Pipit	<i>Hemimacronyx chloris</i>	Vulnerable	Vulnerable
Melodious Lark	<i>Mirafra cheniana</i>	Near-threatened	Near-threatened
Bush Blackcap	<i>Lioptilus nigricapillus</i>	Near-threatened	Near-threatened
Blue Swallow	<i>Hirundo atrocaerulea</i>	Vulnerable	Endangered
Bathawk	<i>Macheiramphus alcinus</i>	Least Concern	Near threatened
Peregrine Falcon	<i>Falco peregrinus</i>	Least Concern	Near-threatened
Lanner Falcon	<i>Falco biarmicus</i>	Least Concern	Near-threatened
Half collared Kingfisher	<i>Alcedo semitorquata</i>	Least Concern	Near-threatened

9.9 IDENTIFICATION OF ENVIRONMENTAL SENSITIVITIES

In terms of ecological sensitivity, the following features are assessed to determine how sensitive the habitat identified within the substation sites and powerline 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.

Terrestrial conservation priorities highlighted in the Terrestrial Systematic Conservation Plan (CPLAN) for the Province (EKZNW, 2010) are **Appendix D**. According to this plan, the majority of the project site and proposed corridors fall within areas known as Biodiversity areas, all the alternatives cross Critical Biodiversity areas 1 Mandatory, or Critical Biodiversity areas Optimal. The existing protected area network is not affected by the corridors or sub stations.

Biodiversity Priority Areas (BPAs) refer to natural areas that are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being. The importance of the biodiversity features in Biodiversity Priority Areas and the associated ecosystem services is sufficiently high that, if their existence and condition are confirmed, the likelihood of a fatal flaw for new development projects is high (i.e. development projects are likely to be significantly constrained or may not receive necessary environmental authorizations).

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9.9.1 Critical Biodiversity Areas including Centres of Endemism

The transmission line corridors and substations falls within the Maputaland-Pondoland Centre of Endemism, this is a biodiversity hotspot. Stretching along the east coast of southern Africa, from southern Mozambique through KwaZulu-Natal and the Eastern Cape in South Africa, the recently recognized Maputaland-Pondoland-Albany Hotspot is an exceptionally diverse area.

The hotspot is the meeting point of six of South Africa's eight major vegetation types. The region boasts an unusually high number of unique species and ecosystems, with one type of forest (sand forest), six types of bushveld and five types of grassland restricted to the hotspot, as well as an entire vegetation type called "subtropical thicket."

The hotspot is a refuge for the critically endangered Black Rhino. It is estimated that only 3,600 Black Rhino remaining in the wild (compared with 65,000 animals recorded in the 1970s), most of which are restricted to this hotspot.

The hotspot is also home to most of South Africa's natural forests, and with nearly 600 tree species it has the highest tree diversity of any temperate forest in the world. The region is home to the 'Big Five' game animals (elephant, lion, rhino, leopard and Cape buffalo).

Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan.

9.9.2 Sensitivity and Conservation Planning Tools

There are several assessments for South Africa as a whole, as well as on provincial levels that allow for detailed conservation planning as well as meeting biodiversity targets for the country's variety of ecosystems. These guides are essential to consult for development projects, and will form an important part of the sensitivity analysis. Areas earmarked for conservation in the future, or that are essential to meet biodiversity and conservation targets should not be developed, and have a high sensitivity as they are necessary for overall functioning. In addition, sensitivity analysis in the field based in much finer scale data can be used to ground truth the larger scale assessments and put it into a more localised context, once field work is complete.

Protected areas

Officially protected areas, either Provincially or Nationally that occur close to a project site could have consequences as far as impact on these areas are concerned. Protected areas that occur within the broader study area (South African Protected Areas Database (2016)) are presented on **Figure 9.8**.

Nationally Threatened Ecosystems

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The list of national Threatened Ecosystems has been gazetted (NEM:BA: National list of ecosystems that are threatened and in need of protection) and result in several implications in terms of development within these areas (**Figure 9.9**).

National Protected Areas Expansion Strategy (NPAES)

The NPAES are areas designated for future incorporation into existing protected areas (both National and informal protected areas). These areas are large, mostly intact areas required to meet biodiversity targets, and suitable for protection. They may not necessarily be proclaimed as protected areas in the future and are a broad scale planning tool allowing for better development and conservation planning (**Figure 9.10**).

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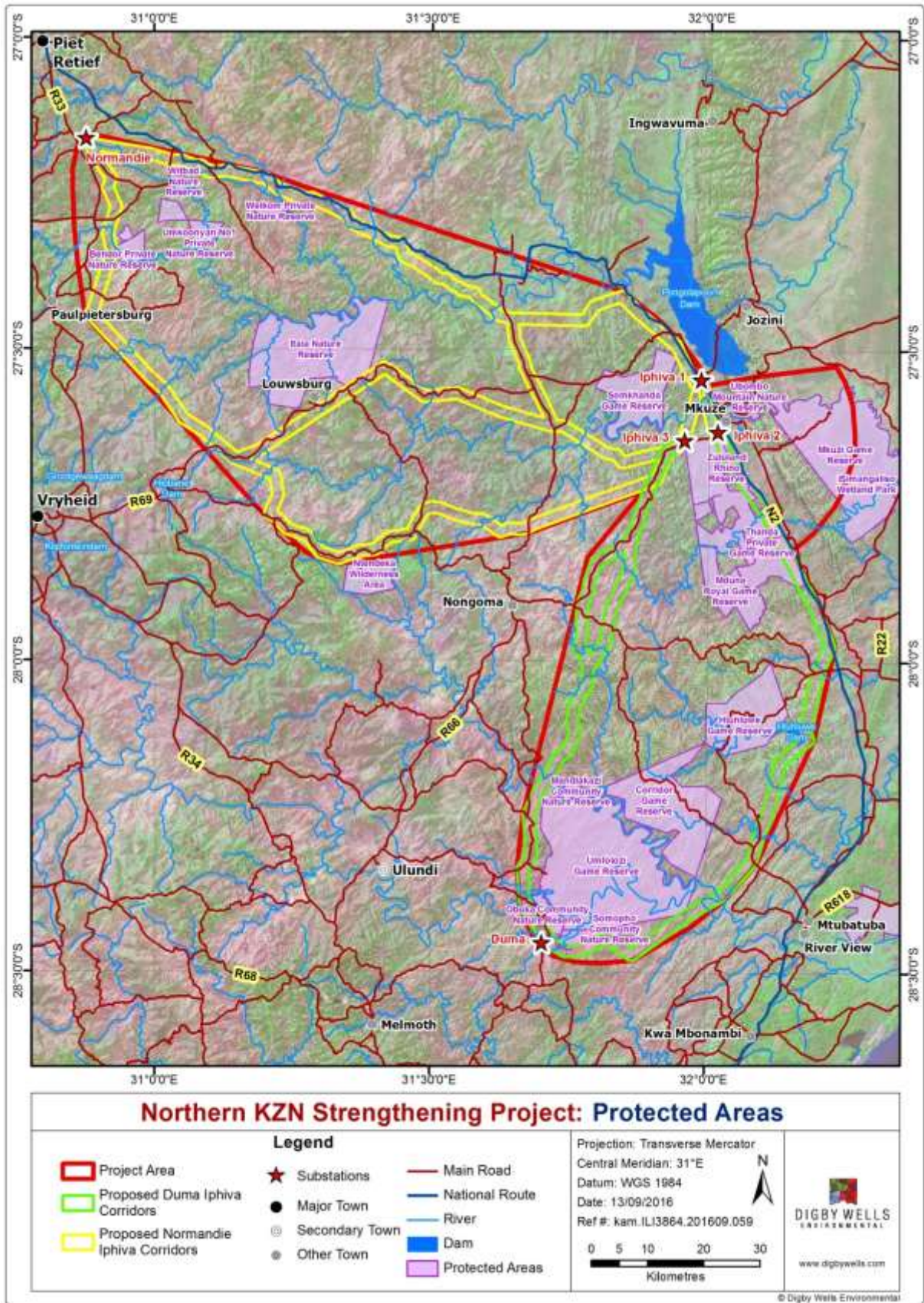


Figure 9.8: Protected area in relation to the study site

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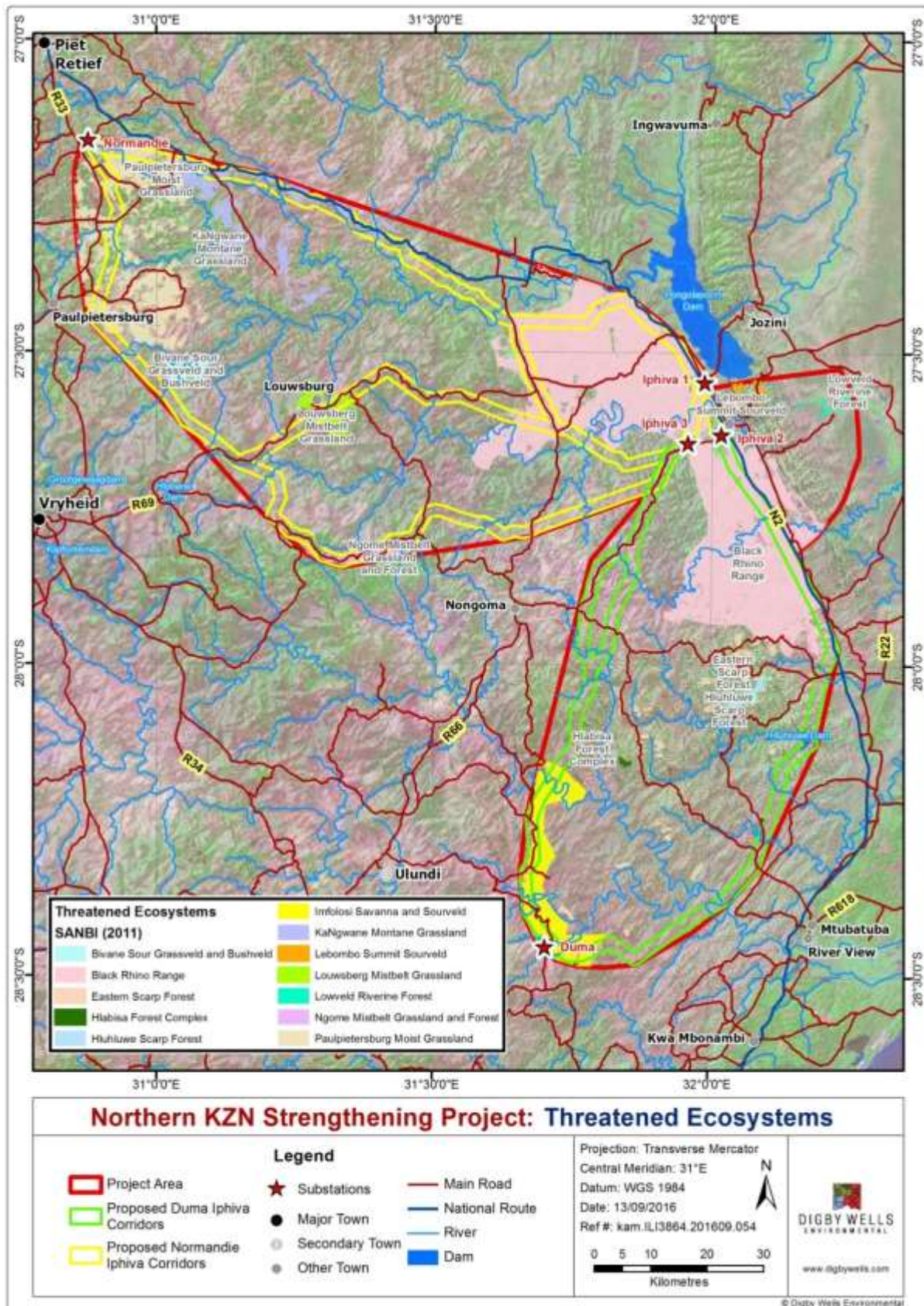


