

132KV TRANSMISSION INFRASTRUCTURE FOR THE 450MW RISK MITIGATION POWER PLANT, KWAZULU NATAL PROVINCE

Basic Assessment Report
November 2020

savannah
environmental

t +27 (0)11 656 3237

f +27 (0)86 684 0547

e info@savannahsa.com

w www.savannahsa.com

Prepared for:

Phinda Power Producers (Pty) Ltd
39 Florida Road, Durban, 4001

Prepared by:

savannah
environmental

PROJECT DETAILS

Title	:	132kV Transmission Infrastructure for the 450MW Risk Mitigation Power Plant, KwaZulu-Natal Province
Authors	:	Savannah Environmental (Pty) Ltd Arlene Singh Jo-Anne Thomas
Client	:	Phinda Power Producers (Pty) Ltd
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PURPOSE OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

Phinda Power Producers (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Basic Assessment (BA) for the 132kV transmission infrastructure, switching station and associated access roads for the 450MW Risk Mitigation Power Plant (RMPP), KwaZulu-Natal Province. The BA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Basic Assessment (BA) report has been compiled in accordance with Appendix 1 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This BA Report describes and assesses this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the proposed 132kV transmission infrastructure and the BA process.
- » **Chapter 2** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed project.
- » **Chapter 3** provides a description of Scope of the proposed project, including identified project alternatives, and the need and desirability of the project.
- » **Chapter 4** outlines the approach to undertaking the BA process.
- » **Chapter 5** describes the existing biophysical and social environment within and surrounding the broader study and development area.
- » **Chapter 6** provides an assessment of the potential issues and impacts associated with the proposed power line and presents recommendations for the mitigation of significant impacts.
- » **Chapter 7** provides an assessment of the potential cumulative impacts.
- » **Chapter 8** presents the conclusions and recommendations based on the findings of the BA Report.
- » **Chapter 9** provides references used in the compilation of the BA Report.

The BA report is available for review from **Friday, 13th of November until Monday, 14th of December 2020**, at the following locations:

- » <https://www.savannahsa.com/public-documents/grid-infrastructure/>.

Please submit your comments by Monday, 14th of December 2020 to:
Nicolene Venter PO Box 148, Sunninghill, 2157 Tel: 011-656-3237 Fax: 086-684-0547 Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

Phinda Power Producers (Pty) Ltd (Phinda) is proposing the development of several 132kV underground cables and a new 132kV switching station with access roads in order to connect the proposed gas to power 450MW Risk Mitigation Power Plant (RMPP) facility to the national grid. The power generated by the 450MW RMPP gas to power facility will be fed into the grid via underground 132kV cables with the anticipated preliminary planned termination point at a proposed new 132kV switching station to be located within the existing Eskom power line servitude running the length between the Impala substation and Bayside Aluminium, with the switching station located at the terminus of the Bayside lines.

Several cabling routes have been identified for investigation within which the development of the 132kV underground grid connection could be developed, all terminating at the same proposed 132kV switching station location. The assessment of four (4) corridor options of 50m to 100m in width will allow for the optimisation of the cabling route, and are proposed to run along existing gas pipelines and road servitudes where possible. The consideration of four (4) different route alternatives also provides an opportunity to avoid environmental sensitivities which may be present. Existing access points off the road network will be used to access the power line routes for construction. Where existing access roads are not available, designed access points will be included.

The four corridor alternatives and associated infrastructure traverse numerous affected properties, namely:

Affected Properties: Farm Name(s), Number(s) and Portion Numbers for Grid Connection Routes	132kV Route Option 1:
	<ul style="list-style-type: none"> » Remainder of Erf 1854 » Portion 2 of Erf 1854 Richards Bay; » Kraft Link Road crossing » Portion 1 of Erf 1795 » Erf 16875 » Portion 118 of Erf 5333 » Portion 145 of Erf 5333 » Portion 150 of Erf 5333 » Remainder of Portion 8 of Erf 5333 » Remainder of Erf 5333
	<p>132kV Route Option 2:</p> <ul style="list-style-type: none"> » Remainder of Erf 1854 » Portion 2 of Erf 1854 Richards Bay; » Kraft Link Road crossing » Geleier Gang Road » Erf 16875 » Portion 118 of Erf 5333 » Portion 145 of Erf 5333 » Portion 150 of Erf 5333 » Remainder of Portion 8 of Erf 5333 » Remainder of Erf 5333
	<p>132kV Route Option 3:</p> <ul style="list-style-type: none"> » Remainder of Erf 1854 » Portion 2 of Erf 1854 Richards Bay; » Kraft Link Road crossing; » Geleier Gang Road » Erf 16875 » Portion 118 of Erf 5333

	<ul style="list-style-type: none"> » Portion 148 of Erf 5333 » Remainder of Portion 8 of Erf 5333 » Remainder of Erf 5333
	<p>132kV Route Option 4:</p> <ul style="list-style-type: none"> » Remainder of Erf 1854 » Portion 2 of Erf 1854 Richards Bay; » Kraft Link Road crossing » Geleier Gang Road » Erf 16875 » Portion 118 of Erf 5333 » Remainder of Portion 8 of Erf 5333 » Remainder of Erf 5333
Affected Property: Farm Name(s), Number(s) and Portion Numbers for the new 132kV switching station	<ul style="list-style-type: none"> » Remainder of Erf 5333

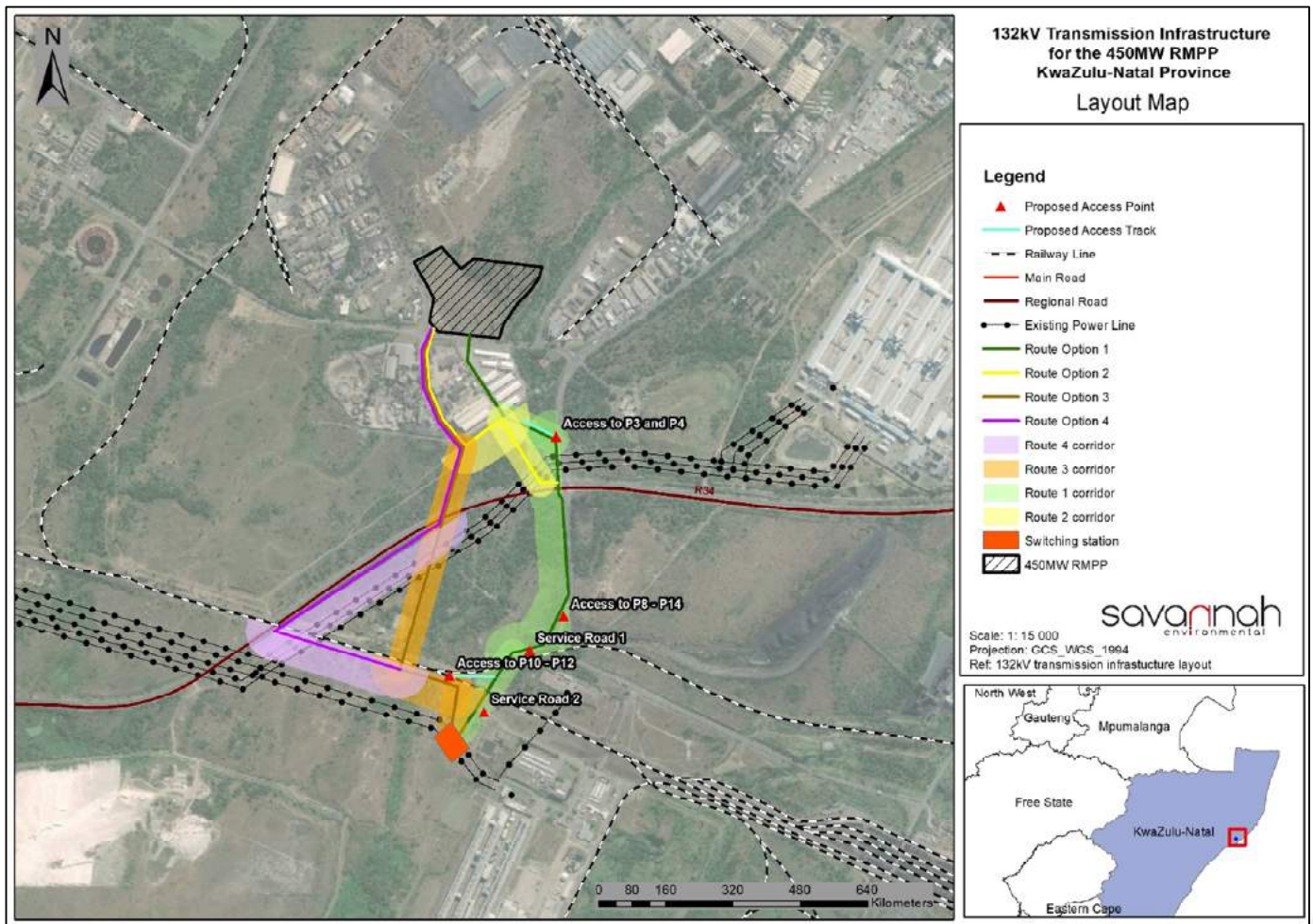


Figure 1: Locality map showing the 132kV transmission infrastructure, switching station and proposed access roads.

No environmental fatal flaws were identified in the detailed specialist studies conducted for the 132kV transmission infrastructure corridor alternatives, switching station and access roads. All impacts associated with the project establishment within the preferred corridor (route 1) can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures.

The potential environmental impacts associated with the 132kV transmission infrastructure, switching station and access road points identified and assessed through the BA process include:

Ecological Impacts - The terrestrial ecology report (**Appendix D**) indicated that several areas within the study area have been transformed for industrial developments, roads, railways and small businesses and identified the following impacts for the proposed transmission infrastructure development across the four (4) alternative corridor route options, development of a switching station and access roads:

- » loss of vegetation and terrestrial habitat;
- » potential loss of faunal species; potential loss of species of special concern;
- » habitat fragmentation (loss of corridors); and
- » infestation of alien species.

Impacts were determined to be of low, and in some instances medium significance with the implementation of the recommended mitigation measures. It is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from an aquatic perspective. The most preferred routes were determined to be route 1 or 4 including the access road points as these routes are mostly situated along the existing road and railway line reserves. Although these two routes cross the *Phragmites - Typha* channelled valley bottom wetlands, the impacts can be mitigated by ensuring, to the extent possible, that these routes are within the road and railway reserves to reduce the impact on the natural vegetation and wetland habitat.

Aquatic Impacts – Three wetland units were identified within the NWA 500 m regulated area of the proposed project, namely; 1) *Typha capensis - Cyprus papyrus* mixed marshland channelled valley bottom; 2) *Phragmites-Typha* channelled valley bottom; and 3) *Imperata cylindrica* depression (**Appendix E**). The largest portion of the wetlands within the study area were classified as *Phragmites - Typha* channelled valley bottom wetlands. The *Phragmites - Typha* channelled valley bottom wetland was largely modified, and therefore a large change in ecosystem processes and loss of natural habitat and biota had occurred. The following impacts were identified for the proposed transmission infrastructure development across the four (4) alternative corridor route options, development of a switching station and access roads:

- » destruction of natural habitat –wetland habitat;
- » potential loss of Species of Special Concern;
- » habitat fragmentation (loss of corridors);
- » infestation of alien species; hydrological impacts; and
- » pollution of surface and groundwater due to chemical, oil and fuel spills.

Impacts were determined to be a of low to medium significance with the implementation of the recommended mitigation measures. It is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from an aquatic perspective. The most preferred routes were determined to be route 1 or 4 including the access road points as these routes are mostly situated along the existing road and railway line reserves. Although these two routes cross the *Phragmites - Typha* channelled valley bottom wetlands the impacts can be mitigated by

ensuring, to the extent possible, that these routes are within the road and railway reserves to reduce the impact on the natural vegetation and wetland habitat.

It was concluded that the project could be authorised provided the recommended mitigation measures are implemented.

Soils, Agriculture and Land potential Impacts – The Soils & Agricultural Compliance Statement (**Appendix F**) identified the entire area of the assessment as being permanently transformed to industrial usage and confirmed the two Soil Forms found across the entire site, namely the Fernwood and Hutton Clanssthal Soil Forms. These soil forms cannot be categorised as arable agricultural land due to their inherent physical limitations. The anticipated impact to the soil is determined to occur during the construction phase and to be of very low significance. The anticipated impact is associated with a short-term duration, given the short duration of the construction phase, i.e. 6 months. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from a soil, agricultural and land potential perspective. From an agronomic or agribusiness viewpoint there is no stated preference. It can therefore be based purely on civil engineering considerations.

Impacts on Heritage Resources (including archaeology and palaeontology)– Impacts to heritage resources may occur during the construction phase due to the potential to uncover human graves that may be associated with historical settlements in the vicinity of the four alternative corridor routes (**Appendix G**). Corridors 1, 2 or 3 were determined to be the most feasible options in terms of heritage sites as any aspects of heritage significance may have been destroyed by previous developments. No archaeological resources or significance were identified. However, a 50m buffer around the unmarked graves along corridor route 4 should be implemented should this corridor be considered as the preferred alternative.

The area is of very low palaeontological sensitivity and has no or very low, palaeontological value. The impact to heritage resources was identified to be of low significance with the implementation of the proposed mitigation measures.

No impacts are expected during the operation phase of the project. As such, the development of the 132kV transmission infrastructure and its associated infrastructure along corridor 1 and 3 are not associated with any fatal flaws from a heritage, archaeological and palaeontological perspective, and it is considered to be acceptable. It was therefore concluded that the project can be authorised.

Socio-Economic Impacts – The Social Impact Assessment (**Appendix H**) identified that the majority of the negative and immediate positive social impacts associated with the project are anticipated to occur during the construction phase. Long term positive social benefits will occur during the operational phase.

The anticipated duration for the construction phase of the project is approximately 6 months, following which the 132kV transmission lines and switching station could potentially be handed over to Eskom for the duration of the operation phase, and if not handed over to Eskom would be operated by the project proponent, which is anticipated to be approximately 20 years. These impacts include the creation of direct and indirect employment opportunities; skills development; an influx of jobseekers and a change in the population; safety and security impacts; impacts on the daily living and movement patterns; nuisance impacts; and a sense of place impacts. These impacts will be of a short-term duration with low significance of negative impacts and a medium – high significance on the positive impacts identified.