Figure 9.9: Nationally Threatened Ecosystems

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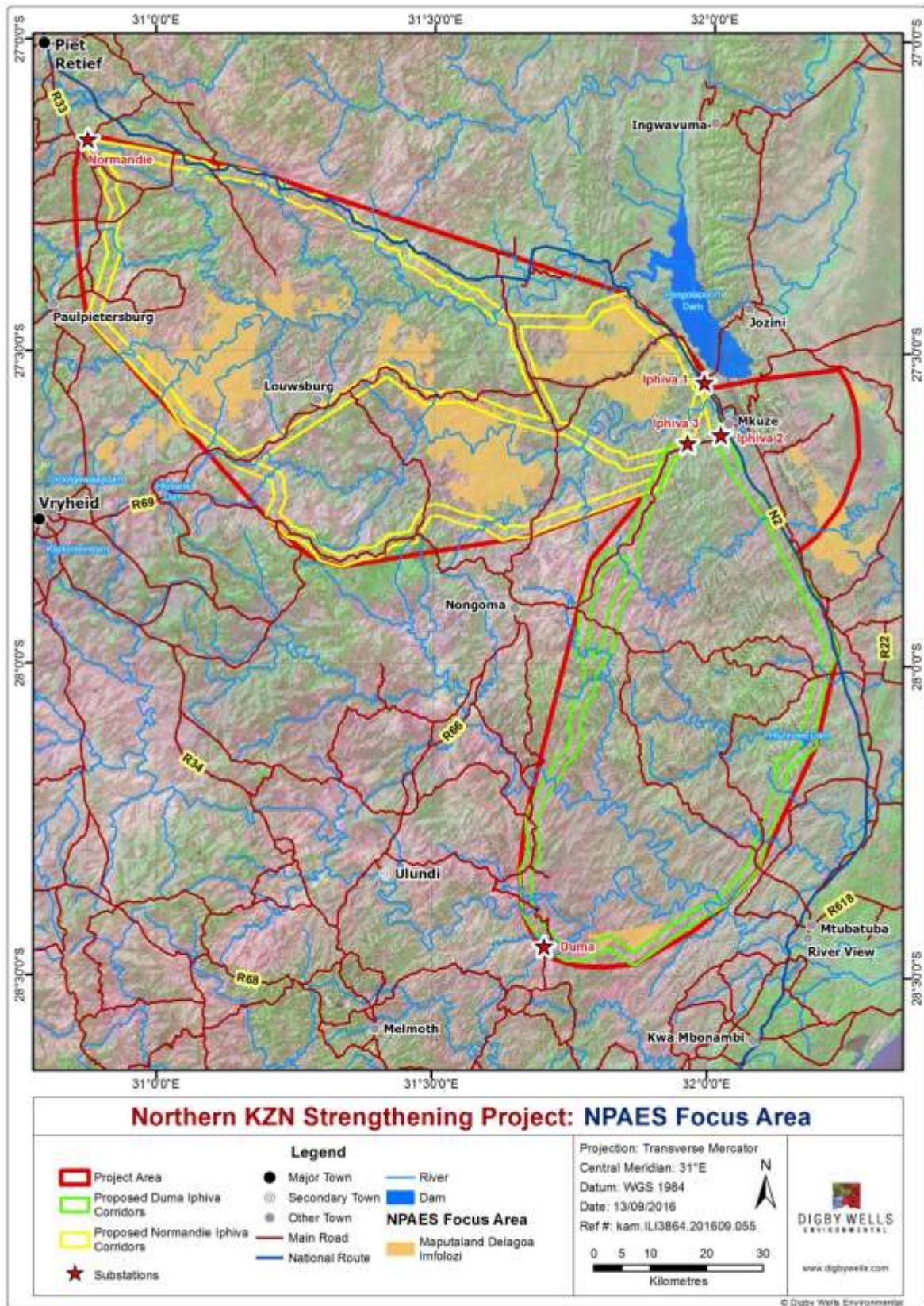


Figure 9.10: NPAES Focus Areas

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9.10 HERITAGE

The baseline profile and identified heritage resources show that the study area is underlain by palaeontologically sensitive area, and known heritage resources and events span from the Stone Age through to the historical period.

Lithostratigraphic units underlying the study area are considered to be of high sensitivity. These underlay a significant portion of the Duma – Iphiva West 1, West 2 and East options. While surface disturbance through project related activities are unlikely to expose fossiliferous material, rock outcrops would need to be surveyed to identify any potential fossil heritage.

Archaeological resources associated with the Stone Age, rock art and farming community period have been identified in the region. *In situ* archaeological sites and heritage resources are more likely to be identified in areas that have been minimally disturbed through anthropogenic processes. Open / undisturbed areas are therefore considered to be of high sensitivity, where minimally disturbed areas, such as field, or heavily disturbed areas such as urban / settlements are considered to be of medium and low sensitivity respectively.

Heritage resources associated with the historical period that have been identified in the study area include the following:

- Battlefields;
- Monuments and memorials;
- Historic built structures; and
- Burial grounds and graves.

With the exception of the identified battlefield, the majority of the heritage resources associated with the historical period occur within urban / settlement areas that have been altered through time via anthropogenic processes. While the individual resources themselves may be considered to have a high cultural sensitivity, the proposed development will like have a negligible impact to these resource types.

The heritage sensitivity plan is presented as **Figure 9.11**.

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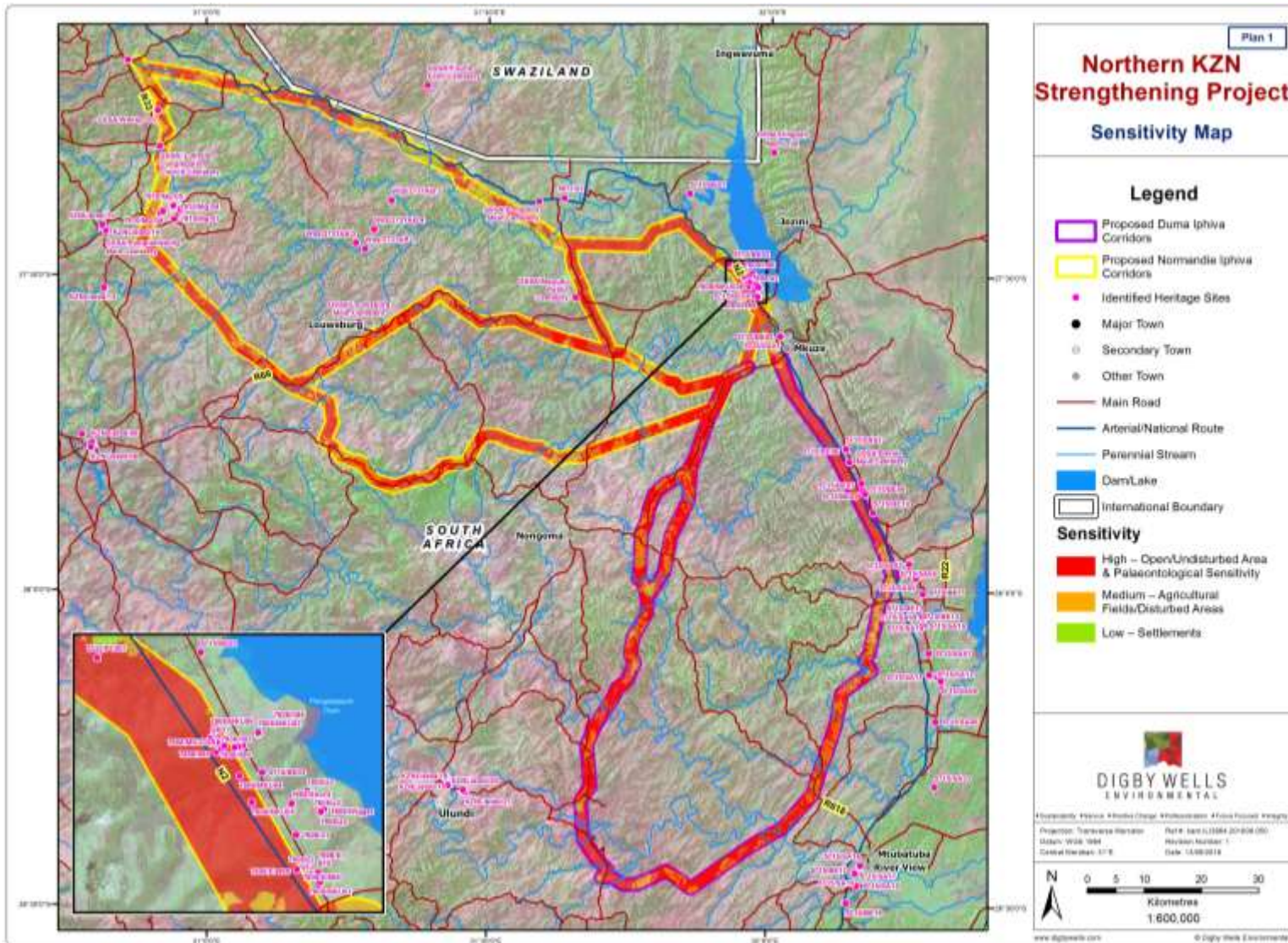


Figure 9.11: Heritage sensitivity

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9.11 LAND USE

The majority of the study area's land use consist of:

- **Commercial farming** - large sugarcane plantations occur around Pongola as well as an area on the R66 towards Nongoma, where the R66 crosses the Mkhuze River. Croplands coincide with the more evenly sloped areas.
- **Forestry** - Significant forestry areas occur in the following high-lying areas:
 - Areas north of Frischgewaagd; and
 - Along the R69 to Louwsburg.
- **Dispersed rural settlement** - informal housing settlements (villages) and single isolated homesteads are scattered throughout the study area, coinciding with subsistence agriculture.
- **Larger formalised towns** - these include Louwsburg, located more towards the west of the study area and Pongola, located towards the north of the study area.
- **Existing infrastructure** – The presence of infrastructure such as roads, rail and power lines affect the visual sensitivity of the landscape. These features will be mapped during the EIA phase as part of the baseline description.
- **Conservation / game farming** – there are large areas in the study area with formal status under NEM:PAA.

9.12 SOCIO-ECONOMIC CHARACTERISTICS

The study area is mostly located in the KwaZulu-Natal province, with a small portion located in the Mpumalanga Province. There are only a few large towns in the area. The rest of the area consist of settlements in areas under traditional leadership, commercial farms as well as some game reserves.

For the baseline description of the area (**Appendix C**), data from Census 2011, Community Survey 2016, municipal IDP's and websites were used. It must be noted that some of the municipalities amalgamated or were incorporated in other municipalities on 3 August 2016. As the most of the data is based on the 2011 demarcation boundaries, these are used for a description of the area (**Table 9.7**) (**Figure 9.12**).

The results should be viewed as indicative of the population characteristics in the area and should not be interpreted as absolute.

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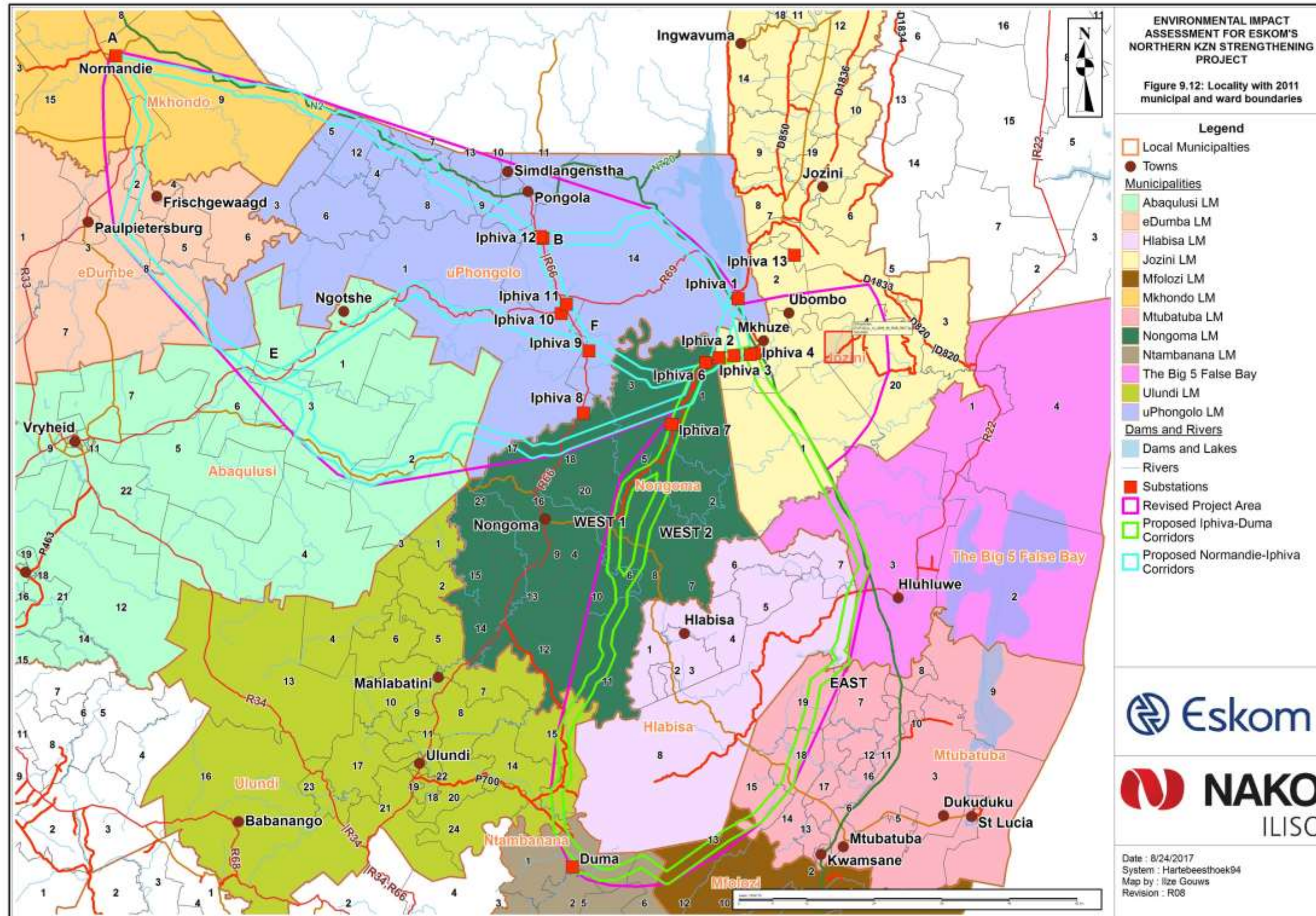


Figure 9.12: Locality with 2011 municipal and ward boundaries

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Table 9.6: Project area in municipal context (2011 demarcation boundaries).