For the operation phase of the transmission infrastructure, the impacts identified include direct and indirect employment opportunities; increased production; positive impacts on GDP; improved standard of living and increased household income and improvement in the energy generation sector. These impacts are associated with a long-term duration and will be of a low - medium significance following the implementation of the recommended mitigation and enhancement measures.

The development of the transmission infrastructure is unlikely to result in permanent damaging social impacts. From a social perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the 132kV transmission infrastructure and its associated infrastructure can be authorised from a social perspective. From a socio-economic perspective all four routes have similar impacts and as they are more or less the same length and have to cross the same terrain and obstacles.

Cumulative Impacts - Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of grid connection infrastructure in South Africa and within the surrounding area of the grid connection corridor route alternatives. The surrounding area is associated with large scale industrial activities within the Port of Richards Bay, Alton industrial area and the Richards Bay IDZ.

These industries have contributed to the transformation and industrialisation of the landscape in the area. The transmission corridor route alternatives and associated infrastructure for the 450MW RMPP are located within an area where several grid connection and overhead transmission line developments are proposed and existing. Existing overhead grid connection infrastructure within the vicinity of the grid connection corridor for the 132kV transmission include the unutilised Bayside transmission infrastructure and the overhead grid infrastructure for South32 Aluminium and proposed grid connection infrastructure for Eskom's Richards Bay CCPP. The 132kV transmission lines are to be cabled underground and therefore considers the existing and proposed infrastructure and eliminates further visual impacts to the Alton industrial area, with the exception of the switching station. The transmission infrastructure and access roads are located as far as possible within existing road and rail servitudes with the proposed switching station located within the existing Eskom's servitude for the Bayside transmission lines. Therefore, considering all aspects, cumulative impacts associated with the 132kV transmission lines, access road points and switching station for the 450MW RMPP have been assessed to be acceptable, with no unacceptable loss or risk expected (refer to Table 8.1 and Chapter 7)

Figure 2 provides an environmental sensitivity map of the 132kV underground transmission route corridor alternatives, switching station and access road points assessed as part of the BA process.

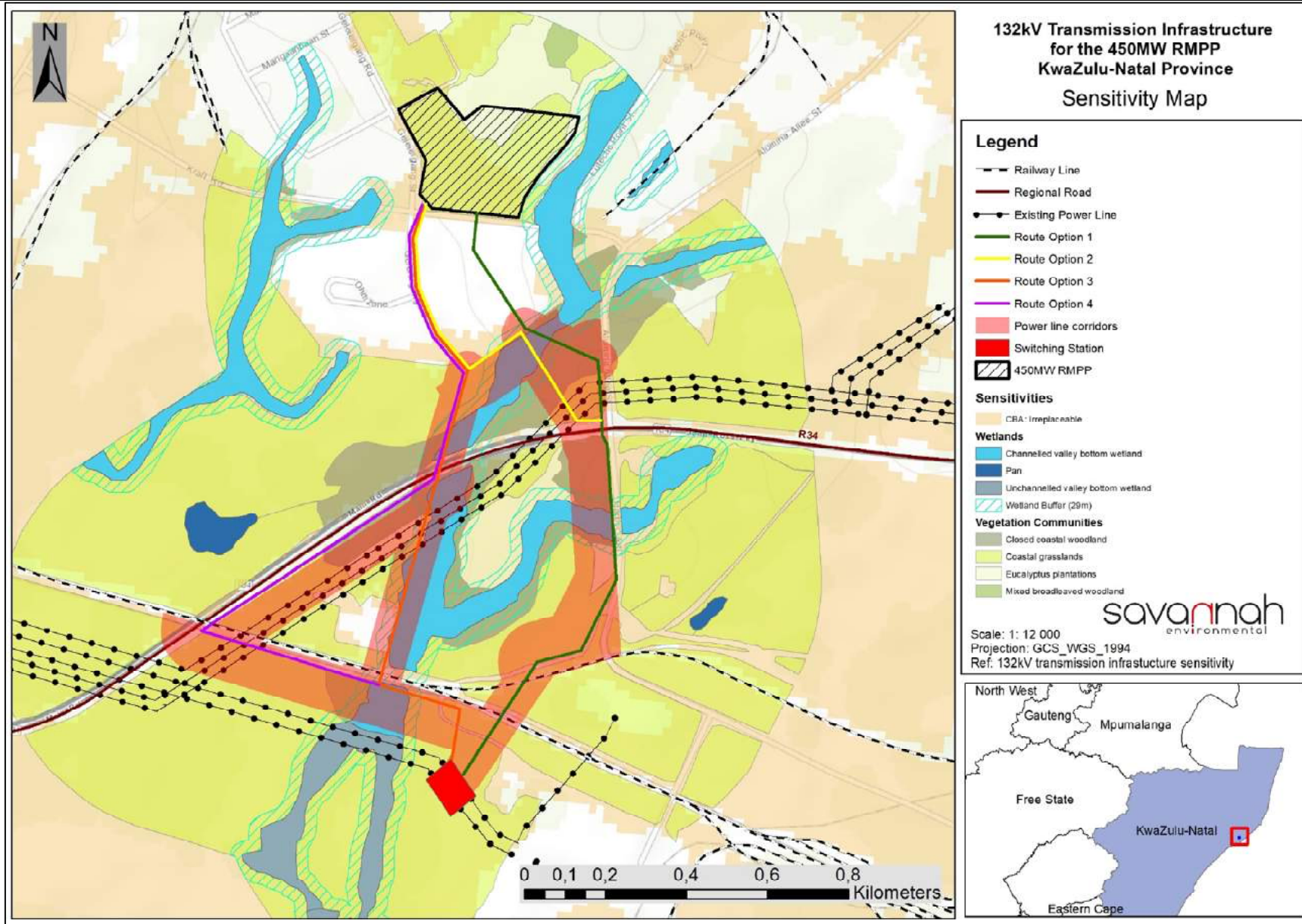


Figure 2: Environmental sensitivity map for the proposed 132kV transmission infrastructure (underground cable route alternatives, switching station and access road points)

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Commissioning: Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the wind turbine are installed.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Endemic: An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Method statement: A written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

Mitigation hierarchy: The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances).

Pre-construction: The period prior to the commencement of construction, this may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

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CHAPTER 1: INTRODUCTION

Phinda Power Producers (Pty) Ltd (Phinda) is proposing the development of several 132kV underground cables and a new 132kV switching station with access roads in order to connect the proposed gas to power 450MW Risk Mitigation Power Plant (RMPP) facility¹ to the national grid. The project is located south west of Richards Bay within the jurisdiction of the City of uMhlathuze Local Municipality and the King Cetshwayo District Municipality, KwaZulu-Natal Province. The 132kV transmission infrastructure and gas to power facility have been initiated by Phinda Power Producers (Pty) Ltd in response to the procurement process initiated by the Independent Power Producer Office (IPP Office) for the procurement of up to 2000MW of dispatchable generation capacity from a range of technologies. This allocation is in accordance with the new generation capacity required as specified in the Integrated Resource Plan 2019 and accompanying ministerial determination from the Minister for the Department of Mineral Resources and Energy (DMRE) to which the National Energy Regulator of South Africa (NERSA) has concurred.

The power generated by the 450MW RMPP gas to power facility will be fed into the grid via underground 132kV cables with the anticipated preliminary planned termination point at a proposed new 132kV switching station to be located within the existing Eskom power line servitude running the length between the Impala substation and Bayside Aluminium, with the switching station located at the terminus of the Bayside lines. The servitude is 80m wide and the power lines are no longer in use as a result of the closure of Bayside Aluminium, but are still operable having been upgraded by Eskom in 2015. The grid connection infrastructure will be used by Phinda to strengthen the existing grid network within Alton in order to ensure a dispatchable supply of electricity in support of the Risk Mitigation IPP Procurement Programme.

1.1 Overview of the Phinda Power Producers 132kV underground transmission infrastructure and 132kV switching station

Several cabling routes have been identified for investigation within which the development of the 132kV underground grid connection could be developed, all terminating at the same proposed 132kV switching station location. The consideration of four (4) corridor options of 50m to 100m in width will allow for the optimisation of the cabling route, and are proposed to run along existing gas pipelines and road servitudes where possible. The consideration of four (4) different route alternatives also provides an opportunity to avoid environmental sensitivities which may be present. Existing access points off the road network will be used to access the power line routes for construction. Where existing access roads are not available, designed access points will be included.

The nature and extent of the 132kV transmission infrastructure, as well as the potential environmental impacts associated with the construction, operation and decommissioning phases of infrastructure of this nature is explored in detail in this BA Report. Site specific environmental issues and constraints within the assessed corridor alternatives are considered within the independent specialist studies in order to test the environmental suitability of the corridors identified for the development of the 132kV underground transmission infrastructure and the switching station. The objective of the specialist studies is to also delineate areas and features of sensitivity along the proposed cable routes and switching station location and ultimately inform the preferred route alternative selected as the preferred option. The assessed routes identified for the construction and operation of the 132kV underground cables traverse multiple properties with the new 132kV switching station being located on Remainder of Erf 5333 (**Figure 1.1**).

¹ An EIA process is currently underway for the 450MW RMPP (DEFF Reference number 14/12/16/3/3/2/2004)

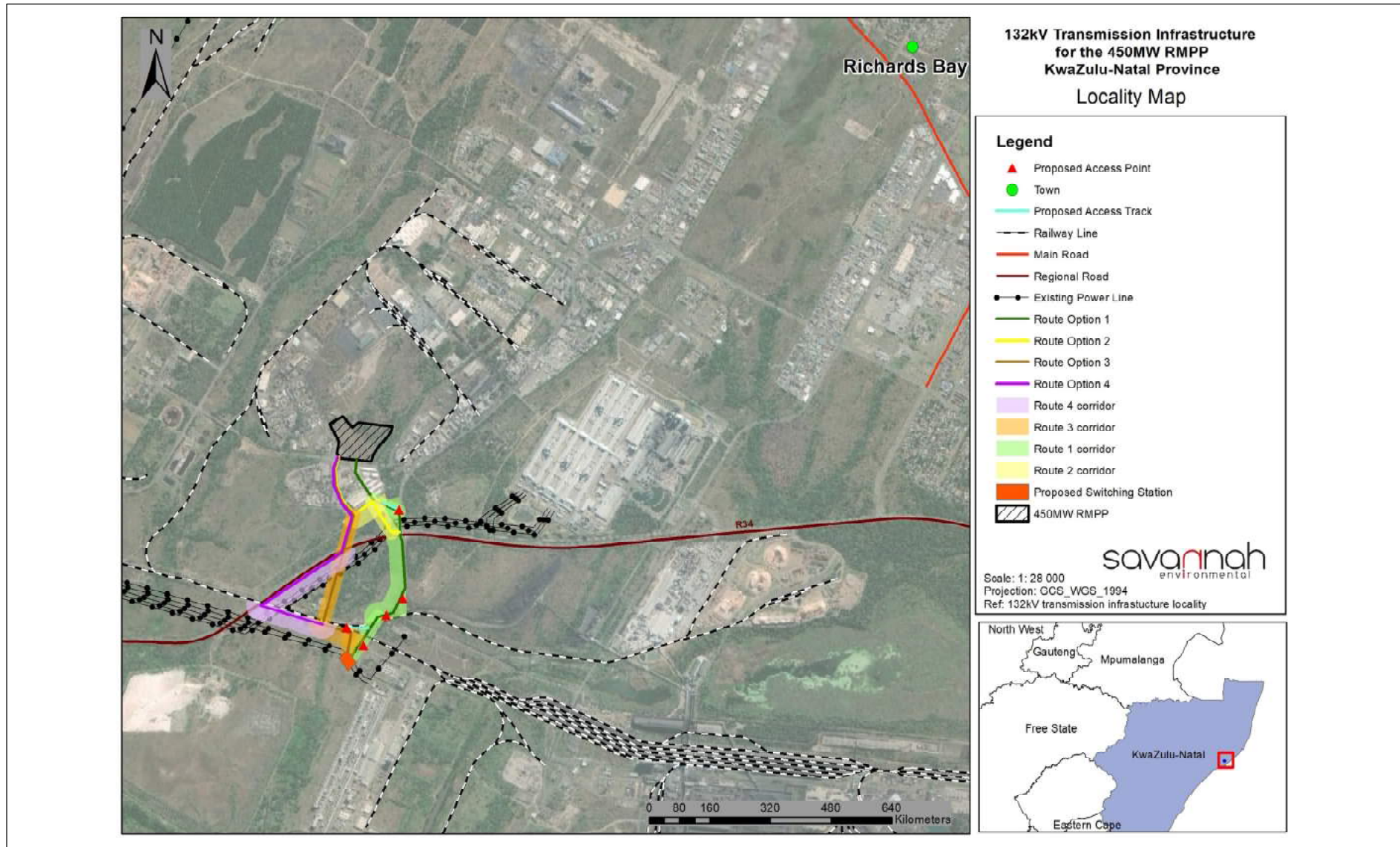


Figure 1: Locality Map of the proposed cable route alternatives within the corridors and switching station location

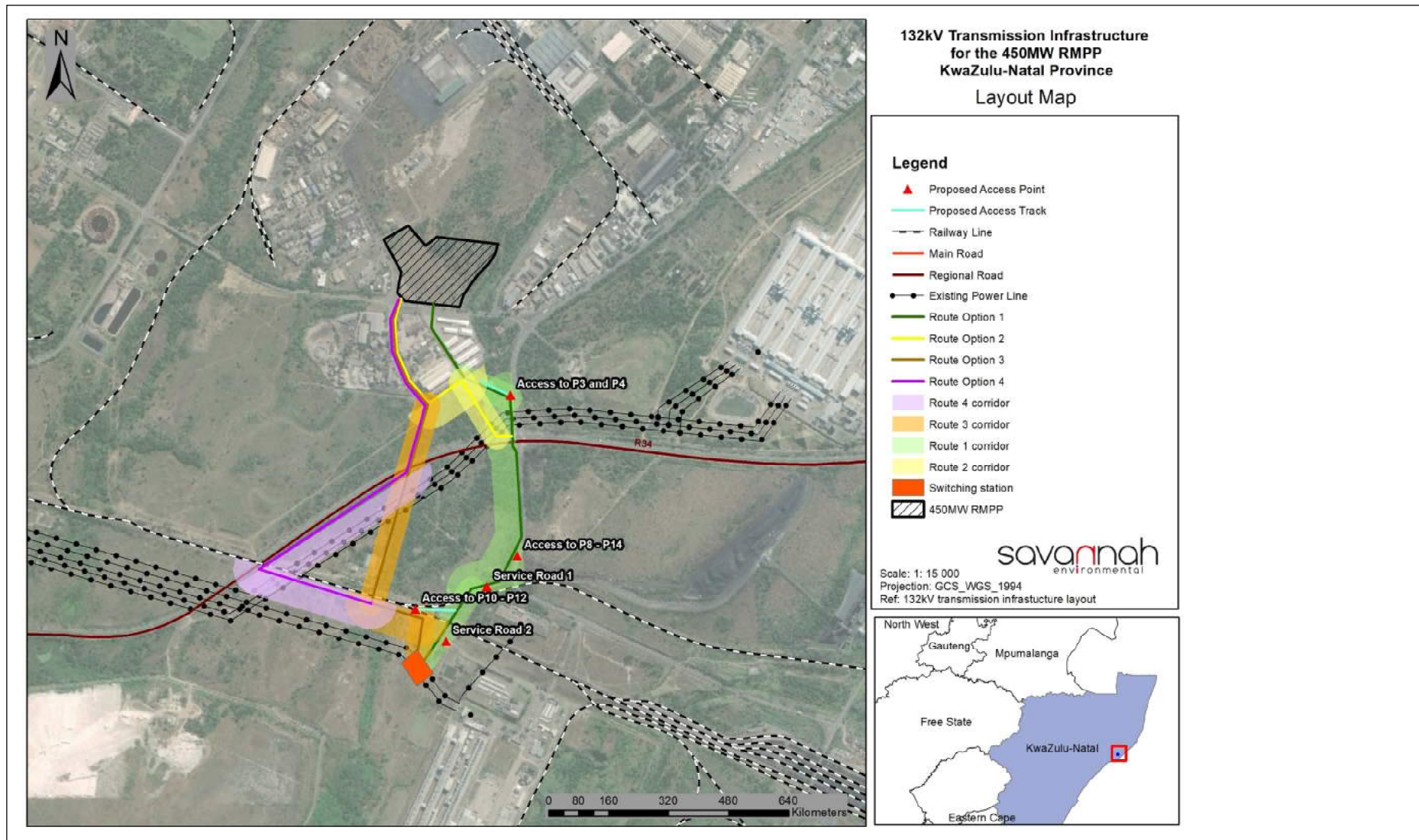


Figure 2: Layout Map of the proposed cable route alternatives, switching station and proposed access road points along the preferred cable route

Table 1.1 below provides an overview of the locality details for the grid connection. The key project details associated with the Phinda Power Producers 132kV underground transmission infrastructure are described in detail in Chapter 2 of this BA Report.

Table 1.1: Details of the assessed grid connection routes and switching station for the proposed 450MW RMPP

Province	KwaZulu- Natal Province
District Municipality	King Cetshwayo District Municipality
Local Municipality	City of uMhlathuze Local Municipality
Ward number(s)	26
Nearest town(s)	Alton, Richards Bay, Arboretum, Empangeni, Ichubo
Affected Properties: Farm Name(s), Number(s) and Portion Numbers for Grid Connection Routes	132kV Route Option 1:
	» Remainder of Erf 1854
	» Portion 2 of Erf 1854 Richards Bay;
	» Kraft Link Road crossing
	» Portion 1 of Erf 1795
	» Erf 16875
	» Portion 118 of Erf 5333
	» Portion 145 of Erf 5333
	» Portion 150 of Erf 5333
	» Remainder of Portion 8 of Erf 5333
	» Remainder of Erf 5333
	132kV Route Option 2:
	» Remainder of Erf 1854
	» Portion 2 of Erf 1854 Richards Bay;
	» Kraft Link Road crossing
	» Geleier Gang Road
	» Erf 16875
	» Portion 118 of Erf 5333
	» Portion 145 of Erf 5333
	» Portion 150 of Erf 5333
	» Remainder of Portion 8 of Erf 5333
	» Remainder of Erf 5333
	132kV Route Option 3:
	» Remainder of Erf 1854
	» Portion 2 of Erf 1854 Richards Bay;
	» Kraft Link Road crossing;
	» Geleier Gang Road
	» Erf 16875
	» Portion 118 of Erf 5333
	» Portion 148 of Erf 5333
	» Remainder of Portion 8 of Erf 5333
	» Remainder of Erf 5333
	132kV Route Option 4:
	» Remainder of Erf 1854
	» Portion 2 of Erf 1854 Richards Bay;
	» Kraft Link Road crossing
	» Geleier Gang Road
	» Erf 16875
	» Portion 118 of Erf 5333
	» Remainder of Portion 8 of Erf 5333

	» Remainder of Erf 5333
Affected Property: Farm Name(s), Number(s) and Portion Numbers for the new 132kV switching station	» Remainder of Erf 5333
Location of laydown areas	<p>The laydown areas will be located along the length of the routing as per the access roads for construction you mentioned previously. For the switching station, it will be within the 80 x 100m designated area</p> <ul style="list-style-type: none"> » Access Point 1: From Kraft link road and through the "Baront" property owned by an associated group company of the project proponent. » Access Point 2: From Alugang which is actually Alumina Alley as shown on GE. The section from this access point down to P3 and P4 is the existing Sasol Gas pipeline servitude "grass track" used for access. » Access Point 3: From above access Point all the way down to the next Access Point for P8 and onwards, the servitude runs alongside existing Alugang and Harbour Arterial roads (within existing road reserve). » Access Point 4: Access from Harbour Arterial and then alongside existing Service Road 1. » Access Point 5: Access from existing service "track" where the above service road crosses existing rail lines. » Access Point 6: Access from existing Service Road 2
SG 21 Digit Code (s) for Grid Connection Routes and 132kV switching station	<p>132kV Route Option 1:</p> <ul style="list-style-type: none"> » NOGV04210000185400002 » NOGV04210000179400000 » NOGV04210000179500001 » NOGV04210001687500000 » NOGV00000000533300118 » NOGV04210000533300145 » NOGV04210000533300150 » NOGV04210000533300008 » NOGV04210000533300000 <p>132kV Route Option 2:</p> <ul style="list-style-type: none"> » NOGV04210000185400002 » NOGV04210000179400000 » NOGV04210001542600000 » NOGV04210001687500000 » NOGV00000000533300118 <p>132kV Route Option 3:</p> <ul style="list-style-type: none"> » NOGV04210000185400002 » NOGV04210000179400000 » NOGV04210001542600000 » NOGV04210001687500000 » NOGV00000000533300118 » NOGV04210000533300148 » NOGV04210000533300008 » NOGV04210000533300000

	132kV Route Option 4: » NOGV04210000185400002 » NOGV04210001542600000 » NOGV04210001687500000 » NOGV00000000533300118 » NOGV04210000533300008 » NOGV04210000533300000 Switching station: » NOGV04210000533300000		
Grid Connection Routes Co-ordinates:	Starting Point (450MW RMPP Site)	Middle Point	End Point (New 132kV switching station)
Route Option 1	28°46'3.09"S 32° 0'40.21"E	28°46'24.34"S 32° 0'54.53"E	28°46'47.49"S 32° 0'43.62"E
Route Option 2	28°46'2.98"S 32° 0'35.55"E	28°46'24.34"S 32° 0'54.53"E	28°46'47.49"S 32° 0'43.62"E
Route Option 3	28°46'3.12"S 32° 0'35.28"E	28°46'30.11"S 32° 0'37.68"E	28°46'46.44"S 32° 0'42.53"E
Route Option 4	28°46'2.90"S 32° 0'35.20"E	28°46'28.56"S 32° 0'32.67"E	28°46'46.44"S 32° 0'42.53"E
New 132kV switching station corner co-ordinates	1) 28°46'48.18"S; 32° 0'40.42"E 2) 28°46'46.36"S; 32° 0'42.40"E 3) 28°46'49.09"S; 32° 0'44.99"E 4) 28°46'50.87"S; 32° 0'42.89"E		
Description of proposed access points along the preferred cable route (Refer to Figure 2)	» Access Point 1: From Kraft link road and through the "Baront" property owned by an associated group company of the project proponent. » Access Point 2: From Alugang which is actually Alumina Alley as shown on GE. The section from this access point down to P3 and P4 is the existing Sasol Gas pipeline servitude "grass track" used for access. » Access Point 3: From above access Point all the way down to the next Access Point for P8 and onwards, the servitude runs alongside existing Alugang and Harbour Arterial roads (within existing road reserve). » Access Point 4: Access from Harbour Arterial and then alongside existing Service Road 1. » Access Point 5: Access from existing service "track" where the above service road crosses existing rail lines. » Access Point 6: Access from existing Service Road 2.		
Co-ordinates of proposed access points	Access Point 1: 28°46'3.51"S 32° 0'40.19"E and 28°46'4.65"S 32° 0'39.25"E Access Point 2: 28°46'13.45"S and 32° 0'52.31"E Access Point 3: 28°46'33.42"S 32° 0'55.38"E Access Point 4: 28°46'41.25"S 32° 0'41.68"E Access Point 5: 28°46'37.63"S 32° 0'51.51"E Access Point 6: 28°46'44.86"S 32° 0'46.45"E		

1.2 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This BA Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental

Management Act (No. 107 of 1998). This Chapter of the BA Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
1 (a) the details of the EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details and expertise of the EAP who prepared the report is included in section 1.4 and CVs of the project team are included in 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 and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.	A description of the location of the grid connection routes assessed for the Phinda Power Producers 132kV underground transmission infrastructure and new 132kV switching station is included in Table 1.1 and Figure 1.1 . The information provided includes the 21-digit Surveyor General Code of the affected properties and the farm names and numbers. Information on the relevant province, local and district municipalities, municipal wards and current land zoning and land use is also provided.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A plan which locates the proposed activity is included as Figure 1.1 . The starting, middle and ending point coordinates of the grid connection corridor are included in Table 1.1 .

The BA Report is structured according to the following chapters:

- » **Chapter 1** provides background to the proposed 132kV transmission infrastructure and the BA process.
- » **Chapter 2** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed project.
- » **Chapter 3** provides a description of Scope of the proposed project, including identified project alternatives, and the need and desirability of the project.
- » **Chapter 4** outlines the approach to undertaking the BA process.
- » **Chapter 5** describes the existing biophysical and social environment within and surrounding the broader study and development area.
- » **Chapter 6** provides an assessment of the potential issues and impacts associated with the proposed power line and presents recommendations for the mitigation of significant impacts.
- » **Chapter 7** provides an assessment of the potential cumulative impacts.
- » **Chapter 8** presents the conclusions and recommendations based on the findings of the BA Report.
- » **Chapter 9** provides references used in the compilation of the BA Report.

1.3 Requirements for a Basic Assessment Process

The construction and operation of the Phinda Power Producers 132kV transmission infrastructure is subject to the requirements of the EIA Regulations, 2014 (as amended), published in terms of Section 24(5) of the National Environmental Management Act (NEMA) 107 of 1998. The NEMA is the national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. The DEFF is the Competent

Authority for the proposed development and will be assisted by the KwaZulu-Natal Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) as the Commenting Authority.

In terms of the EIA Regulations of 2014 (as amended on 07 April 2017) promulgated under Sections 24 and 24D of the NEMA, various aspects of the project are listed as activities that may have a detrimental impact on the environment. The main listed activity triggered by the development of the transmission infrastructure is Activity 11(i) of Listing Notice 1 (GNR 327 of the EIA Regulations, 2014 (as amended)), which relates to the development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.

As a result, a BA process must be undertaken in support of an application for environmental authorisation for the construction and operation of the proposed 132kV transmission infrastructure.

» 1.4 Details and Expertise of the Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326), Phinda has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent environmental consultant to undertake the Basic Assessment process for the 132kV transmission infrastructure. Neither Savannah Environmental nor any of its specialists are subsidiaries of/or are affiliated to Phinda. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed 132kV underground cabling or new switching station.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-Based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa, including those associated with electricity generation and transmission.

The Savannah Environmental team comprises:

- » **Arlene Singh.** She holds a Bachelor degree in Environmental Science and an Honours degree in Environmental Management and has seven years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, public participation, environmental management plans and programmes. She is registered as an Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa

(EAPASA)(2019/898) and registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).

- » **Jo-Anne Thomas.** She holds a Master of Science Degree in Botany (M.S.c Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with SACNASP and a registered Environmental Assessment Practitioner (EAP) with EAPASA (2019/726). She has over 20 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. She has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.
- » **Nicolene Venter.** She is a Board Member of IAPSA (International Association for Public Participation South Africa). She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

» **1.5 Details of the Independent Specialist Team**

In order to adequately identify and assess potential impacts associated with the project, a number of specialists have been appointed as part of the project team and have provided specialist input into this BA Report (refer to **Table 1.3**). CVs detailing the independent specialists' expertise and relevant experience are provided in **Appendix A**.

Table 1.3: Independent Specialists that contribute to the BA Report

Company	Specialist Area of Expertise	Specialist Name
Exigent Engineering Consultants	Ecological Assessment	Jacquette Adam and Charlene Smuts
	Aquatic Assessment	
Umlando: Archaeological Surveys and Heritage Management	Heritage and Palaeontology	Gavin Anderson
Mzansi Agriculture	Soil and Agricultural Potential	John Phipson
Urban Econ	Socio-Economic	Eugene de Beer

CHAPTER 2: POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of the 132kV transmission infrastructure is proposed. It identifies environmental 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 which may be applicable to or have bearing on the proposed project. As the project is essential supporting infrastructure for the 450MW RMPP proposed by Phinda, the policy and legislative context for this project is closely aligned with that for the power station.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report. (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments.	A description of the policy and legislative context within which development of the 132kV transmission infrastructure is proposed is included in section 2.3, 2.4 and 2.5.

2.1.2. Regulatory Hierarchy

The regulatory hierarchy of policy and planning documentation that supports the development of a project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels (**Figure 2.1**). These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the proposed power line.