Province	District Municipality	Local Municipality	Wards
Mpumalanga	Gert Sibande	Mkhondo	9, 15
KwaZulu-Natal	Zululand	eDumbe	2, 4, 5, 6, 7, 8
		Uphongolo	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
		Abaqulusi	1, 2, 3, 4, 5, 6, 7
		Nongoma	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 17, 18, 19, 20
		Ulundi	14, 15
	Umkhanyakude	Jozini	1, 2, 4, 20
		Mtubatuba	7, 15, 18, 19
		Big 5 False Bay*	3
		Hlabisa*	1, 2, 3, 4, 5, 6, 7, 8
	Uthungulu**	Mfolozi	10, 12, 13
Ntambanana***		1, 2, 5, 6	

* The Hlabisa and Big 5 False Bay Local Municipalities have merged into the Big 5 Hlabisa Local Municipality on 3 August 2016)

** The Uthungulu District Municipality was renamed the King Cetshwayo District Municipality

*** The Ntambanana Local Municipality was disestablished on 3 August 2016 and merged with the uMhlatuze, Mthonjaneni and Mfolozi Local Municipalities

All the land that was owned or belonged to the KwaZulu Natal Government is held by the Ingonyama Trust (www.ingonyamatrust.co.za) since 1994. The mandate of the trust is to hold the land for “the benefit, material welfare and social well-being of the members of the tribes and communities” living on the land. The Zulu King is the sole trustee of the land. The Ingonyama Trust Board administers the affairs of the Trust and the Trust land. Most, if not all, the land in KZN that is under traditional authority belongs to the Ingonyama Trust.

Settlement patterns in the study area are scattered and dwellings consist mostly of brick structures or traditional structures. Most people have isiZulu as home language.

Basic and social infrastructure is limited and does not meet the needs of the entire population in the area. Municipalities in the area are faced with challenges that urban municipalities do not have. The settlement patterns make it extremely challenging to provide infrastructure such as piped water and sanitation. Road infrastructure in general needs some upgrading and the conditions of the roads make it challenging to reach the communities that need to be served. In some areas relationships with traditional leadership provides an additional challenge. As there are few employment opportunities in these areas, many males have migrated to urban areas in search of employment, resulting in a community that stays behind with more females than males, as well as a very young population group. Other challenges include poverty, unemployment, illiteracy and skills levels and crime.

Most of the municipal areas have shown an increase both in the number of people as well as the number of households. In most areas the household sizes have decreased. This can be

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due to children leaving their parents' house to stay on their own and start families of their own.

The area is characterised by high levels of poverty as well as deprivation on a number of dimensions which mostly related to access to basic services. Education levels are low and there are very few employment opportunities. In areas under traditional leadership, subsistence farming is a very important livelihood strategy and informal trading plays a much greater role in survival than in urban areas.

In terms of commercial farming, sugar cane and forestry are concerns when it comes to the presence of power lines. Sugar cane needs to be burnt, and as such cannot be planted below power lines. Although there are other methods to harvest sugar cane, those are more expensive and labour intensive. Fire is a great risk in terms of forestry, and a spark or a snapped power line could cause extensive damage. Fire is often use as a retribution measure in some areas, and this might also cause damage to power lines.

The detailed description of the area highlights the following important aspects for Eskom:

- Documentation used for communicating about the project should be available in English and isiZulu;
- High levels of illiteracy means that written word will not in all cases be the best way to communicate with some of the communities. Additional ways to communicate with the communities that are culturally appropriate must be found;
- Traditional leadership and the Ingonyama Trust are key stakeholders that need to be consulted with in certain areas. Sufficient time should be allowed for doing this in the correct way, meeting the cultural requirements;
- Recent changes in terms of municipal boundaries should be taken into consideration;
- Basic infrastructure in the area varies and Eskom should take into consideration the characteristics of the specific area when planning the project, as there might, for example not be water available in the area;
- Areas where there is a low incidence of access to electricity may have expectations in terms of getting access to electricity as one of the benefits of the project;
- Finding the required skills in the area might be a challenge and using local labour might be a challenge. This must be taken into consideration when planning the project and it may be necessary to include a skills development component;
- There might be greater expectations in terms of job opportunities in poorer, more deprived areas and there is also greater potential for social unrest in these areas as there might be greater competition for a scarce resource like a job;
- Given the characteristics of the area, the locations of the construction camps will have to be planned very carefully to ensure that the required infrastructure is available, and if not, how that will be dealt with;
- Opportunistic theft of materials might be more of a challenge in some areas than in others, but the safety of materials and stock must be considered in planning;

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- Tourism and agriculture are the main forms of livelihoods in most areas, and anything that adversely affect these livelihoods will have a negative impact on an area that is already battling poverty. Care must be taken when planning the detailed route of the power lines; and
- Sugar cane and forestry will provide a challenge given their unique requirements and characteristics.

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10. PLAN OF STUDY FOR EIA

GN 982 Appendix 2 item 2:
(i) a plan of study for undertaking the environmental impact assessment process to be undertaken, including-
(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;
(iii) aspects to be assessed by specialists;
(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
(v) a description of the proposed method of assessing duration and significance;
(vi) an indication of the stages at which the competent authority will be consulted;
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

10.1 APPROACH, SCOPE AND DEFINITIONS

10.1.1 Approach

For this project, authorisation of site (approximately 1 km x 1km) within which a portion of land (600 m x 600 m) can be acquired for the construction of the substation that has a footprint of 400 m x 400 m. The approach of this study is to avoid or reduce environmental impacts by identifying a site that will have the least impacts on the environment (biophysical, socio-economic and heritage).

The substation design will only be undertaken after Environmental Authorisation (EA) has been received.

10.1.2 Regulated activities and the scope of Impact Assessment

The NEMA 2014 EIA Regulations require authorisation for specific **activities** only, as detailed in **Tables 3.1**. However, the Environmental Management Programme required in terms of these Regulations requires the management of a broader set of aspects. The impact assessment, therefore, needs to extend beyond these activities.

10.1.3 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

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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)) 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.

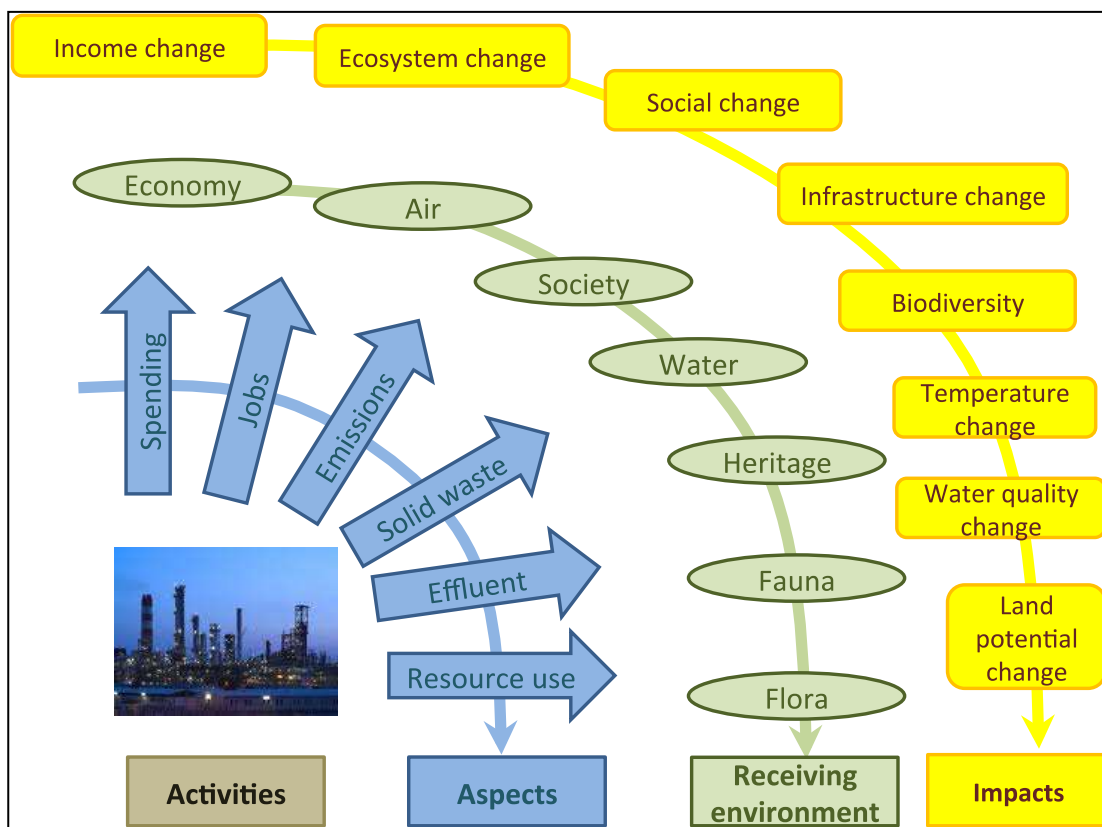


Figure 10.1 Schematic presentation of how activities bring about environmental and social aspects, which result in changes to the receiving environment, which are defined as impacts

Source: O’Beirne, S: Draft Good Practice Manual, prepared for IAIAAsa, 2017

The aspects have been identified for the project are listed in **Table 10.1**.

Table 10.1: Aspects to be assessed by specialists

Aspect Category	Aspect	Specialist study that will address this aspect
Resource use	Water	None

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Aspect Category	Aspect	Specialist study that will address this aspect
	Energy	None
	Land (land transformation)	Fauna and Flora, Avifauna, Heritage, Wetlands, Agricultural potential, Visual Impact Assessment and Social
	Raw materials	None
Waste and pollution	Atmospheric emissions	None
	Effluent	None
	Solid/liquid wastes	None
	Energy emitted (noise, light)	Visual Impact Assessment
Socio-Economic	Jobs	Socio-economic
	Spending	Socio-economic
	Skills	Socio-economic

10.2 ALTERNATIVES TO BE ASSESSED IN THE IMPACT ASSESSMENT PHASE

The site/location alternatives for the Iphiva Substation are described and comparatively assessed in **Chapter 5**. The alternatives that the EAP recommends are taken through to the Impact Assessment Phase of the project, including the specialist studies are Iphiva 3 and 6.

10.3 ASPECTS TO BE ASSESSED BY SPECIALISTS

The following specialist studies will be undertaken:

- Fauna and Flora (see **Section 10.7.1** for ToR);
- Avifauna (see **Section 10.7.1** for ToR);
- Wetlands (see **Section 10.7.3** for ToR);
- Soils and Land Capability (i.e. agricultural potential) (see **Section 10.7.4** for ToR);
- Geotechnical (see **Section 10.7.5** for ToR);
- Visual (see **Section 10.7.6** for ToR)
- Heritage (see **Section 10.7.7** for ToR);
- Social (see **Section 10.7.8** for ToR); and
- Economic (see **Section 10.7.9**)

10.4 ASSESSMENT METHODOLOGY

The EIA will build on the Scoping Report and focuses on the assessment of key impacts, determining their significance, and recommending appropriate measures to mitigate negative impacts and enhance benefits.

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The key issues identified during the Scoping Phase 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. In the EIA the significance of the potential impacts will be 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) will be given. A separate EIA will be required for decommissioning.

10.4.1 Calculating the Significance of Impacts

The following criteria will be 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 10.2**).

Table 10.2: 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 10.3**).

Table 10.3: 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.

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- **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 10.4**).

Table 10.4: 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 or 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 10.5**).

Table 10.5: 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 10.6**).

Table 10.6: Probability of Impact

Rating	Probability	Description
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur is low due to its 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 10.7**).

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Table 10.7: 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 10.8**).

Table 10.8: 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.

10.4.2 Cumulative Impacts

The location of the Iphiva 400/132 kV Substation may have significant effects on the impacts of the associated 400 kV and 132 kV powerlines that will link into it. For this reason, the assessment of the four components of the project are being undertaken concurrently and inter-relatedly.

The section of the study area that is of particular concern due to the sensitivity of the area as well as the number of powerlines that may traverse it is the P234 road between the N2 and Iphiva 6. The possible scenarios for the P234 lines are presented in **Figures 10.2** and **10.3**.

The various combinations of burying and multi-circuit towers is presented in **Table 10.9**. These will be assessed further in the specialist studies and EIA Report.

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Table 10.9: Combinations of burying and multi-circuit towers in the P234 Corridor

	Iphiva-Duma West	Iphiva-Duma East
All above ground (132k V powerlines on double circuit towers)	1	2
Burying 4 x 132 kV powerline and construct 1 x 400 kV powerline next to them	3	4
Bury all of the lines	(same as 3)	5
Bury the 400 kV powerline and construct 132 kV above ground on double circuit towers next to it	(same as 1)	6
One tower with 1x400 kV and 2x 132kV powerlines and 1 x 132kV powerline buried	N/A	7