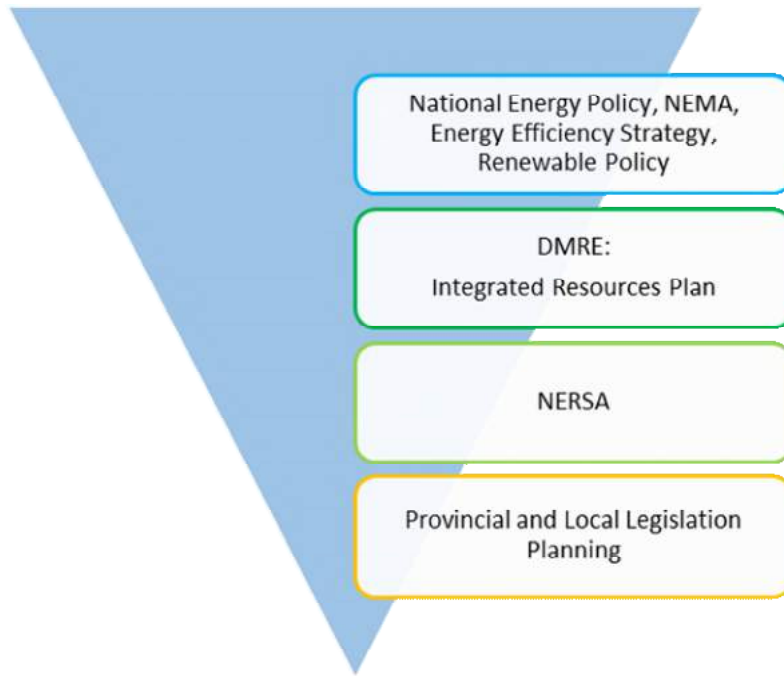


Figure 2.1: Hierarchy of electricity and planning documents

At **National Level**, the main regulatory agencies are:

- » **Department of Environment, Forestry and Fisheries (DEFF):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the 2014 EIA Regulations (GN R 982 as amended by GN 326 of 7 April 2017). DEFF is the competent authority for this project (as per GNR 779 of 01 July 2016 and is charged with granting the EA for the project under consideration. Furthermore, the Department is also responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15 (1) of the National Forest Act (No. 84 of 1998) (NFA).
- » **South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- » **Department of Human Settlements, Water and Sanitation (DHSWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e. Water Use Licenses (WUL) and General Authorisation), where these may be applicable.
- » **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for granting approvals for the use of land which is contrary to the objectives of the Mineral and Petroleum Resource Development Act (No. 28 of 2002) (MPRDA) in terms of Section 53 of the MPRDA. Therefore, in terms of the Act, approval from the Minister, in those circumstances, is required to ensure that the proposed activities do not sterilise mineral resources that may occur within the broader study area and development area.
- » **The Department of Agriculture, Rural Development and Land Reform (DARDLD):** This Department is the custodian of South Africa's agricultural resources and is responsible for the formulation and implementation of policies governing the agriculture sector and the initiation, facilitation, coordination and implementation of integrated rural development programmes.
- » **National Energy Regulator of South Africa (NERSA):** This body is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.

At **Provincial Level**, the main regulatory agencies are:

- » **KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDEAT):** This Department is the commenting authority for the basic assessment process for the project.
- » **Ezemvelo KZN Wildlife (EKZN):** is responsible for the management of nature conservation and protected areas in KwaZulu-Natal and issuing of other biodiversity and conservation-related permits.
- » **AMAFA (KZN Heritage Authority):** This Department identifies, conserves and manage heritage resources throughout the KwaZulu-Natal Province.

At the **Local Level**, the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment within its competence. In the KwaZulu Natal Province, both the local and district municipalities play a role. The local municipality includes the **uMhlathuze Local Municipality** which forms part of the **King Cetshwayo District Municipality**. In terms of the Municipal Systems Act (No. 32 of 2000), it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

2.2. National Policy

2.2.1. The National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008) One of the objectives of the Act is to promote the diversity of the supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources and states that provision must be made for increased generation. The Act provides the legal framework which supports the development of power generation facilities, such as the 450MW RMPP and the proposed grid connection infrastructure.

2.2.2. White Paper on the Energy Policy of South Africa, 1998

The South African Energy Policy of 1998 identifies five key objectives, namely increasing access to affordable energy services, improving energy sector governance, stimulating economic development, managing energy related environmental impacts and securing supply through diversity. In order to meet these objectives South Africa needs to optimally use available energy resources. The development of the 132kV transmission infrastructure for the 450MW RMPP facility will enable the contribution to the achievement of the five objectives of the Energy Policy of the country, albeit to a limited extent.

2.2.3. The Electricity Regulation Act (No. 04 of 2006) (ERA)

The Electricity Regulation Act (No. 04 of 2006) as amended by the Electricity Regulation Act (No. 28 of 2007), replaced the Electricity Act (No. 41 of 1987), as amended, with the exception of Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry.

The ERA establishes a national regulatory framework for the electricity supply industry and made NERSA custodian and enforcer of the National Electricity Regulatory Framework. The ERA also provides for licences and registration as the manner in which the generation, transmission, distribution, reticulation, trading, and import and export of electricity is regulated.

2.2.4. The National Development Plan (NDP) 2030

The National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines desired destinations where inequality and unemployment are reduced, and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living.

While the achievement of the objectives of the NDP requires progress on a broad front, three priorities stand out, namely:

- » Raising employment through faster economic growth
- » Improving the quality of education, skills development and innovation
- » Building the capability of the state to play a developmental, transformative role

In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:

- » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

In formulating its vision for the energy sector, the NDP took the IRP 2010 as its point of departure. Therefore, although electricity generation from coal is still seen as part of the energy mix within the NDP, the plan sets out steps that aim to ensure that, by 2030, South Africa's energy system looks very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, imported hydroelectricity and other technology– will play a much larger role.

2.2.5. Integrated Energy Plan (IEP), November 2016

The purpose and objectives of the Integrated Energy Plan (IEP) are derived from the National Energy Act (No. 34 of 2008). The IEP takes into consideration the crucial role that energy plays in the entire economy of the country and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple aims, some of which include:

- » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector.
- » To guide the selection of appropriate technologies to meet energy demand (i.e. the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels).
- » To guide investment in and the development of energy infrastructure in South Africa.
- » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors.

A draft version of the IEP was released for comment on 25 November 2016. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others.

The 8 key objectives of the integrated energy planning process are as follows:

- » Objective 1: Ensure security of supply.
- » Objective 2: Minimise the cost of energy.
- » Objective 3: Promote the creation of jobs and localisation.
- » Objective 4: Minimise negative environmental impacts from the energy sector.
- » Objective 5: Promote the conservation of water.
- » Objective 6: Diversify supply sources and primary sources of energy.
- » Objective 7: Promote energy efficiency in the economy.
- » Objective 8: Increase access to modern energy.

2.2.6. Integrated Resource Plan (IRP) for Electricity 2010 - 2030

The Integrated Resource Plan (IRP) for Electricity is a subset of the IEP and constitutes South Africa's National electricity plan. The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, considering security of supply and the environment. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.

The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development.

Following the promulgation of the IRP 2010–2030, implementation followed in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation (Act No. 4) of 2006. The Ministerial Determinations give effect to planned infrastructure by facilitating the procurement of the required electricity capacity.

Since the promulgated IRP 2010–2030, the following capacity developments have taken place:

- » A total 6 422 MW under the Renewable Energy Independent Power Producers Programme (REIPPP) has been procured, with 3 876 MW operational and made available to the grid.
- » IPPs have commissioned 1 005 MW from two Open Cycle Gas Turbine (OCGT) peaking plants.
- » Under the Eskom build programme, the following capacity has been commissioned:
 - * 1 332 MW of Ingula pumped storage, 1 588 MW of Medupi, 800 MW of Kusile and
 - * 100 MW of Sere Wind Farm.
- » 18 000MW of new generation capacity has been committed to.

Besides capacity additions, a number of assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom’s existing plant performance, as well as new technology costs. In addition, environmental considerations such as South Africa’s contribution to Greenhouse gases which contribute to climate change, local air quality and water availability have come to the fore.

These considerations necessitated the review and update of the IRP and ultimately the promulgation of a revised plan in October 2019 (IRP 2019). In terms of the IRP 2019, South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. In the period prior to 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity. South Africa is a signatory to the Paris Agreement on Climate Change and has ratified the agreement. In line with INDCs (submitted to the UNFCCC in November 2016), South Africa’s emissions are expected to peak, plateau and from year 2025 decline.

Following consideration of all these factors, the following Plan was promulgated.

	Coal	Coal (Decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1,403				300	818			
2022	711	-844			513	400	1,000	1,600		
2023	750	-555				1,000	1,600		500	
2024			1,860				1,600	1,000	500	
2025						1,000	1,600		500	
2026		-1,219					1,600		500	
2027	750	-847					1,600	2,000	500	
2028		-475				1,000	1,600		500	
2029		-1,694			1,575	1,000	1,600		500	
2030		-1,050		2,500		1,000	1,600		500	
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

<ul style="list-style-type: none"> Installed Capacity Committed/Already Contracted Capacity Capacity Decommissioned New Additional Capacity Extension of Koeberg Plant Design Life Includes Distributed Generation Capacity for own use 	<ul style="list-style-type: none"> 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030. Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work. Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility. Short term capacity gap is estimated at 2,000MW.
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Figure 2.2: IRP 2019 as promulgated in October 2019

The development of the proposed grid connection infrastructure enables the evacuation of the generated power from the proposed 450MW RMPP facility into the national grid and thereby contributes to the energy mix of the country as set out in the IRP 2019 identified as the short term capacity gap of 2000MW. Following

promulgation of the IRP 2019, the Minister for the Department of Mineral Resources and Energy has issued a determination to procure 2000MW of new generation capacity from a variety of generation technologies, to which ministerial determination Nersa has concurred. This culminated in the commencement of by the IPP Office of the Risk Mitigation Independent Power Procurement Programme (RMIPPPP) that is seeking to procure 2000MW of new generation capacity to be commissioned by latest 30 June 2022. It is in direct response to the RMIPPPP that the proposed 450MW RMPP and associated 132kV grid connection infrastructure is being developed.

2.2.7. New Growth Path (NGP) Framework, 23 November 2010

The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs by 2020. With economic growth and employment creation as the key indicators identified in the NGP. The framework seeks to identify key structural changes in the economy that can improve performance in term of labour absorption and the composition and rate of growth.

To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas.

2.2.8. National Climate Change Bill, 2018

The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The bill aims to provide for the coordinated and integrated response to climate change and its impacts, provide effective management of inevitable climate change impacts and to make a fair contribution to the global effort to stabilise greenhouse gas concentrations.

2.2.9. National Climate Change Response Policy, 2011

South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. This has been considered in the development of the IRP 2019.

2.2.10. Strategic Integrated Projects (SIPs)

In 2010, a National Development Plan was drafted to address socio-economic issues affecting development in South Africa. These issues were identified and placed under 36 different Strategic Integrated Projects (SIPs) to address the spatial imbalances of the past by addressing the needs of the poorer provinces and enabling socio-economic development. The 132kV transmission infrastructure will support the Strategic Integrated

Projects SIP 10 – electricity transmission and distribution for all, and is a component of SIP 20- Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW):National.(GN 812 of 24 July 2020)

2.3. Provincial Planning and Context

2.3.1. KwaZulu-Natal Provincial Growth and Development Plan (PGDP) (2019)

The KwaZulu-Natal Provincial Growth and Development Plan (PGDP) aims to curb poverty, inequality and achieve shared growth. The PGDP has identified spatial marginalisation as one of the key issues to be addressed through ensuring economic opportunities that will meet the majority of the population's needs. The plan states that alternative sources of energy are a priority and must become a reality. The 132kV transmission infrastructure will contribute to the realisation of energy generation from the 450MW RMPP facility through gas turbines / gas engines as it will enable connection to the grid at a feasible connection point with no deep grid connection costs required.

2.3.2. KwaZulu-Natal Provincial Growth and Development Strategy (PGDS) (2016)

The Provincial Growth and Development Strategy (PGDS) for KZN addresses the triple challenge of poverty, inequality and unemployment. The KZN provincial government's vision is for the province to maximize its position as a gateway to South and Southern Africa, as well as its human and natural resources to create a safe, healthy and sustainable environment by 2035; eliminating poverty, inequality, unemployment and the current disease burden in the province. Through the seven strategic goals the KZN PGDS aims to achieve its vision by 2035, including:

- 1) Inclusive economic growth (expanded and sustained economic output is the fundamental driver for job creation)
- 2) Human resource development (the human resource capacity of KZN is relevant and responsive to the growth and development needs of the province)
- 3) Human and community development (reduce poverty and inequality in KZN)
- 4) Strategic infrastructure (strategic infrastructure provides for social and economic growth and development needs of KZN)
- 5) Environmental sustainability (reduce global greenhouse gas emissions and create social-ecological capacity to adapt to climate change)
- 6) Governance and policy (effective and efficient government systems)
- 7) Spatial equity (increased spatial access to goods and services)

The proposed development of 132kV transmission infrastructure will result in the creation of job opportunities, human resource development, and strategic infrastructure for social and economic growth which will contribute towards reducing poverty and inequality in KZN. This development, together with the 450MW RMPP, will therefore assist the province in achieving the aims of the PGDS to some extent.

2.3.3. KwaZulu-Natal Provincial Spatial Economic Development Strategy (2016)

The Provincial Spatial Economic Development Strategy (PSEDS) serves as a framework for the prioritisation of spatial economic development initiatives in the province. It is meant to capitalise on complementarities and facilitate consistent and focused decision making. In addition, the purpose of the strategy is to ensure

that investment occurs in the sectors that provide the greatest socio-economic return to investment (Department of Economic Development, 2016).

Figure 2.3 demonstrates that the preferred project site within the Richards Bay area is located in an area demarcated as having economies of scale. Economies of scale are achieved when the number of units produced or the volume of services sold are at such a large scale that it allows for the reduced production costs, ultimately increasing the competitiveness of the product or service. High demand for the product or a service is a prerequisite for economies of scale; this implies that the area where the 450MW RMPP is to be built has a high demand for selected goods and services, including electricity. The area is already highly industrialised and hosts an IDZ nearby, which continuously seeks new investments in ICT, agro-businesses, and metals beneficiation. Therefore, the project is to be located in a potentially high economic growth region.

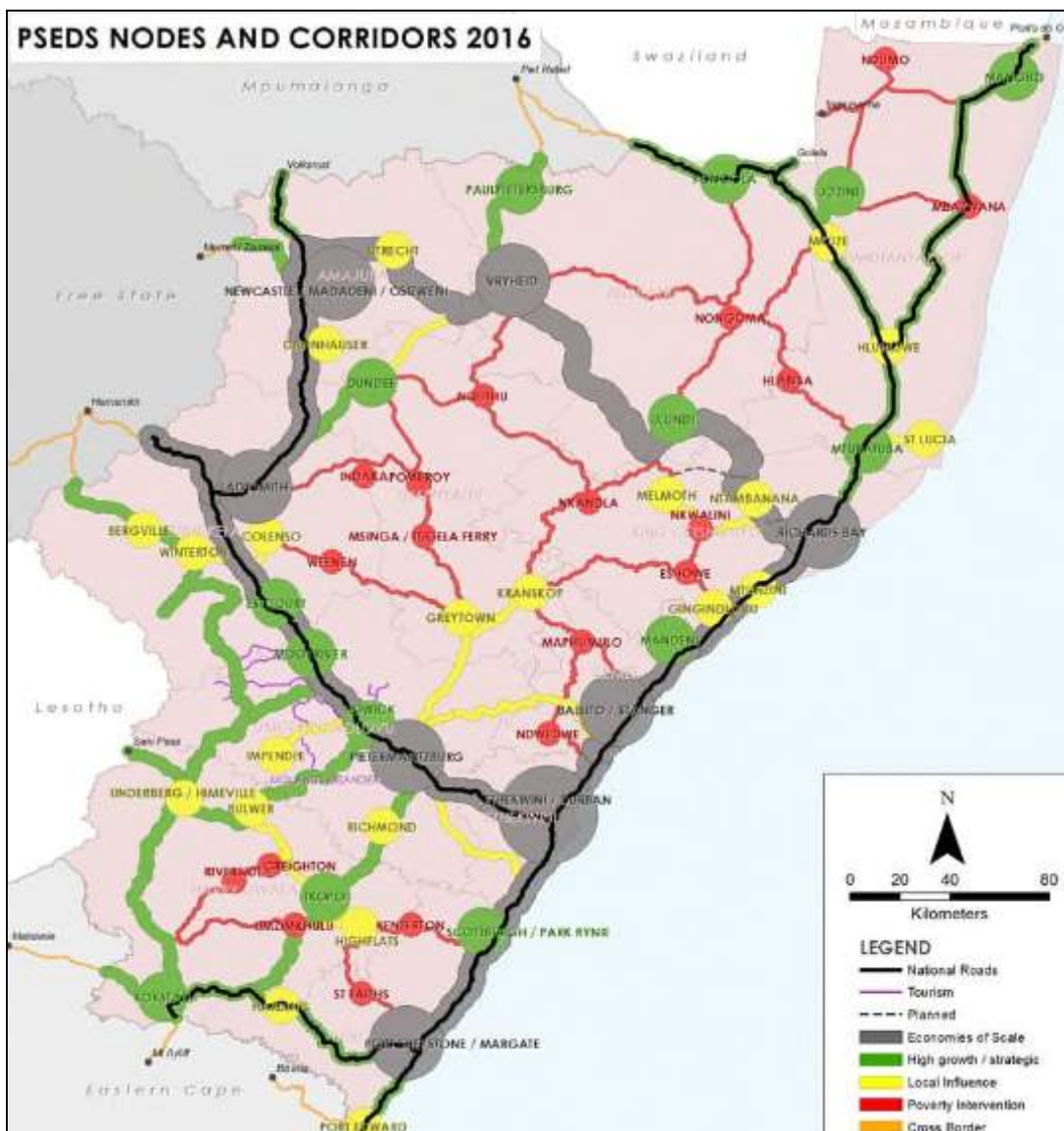


Figure 2.3: KZN Spatial Economic and Development Strategy nodes and corridors

The development of the 132kV transmission infrastructure for the 450MW RMPP facility will drive economic growth, infrastructural transformation and development through the connection of the power plant to the

national electricity grid through existing unused electricity transmission infrastructure. The area for development is seen as a favourable area for investment and development.

2.3.4. KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs Revised Strategic Plan 2015 - 2020

The strategic focus for the KZN EDTEA during the 2020 planning period will be building a resilient KZN provincial economy that can respond to global factors, stimulating provincial economic development, alignment of functions and purpose of all economic development entities as well as building a vibrant organisation. The vision of the strategic plan is 'leading the attainment of inclusive growth for job creation and economic sustenance.' The mission of the strategic plan is to 1) develop and implement strategies that drive economic growth; 2) be a catalyst for economic transformation and development; 3) provide leadership and facilitate integrated economic planning and development; and 4) create a favourable environment for investment. The main objectives of the strategy that relate to the proposed project are as follows:

- » To facilitate the creation of new markets;
- » To drive growth of the KZN provincial economy;
- » To enhance sector and industrial development through Trade, Investment and Exports Logistics, ICT, Manufacturing, Green economy, agri-business, Tourism, Creative Industries, Maritime, Aerotropolis, Aviation;
- » To investigate and develop viable alternative energy generation options.

2.3.5. KwaZulu-Natal Provincial Spatial Development Framework (PSDF)

The KZN Provincial Spatial Development Strategy has been developed in order to achieve the goals and objectives of the PGDS in a targeted and spatial co-ordinated manner. Spatially, it is vital to consider general accessibility as a cross-cutting variable which impacts all three pillars of sustainable development and as a result the four main spatial variables informing the provincial spatial development framework include:

- » Environmental Sensitivity;
- » Economic Potential;
- » Social Needs; and
- » Urban Accessibility.

The PSDF spatial variables were considered collectively and a ranking order to key elements used to formulate a composite Provincial Spatial Development Framework which identifies Broad Provincial Spatial Planning Categories such as:

- » Conservation Corridors;
- » Biodiversity Priority Areas;
- » Areas of Economic Value adding;
- » Areas of Economic support;
- » Areas of Agricultural Development;
- » Areas of High Social Need; and
- » Mandated Service Delivery Areas.

Areas of Economic Support resemble a region of good economic potential in more than just one of the key provincial economic sectors. Typical interventions in these areas would include economic prioritisation of development, labour force interventions (e.g. skills development), key economic infrastructure investment and area promotion. The development of the 132kV transmission infrastructure for the 450MW RMPP facility will contribute towards economic value, economic support and economic growth in the area through the connection of the power plant to the national grid at a feasible connection point with no deep grid connection costs required.

2.3.6. KwaZulu-Natal Climate Change Response and Sustainable Development Plan

In September 2012, the KwaZulu-Natal Provincial Government became the first provincial government to establish a Climate Change and Sustainable Development Council, which boosts multi-stakeholder membership (<http://www.theclimategroup.org/who-we-are/our-members/the-province-of-kwazulu-natal>). The Council has set up three Working Groups, namely Policy and Regulatory Alignment Working Group; Adaptation and Mitigation Working Group and Renewable Energy Working Group.

The province is in the early stages of developing the Climate Change Response and Sustainable Development Plan which is guided by, among others, the national strategy and the KwaZulu-Natal Growth and Development Strategy which has among its goals environmental sustainability as well as:

- » Provision of 100% energy access in KZN Province by 2030, i.e. an additional 600 000 households or some 3 million people.
- » Implementation of a number of significant renewable energy and energy efficiency projects.

The development of the 132kV transmission infrastructure for the 450MW RMPP will promote access to energy through the use of a fuel resource other than coal and will facilitate the transition to alternative energy technologies through the provision of flexible generation capacity.

2.4. Local Policy and Planning Context

The strategic policies at the district and local level have similar objectives for the respective areas, namely to accelerate economic growth, create jobs, uplift communities and alleviate poverty. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

2.4.1. King Cetshwayo District Municipality Draft Integrated Development Plan (2020/21 – 2021/22)

The vision for the King Cetshwayo District Municipality Integrated Development Plan IDP 20/21 – 21/22 is to create a 'safe and healthy environment which promotes sustainable, radical, and inclusive economic and social development reinforced by service excellence' (KCDM, 2020: 34). As indicated in the vision, one of the goals is infrastructure development and service delivery. The Richards Bay Industrial Development Zone (RBIDZ) is identified as a catalytic project (KCDM, 2020: 69). The objective is to promote economic growth in the District and improve the socio-economic conditions of residents.

A catalytic project is defined as a project of significant scale and scope that will make a substantial impact and contribution to the achievement of the vision and goals of the Province. The Richards Bay Industrial Development Zone (IDZ) is defined as a game changer in the context of catalytic projects. The proposed

132kV transmission infrastructure for the 450MW RMPP facility will be located south of the IDZ and, with the switching station, will also provide access to Bayside grid connection for up to 450MW of generation capacity from other projects, thereby contributing to and providing an extension of catalytic projects to the IDZ.

2.4.2. uMhlathuze Municipality Integrated Development Plan (IDP), 2019/2020

The King Cetshwayo District Growth and Development Plan (DGDP) has an integral role in the integration and alignment of the goals of the NDP at national level and PGDP at provincial level. Therefore, the purpose of the DGDP is to translate the Provincial Growth and Development Plan into a detailed implementation plan at a district level (Uthungulu DM, 2015). One strategic intervention identified by the plan is the implementation of the roll-out programme for alternative sources of energy supply in the district where the gas-fired electricity generation is classified as alternative energy supply. The proposed project will therefore assist with this programme as it provides essential infrastructure to the 450MW RMPP.

2.4.3. uMhlathuze Municipality Integrated Development Plan (IDP), 2019/2020

The objective of the IDP is to promote economic growth in the District and improve the socio-economic conditions of residents (uMhlathuze LM, 2019). The unsustainable use of resources, including energy, will ultimately compromise the Municipality's energy security. Challenges similar to these prompted the IDP to focus on sustainable solutions to the energy crisis. Therefore, the aim is to reduce the demand for energy and simultaneously investigate alternative energy sources.

An intervention proposed by the City of uMhlathuze to meet the sustainable development goal of ensuring access to affordable, reliable and modern energy for all, is the generation of 2000MW Gas to Power (uMhlathuze LM, 2019:34). The development of the 132kV Transmission infrastructure for the 450MW RMPP facility will assist with this goal of enhancing energy security within the area as it provides essential infrastructure to the 450MW RMPP and although the power plant will initially utilise LPG as its fuel source, the RMIPPPP envisages a conversion of the 450MW RMPP to natural gas once imported liquified natural gas is available in Richards Bay. The development will also create employment opportunities which will strengthen the current socio-economic conditions of the area, as well as improve the standard of living.

2.5 Conclusion

The findings of the review of the relevant policies, programmes and documents pertaining to the energy sector indicate that the 132kV transmission infrastructure, when considering its functioning as part of the 450MW RMPP facility, is supported at a national, provincial, and local level, and that the development will contribute towards the various targets and policy aims. The 450MW RMPP will also assist in the mitigating the risk of load shedding.

CHAPTER 3: PROJECT DESCRIPTION

This chapter provides an overview of the 132kV transmission infrastructure and details the project scope, which includes the planning/design, construction, operation and decommissioning activities required for the development.

3.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the Basic Assessment Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(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 and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	The location of the proposed transmission infrastructure is detailed in Chapter 1, Table 1.1 , as well as in section 3.3 below.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A layout map illustrating the transmission infrastructure corridor alternatives (50m-100 wide) within which the underground cables are planned to be developed is included as Figure 3.2 .
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the activities to be undertaken with the development of the transmission infrastructure is included in section 3.6
3(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.	The need and desirability of the development of the transmission infrastructure is included and discussed as a whole within section 3.2
3(g) a motivation for the preferred site, activity and technology alternative	The motivation for the alternatives identified for the 132kV transmission infrastructure are included in section 3.5 .
3(h)(i) details of the alternative considered	The details of all alternatives considered for the 132kV transmission infrastructure are included in section 3.5 .
3(h)(ix) the outcome of the site selection matrix	The site selection process followed by the developer in order to identify the corridors for the 132kV transmission infrastructure is described in section 3.5 .
3(h)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	Where no alternatives have been considered, motivation has been included. This is included in section 3.5 .

3.2. Need & Desirability

One of the requirements of Appendix 1 of the EIA Regulations, 2014, as amended, is to motivate for “*the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location*”. The need and desirability of a development needs to consider whether it is the right time and place for locating the type of land-use / activity within the proposed location.

The need and desirability for the proposed project is directly linked to the need for the 450MW Emergency Risk Mitigation Power Plant (RMPP) as the main purpose of the transmission infrastructure is to connect this facility to the national grid at a feasible connection point (i.e. the Bayside utilised power lines which are currently disused but in good condition having been upgraded in 2015 by Eskom). Given the relationship between, and the necessity of, the proposed 132kV transmission infrastructure for the 450MW RMPP, similar need and desirability considerations are applicable. These are aligned with national, regional, and local policies and plans, as detailed below:

- » The need at a national level to diversify the power generation technology mix, as defined in the Integrated Resource Plan (IRP), 2019 (as discussed in detail in **Chapter 2**).
- » The need for the acquisition of new generation capacity needed to supplement Eskom's base load electricity supply, provide flexible generation capacity to assist in supporting renewable energy production and to reduce the extensive utilisation of diesel peaking generators in the immediate to medium term, as defined in the IRP 2019. The 450MW RMPP facility is being proposed in response to the procurement process Risk Mitigation Independent Power Producer Procurement Programme (2000MW);, initiated by the Independent Power Producer Office (IPP Office) for the procurement of up to 2000MW of dispatchable generation capacity from a range of technologies and from any suitable locations in South Africa. The 450MW RMPP facility and its associated 132kV transmission infrastructure is being developed as an innovative solution to comprise of gas to power generation (using LPG or naphtha as the initial fuel source, and in due course once available in Richards Bay in accordance with Transnet's long terminal planning, LNG as a fuel source) in direct response to the 2000MW RMIPPPP. The project therefore aims to meet both the short-term requirements of providing affordable dispatchable generation capacity, but also meet the long-term goal of operating by the use of “other” technology.
- » The need to align development with the requirements of the National Development Plan in order to address the identified socio-economic issues affecting development in South Africa.
- » The need for sustainable development at a Provincial level, including the need to utilise its extensive resources for the benefits of the local area.
- » The identification of the need for potential IPP projects to become operational in the local municipality as per the uMhlatuze Local Municipality Integrated Development Plan.