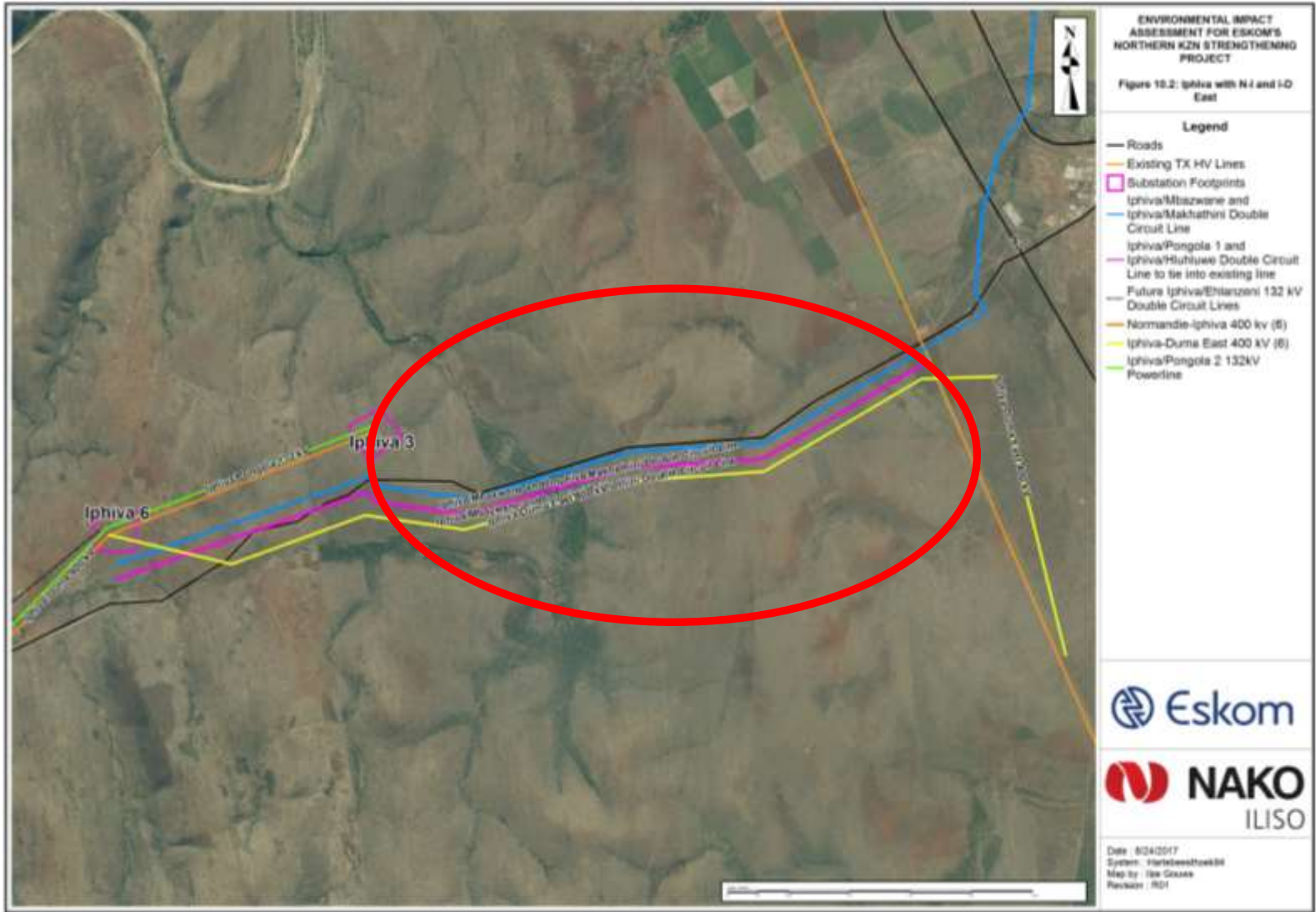


Figure 10.2: Iphiva with N-I and I-D East

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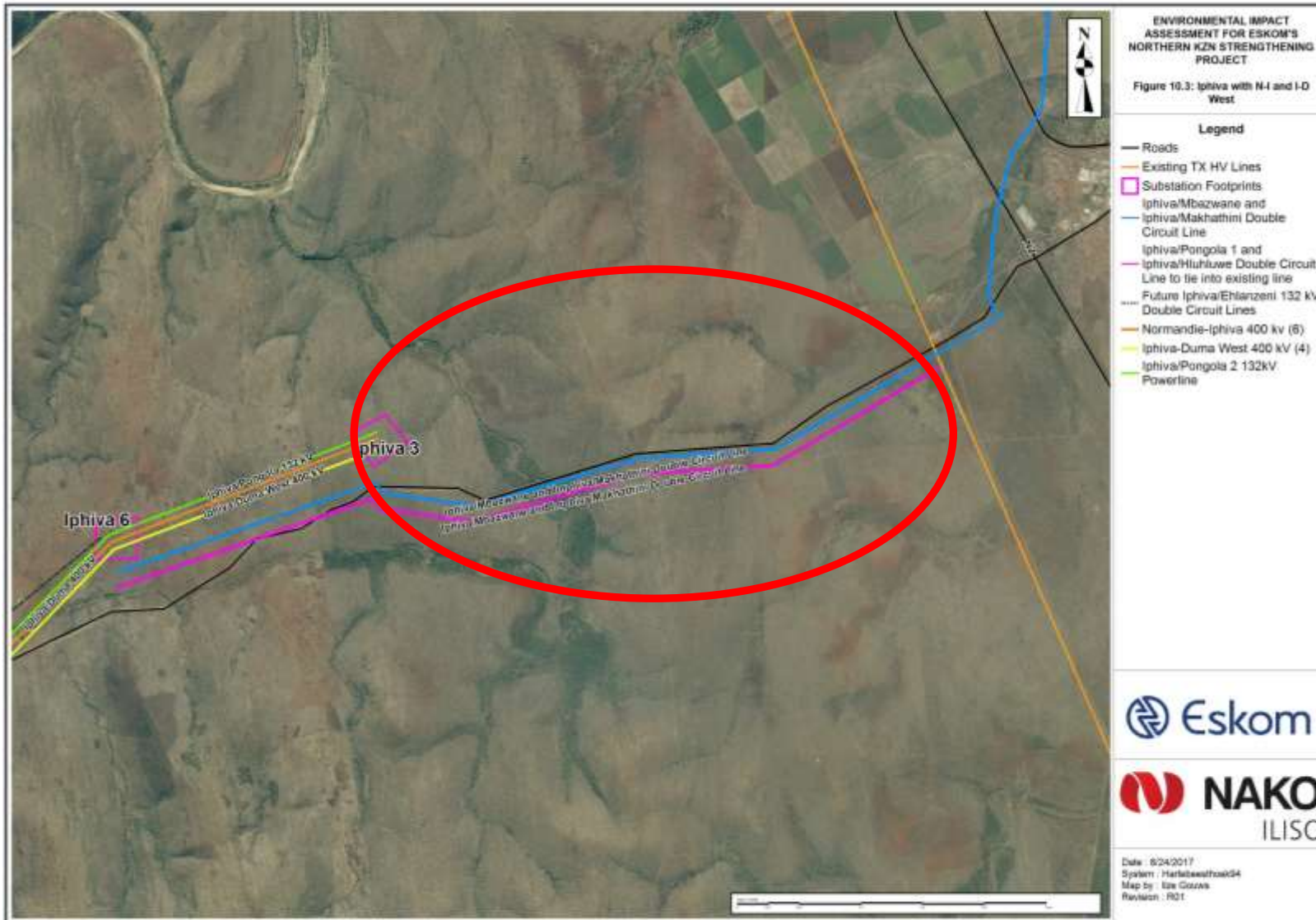


Figure 10.3: Iphiva with N-I and I-D West

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The summary impact tables (**Tables 10.10 to 10-12**) will be completed per impact. The tables include the following scenarios:

Applications 1 and 3

- Iphiva 3 with Iphiva-Duma West
- Iphiva 6 with Iphiva-Duma West
- Iphiva 3 with Iphiva-Duma East
- Iphiva 6 with Iphiva-Duma East

Table 10.10: Application 1 and 3: Planning, Design and Pre-construction Phases

Impact Description:			Mitigation						
			Avoid:						
			Minimise:						
			Restore/Rehabilitation:						
			Compensate/Offset:						
	Nature	Extent	Duration	Intensity	Potential for irreplaceable loss	Probability	Confidence	Consequence	Significance
Iphiva 3 with Iphiva-Duma West									
Without Mitigation									
With Mitigation									
Iphiva 3 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									
Iphiva 6 with Iphiva-Duma West									
Without									
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Mitigation									
With Mitigation									
Iphiva 6 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									

Table 10.11: Application 1 and 3: Construction Phase and Rehabilitation Phases

Impact Description:			Mitigation						
			Avoid:						
			Minimise:						
			Restore/Rehabilitation:						
			Compensate/Offset:						
	Nature	Extent	Duration	Intensity	Potential for irreplaceable loss	Probability	Confidence	Consequence	Significance
Iphiva 3 with Iphiva-Duma West									
Without Mitigation									
With Mitigation									
Iphiva 3 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									
Iphiva 6 with Iphiva-Duma West									
Without Mitigation									

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With Mitigation									
Iphiva 6 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									

Table 10.12: Application 1 and 3: Operational Phase

Impact Description:			Mitigation						
			Avoid:						
			Minimise:						
			Restore/Rehabilitation:						
			Compensate/Offset:						
	Nature	Extent	Duration	Intensity	Potential for irreplaceable loss	Probability	Confidence	Consequence	Significance
Iphiva 3 with Iphiva-Duma West									
Without Mitigation									
With Mitigation									
Iphiva 3 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									
Iphiva 6 with Iphiva-Duma West									
Without Mitigation									
With Mitigation									

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Iphiva 6 with Iphiva-Duma East									
Without Mitigation									
With Mitigation									

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Environmental Management Programme

Based on the findings of the EIR, a practical and feasible EMPr will be compiled. The draft EMPr will outline how negative environmental impacts will be managed and minimized, and how positive impacts will be maximised, during and after construction. The EMPr will fulfil the GNR 982 requirements and will include mitigation measures required during the planning and design, construction, rehabilitation and operational phases of the project as well as a framework for social and environmental monitoring. Recommendations are given with regard to the responsible parties for the implementation of the EMPr.

Tables 6.17 will be completed for each the following phases for each Management Objective, as applicable:

- Planning and Design;
- Pre-Construction activities;
- Construction and Rehabilitation; and
- The operational phase.

Table 10.13: Environmental Management Programme Template

Management Objective		
Management Outcome	Indicator	Targets
Activities		
Aspects		
Impacts and Risks		
Management Actions	Responsible Person	Timeframe
Monitoring		
Method	Frequency	

10.5 CONSULTATION WITH COMPETENT AUTHORITY

A pre-application consultation with the competent authority took place in March 2017. Minutes of the meeting are included in **Appendix F**.

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The competent authority will receive copies of all the documents that are made available to the public and will be invited to key stakeholder and authorities' meetings. The EAP is willing to present the contents of the Scoping and Environmental Impact Assessment Reports and Environmental Management Programme separately to the authorities on request. Any additional meetings requested by the competent authority will be attended.

10.6 PUBLIC PARTICIPATION

The requirements of the NEMA EIA Regulations (2014) for the Public Participation Process (PPP) will be adhered to. The International Association of Public Participation (IAP2) best practice principles will also be applied, including special measures such as additional focus group meetings, and the translation of documents, advertisements and notification letters from English into isiZulu.

NAKO ILISO will provide feedback to stakeholders throughout the process. I&APs and the public will be informed of the availability of the draft EIA report (through written notification to registered stakeholders), as well as of the authorities' decision and the appeal process in respect of the various applications (through newspaper advertisement and written notification to all registered stakeholders).

The draft reports will be distributed to public places and made available for a 30 calendar day public comment period. The draft reports will also be presented at stakeholder meetings, where I&APs will be able to confirm that their issues have been captured correctly, properly understood by the environmental team, and included in the specialist studies and impact assessment. Draft reports will be made available for download on the NAKO ILISO website.

During the public comment period, Key Stakeholder and Authorities meetings will be arranged where the EAP will present the findings of the EIA as documented in the draft EIA report. I&APs will be given an opportunity to comment. Meetings with each of the Traditional Councils and well as Focus Group meetings will also be arranged as requested.

All issues and comments received from the stakeholder consultation process will be captured in an Issues and Responses Report that will form an Appendix to the EIA Report.

10.7 TASKS TO BE UNDERTAKEN

The following tasks will be undertaken during the EIA Phase:

- Public Participation (**Section 10.6**)
- Confirm ToR for specialist studies;
- Specialist studies (as described in **Sections 10.7.1 to 10.7.9**);
- Integration Meeting (**Section 10.8**);
- Draft EIAR (**Section 10.10**);
- Draft EMPr (**Section 10.11**);

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- Authority consultation (**Section 10.5**);
- Finalise reports; and
- Submission of Final Reports.

10.7.1 Fauna and Flora Specialist Study

The ecologist will identify and map the areas affected by possible substation sites or powerlines in KZN that fall in community conservation areas; 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 areas that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; Critical biodiversity areas as identified in systemic biodiversity plans adopted by the competent authority or in bioregional plans; 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; A protected area identified in terms of NEMPAA, excluding conservancies; Areas designated for conservation use in Spatial Development Frameworks adopted by competent authority or zoned for a conservation purpose; or Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.

An ecological assessment of the local flora and fauna communities associated with the proposed substation sites and powerline corridors will be undertaken to determine the current state. Information generated from this survey will be used to assess the impacts that the construction, operational and decommissioning activities will have on this environment. To achieve this, the following objectives were considered:

- To delineate the vegetation/habitat types and describe their sensitivity, present within the study area;
- To determine if any flora and fauna species or assemblages will be directly impacted upon by the proposed activities and associated infrastructure. This includes flora and fauna communities present, the state of these communities and the identification of possible Red Data species in accordance with the International Union for the Conservation of Nature (IUCN), National and Provincial criteria; and
- To undertake an assessment of the impacts associated with various activities on the health of the flora and fauna species or assemblages; and to recommend measures that should be included in the EMP to prevent or limit impacts to flora and fauna species or assemblages.

The fauna and flora survey will cover both of the substation sites.

Vegetation Survey

A floristic survey will be conducted during the growing season (the rainy season when most plants are in flower or seeding, November to April) to determine the species composition of the project area. If drought conditions prevail, the survey will be completed after summer rains have arrived. This will give an indication of the actual species present within the project

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site (corridors and sub-stations) and these will be discussed in context of plant communities within the ecosystem of the area. The protected, endemic, exotic, alien invasive and culturally significant species will also be discussed as separate issues and related back to relevant legal requirements. Furthermore the identification of red data and protected species as listed according to the IUCN List, NEMBA and other Provincial legislation will be completed. Forest vegetation as identified in this report is present and will be surveyed during summer months, during such a survey the forest edge and ecotone will be also be included.