From an overall environmental sensitivity and planning perspective, the proposed grid connection supports the broader strategic context of the municipality as it is linked to an energy facility which is considered a driver for economic growth in the region as per the King Cetshwayo District Municipality's Integrated Development Plan. It is also in line with broader societal needs and the public interest as it is linked to an energy generation facility, for which there is national policy and support. No exceedance of social, ecological, heritage limits will result from the construction of the proposed project, as detailed in this Basic Assessment Report.

The project will assist in reaching these objectives as the IDP of the municipality aims to ensure that the quality of life of the King Cetshwayo District community through purposeful and quality service, and the effective

and optimal utilisation of resources is achieved. This project will assist in supporting the local and national electricity supply through the connection of an energy facility to the national electricity grid whilst avoiding deep grid connection costs due to the availability of the existing unused Bayside transmission lines. The project will further assist in local job creation which will further help achieve IDP objectives and inject money into the local and regional economy.

3.3. Project Site Description

The project site is located within Ward 26 of the uMhlathuze Local Municipality within the greater King Cetshwayo District Municipality in the KwaZulu-Natal Province.

The establishment of the 132kV transmission infrastructure between the 450MW RMPP facility and the new switching station at the point of connection to the existing Bayside transmission lines is proposed to allow for evacuation of the generated electricity from the 450MW RMPP Facility to the national grid. The connection infrastructure includes:

- » Underground cables consisting of up to 12 individual cable cores with various layers of insulation and protection.
- » Switching station consisting of steel lattice gantries; Busbars; high voltage circuit breakers and switches; CT and VT's; control Room consisting of protection and telecontrol equipment, battery room; security fencing; lightning protection masts and area security lighting.
- » Laydown areas.
- » Servitude access road points at strategic locations along the cable route where the cable route cannot be accessed by existing roads.

A summary of the details and dimensions of the infrastructure planned for the development is provided below in **Table 2.1**.

Table 2.1: Details or dimensions of the proposed grid connection infrastructure

Infrastructure	Footprint, dimensions and details
Corridor width (for assessment purposes)	100m, narrowing to 50m (where the cables cross existing gas pipelines and road crossings).
Power line length	2km
Power Line Capacity	132kV
Power Line Servitude Width	20m
Switching station capacity	132kV
Switching station footprint	0.8ha (within the 80m Eskom power line servitude)
Access road points	4m wide unsurfaced access points/tracks

Figure 3.2 illustrates the 132kV transmission infrastructure corridor alternatives assessed within this Basic Assessment.

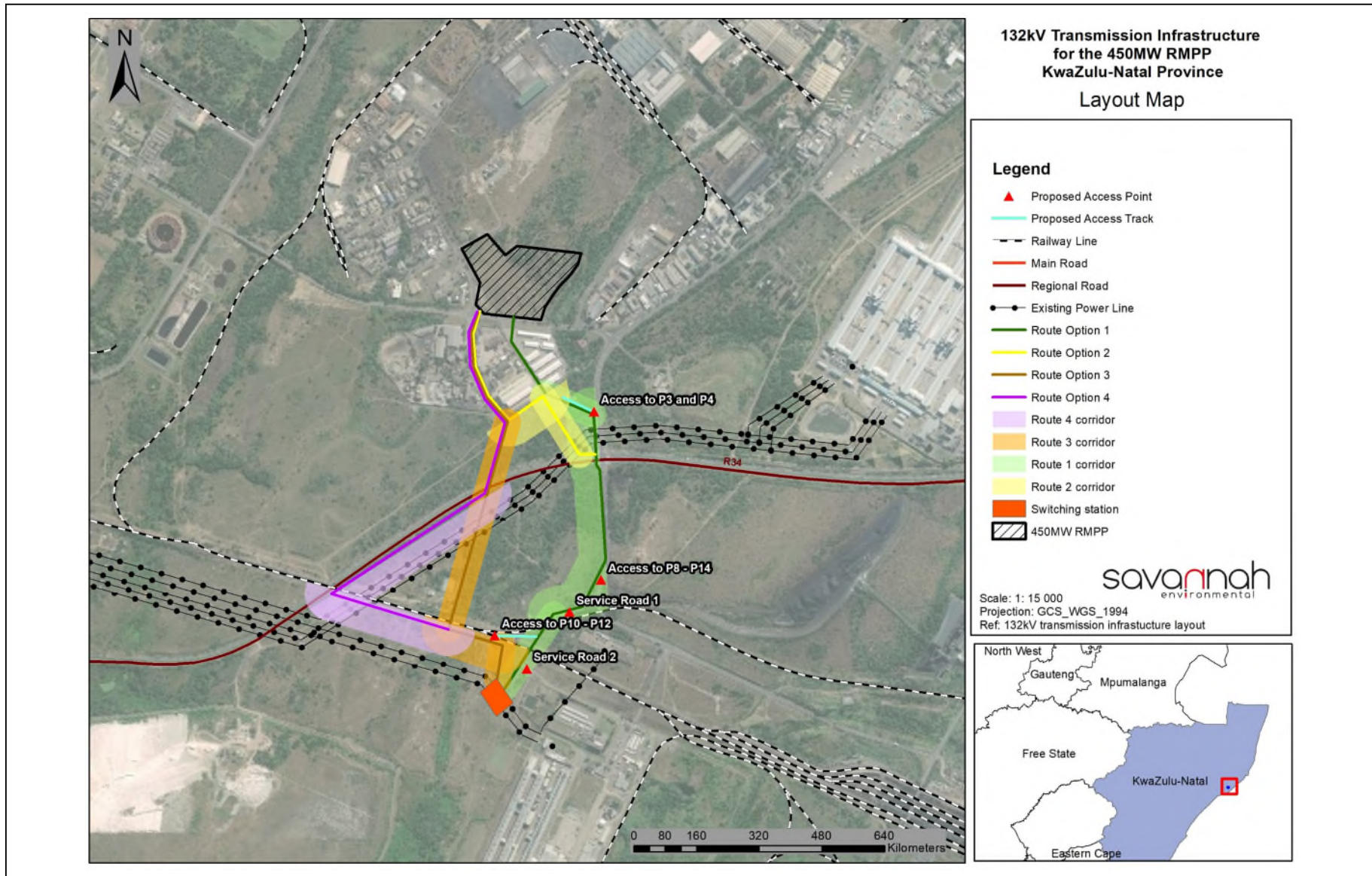


Figure 3.2: Map illustrating the layout of the 132kV transmission infrastructure for the 450MW RMPP facility, which is assessed in this BA Report

3.4. Description of Project Alternatives

In accordance with the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326), an EIA process must contain a consideration of alternatives, which can include site (i.e. development footprint), activity, technology and site access alternatives, as well as the “do-nothing” alternative. Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

The sections which follow provide details of the feasible alternatives indentified and assessed for the power line.

It is expected that the areas affected by the development of the switching station and underground grid connection infrastructure will be rehabilitated back to their original land use, so the affected areas can be used during the operation phase of the power line. The areas affected by decommissioning activities when the power line reaches its economic life and all infrastructure is decommissioned, will be rehabilitated and where possible, the original land use of the areas will be retained. Land use activities in the vicinity of the grid infrastructure include general industrial and commercial. These land uses are anticipated to continue during the project life cycles of the grid infrastructure.

3.4.1. Location Alternatives

Four alternative grid connection corridors have been identified for the proposed project, all proposing to originate from the 450MW RMPP at the same point and terminate the at the same switching station point at the terminus of the existing Bayside transmission lines.

These alternatives were identified by Phinda Power Producers (Pty) Ltd through the consideration of the use of the existing unutilised 132kV Bayside transmission lines to evacuate power from the 450MW RMPP. These 132 kV Bayside lines were upgraded by Eskom in 2015 so are in good condition. In addition, the RMIPPPP specifically mandates that only projects that are able to connect into the national grid with limited or no “deep grid connection costs” will be considered, which evacuation through the Bayside lines achieves. .

The following specific criteria were considered in the identification of the alternative grid connection corridors.

- » *Land Ownership and existing services* – Limitation as far as possible the number of land owners and existing services that would need to be traversed in order to connect from the 450MW RMPP to the switching station.
- » *Land Availability and Land Use* – In order to develop the underground grid connection infrastructure, sufficient space and access to land outside is required. The land use along the four alternative routes mainly includes general industrial, general commercial, existing roads, existing railways and numerous other services such was water, gas and electricity distribution infrastructure. In addition, sufficient space is available for the establishment of the infrastructure within the identified corridors.
- » *Access to the National Grid* – The developer consulted with the Eskom network planners to understand the future demand centres and the strategic plans to upgrade and strengthen the local networks in the area. Through this consultation it was confirmed that Eskom requires the addition of a switching station to enable the connection of more than one project to the existing Bayside power lines which have a

capacity to evacuate up to 900MW of new generation capacity. Considering this, and restricted by the RMIPPPP that indicated that no “deep grid connection costs” are allowed, the developer identified the existing unutilised Bayside infrastructure as the preferred and only grid connection point for the 450MW RMPP, although various route options for the 132kV underground cables do exist.

- » *Geographical and topographical considerations* – The terrain traversed by the four alternative underground grid connection route options is fairly flat, providing good conditions for power line construction. The exception is the area where the route alternative 1 and 2 crosses over a ravine early on in the route and potentially a second crossing midway through the routing. The developer has confirmed that it will be possible to traverse these ravines through the use of an above ground service bridge (either steel or concrete) with the cables being housed within a physical protective structure upon this service bridge .
- » *Consideration of sensitive environmental features* – The assessment of four potential corridor alternatives within which the grid connection infrastructure can be placed provides an opportunity for the avoidance of sensitive environmental features and areas. In addition, the consideration of a wider corridor enables the avoidance of the environmental sensitivities within the identified preferred corridor, thereby ensuring that the preferred grid connection route can be appropriately placed without resulting in an unacceptable environmental impact. This consideration is in line with the mitigation strategy and enables the achievement of the objectives of the mitigation hierarchy (i.e. avoid, minimise, mitigate). This application of the mitigation strategy will result in the identification of the optimised placement of the grid connection infrastructure within the identified preferred corridor.

The following four (4) grid connection corridor locations have been considered for the placement of the grid connection infrastructure (refer to Figure 1.2):

Route Option 1 (Technically Preferred Location):

The 132kV grid connection route corridor is approximately 1.68km long from the 450MW RMPP site to the unutilised distribution lines. This is the technically preferred option as it runs mostly within the servitudes of other linear infrastructure such as pipelines and roads. This corridor crosses the following infrastructure and environmental features:

- » The proposed LPG storage site for the 450MW RMPP
- » The Sasol gas pipeline
- » The John Ross Parkway
- » A ravine crossing
- » The Grindrod railway line
- » The Transnet railway line
- » The uMhlatuze water pipeline

Route Option 2:

The 132kV grid connection route corridor is approximately 1.94km long from the 450MW RMPP site to the unutilised distribution lines. This corridor crosses the following infrastructure and environmental features:

- » Two ravine crossings
- » The Sasol gas pipeline
- » The John Ross Parkway
- » The Grindrod railway line

- » The Transnet railway line
- » The uMhlatuze water pipeline

Route Option 3:

The 132kV grid connection route corridor is approximately 1.59km long from the 450MW RMPP site to the unutilised distribution lines. This corridor crosses the following infrastructure:

- » The R38
- » The Grindrod railway line
- » The Transnet railway line
- » The Sasol gas pipeline

Route Option 4:

The 132kV grid connection corridor is approximately 2.17km long from the 450MW RMPP site to the unutilised distribution lines. This corridor crosses the following infrastructure:

- » The R38
- » The Grindrod railway line
- » The Transnet railway line
- » The Sasol gas pipeline

3.4.2. Design and Layout Alternatives

The design of the power lines and switching station are required to conform to Eskom's technical standards and the Grid Code as they will form part of the national electricity supply network and must therefore be in-line with the existing network systems, technology and infrastructure. No feasible design alternatives exist. Therefore, no alternatives are assessed within this Basic Assessment report.

The grid connection corridors assessed within this BA process represents technically feasible areas for construction of the underground cables, switching station and access points and allows for the avoidance of identified environmental sensitivities through the appropriate placement of the switching station and power line footprint within the identified preferred corridor. The specific location of the infrastructure within the identified preferred corridor will be determined following landowner negotiation and final design. No layout alternatives within the identified corridors have been identified for assessment within this Basic Assessment report.

3.4.3. Technology Alternatives

No technology alternatives exist for the distribution of electricity as the use of overhead power lines is not considered to be feasible due to a combination of: the much wider servitude with that would be required and the need to cross over existing 132kV lines providing power to the Hillside Aluminium smelter which would entail very high transmission towers to clear this existing infrastructure. As such, no technology alternative is assessed for the project as part of this BA process.

3.4.4. The “Do-Nothing” Alternative

The ‘do nothing’ alternative is the option of not constructing the grid connection infrastructure. Should this alternative be selected, there would be no environmental impacts or benefits as a result of the construction and operation activities associated with the transmission infrastructure. The ‘do nothing’ alternative for the project has been assessed as part of the BA process in **Chapter 6** of this BA Report.

3.5. Activities during the Project Development Stages

In order to establish the 132kV Transmission Infrastructure, a series of activities will need to be undertaken during the design, pre-construction, construction, operation, and decommissioning phases. These are discussed in more detail in **Table 2.2** below.