Depending on the vegetation and terrain the Braun-Blanquet sampling method, belt or line transect methods will be used during vegetation assessments, however should dominant vegetation types require other methods be used, then these shall be motivated. The Braun-Blanquet method allows for the following to be compiled:

- Vegetation classification regarding plant communities within the pre-determined survey points along the final route alignment project area and sub communities and variations of these;
- Species list for each plant community, including diagnostic and dominant species.
- Invasive species (if present) for each plant community;
- Exotic species (if present) for each plant community;
- Protected and/or endemic species for each plant community; and
- Culturally significant plant species within each community.

Faunal Survey

Field surveys will be conducted concurrently with vegetation surveys and all animals observed in the area will be noted. Detailed fauna lists will be generated and discussed and related back to the floristic component of the final transmission line route alignment. The probability of occurrence for species not observed during field surveys will be updated if applicable regarding available habitats. Protected and endemic species will be the focus of discussion. Diurnal and nocturnal surveys will be performed. The number of sample plots will vary for each component of the faunal survey.

The current status of the faunal environment will be determined and an evaluation of the extent of site-related effects in terms of certain ecological indicators, as well as identification of specific important ecological attributes such as rare and endangered species, protected species, sensitive species and endemic species will be made. The faunal environment and habitat will be characterised in relation to biota and the extent of site related effects. Presence of red data and protected species will be indicated on a map. The deliverables include:

Mammals

A list of all potential mammals will be compiled by means of desktop study and all potential red data species will be highlighted with short habitat descriptions.

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The presence of mammals will be recorded using tracks, dung, ecological indicators, camera traps, non-fatal traps (Sherman traps) and visual sightings of the animals themselves, sample sites will cover all habitat available for mammals' species within the study area.

A field visit will be used to establish various bat habitats present within which the presence of bats will be confirmed using the EM3 bat detector. Vehicle transects will be driven to cover as much of the transmission line corridor as possible during the time available on site. The EM3 calls will be downloaded and analysed in Analook after being converted to zero crossing files. Noise files were filtered out using Wildlife Acoustics' WAC to WAV converter. A full survey to determine species richness will be carried out. The following will be recorded during the mammal survey:

- All mammals encountered or noted during the surveys will be recorded;
- Tracks and dung of mammals encountered during the survey will be, where possible, identified and recorded (if possible);
- A list of the most prominent mammal species will be compiled;
- A list of rare and endangered species encountered during the survey, as well as species listed according to the results of a desktop study but which were not recorded during the survey, will be compiled;
- A list of protected species that occur on the potential list but not recorded during the site visits or surveys; and
- A list of exotic or introduced vertebrate species occurring on the property.

Amphibians and Reptiles

Reptiles and amphibians will be sampled using both active and passive sampling techniques. Active searching will be done and as many as possible caught, identified and photographed using the rubber band technique. Sample sites will be concentrated in areas where habitat that could support reptile and amphibian species are found. Passive sampling will include drift fence arrays and pitfall traps where possible. Amphibians will be sampled using active methods such as netting during their hours of activity (night). Burrowing species will be surveyed after rains, where possible. Passive sampling methods will include pitfall traps and sound recordings where possible:

- All frogs, snakes, lizards and tortoises encountered or noted during the surveys will be recorded;
- A list of the most prominent amphibian and reptile species will be compiled;
- A list of rare and endangered species encountered during the survey, as well as species listed according to the results of a desktop study but which were not recorded during the survey, will be compiled; and
- A list of protected species that occur on the potential list but not recorded during the site visits or surveys.

Invertebrates

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Indicator invertebrates groups will be sampled using appropriate methodology, such as sweep netting. For each sample plot the insects are identified to at least family level and where possible to genus and species level. Groups including ants, ground living beetles (*Tenebrionidae* and *Carabidae*), termites, leafhoppers, spiders and scorpions will be included if present. The methodology of how the field surveys will be conducted (pitfall traps, active search, netting, etc.) will be included.

Sensitive Areas

All sensitive areas, as described by the provincial and national legislation, will be identified. The locality and extent, as well as species composition of sensitive areas such as the wetlands or pans, streams, rivers and rocky outcrops will be conducted in order to identify and map all such sensitive areas present. Threatened ecosystems as listed by NEMBA (2004) and ratified by the minister in December 2011, will be identified and delineated.

Fauna and Flora Specialists

Rudi Greffrath (see CV in **Appendix A5**) is the Manager of Digby Wells' Biophysical Department's Ecology Unit and has a National Diploma and B-tech in Nature Conservation from the Nelson Mandela Metropolitan University's (NMMU) George Campus. He is also SACNASP registered and has more than 10 years' experience. Rudi has ten years' experience in the environmental consulting field specifically in terrestrial ecology within the Highveld Grasslands and Savanna regions of Southern and Central Africa and the forest regions of Central and West Africa. He specialises in fauna and flora surveys, biodiversity surveys, environmental management plans, environmental monitoring and rehabilitation for projects in accordance with the International Finance Corporation (IFC) and World Bank. Rudi has gained experience working throughout Africa specifically the Democratic Republic of Congo, Sierra Leone, Ghana, Mali, Botswana, Namibia and Ivory Coast.

Danie Otto (Pr. Sci. Nat) (see CV in **Appendix A6**) is a Director and Manager of the Natural Sciences Division at Digby Wells. The division includes water, air quality, rehabilitation, fauna & flora, aquatics, wetlands and soil. He holds an M.Sc in Environmental Management with B.Sc Hons (Limnology, Geomorphology, GIS and Environmental Management) and B.Sc (Botany and Geography & Environmental Management). He is a registered Professional Natural Scientist since 2002. Danie has 20 years of consulting experience within the mining industry undertaking environmental assessments and compiling Environmental, Water & Waste Management Plans. He has wetland and geomorphology working experience across Africa including specialist environmental input into various water resource related studies. These vary from studies of swamp forests in central Africa to alpine systems in Lesotho. Danie will be responsible for reviewing of specialist studies.

10.7.2 Birds

The avi-fauna specialist study will:

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- Describe the baseline avifaunal environment and the species diversity and density of the proposed project area;
- Describe the current state of avifauna within the study area, outlining important avifaunal characteristics which may influence the proposed infrastructure during construction and operation of the proposed powerlines;
- Identify Red Data Listed (including endemic, near endemic and rare) species potentially affected by the proposed powerlines and substation;
- Identify potential impacts (positive and negative, including cumulative impacts if relevant) of the proposed development on avifauna during construction and operation;
- Identify information gaps, limitations and additional information required; and
- Identify and address any other aspects related to avifauna in the study area.

The impacts that could be associated with a project of this nature include: collision of birds with the overhead cables; electrocution; destruction of habitat; and disturbance of birds. Collisions are the biggest potential risk to avifauna, while habitat destruction is also expected to be an important impact of this project.

Data from a desktop level will be examined to determine the location and abundance of power line sensitive Red Data Listed species as well as potentially “power line sensitive” species in the study area. A desk top examination, using Google Earth imagery will be done to compare the alternatives. The area will be visited in the summer months, and traversed by vehicle and on foot to obtain a first-hand understanding of the proposed routes, habitat and avifauna, and to determine which bird micro-habitats are present and relevant to the study. This will involve driving the study area, taking photographs, and walking certain accessible areas, to see as much as possible of the proposed routes for the power line. The impacts of the proposed substation and powerlines on avifauna will be predicted on the basis of experience in gathering and analysing data on avifaunal impacts with power lines. Recommended mitigation measures for significant impacts will be proposed.

Avifauna Specialist

Phil Patton (see CV in **Appendix A7**) was the Manager of the Biophysical Department at Digby Wells and is now in an Associate position for Avifauna related projects. He holds a BSc Hons from the University of Cape Town, and a BSc from the University of Port Elizabeth. He is an experienced ornithologist, and has been registered as a Professional Natural Scientist since 2012. Phil has over 17 years of consulting experience in High Conservation Value (HCV) assessments, ecological assessments and environmental auditing within the mining, agriculture, and other similar industries. Recently Phil has conducted avifaunal assessments in the Democratic Republic of Congo, Sierra Leone and throughout Southern Africa. He has ornithological and environmental working experience across Africa, Europe and the Middle East.

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10.7.3 Wetlands

A thorough assessment of wetlands associated with the substation sites will be undertaken, while only a preliminary desktop assessment of wetlands associated with the powerlines will be done.

Objectives of the Study

The objectives of the Wetlands Impact Assessment include the following:


- Delineation of wetland boundaries;
- Assessment of wetland baseline integrity and functionality;
- Assessment of the potential impacts of the proposed development on wetlands;
- Guidance on placement of powerline routes and infrastructure to ensure a no-net-loss of wetlands; and
- To prescribe mitigation and management measures.

Methodology for Wetland Impact Assessment

As detailed in the Guidelines for Biodiversity Impact Assessments in KwaZulu-Natal (Ezemvelo KZN Wildlife, 2013); all wetlands and riparian zones adjacent to the study site must be identified and delineated as per the DWAF (2005) guideline. The methodology employed for the identification and delineation of wetlands, as well as the assessment of their ecological integrity and functionality, is described in this section.

Desktop Delineation

Maps were generated from 1:50 000 topographic maps and aerial photographs, onto which the wetland areas were identified and preliminary wetland boundaries were delineated at the desktop level. The identified wetlands were temporarily classified according to their HGM Unit determinants based on modification of the system proposed by Brinson (1993), and modified for use by Marneweck and Batchelor (2002) and subsequently revised by Kotze *et al.*; (2007). The HGM Unit system of classification focuses on the HGM setting of wetlands which incorporates geomorphology; water movement into, through and out of the wetland; and landscape / topographic setting. Once wetlands have been identified, they are categorised into HGM Units as in **Figure 10.6**.

Hydromorphic wetland type	Diagram	Description
Floodplain		Valley bottom areas with a well-defined stream channel, gently sloped and characterised by floodplain features such as oxbow depression and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.

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Hydromorphic wetland type	Diagram	Description
Valley bottom with a channel		Valley bottom areas with a well-defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterized by the net accumulation of alluvial deposits or may have steeper slopes and be characterised by the net loss of sediment. Water inputs from the main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom without a channel		Valley bottom areas with no clearly defined stream channel usually gently sloped and characterised by alluvial sediment deposition, generally leading to a net accumulation of sediment. Water inputs mainly from the channel entering the wetland and also from adjacent slopes.
Hillslope seepage linked to a stream channel		Slopes on hillsides, which are characterised by colluvial (transported by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.
Isolated hillslope seepage		Slopes on hillsides that are characterised by colluvial transport (transported by gravity) movement of materials. Water inputs are from sub-surface flow and outflow either very limited or through diffuse sub-surface flow but with no direct link to a surface water channel.
Pan/Depression		A basin-shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. It is inward draining). It may also receive subsurface water. An outlet is usually absent and so this type of wetland is usually isolated from the stream network.

Figure 10.4: Wetland HGM Units

(Modified from Brinson 1993; Kotze 1999 and Marneweck and Batchelor 2002)

Field Investigation and Reporting

Wetland Delineation

The wetland delineation will be completed according to the following features, outlined in the DWAF (2005) guidelines (now Department of Water and Sanitation):

- Terrain Unit Indicator – helps to identify those parts of the landscape where wetlands are more likely to occur;
- Soil Form Indicator – identifies the soil forms, which are associated with prolonged and frequent saturation;
- Soil Wetness Indicator – identifies the morphological “signatures” developed in the soil profile as a result of prolonged and frequent saturation; and

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- Vegetation Indicator – identifies hydrophilic vegetation associated with frequently saturated soils.

The following riparian indicators will be taken into account for the delineation of riparian areas (DWAF 2005):

- Topography associated with the watercourse;
- Vegetation; and
- Alluvial soils and deposited material.

Prior to the field assessment, aerial imagery (1:50 000) will be used to delineate wetlands preliminarily. The wetland delineation will then be ground-truthed in the field and the boundaries of the riparian and wetland indicators will be recorded with a GPS. Transects will be walked across the various wetlands to determine the boundaries. The identified wetlands will then be classified according to their hydro-geomorphic (HGM) determinants based on modification of the system proposed by Brinson (1993), and modified for use by Marnebeck and Batchelor (2002) and subsequently revised by Kotze *et. al.*; (2004).

Wetland Integrity

A PES analysis will be conducted to establish baseline integrity (health) for the associated wetlands. In order to determine the integrity (health) of the characterised HGM units for the project area, the WET-Health tool will be applied. According to Macfarlane *et. al.*; (2007) the health of a wetland can be defined as a measure of the deviation of wetland structure and function from the wetland’s natural reference condition. The health assessment attempts to evaluate the hydrological, geomorphological and vegetation health in three separate modules in order to attempt to estimate similarity to or deviation from natural conditions. The Present Ecological State (PES) is determined according to **Table 10.14**.

Table 10.14: Impact scores and Present Ecological State categories used by Wet-Health

Description	Combined Impact Score	PES Category
Unmodified, natural.	0-0.9	A
Largely natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota has taken place.	1-1.9	B
Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.	2-3.9	C
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4-5.9	D
The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.	6-7.9	E
Modifications have reached a critical level and ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8-10	F

(Macfarlane *et. al.*; 2007)

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Wetland Ecological Importance and Sensitivity

The Ecological Importance and Sensitivity (EIS) tool was derived to assess the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred. The purpose of assessing importance and sensitivity of water resources is to be able to identify those systems that provide higher than average ecosystem services, biodiversity support functions or are especially sensitive to impacts. Water resources with higher ecological importance may require managing such water resources in a better condition than the present to ensure the continued provision of ecosystem benefits in the long term. The methodology outlined by DWAF (1999) and updated in Rountree and Kotze, (2012), in Rountree *et. al.*; (2012) was used for this study.

For this method there are three suites of importance criteria; namely:

- **Ecological Importance and Sensitivity:** incorporating the traditionally examined criteria used in EIS assessments of other water resources by DWS and thus enabling consistent assessment approaches across water resource types;
- **Hydro-functional Importance:** which considers water quality, flood attenuation and sediment trapping ecosystem services that the wetland may provide; and
- **Importance in terms of Basic Human Benefits:** this suite of criteria considers the subsistence uses and cultural benefits of the wetland system.

These determinants are assessed for the wetlands on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance. It is recommended that the highest of these three suites of scores be used to determine the overall Importance and Sensitivity category of the wetland system, as defined in **Table 10.15**.

Table 10.15: Interpretation of Overall EIS Scores for Biotic and Habitat Determinants

Ecological Importance and Sensitivity Category (EIS)	Range of Scores
<u>Very high</u>	
Wetlands that are considered ecologically important and sensitive on a national or even international level. The biodiversity of these systems is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water of major rivers.	>3 and <=4
<u>High</u>	
Wetlands that are considered to be ecologically important and sensitive. The biodiversity of these systems may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.	>2 and <=3
<u>Moderate</u>	>1 and <=2

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Ecological Importance and Sensitivity Category (EIS)	Range of Scores
Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	
<u>Low/marginal</u>	
Wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these systems is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.	>0 and <=1

(Rountree & Kotze, 2012)

Project Specialist

The wetland assessment will be completed by **Kieren Bremmer** (See CV in **Appendix A14**) from Digby Wells. C Rowe (see CV in **Appendix A15**) will review and sign the wetlands specialist study off.

10.7.4 Soils and agricultural potential

Soil observations will be done on a 150 x150 m grid for the two substation sites to determine the soil form, as well as the depth to limiting layer (e.g. clay layers, hard rock, hard and soft plinthite) and general soil physical properties like finger feel clay content. Chemical characteristics will be done per laboratory analysis.

Land capability and land use will also be assessed. Sensitive sites like wetlands will be demarcated by soil auger. Agricultural activities (like crop, pasture, or natural field) will be noted. Google Earth images of the routes will be used as bases for selection of sampling points, especially to determine fields with agricultural activities. GPS co-ordinates of each sample point will be recorded. Interpretations will be based on field survey data and site specific requirements.

Soil samples for chemical analysis will only be taken on the proposed substation sites. The following will be analysed:

- Electrical conductivity of the saturation extract (salinity hazard);
- Soluble cations (Na, Ca, and Mg) of the saturation extract to calculate sodium adsorption ratio (SAR);
- pH Water;
- Exchangeable cations (Na, Ca, Mg, and K);
- Cation exchange capacity to calculate exchangeable sodium percentage (ESP); and
- Soil textural analysis (sand, silt and clay) fraction.

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The classic concepts of land capability, as established by Klingebiel and Montgomery (1961) will be used as far as possible. These concepts will be brought under parameters suited to South African conditions and the local availability of data. Land Capability Classes (Klingebiel & Montgomery, 1961) are summarised in **Table 10.16**.

Table 10.16: Land capability classes

LAND CAPABILITY CLASS	LAND USE OPTIONS	LAND CAPABILITY GROUPS
Class I	W F LG MG IG LC MC IC VIC	Arable land
Class II	W F LG MG IG LC MC IC	Arable land
Class III	W F LG MG IG LC MC	Arable land
Class IV	W F LG MG IG LC	Arable land
Class V	W F LG MG	Grazing
Class VI	W F LG MG	Grazing
Class VII	W F LG MG	Grazing
Class VIII	W	Wildlife

W - Wildlife LC - Poorly adapted cultivation

F - Forestry MC - Moderately well adapted cultivation

LG - Light grazing IC - Intensive, well adapted cultivation

MG - Moderate grazing VIC - Very intensive, well adapted cultivation

IG - Intensive grazing

Project Specialist

Soils and agricultural potential will be determined by **Francois Botha** who is SACNASP registered in the field of Soil Science (See CV in **Appendix A10**). He has a BSc (Hon) in Soil Science from Potchefstroom University for Christian Higher Education (PU for CHE). Francois has been in consulting in the field of soils science for the past thirteen years. Prior to this, he spent seven years as a Senior Extension Officer for the SA Sugar Association Experiment. He also lectured in soil science at the Department of Agriculture for five years.

10.7.5 Geotechnical

The aim of the preliminary geotechnical investigation is essentially to determine the geotechnical subsoil conditions relative to the proposed earthworks, to identify potential geotechnical “red flags” and ultimately to rank/determine the most suitable sites according to their geotechnical properties, namely:

- Site geology and stratigraphy.
- Soil and rock classification.
- Potential geotechnical problems.
- Earthworks and terrace construction recommendations.
- Excavatability of material on site as per SANS 1200 specifications.
- The identification of areas of steep and potentially unstable slopes.
- The delineation of seepage zones and drainage channels.
- Establish the sources available to obtain G5/G6/G7 material for fill construction

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- Corrosion protection.
- Seismic assessment and classification of the site.

Once the most suitable site is chosen, this will be followed by a site specific detailed geotechnical investigation after the EIA during implementation to provide sufficient information to accurately determine designs and specifications for earthworks, in particular materials utilisation, excavatability, stability design of cut/fill earthworks, and general foundation recommendations for structures. Structure specific geotechnical investigations may also still be required post earthworks phase depending on the structure types and loads.

The Geotechnical investigations will be undertaken by **Karl Ribbink** (CV in Appendix A 16) from Maud Drennan and Associates.

10.7.6 Visual

The visual specialist study will define the spatial context of influence of the proposed projects in terms of the visibility of the overhead transmission and distribution power lines and the substation, and to identify potential sensitive receptor locations.

The proposed development is a medium scale infrastructure project and the receiving environment is an “an area with high scenic, cultural and historic significance”. The development can therefore be expected to result in moderate to high visual impacts, which will require a Level 4 visual assessment as described in the Guideline for Involving Visual and Aesthetic Specialist on EIA Processes (Oberholzer, 2005).

Approach to study

Figure 10.5 provides a schematic summary of the approach to visual assessment.

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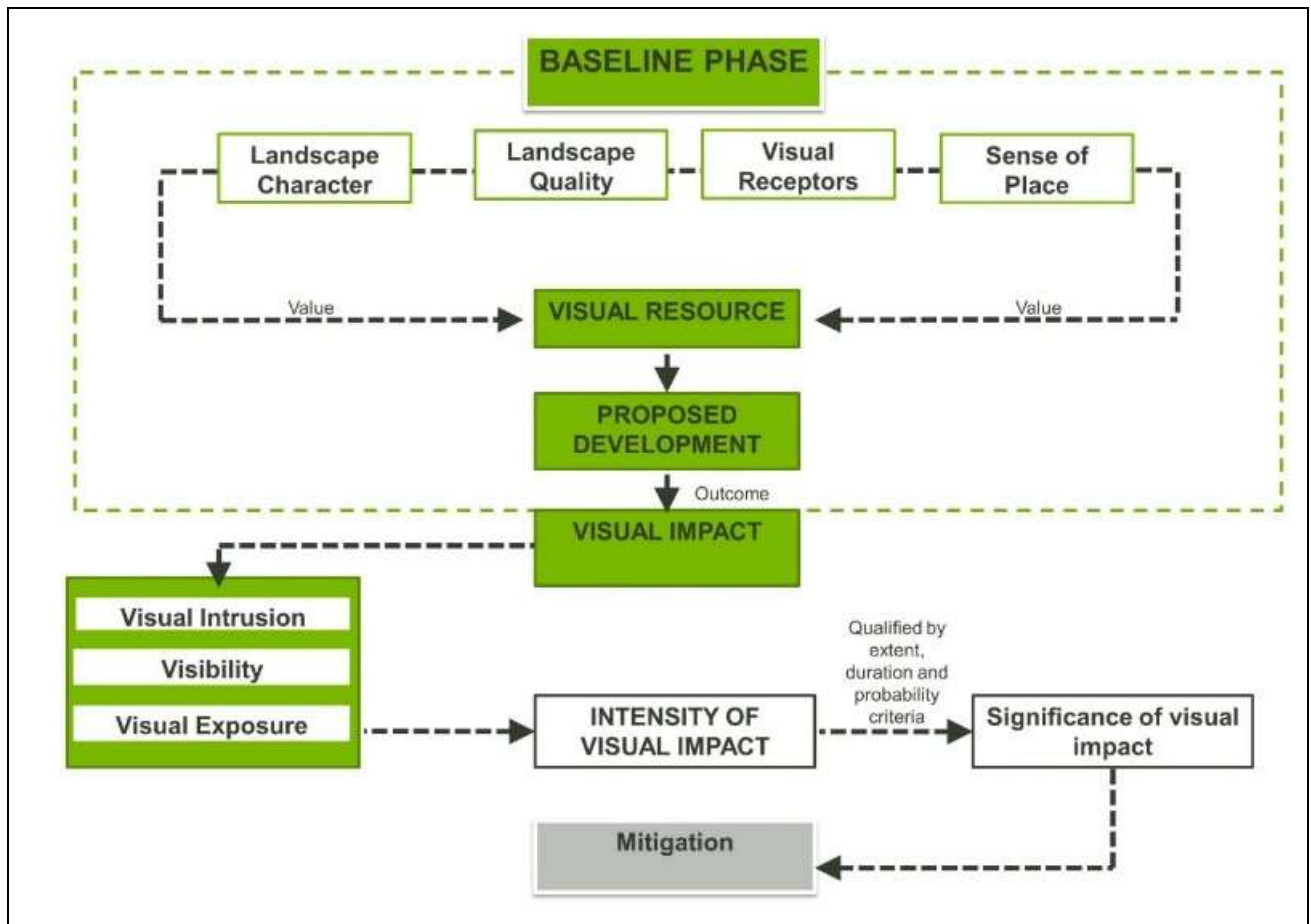


Figure 10.5: Approach to study

Methodology

The following method will be used:

- A site visit will be undertaken;
- The landscape will be mapped using GIS technology;
- The physical and technical characteristics of the project components will be described and illustrated;
- The visual resource (landscape character, landscape quality, sense of place and visual receptors) will be described; and
- The information will be depicted by maps. Critical areas will be highlighted during this phase, which will be studied in more detail during the impact assessment phase.

Baseline phase

The baseline phase will describe the visual resource and the technical information associated with the proposed development. The description of the visual resource includes:

- The baseline conditions in terms of the **landscape character**;

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- The **landscape quality** in terms of the visual absorption capacity and overall aesthetic appeal which included the existing land cover, intrinsic physical properties, landform, vegetation, water, colour, adjacent scenery, scarcity and cultural modifications; and
- The **sense of place/genius loci**

The technical information focuses on the main project components.

Assessment phase

The assessment phase consists of the following tasks:

- Analysis of the proposed development in terms of the criteria such as **visual intrusion, visibility, visual exposure, visual absorption capacity** and **viewer sensitivity** to determine the **intensity** of the impact. A 3D GIS terrain model will be used to assess the visibility of the infrastructure as a whole, or parts thereof, from significant viewpoints within the viewshed.
- Emphasis will be placed on potential visual receptors and critical views towards the proposed development. Photographs and a GPS will be used to record relevant geographical locations within the vicinity of the corridor. Unique viewpoints will be selected according to land uses and different landscape characteristics
- Determine the impact **significance** by synthesising the assessment criteria as described above.
- Recommend **mitigation measures** to reduce the potential negative impacts; and
- Photomontages will be used to compare the existing views with the probable effect of the proposed infrastructure.

Assessment of route alternatives

The following criteria will be used to analyse alternatives and identify the preferred site/corridor (from visual impact perspective):

- Visual resource sensitivity (based on topography, vegetation, land use);
- Sensitivity of visual receptors (are they residing in the area or just passing by?);
- Visibility of the project (lower lying areas, compared to higher lying areas);
- Length of the corridor line; and
- Does the corridor cross (or come into close proximity) to large game reserves and areas of high tourism value.

Project Specialist

Johan Goosen (See CV in **Appendix A8**) is employed as an environmental planner and landscape architect and at Aurecon. He has more than 15 years' experience in landscape architecture and environmental planning in a wide variety of sectors. His expertise includes urban open space planning and regional environmental planning frameworks, end land use planning for mining and waste facilities and brownfields site re-development. He has further been involved in numerous projects requiring environmental screening, impact assessment/permitting, construction monitoring and VIA for linear infrastructure such as roads, rail, bulk water, urban and rural property developments and the mining and metals

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sector.

Johan holds a Bachelor in Landscape Architecture, which he obtained from the University of Pretoria (UP) in 1998, and completed a Graduate Diploma in Environmental Engineering from the Witwatersrand University (WITS) in 2014. He is a member of both the IAIAAs and the Institute for Landscape Architecture in South Africa (ILASA). He is also a Registered Professional Landscape Architect with the South African Council for Landscape Architectural Professionals (SACLAP).

He has also been the co-writer and examiner of the environmental section of the SACLAP professional exam from 2009 to 2015, and regularly acts as external examiner for UP landscape architecture on environmental engineering aspects.

10.7.7 Heritage

The Heritage Impact Assessment (HIA) will comply with Section 38(3) of the National Heritage Resources Act (NHRA). The Heritage Resources Agency (HRA) will be furnished with:

- Information on identified heritage resources;
- Assessments of the cultural significance of identified heritage resources;
- Assessment of identified heritage impacts;
- Evaluation of heritage impacts relative to the socio-economic benefits of the project;
- Consideration of alternatives;
- Recommended management or mitigation measures;
- Any limitations or conditions of the development; and
- The general protection applicable in terms of the National Heritage Resources Agency (NHRA) and the KwaZulu-Natal Heritage Agency (KZNHA).

The components that the HIA will consider are presented in **Table 10.17**.