Table 2.2: Details of the grid connection infrastructure development phases (i.e. construction, operation and decommissioning)

Construction Phase	
<ul style="list-style-type: none"> » Duration of the construction phase is expected to be up to 6 months, with the switching station potentially taking as long as 12 months to construct. » The project will create up to 10 employment opportunities for the local community members during the construction phase. » No on-site labour camps will be permitted. Employees are to be accommodated in Richards Bay and will be transported to site on a daily basis. » Overnight on-site worker presence, if required, will be limited to security staff. » Construction waste will be stored at the main Contractor’s Camp and the removal will be undertaken by a sub-contractor or the uMhlathuze Local Municipality. » At least 30 000 kilo litres of water will be required for the duration of the construction phase. Water will either be sourced from either the uMhlathuze Municipality or Mhlathuze Water. 	<p>Construction Sequence</p> <p>Underground power lines are constructed in the following simplified sequence:</p> <ul style="list-style-type: none"> » Step 1: Surveying of the development servitude and negotiating with affected landowners. » Step 2: Final design and micro-siting of the infrastructure based on geo-technical, topographical conditions and potential environmental sensitivities; obtain required environmental permits (such as biodiversity permits, heritage permits & WUL/GA). » Step 3: Vegetation clearance and construction of access roads/tracks (where required). » Step 4: Excavation of cabling routes. » Step 5: Assembly and implementation of infrastructure within and along the servitude. » Step 6: Rehabilitation of disturbed areas. » Step 7: Continued maintenance. <p>The final definition of the centre line for the underground cables and co-ordinates of each bend in the line (if applicable) will be determined on receipt of an environmental authorisation of the assessed corridor by the Competent Authority and after negotiations with landowners and final environmental and technical surveys².</p> <p>Similarly, the following simplified sequence is conducted for the construction of the switching station:</p>

² The start, middle and end coordinates of the nominated preferred route is included in **Appendix M**.

	<ul style="list-style-type: none"> » Step 1: Surveying of the development area, engaging with affected landowners, environmental specialist walkthroughs to inform permitting requirements. » Step 2: Final design and micro-siting of the infrastructure based on geo-technical, topographical conditions and potential environmental sensitivities. » Step 3: Search-and-rescue activities, vegetation clearance and construction of access roads/tracks (where required), including installation of fencing. » Step 4: Trenching and ground grid conduit installation. » Step 5: Installation of concrete foundations. » Step 6: Assembly and installation of steel structures and isolators. » Step 7: Control building assembly. » Step 8: Gravel placement and commissioning. » Step 9: Rehabilitation of disturbed areas. » Step 10: Continued maintenance.
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Activities to be Undertaken

Conduct surveys prior to construction	<ul style="list-style-type: none"> » Including, but not limited to: a geotechnical survey, site survey and confirmation of the underground cabling servitude, and all other associated infrastructure. » Identification and Search and Rescue (for flora and fauna species of concern), where required and the identification of any cultural/heritage sites worthy of conservation along the final underground cabling route.
Establishment of Access Road	<ul style="list-style-type: none"> » The Access Road points will be established as construction commences at the various locations within the servitude. » Existing access roads in the area will be used, where possible to minimise impact. » The new access/haul road points will be 4m wide and will only be required for the construction phase.
Undertake Site Preparation	<ul style="list-style-type: none"> » Including the clearance of vegetation within the underground cabling servitude for the establishment of access roads/tracks and excavations for cabling. » Stripping of topsoil along the cable route. Soil will be stockpiled and used for backfilling and rehabilitation purposes. » Stripping of soil and the clearance of vegetation will be undertaken in a systematic manner in order to reduce the risk of the exposed ground being prone to erosion.
Establishment of a Laydown Area	<ul style="list-style-type: none"> » A Laydown Area for the storage of grid infrastructure components, including the civil engineering construction equipment. » No borrow pits will be required. Infilling or depositing materials will be sourced from licensed borrow pits within the surrounding areas
Undertake Site Rehabilitation	<ul style="list-style-type: none"> » Commence with rehabilitation efforts once construction is completed in an area, and all construction equipment is removed. » On commissioning, access points to the site that will not be required for the operation phase will be closed and rehabilitated.

Operation Phase

<ul style="list-style-type: none"> » Duration will be for a minimum of 20 years from the date of commissioning (30 June 2022), with options for extension. » Requirements for security and maintenance of the grid connection infrastructure. » Employment opportunities relating mainly to operation activities and maintenance. Very limited employment opportunities will be available post construction due to the nature of the infrastructure³. » Current land-use activities can continue in the areas adjacent to the infrastructure as the cabling will be underground.

³ It must be noted that ownership of the power could will be transferred to Eskom following the completion of construction. The operation and maintenance of the lines could be undertaken by Eskom or the project sponsor. Who will finally operate the underground cables and switching station will be a matter of negotiation between Eskom and the project sponsor.

Activities to be Undertaken	
Operation and Maintenance	<ul style="list-style-type: none"> » On-going rehabilitation of those areas which were disturbed during the construction phase. » During this operation phase vegetation within the power line servitude (up to 5m), will require management only if it impacts on the safety and operational objectives of the project. » The maintenance of the grid connection infrastructure will be the responsibility of either Eskom or Phinda dependent upon who is ultimately responsible to operate this infrastructure. » Underground cables will be accessed via existing roads adjacent to the cables for maintenance purposes where these already exist or via the 5m servitude in which the cables run where existing roads do not exist.
<u>Decommissioning Phase</u>	
Requirements	<ul style="list-style-type: none"> » Decommissioning of the grid connection infrastructure at the end of its economic life. » Expected lifespan of a minimum of 20 years (with maintenance) from date of commissioning before decommissioning is required. » Decommissioning activities to comply with the legislation relevant at the time.
Activities to be undertaken	
Site preparation	<ul style="list-style-type: none"> » Confirming the integrity of access to the power line to accommodate the required equipment. » Mobilisation of decommissioning equipment.
Disassemble components and rehabilitation	<ul style="list-style-type: none"> » The switching station infrastructure components will be disassembled, removed and reused and recycled (where possible). » Where components cannot be reused or recycled these will be disposed of in accordance with the regulatory requirements at the time of decommissioning. » Disturbed areas, where infrastructure has been removed (along the cabling route and at the switching station), will be rehabilitated, if required and depending on the future land-use of the affected areas and the relevant legislation applicable at the time of decommissioning.

Land use activities within the vicinity of the corridor include general Industrial and commercial . It is expected that the areas affected by the development of the transmission infrastructure will be rehabilitated back to their original land use. The areas affected by decommissioning activities when the transmission infrastructure reaches its economic life and all infrastructure is decommissioned, will be rehabilitated and where possible and depending on the landowner requirements, the original land use of the area will be retained.

CHAPTER 4: APPROACH TO THE BA PROCESS & LEGISLATIVE REQUIREMENTS

In terms of the EIA Regulations of December 2014 (as amended) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of the 132kV transmission infrastructure required for the evaluation of electricity from the 450MW RMPP is a listed activity requiring environmental authorisation. The application for authorisation is required to be supported by a Basic Assessment (BA) process.

The BA process aims at identifying and describing potential environmental issues associated with the development of the proposed underground power lines and switching station. In order to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the impacts of the development, detailed independent specialist studies were undertaken as part of the BA process. In addition, a comprehensive consultation process was conducted, and includes I&APs, the competent authority, directly impacted landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders. This chapter serves to outline the process that was followed during the BA process.

4.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of the EIA Regulations, 2014 - Appendix 1: Content of basic assessment reports:

Requirement	Relevant Section
3(e)(i) 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 have been considered in the preparation of the report	Sections 4.5, 4.6 and 4.7 and provide an overview of the policy and legislative context relevant to the development of the proposed transmission infrastructure. The regulatory and planning context has been considered at a national, provincial and local level.
3(e)(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools, frameworks and instruments.	Tables 4.5 and 4.6 illustrate the compliance of the project with the legislation, policies, plans, guidelines, tools, frameworks and instruments from a national, provincial and local level.
3(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for.	All listed activities triggered as a result of the project have been included in section 4.6 within Table 4.4 .
3(h)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The details of the public participation process undertaken for the project are included and described in section 4.3.2 . In addition, the public participation plan proposed and approved by the DEFF is included in Appendix C1 of the BA Report.
3(h)(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.	Any comments received following the announcement of the BA process and the proposed development have been included as part of a Comments and Responses (C&R) Report which is included as Appendix C9 of the BA Report.

Requirement	Relevant Section
3(h)(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.	The methodology used to assess the significance of the impacts of the project are included in section 4.3 .

4.2 Relevant Legislative Permitting Requirements and Guidelines that have informed the preparation of the BA Report

The legislative permitting requirements applicable to the project as identified at this stage in the process are described under the respective sub-headings.

» **4.5.1 National Environmental Management Act (No. 107 of 1998) (NEMA)**

NEMA is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant EA.

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that proponents are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the competent authority with sufficient information in order for an informed decision to be taken regarding the project.

The BA process conducted for the project is undertaken in accordance with Section 24 (5) of NEMA. Section 24 (5) of NEMA pertains to Environmental Authorisations (EAs), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

Table 4.1 details the listed activities in terms of the EIA Regulations of December 2014 (as amended) that apply to the project, and for which an Application for Environmental Authorisation has been submitted. The table also includes a description of the specific project activities which relate to the applicable listed activities.

Table 4.1: Listed activities as per the EIA Regulations GNR 983-885 of 4 December 2014, (as amended, with particular reference to GNR 327-329 of 7 April 2017) that are triggered by the project

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
GN 983 , 04 December 2014 (as amended, in	11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity -

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
GN 983 , 04 December 2014 (as amended, in particular, on 07 April 2017)		(i). outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts. The project includes the construction and operation of 132kV electricity distribution to the grid via underground cables, 132kV switching station and access roads.
GN 983 , 04 December 2014 (as amended, in particular, on 07 April 2017)	12 (ii)(a)(c)	The development of – (ii). Infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs – (a) within a watercourse; and (c) If no development set back exists, within 32 metres of a watercourse, measured from the edge of the watercourse. Wetlands have been identified within the assessment corridors of the 132kV underground cables , switching station and access roads. The corridor will however be located within 32 meters of wetlands.
GN 983 , 04 December 2014 (as amended, in particular, on 07 April 2017)	19	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse. The construction phase of the transmission infrastructure will require excavation of soil along the corridor route to lay the cabling for the transmission infrastructure. Wetlands have been identified within the corridor routes.
GN 983 , 04 December 2014 (as amended, in particular, on 07 April 2017)	12	The clearance of an area of 300 square meters or more of indigenous vegetation (d) KZN (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 area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004 (v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans The development of the 132kV underground cable infrastructure, access roads and switching station will require the clearance of an area of 300 square metres or more of indigenous vegetation and is located within Critical Biodiversity Areas (CBA).
GN 9835 , 04 December 2014 (as amended, in particular, on 07 April 2017)	14	The development of (ii) infrastructure or structures with a physical footprint of 10 square meters or more where such development occurs: (b) within 32 meters of a watercourse, measured from the edge of a watercourse

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
		<i>The 132kV underground cables will be located within 32 meters of a wetland that is located within the assessment corridor and within Critical Biodiversity Area (CBA)</i>

4.3 Overview of the Basic Assessment Process for the 132kV transmission infrastructure for the 450MW RMPP

Key tasks undertaken for the BA included:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed Application for Environmental Authorisation to the competent authority (i.e. DEFF) in terms of Regulations 5 and 6 of the EIA Regulations GNR 983-885 of 4 December 2014, (as amended, with particular reference to GNR 327-329 of 7 April 2017) in , as amended.
- » Undertaking a public participation process in accordance with Chapter 6 of GNR326 (and as per the approved public participation plan), and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- » Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended and the relevant Specialist Protocols defined in Government Notice 320 of 20 March 2020, as relevant.
- » Preparation of a BA report and EMPr in accordance with the requirements of Appendix 1 and Appendix 4 of GNR 326.
- » 30-day public and authority review period of the BA report.
- » Compilation of a Comments and Responses (C&R) Report detailing the comments raised by I&APs, addressing these comments in detail and finalisation of the BA report.
- » Submission of a final BA report to the DEFF for review and decision-making.

The tasks are discussed in detail in the sub-sections below.

» **4.3.1 Authority Consultation and Application for Environmental Authorisation in terms of the EIA Regulations, 2014 (as amended)**

In terms of Government Notice 779 of 01 July 2016, the National Department of Environment, Forestry and Fisheries (DEFF) is the competent authority for all projects related to the IRP. Through the decision-making process, the DEFF will be supported by the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA) as the Commenting Authority.

Consultation with the regulating authorities (i.e. DEFF and EDTEAT) as well as with all other relevant Organs of State have been undertaken and will continue throughout the BA process. To date, this consultation has included the following:

- » Holding a pre-application meeting with the DEFF on 18 August 2020 (via the Microsoft Teams Platform) during which the project details and proposed Public Participation Plan were presented. The Public

Participation Plan was approved following the pre-application meeting with the Case Officer's Supervisor (Mr Bathandwa Ncube) via email on 18 August 2020.

- » Submission of the application for Environmental Authorisation to the DEFF via the use of the DEFF Novell Filr System.
- » Submission of the BA Report for a 30-day review and comment period by:
 - * The competent and commenting authorities.
 - * State departments that administer laws relating to a matter affecting the environment relevant to an application for Environmental Authorisation.
 - * Organs of State that have jurisdiction in respect of the activity to which the application relates.

The submissions, as listed above, were undertaken electronically. The regulations were repealed with the September Gazette relevant to Level 1 of the lockdown.

A record of all authority correspondence undertaken during the BA process is included in **Appendix C**.

» **4.3.2 Public Participation Process**

Public Participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations, 2014 (GNR 326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations, 2014 (GNR 326) (as amended) and is being followed for this proposed project.

The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs to become actively involved in the BA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process:

- » provide an opportunity to submit comments regarding the project;
- » assist in identifying reasonable and feasible alternatives;
- » contribute relevant local information and knowledge to the environmental assessment;
- » allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
- » foster trust and co-operation;
- » generate a sense of joint responsibility and ownership of the environment; and
- » comment on the findings of the environmental assessments.

During the decision-making phase:

- » to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.

- » The information presented during the public participation process is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- » Various ways are provided to I&APs to correspond and submit their comments i.e. fax, post, telephone, email and the online stakeholder engagement platform.
- » An adequate review period is provided for I&APs to comment on the findings of the BA Report.

The Public Participation Process undertaken for the proposed development of the 132kV transmission infrastructure considers the restrictions and limitations imposed by Government through section 27 (2) of the Disaster Management Act (Act No. 57 of 2002) of 2002 and the Directions issued by the Minister of Forestry and Fisheries (DEFF) in terms of consultations with I&APs. A Public Participation Plan was prepared and submitted to the DEFF on 17 August 2020, prior to the pre-application meeting. Approval of the Plan was provided by the DEFF Case Officer Ms Bathandwa Ncube via email on 18 August 2020 following the pre-application meeting (**Appendix C8**).