Table 10.17: General and special protection in terms of the NHRA and KZNHA

General and Special Protection	NHRA	KZNHA
Archaeology, Palaeontology and Meteorites	Section 35	Section 34
Battlefields, archaeology, rock art, palaeontology and historic fortifications	Section 35	Section 34
Battlefield sites, public monuments and memorials	Section 37	Section 41
Burial grounds and graves	Section 36	Section 34, 35 and 40
Graves of victims of conflict	Section 36	Section 34
Heritage landmarks	Section 27	Section 38
Provincial landmarks	Section 27	Section 39
Structures	Section 34	Section 33

The HIA will include assessments of the identified heritage resources to determine Cultural Significance (CS) and Field Ratings, the intensity of predicted heritage impacts on heritage

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resources by projected related activities and the development of reasonable and feasible management and mitigation measures.

Heritage Specialists

Justin du Piesanie (see CV in **Appendix A9**)

ASAPA Member 270

AMAFSA Registered

ICOMOS Member 14274

Justin holds the position of Heritage Management Consultant: Archaeologist at Digby Wells, after joining the company in August 2011. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage.

10.7.8 Social

Social change processes are set in motion by project activities and can be measured objectively, independent of the local context. Examples of a social change process are increase in the population, relocation or presence of temporary workers. Under certain circumstances these processes may result in social impacts, but if managed properly these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place (Vanclay, 2003).

The following categories of social change processes will be investigated:

- Demographic processes;
- Economic processes;
- Geographic processes;
- Institutional and legal processes;
- Emancipatory and empowerment processes; and
- Socio-cultural processes.

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A social impact is 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. Therefore, two types of social impacts can be distinguished:

- Objective social impacts – i.e. impacts that can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety.
- Subjective social impacts – i.e. impacts that occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life.

It is important to include subjective social impacts, as these can have far-reaching consequences in the form of opposition to, and social mobilisation against the project (Du Preez & Perold, 2005). The following categories of social impacts will be investigated:

- Health and social well-being;
- Quality of the living environment;
- Economic impacts and material well-being;
- Cultural impacts;
- Family and community impacts;
- Institutional, legal, political and equity impacts; and
- Gender impacts.

A participatory approach will be adopted. The World Bank Social Standards, Equator Principles, International Principles for Social Impact Assessment and the SIA Guidance document published by the IAIA will be applied in the study. International standards and principles will be adapted to ensure that it can be applied in the local social context. The methodology proposed focuses on involving the affected public in the research and planning where it is realistically possible and executable. Different methodologies will be utilised to ensure the affected communities are consulted in the way that is most appropriate to the community.

The following activities will form part of the process:

- Fieldwork will be conducted to obtain additional information and communicate with key stakeholders. Key stakeholders are likely to include:
 - Authorities: local municipalities that fall in the project area.
 - Affected parties: communities that will be affected by the project, farm labourers and farmers.
 - Interested parties: local business in the area, community-based organisations and non-governmental organisations within the affected communities, trade unions, and political groups.
- Methodologies will include in-depth interviews, participatory rural appraisal, in-the-moment discussion groups, focus groups and immersions. Field notes will be kept of all interviews and focus groups. Initial meetings have been conducted by the public participation team.

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- An interview schedule might be utilised instead of formal questionnaires. An interview schedule consists of a list of topics to be covered, but it is not as structured as an interview. It provides respondents with more freedom to elaborate on their views.
- The final report will focus on current conditions, providing baseline data. Each category will discuss the current state of affairs, but also investigate the possible impacts that might occur in future. The impacts identified in the scoping report will be revisited and rated accordingly. New impacts that have not been identified will be added to the report. Recommendations for mitigation will be made at the end of the report.
- The SIA process will have a participatory focus. This implies that the SIA process will focus strongly on including the local community and key stakeholders.
- The public consultation process needs to feed into the SIA.
- Impacts will be rated according to significance (severity), probability, duration, spatial extent and stakeholder sensitivity.

Information obtained through the public processes will inform the writing of the final SIA and associated documents.

The following assumptions and limitations were relevant:

- The socio-economic environment constantly changes and adapts to change, and external factors outside the scope of the project can offset social changes, for example changes in local political leadership. It is therefore difficult to predict all impacts to a high level of accuracy, although care has been taken to identify and address the most likely impacts in the most appropriate way for the current local context within the limitations.
- Social impacts can be felt on an actual or perceptual level, and therefore it is not always straightforward to measure the impacts in a quantitative manner.
- Social impacts commence when the project enters the public domain. Some of these impacts are thus already taking place, irrespective of whether the project continues or not. These impacts are difficult to mitigate and some would require immediate action to minimise the risk.

There are different groups with different interests in the community, and what one group may experience as a positive social impact, another group may experience as a negative impact.

San-Marié Aucamp (see CV in **Appendix A4**) is a registered Research Psychologist with extensive experience in both the practical and theoretical aspects of social research. She has more than 10 years of experience in social research and she occasionally presents guest lectures on social impact assessment. Her experience includes social impact assessments, social and labour plans, training, group facilitation as well as social research. She is a past council member of the Southern African Marketing Research Association (SAMRA).

Ilse Aucamp (see CV in **Appendix A3**) holds a D Phil degree in Social Work obtained from the University of Pretoria in 2015. She also has Masters degree in Environmental

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Management (Cum Laude) from the Potchefstroom University for Christian Higher Education which she obtained in 2004. Prior to that she completed a BA degree in Social Work at the University of Pretoria, She is frequently a guest lecturer in pre- as well as post-graduate programmes at various tertiary institutions. Her expertise includes social impact assessments, social management plans, social and labour plans, social auditing, training as well as public participation. She is the past international chairperson of the Social Impact Assessment section of the International Association of Impact Assessment (IAIA) as well as a past member of the National Executive Committee of IAIA South Africa. She advises the Centre for Environmental Rights on social issues, and is also on the advisory panel of the SIAhub, an international website aimed at SIA practitioners. She is a co-author of the newly published Social Impact Assessment: Guidance for assessing and managing the social impacts of projects document published by the International Association for Impact Assessment.

10.7.9 Economic

One of the key issues that landowners affected by the proposed project have raised is the impact on the eco-tourism activities and knock-on effects including decline in property values, loss of jobs, reduced budgets for conservation of animals. The socio-economic specialist study only allowed for this to be assessed on a qualitative level. Interaction with the landowners has highlighted that the project could be opposed should this aspect not be adequately addressed. The inclusion of a more detailed economic assessment has therefore been commissioned. The assessment will consider area of influence for a specific impact as well as a regional / national impact. The site specific analysis will have a strong focus on the site and immediate surroundings which depends on existing land uses, sense of place aspects and local development opportunities. The regional / national impact is quantified through the use of econometric modelling and multipliers and indicate the value of the investment through gross value added (GVA), employment creation business sales, etc. as a result of the project.

The economic assessment will be undertaken by **David Dyason** (see CV in **Appendix A11**) from the University of the North West. David Dyason is a specialist in the field of economic impact analysis. His interest is in geographical economics and impact analysis. He has 10 years' experience in the private sector and prior to joining the North-West University, David worked as a market analyst for Demacon Market Studies. Among the projects he worked on were: economic- and socio-economic impact studies, mixed land use market assessments, local economic development plans, freight and corridor plans, and tourism-related studies. He is also a GIS specialist, with several years' experience in mapping and spatial analysis.

10.8 INTEGRATION MEETING

An Integration Meeting will take approximately two weeks before the specialist reports are due. The objectives of this meeting will be:

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- For each specialist to present the findings and recommendations of his or her study to the rest of the team;
- For the PPP team leader to ensure that I&AP issues have been adequately addressed in the specialist studies;
- To discuss the significance ratings of impacts assessed to confirm that the methodology has been applied consistently across aspects;
- To agree on the interpretation of “irreplaceable resource: and “cumulative impact” and how these have been assessed;
- To agree on the key issues to inform the recommendations of the EIA;
- To debate any conflicting findings and trade-offs that may be required; and
- To confirm key mitigation measures to be recommended, specifically regarding any no-go areas, deviations to corridors or offsets.

10.9 MITIGATION HIERACHY

The aspects to be assessed in the Impact Assessment, as well as the activity that could impact on them and the impacts that could occur are listed in **Table 10.18**. Suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored (GN 982 Appendix 2 item 2 (i) (ix)) are also indicated in **Table 10.18**.

10.10 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

A draft Environmental Impact Assessment Report (EIAR) that complies with the content requirements specified in Section 3 of Appendix 3 of GN. R 982 will be compiled. The draft EIAR will be subject to a 30 day public comment period. All comments received will be considered and incorporated to produce a final EIAR that will be submitted to the competent authority for decision making.

10.11 ENVIRONMENTAL MANAGEMENT PROGRAMME

Based on the findings of the EIR, a practical and feasible EMPr will be compiled. The EMPr will outline how negative environmental impacts will be managed and minimized, and how positive impacts will be maximised, during and after construction. The EMPr will fulfil the content requirements specified in Appendix 4 of GN. R 982, as amended by Appendix 4 of GN 326 of 7 April 2017, and include mitigation measures required during the planning, construction and operational phases of the project as well as a framework for social and environmental monitoring. Recommendations will be given with regard to the responsible parties for the implementation of the EMPr.

Specialists will provide input into this EMPr. It will be further strengthened by information compiled as part of the SEA for Electricity Grid Infrastructure in South Africa.

The draft EMPr will be subject to a 30 day public comment period at the same time as the draft EIR. All comments received will be considered and incorporated to produce a final EMPr that will be submitted to the competent authority for decision making.

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Table 10.18: Potential Impacts identified for the Iphiva Substation

Environmental Aspect	Project Activity	Potential Impact	Project Phase	Proposed Mitigation Type	Potential for Residual Risk
Heritage	Access roads for the construction and operation of the substation will be required. These will be within the authorised corridor. (GN R 983 – Activity 24)	Direct impact – damage and / or destruction of <i>in situ</i> heritage resources that results in a change in <i>status quo</i> and cultural significance (CS).	Construction and Operation	Conduct an HIA to: Identify heritage resources in relation to the Project; Determine the actual CS of heritage resources; Assess impacts on heritage resources based on development activities and CS; and Develop mitigation and management measures the CS	Possible public resistance Additional requirements from the HRA's Negative RoD from HRAs for the development
	The proposed substation is for the transmission of electricity with a capacity of 400kV outside an urban area or industrial complex. (GN R 984 – Activity 9)				
	The proposed substation is for the transmission of electricity with a capacity of 400kV outside an urban area or industrial complex. (GN R 984 – Activity 9)	Indirect impact – alteration of the sense-of-place that compromise the integrity of and CS of heritage landscapes	Operation		
Flora and Fauna	The footprint of the substation site (approximately 400 m x 400 m will be cleared)	During the construction phase habitat destruction takes place in certain areas such as the sub stations, footprint of the transmission lines, and access roads. Degradation of habitat occurs within the servitude where trees are	Construction	Removal of vegetation during construction and operation must be minimised and strictly kept to the designated project site to reduce the risk of open areas occurring; Protected plant species encountered may not be disturbed without permits;	Aline invasive plants spreading. Potential impacts and displacement of Red Data /protected fauna and flora species; Loss of threatened Ecosystems Erosion occurring in open areas

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Environmental Aspect	Project Activity	Potential Impact	Project Phase	Proposed Mitigation Type	Potential for Residual Risk
		kept at a certain height. Possible destruction of Red Data plant species.		(avoidance as far as practical possible, if not possible relocation of red data flora species Protected animal species encountered may not be disturbed without applicable permits (avoidance as far as practical possible, if not possible relocation of red data faunal species or rehabilitated areas to provided preferred habitat? The footprint of the area disturbed by the operation must have natural vegetation restored through rehabilitation.	
	Vehicular movement and access during construction and operation	Uncontrolled vehicle access can result in unnecessary loss of indigenous and riparian vegetation and preferred habitat for nesting bird species.	Construction and Operation	Adhere to designated paths and roads; and Do not drive in sensitive areas.	Impacts of sensitive areas; Poaching if access are not controlled; Veld fires;

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Environmental Aspect	Project Activity	Potential Impact	Project Phase	Proposed Mitigation Type	Potential for Residual Risk
	Site clearing for infrastructure placement including the increased traffic to complete the activity.	Creation of open areas that promote alien vegetation establishment	Construction and Operation	Alien invasive and weed species management plan must be in place;	AIP establishment in disturbed areas if not rehabilitated properly
Avifauna	The substation will have a foot print of approximately 400 m x 400 m.	During the construction phase some habitat destruction and alteration takes place. This happens with the construction of access roads, and the clearing of servitudes, as well as clearing vegetation at the substation site.	Construction	Strict control should be maintained over all activities during construction, in particular heavy machinery and vehicle movements, and staff. It is difficult to mitigate properly for this as some habitat destruction is inevitable. It is important to ensure that the construction Environmental Management Plan incorporates guidelines as to how best to minimize this impact.	Strict control should be maintained over all activities during construction. It is difficult to mitigate properly for this as some disturbance is inevitable. During Construction, if any of the SSC are observed to be roosting and/or breeding in the vicinity (within 1km of the power line), the Avifaunal Specialist is to be contacted for further instruction.
	Vehicular movement and access	Uncontrolled vehicle access can result in unnecessary loss of indigenous and riparian vegetation and preferred habitat for nesting bird species.	Construction and maintenance	Ensure access routes are planned, clearly demarcated and suitable for the vehicles that will be using them. Ensure drivers are sensitised and disciplined. Vehicle access through riparian or wetland	No nests may be removed, without consulting the specialist. During maintenance, if any of the SSC identified in the EIA report are observed to be roosting and/or breeding in the

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Environmental Aspect	Project Activity	Potential Impact	Project Phase	Proposed Mitigation Type	Potential for Residual Risk
				system to be limited to existing formal access only	vicinity, the avifaunal specialist is to be contacted for further instruction.
Avifauna	Site clearing for substation	Loss of habitat	Construction	A buffer of 100m at least should be placed around all wetland areas associated with the proposed substation footprint areas. The extent of the buffer zone around wetlands should be clearly demarcated with wooden stakes in the ground during construction.	
Wetlands	Site clearing for access roads	Loss of habitat	Construction	A buffer of 100m at least should be placed around all wetland areas associated with the proposed access routes and routes should be re-aligned to avoid wetlands. Where wetlands cannot be avoided, bridges and suitable erosion control structures should be put in place.	

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Environmental Aspect	Project Activity	Potential Impact	Project Phase	Proposed Mitigation Type	Potential for Residual Risk
Social	See Table 8.2	Security impacts Loss of sense of place Impact on livelihoods – economic impacts	Construction Operation	See Table 8.2 for details	High if impacts are not managed, especially access control
Soils and Agricultural potential	Construction of a substation in close proximity of tourist attractions	Negative impact due to high visibility and poor aesthetic quality	Construction and operation	The alignment should avoid natural features such as elevated ridges , koppies that could be considered as visual assets and that therefore have the potential to be utilised for passive tourist related activities	
Visual	Vegetation clearing for the substation, construction camps and access roads	Negative impact on sense of place, visual quality and landscape character May reduce the landscape's ability to absorb the proposed development	Construction and operation	Follow the existing grade as closely as possible Servitudes should be kept at the absolute minimum required width Do not locate camp sites in areas where it would be necessary to remove trees and shrubs or large areas of well established vegetation	

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11. CONCLUSION AND RECOMMENDATIONS

The northern KZN network is currently fed at 132 kV by Normandie Substation and Impala Substation. The major load centres are Pongola and Makhatini Flats. Normandie Substation is situated approximately 160 km north of Pongola and Impala Substation is situated approximately 180 km south of Makhatini Flats. High voltage drops are experienced in the 132 kV network and the voltages are approaching unacceptable levels as the demand increases. Contingencies on the main 132 kV supplies also lead to thermal overloading of the remaining network.

In order to alleviate current and future network constraints in northern KZN, it is proposed that the Iphiva 400/132 kV Substation (Iphiva 400/132kV Substation) be introduced in the area, which will de-load the main sub-transmission network and improve the voltage regulation in the area. The Iphiva 400/132kV Substation will be integrated with the existing electricity network by 400 kV Transmission powerline namely the approximately 150 km Normandie-Iphiva, the approximately 130 km Iphiva-Duma 400 kV Transmission powerlines and approximately 165 km of 132 kV Distribution powerlines.

The proposed project triggers several activities listed in the National Environmental Management Act (Act 36 of 1998) (NEMA), as amended, as requiring environmental authorisation before they can commence. The purpose of this study is to undertake an Environmental Impact Assessment (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. Four application forms will be submitted, one each for the following:

1. The Iphiva Substation;
2. The 400 kV powerline from the Iphiva Substation to the Normandie Substation;
3. The 400 kV powerline from the Iphiva Substation to the Duma Substation, and
4. 165 km of 132 kV distribution lines.

Eskom and the EAP undertook a desktop assessment followed by site visits to identify possible sites for the construction of the Iphiva Substation. Thirteen (13) potential sites were evaluated for technical feasibility. Environmental aspects were then identified to comparatively assess the technical feasible sites, in consultation with the specialists and I&APs, specifically potentially affected landowners.

The EAP recommends that sites Iphiva 3 and 6 be assessed further in specialist studies and the Impact Assessment Phase for the project.

The following key issues have been identified in the Scoping Phase of the EIA:

- Impacts on protected areas resulting in loss of plants and animals of conservation value and a loss in the income from and value of the facilities, primarily due to visual impacts;
- Impacts on the rich and diverse fauna and flora (specifically large birds);

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- Impacts on landuse, particularly for sugar cane farmers and forestry;
- Impacts on Heritage Resources'
- Social impacts;
- Economic Impacts;
- Impacts on the biophysical environment resulting from access roads;
- Construction Impacts; and
- Cumulative impacts.

The EIA phase will build on the Scoping report and will focus on assessing the key impacts, determining their significance, and recommending appropriate measures to mitigate negative impacts and enhance benefits. Where required, this will involve specialist input. The contents of the EIR will be as prescribed in the EIA Regulations, 2014, as amended.

Some of the key issues identified during the Scoping Phase will require further investigation by appropriately qualified and experienced specialists. The specialist studies to be undertaken during the EIA phase are listed below. These studies will be synthesised and integrated into the overall impact assessment (full reports will be included as appendices to the EIR), and recommendations for mitigation will be included in the EMP. The contents of all specialist reports will include information as prescribed in the EIA Regulations, 2014, as amended.

The EAP recommends that the following specialist studies be undertaken in the Impact Assessment phase of the EIA:

- An ecological assessment of the local **flora and fauna** communities associated with the proposed substation sites and powerline corridors will be undertaken to determine the current state. Information generated from this survey will be used to assess the impacts that the construction, operational and decommissioning activities will have on this environment. The vegetation/habitat types will be delineated and their sensitivity described. Any flora and fauna species or assemblages that will be directly impacted upon by the project will be identified. This includes flora and fauna communities present, the state of these communities and the identification of possible Red Data species in accordance with the International Union for the Conservation of Nature (IUCN), National and Provincial criteria. An assessment of the impacts associated with various activities on the health of the flora and fauna species or assemblages will be undertaken; and measures that should be included in the EMP to prevent or limit impacts to flora and fauna species or assemblages will be recommended.
- Impacts on **birds** that could be associated with a project of this nature include: collision of birds with the overhead cables; electrocution; destruction of habitat; and disturbance of birds. Collisions are the biggest potential risk to avifauna, while habitat destruction is also expected to be an important impact of this project.

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In the **avi-fauna** specialist study, data from a desktop level will be examined to determine the location and abundance of power line sensitive Red Data Listed species as well as potentially “power line sensitive” species in the study area. A desk top examination, using Google Earth imagery will be done to compare the alternatives. The area will be visited in the summer months, and traversed by vehicle and on foot to obtain a first-hand understanding of the proposed routes, habitat and avifauna, and to determine which bird micro-habitats are present and relevant to the study. This will involve driving the study area, taking photographs, and walking certain accessible areas, to see as much as possible of the proposed routes for the power line. The impacts of the proposed substation and powerlines on avifauna will be predicted on the basis of experience in gathering and analysing data on avifaunal impacts with power lines. Recommended mitigation measures for significant impacts will be proposed.

- A thorough assessment of **wetlands** associated with the substations will be undertaken, while only a preliminary desktop assessment of wetlands associated with the powerlines will be done. The objectives of the Wetlands Impact Assessment include Delineation of wetland boundaries; Assessment of wetland baseline integrity and functionality; Assessment of the potential impacts of the proposed development on wetlands; Guidance on placement of infrastructure to ensure a no-nett-loss of wetlands; and to prescribe mitigation and management measures.
- The **soil** specialist will undertake soil observations on a 150 x150 m grid for the alternative substation sites to determine the soil form, as well as the depth to limiting layer (e.g. clay layers, hard rock, hard and soft plinthite) and general soil physical properties like finger feel clay content. Chemical characteristics will be done per laboratory analysis. The soil survey for the 2 km and 500 m wide corridors being assessed will be done on a free survey method. Land capability and land use will also be assessed. Sensitive sites like wetlands will be demarcated by soil auger. Agricultural activities (like crop, pasture, or natural field) will be noted. Google Earth images of the routes will be used as bases for selection of sampling points, especially to determine fields with agricultural activities. GPS co-ordinates of each sample point will be recorded. Interpretations will be based on field survey data and site specific requirements. The classic concepts of land capability, as established by Klingebiel and Montgomery (1961) will be used as far as possible.
- The **Heritage Impact Assessment** will comply with Section 38(3) of the National Heritage Resources Act. The Heritage Resources Agencies will be furnished with information on identified heritage resources; assessments of the cultural significance of identified heritage resources; assessment of identified heritage impacts; evaluation of heritage impacts relative to the socio-economic benefits of the project; consideration of alternatives; recommended management or mitigation measures;

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any limitations or conditions of the development; and the general protection applicable in terms of the National Heritage Resources Agency (NHRA) and the KwaZulu-Natal Heritage Agency (KZNHA). The HIA will consider archaeology, palaeontology and meteorites, battlefields, archaeology, rock art, palaeontology and historic fortifications, battlefield sites, public monuments and memorials, burial grounds and graves, graves of victims of conflict, heritage landmarks, provincial landmarks and structures.

- The **visual specialist study** will define the spatial context of influence of the proposed projects in terms of the visibility of the overhead transmission and distribution power lines and the substation, and to identify potential sensitive receptor locations. The development is expected to result in moderate to high visual impacts, which will require a Level 4 visual assessment as described in the Guideline for Involving Visual and Aesthetic Specialist on EIA Processes (Oberholzer, 2005). A site visit will be undertaken. The landscape will be mapped using GIS technology. The physical and technical characteristics of the project components will be described and illustrated. The visual resource (landscape character, landscape quality, sense of place and visual receptors) will be described; and the information will be depicted by maps. Critical areas will be highlighted. Analysis of the proposed development in terms of the criteria such as visual intrusion, visibility, visual exposure, and visual absorption capacity and viewer sensitivity to determine the intensity of the impact will be undertaken. A 3D GIS terrain model will be used to assess the visibility of the infrastructure as a whole, or parts thereof, from significant viewpoints within the viewshed. Emphasis will be placed on potential visual receptors and critical views towards the proposed development. Photographs and a GPS will be used to record relevant geographical locations within the vicinity of the corridors. Unique viewpoints will be selected according to land uses and different landscape characteristics. The impact significance will be determined by synthesising the assessment criteria. Recommend mitigation measures to reduce the potential negative impacts; and photomontages will be used to compare the existing views with the probable effect of the proposed infrastructure.
- Demographic, economic, geographic, institutional, legal, emancipatory, empowerment, and socio-cultural processes will be investigated in the **Social Impact Assessment**: Health and social well-being, quality of the living environment, economic impacts and material well-being, cultural impact, family and community impacts, institutional, legal, political and equity impacts, and gender impacts will be investigated. Fieldwork will be conducted to obtain additional information and communicate with key stakeholders. Methodologies will include in-depth interviews, participatory rural appraisal, in-the-moment discussion groups, focus groups and immersions. Field notes will be kept of all interviews and focus groups. Initial meetings have been conducted. An interview schedule might be utilised instead of formal questionnaires. An interview schedule consists of a list of topics to be

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covered, but it is not as structured as an interview. It provides respondents with more freedom to elaborate on their views. The final report will focus on current conditions, providing baseline data. Each category will discuss the current state of affairs, but also investigate the possible impacts that might occur in future. The impacts identified in this scoping report will be revisited and rated accordingly. New impacts that have not been identified will be added to the report. Recommendations for mitigation will be made at the end of the report.

- One of the key issues that landowners affected by the proposed project have raised is the impact on the eco-tourism activities and knock-on effects including decline in property values, loss of jobs, and reduced budgets for conservation of animals. The socio-economic specialist study only allowed for this to be assessed on a qualitative level. Interaction with the landowners has highlighted that the project could be opposed should this aspect not be adequately addressed. The inclusion of a more detailed **economic assessment** has therefore been commissioned. The assessment will consider area of influence for a specific impact as well as a regional / national impact. The site specific analysis will have a strong focus on the site and immediate surroundings which depends on existing land uses, sense of place aspects and local development opportunities. The regional / national impact is quantified through the use of econometric modelling and multipliers and indicate the value of the investment through gross value added (GVA), employment creation business sales, etc. as a result of the project.

The EAP recommends that this Scoping Report be approved by the competent authority and that the Impact Assessment Phase of the EIA proceeds according to the Plan of Study presented.

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ANNEXURE A: CURRICULA VITAE

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ANNEXURE B: SG CODES

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ANNEXURE C: SOCIAL SCOPING REPORT

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ANNEXURE D: ECOLOGICAL SCOPING REPORT

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APPENDIX E: PUBLIC PARTICIPATION

- APPENDIX E1: Public Participation Map
- APPENDIX E2: I&AP Database
- APPENDIX E3: Newspaper Advertisements
- APPENDIX E4: Notification and Invitation letters
- APPENDIX E5: Background Information Document and I&AP Registration Form
- APPENDIX E6: Minutes of Key Stakeholder and Authorities Meetings
- APPENDIX E7: Focus Group Meeting Minutes
 - Ezemvelo KZN Wildlife – 9 September 2016
 - Iphiva alternatives landowners – 25 October 2016
- APPENDIX E8: Traditional Council Meetings
- APPENDIX E9: Comments and Responses Report

EIA for Eskom's Northern KZN Strengthening Project: Iphiva Substation	Final Scoping Report	Status: Final
Owner: NAKO ILISO (Terry Calmeyer)	Page 12-3	Date: October 2017

**APPENDIX F:
MINUTES OF PRE-APPLICATION CONSULTATION WITH
DEA**

EIA for Eskom's Northern KZN Strengthening Project: Iphiva Substation	Final Scoping Report	Status: Final
Owner: NAKO ILISO (Terry Calmeyer)	Page 12-4	Date: October 2017

APPENDIX G: DECLARATIONS OF INTEREST

EIA for Eskom's Northern KZN Strengthening Project: Iphiva Substation	Final Scoping Report	Status: Final
Owner: NAKO ILISO (Terry Calmeyer)	Page 12-5	Date: October 2017