Together with the standard public participation approach, additional alternative means of undertaking consultation have been designed and implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to access project information and raise comments on the project through an interactive web-based platform (i.e. online stakeholder engagement platform) readily available and accessible to any person registering their interest in the project, and ensures that the public participation process is undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014 as amended. The Public Participation Plan (**Appendix C8**) considers the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, limitations which certain I&APs may have in terms of access to computers and internet, as well as access to public spaces currently not open for operation that inhibits access to hard copy documentation. The online stakeholder engagement platform utilised by Savannah Environmental for the project allows the EAP to visually present details regarding the project as well as consultation documentation, including project maps and plans, presentations and posters. The platform also contains the BA report available for review. The use of an online tool enables stakeholders and I&APs to explore the project-specific content in their own time, and still enables them to participate in a meaningful way in the consultation process. The online platform allows for feedback and comments to be submitted by I&APs, in so doing saving time for the stakeholder and also giving the assurance that their comments have been submitted for inclusion in the project reporting. Access to the project documentation via the Savannah Environmental website remains unrestricted to all I&APs. I&APs wanting to access the report electronically are required to request a release code to access the documents in order to register the I&AP on the project database. The online portal supports the EAP in maintaining a complete and accurate record and database of all parties who have interest in the project (and who choose to access the report via the online portal), in line with the requirements of the Regulations.

Where I&APs do not have access to the online platform, information will be shared via other means such as telephone, email, WhatsApp, CD and communication via the Ward Councillor and community representatives.

In terms of the requirements of Chapter 6 of the EIA Regulations, 2014 (as amended), the following key public participation tasks have been undertaken:

- » Fix a notice board at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- » Give written notice to:
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority.
- » Place an advertisement in one local newspaper.
- » Open and maintain a register of I&APs and Organs of State.
- » Release a BA Report for a 30-day review and comment period.
- » Prepare a Comments and Responses (C&R) report which documents the comments received on the BA process and the responses provided by the project team.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), and the approved Public Participation Plan, the following summarises the key public participation activities implemented. The schematic diagram below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation.



Tasks undertaken as part of the public participation process for this BA process and the separate Scoping & EIA process undertaken for the 450MW RMPP are described in the sections which follow.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
- (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
 - (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
 - (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the greater study area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project. An initial list of key stakeholders identified and registered is listed in **Table 4.2**.

Table 4.2: List of Stakeholders identified for the inclusion in the project database during the public participation process for the 132kV transmission infrastructure

Organs of State
National Government Departments
Department of Environment, Forestry and Fisheries (DEFF)
Department of Mineral Resources and Energy (DMRE)
Department of Agriculture, Rural Development and Land Reform (DARDLR)
Department of Human Settlement, Water and Sanitation (DHSWS)
Government Bodies and State-Owned Companies
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
Transnet SA SOC Limited
Provincial Government Departments
KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA)
Amafa / Heritage KwaZulu-Natal
Ezemvelo KZN Wildlife
Local Government Departments
King Cetshwayo District Municipality
City of uMhlatuze Local Municipality
Non-Governmental Organisations
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Landowners
Affected landowners, tenants and occupiers
Neighbouring landowners, tenants and occupiers

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names of:⁴

- » all persons who requested to be registered on the database in writing and disclosed their interest in the project.
- » all Organs of State which hold jurisdiction in respect of the activity to which the application relates;

⁴ Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (Act No. 4 of 2013).

- » all persons identified and approached through networking or a chain referral system to identify any other stakeholder (i.e. ratepayers associations); and
- » all persons who submitted written comments or attended meetings during the public participation process.

I&APs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the BA process. The database of I&APs will be updated throughout the BA process and will act as a record of the I&APs involved in the public participation process.

ii. Advertisements and Notifications

- 40.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
 - (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - (ii) Any alternative site.
- 40.(2)(b) Giving written notice, in any of the manners provided for in section 47D of the Act, to –
 - (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) The municipality which has jurisdiction in the area;
 - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) Any other party as required by the competent authority.
- 40.(2)(c) Placing an advertisement in –
 - (i) One local newspaper; or
 - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- 40.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 40.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
 - (i) Illiteracy;
 - (ii) Disability; or
 - (iii) Any other disadvantage.

The BA process was announced with an invitation to the Organs of State, affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- » Compilation of a background information document (BID) (refer to **Appendix C2**) providing technical and environmental details on the project and how I&APs can become involved in the BA process. The BID was made available on the Savannah Environmental website (<http://www.savannahsa.com/public->

- [documents/grid-infrastructure/](#)), and was distributed via email on **10 September 2020** together with a process notification letter (refer to **Appendix C**).
- » Placement of site notices announcing the BA process at visible points along the routes of the transmission infrastructure in accordance with the requirements of the EIA Regulations, 2014 (as amended). Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C3**. The site notices were placed on **11 September 2020**, on areas in the vicinity of the alternative cabling routes.
 - » Placement of an advertisement announcing the BA process, the availability of the BA Report, and inviting comment on the BA Report in Zululand Observer Newspaper on **12 November 2020**. The proof of the newspaper advert placement will be included in **Appendix C3** of the Final BA Report. This advert:
 - o announced the project and the associated BA process,
 - o announced the availability of the BA report, the review period, and where it is accessible for review, and invited comment on the BA Report,
 - o provided all relevant details to access the Savannah Environmental online stakeholder engagement platform.
 - » A copy of the newspaper advert as sent to the newspaper is included in **Appendix C3** of the BA Report. The newspaper advert tear sheet will be included in the Final BA Report in **Appendix C3**.
 - » A Radio Live Read by North Coast Radio during the the 30-day review and comment period. Proof of the signed of schedule will be included in the final basic assessment report (**Appendix C3**). North Coast Radio is the local radio station covering the study area.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the assessed corridor and the surrounding area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues.

Table 4.2 below includes the methods of consultation used to engage with relevant organs of state, government departments and interested and affected parties.

Table 4.2: Public involvement for the 132kV transmission infrastructure project

Activity	Date
Distribution of the BID and the process notification letters (including a stakeholder reply form) announcing the BA process and inviting I&APs to register on the project database.	10 September 2020
Placement of site notices on-site and in public places.	11 September 2020
Distribution of a notification letter announcing the availability of the BA Report for a 30-day review and comment period. The letter was distributed to Organs of State, Government Departments, Ward Councillors, landowners within the greater study area (including neighbouring landowners) and key stakeholder groups.	13 November 2020
Advertising of the availability of the BA Report for a 30-day review and comment period in the Zululand Observer newspaper.	12 November 2020
Radio Live Read by the North Coast Radio advertising the availability of the BA Report for a 30-day review and comment period, and the details of how to get involved and how contact with Savannah Environmental can be made.	Commencing on the 13 November and will be advertised 3 times for the duration of the comment period.
30-day review and comment period of the BA Report.	13 November 2020 – 14 December 2020

Activity	Date
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: <ul style="list-style-type: none"> » Landowners » Authorities and key stakeholders (including Organs of State, local municipality and official representatives of community-based organisations. » Where an I&AP does not have access to a computer and/or internet to participate in a virtual meeting telephonic discussions (including WhatsApp video call) will be set-up and minuted for inclusion. The preferred language of the I&AP has been considered when setting up these discussions. 	To be undertaken during the 30-day review and comment period
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs	Continuous throughout the BA process

iv. Registered I&APs entitled to Comment on the BA Report

43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –

- (a) A lack of skills to read or write;
- (b) Disability; or
- (c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

No such person in terms of Regulation 44(2)(a) and (b) has been identified for the 132kV transmission infrastructure during the consultation process undertaken for the project.

The BA Report has been made available for review by I&APs for a 30-day review and comment period from **13 November 2020 to 14 December 2020**. The BA Report has also been made available on the Savannah Environmental website (<https://www.savannahsa.com/public-documents/grid-infrastructure/>). An electronic version of the BA Report (CD and/or Dropbox access link) has been circulated to Organs of State via courier and email at the commencement of the 30-day review period. The BA Report is also available on the Savannah Environmental website. The evidence of distribution of the BA Report will be included in the final BA Report, which will be submitted to the DEFF.

I&APs registered on the database have been notified by means of a notification letter of the release of the BA Report for a 30-day review and comment period, invited to provide comment on the BA Report, and informed of the manner in which, and timeframe within which such comment must be made. In addition, the availability of the report was advertised in the local newspaper and via live reads on the local radio

station (as detailed in the sections above). Proof of distribution of the BA Report will be included in the final BA Report, which will be submitted to the DEFF.

In accordance with the approved public participation plan, the report has been made available in soft copy to I&APs due to restrictions and limitations on public spaces during the national state of disaster related to COVID-19. No hard copies of the report have been made available for review and comment. I&APs are able to provide comment via the online stakeholder engagement platform, e-mail, fax, telephone or post. Where I&APs were not able to provide written comments (including SMS and WhatsApp), other means of consultation, such telephonic discussions were used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development.

v. Recording of Comments

Comments raised by I&APs following the announcement of the BA process have been synthesised into a Comments and Responses (C&R) Report which is included in the BA Report as **Appendix C7**. The C&R Report includes detailed responses from the members of the EIA project team and/or the project proponent to the comments raised during the public participation process. The C&R Report only consists of written comments received.

All comments raised as part of the discussions and written comments submitted during the 30-day review and comment period will also be recorded and included in the final BA Report. Meeting notes will be drafted of all the focus group meetings conducted and discussions held during the 30-day review and comment period and will be included in **Appendix C6**.

» **4.4 Assessment of Issues Identified through the BA Process**

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report (Appendix M) for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). **Table 4.4** provides a summary of the specialist assessment requirements identified for the project site in terms of the screening tool and responses to each assessment requirement based on the nature and extent of the project

Table 4.3: Sensitivity ratings from the DEFF's web-based online Screening Tool associated with the development of the 132kV infrastructure

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Landscape/Visual Assessment	Not specified within screening tool	A Visual Impact Assessment has not been undertaken as the proposed transmission infrastructure will be underground and the proposed switching station will be located within the existing Eskom servitude that currently contains overhead transmission infrastructure.

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Archaeological and Cultural Heritage Impact Assessment	Not specified within screening tool	A Heritage Impact Assessment has been undertaken for the proposed project.
Palaeontology Impact Assessment	Not specified within screening tool	A Heritage Impact Assessment encompassing a Palaeontology assessment has been undertaken for the proposed project.
Terrestrial Biodiversity Impact Assessment	Very High Sensitivity	A Terrestrial Biodiversity Impact Assessment has been undertaken for the proposed project.
Aquatic Biodiversity Impact Assessment	Very High Sensitivity	An Aquatic Biodiversity Impact Assessment has been undertaken for the proposed project.
Hydrology Assessment	Not specified within screening tool	An Aquatic Assessment encompassing a wetland assessment and delineation has been undertaken to determine the surface water bodies and watercourses which may be impacted by the project.
Socio-Economic Assessment	Not specified within screening tool	A Socio-Economic Impact Assessment has been undertaken for the proposed project.
Plant Species Assessment	Medium Sensitivity	A plant species assessment has been included within the Terrestrial Biodiversity Assessment.
Animal Species Assessment	High Sensitivity	An animal species assessment has been included within the Terrestrial Biodiversity Assessment.
Soil and Agricultural Assessment	Not listed in the tool	A Soil and Agricultural Potential Assessment has been undertaken for the proposed project.

Based on the results of the screening, and from experience on similar projects and in the study area, the EIA project team has identified the following issues as requiring investigation

Table 4.4: Specialist consultants appointed to evaluate the potential impacts associated with the 132kV transmission infrastructure

Specialist Name	Specialist Company	Specialist Area of Expertise	Appendices
Jacquette Adam and Charlene Smuts	Exigent Engineering Consultants	Ecology Impact Assessment (including avifauna)	Appendix D
Jacquette Adam and Charlene Smuts	Exigent Engineering Consultants	Aquatic Assessment (incl wetland delineation)	Appendix E
Gavin Anderson	Umlando: Archaeological Surveys and Heritage Management	Heritage and Palaeontology Assessments	Appendix F
John Phipson	Mzansi Agriculture	Soil and Agricultural Potential Assessment	Appendix G
Eugene de Beer	Urban-Econ	Social-Economic Impact Assessment	Appendix H

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the project. Issues were assessed in terms of the following criteria:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;

- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4;
 - * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease);
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely);
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- » The **status**, which is described as either positive, negative or neutral;
- » The degree to which the impact can be reversed;
- » The degree to which the impact may cause irreplaceable loss of resources;
- » The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

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

S = Significance weighting.

E = Extent.

D = Duration.

M = Magnitude.

P = Probability.

The **significance weightings** for each potential impact are as follows:

- » **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
- » **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);

- » **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

As the proponent has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations, 2014 (as amended)), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. An Environmental Management Programme (EMPr) is required for the proposed transmission infrastructure and a Generic Environmental Management Programme (EMPr) is required for the 132kV switching station in accordance with GNR 435 of March 2019 have been completed and is included as **Appendix K** in the BA Report.

» **4.5 Assumptions and Limitations of the BA Process**

The following assumptions and limitations are applicable to the studies undertaken within this BA process:

- » All information provided by the proponent and I&APs to the environmental team was correct and valid at the time it was provided.
- » It is assumed that the route alternatives and corridors identified by the proponent represents a technically suitable site for the establishment of the underground transmission infrastructure and switching station, which is based on the design undertaken by technical consultants for the project.
- » This BA Report and its investigations are project-specific, and consequently the environmental team did not evaluate any other electricity transmission alternatives.

Refer to the specialist studies in **Appendices D – H** for specialist study specific limitations.

» **4.6 Legislation and Guidelines that have informed the preparation of the BA Report**

The legislation and policies listed above have informed the scope and content of this BA Report. The form and substance of the BA report have been informed by:

- » National Environmental Management Act (Act No. 107 of 1998).
- » EIA Regulations of December 2014 published under Chapter 5 of NEMA (EIA Regulations GNR 983-885 of 4 December 2014, (as amended, with particular reference to GNR 327-329 of 7 April 2017)
- » Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations; and
- » International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Table 4.5 provides an outline of the legislative permitting requirements applicable to the 132kV transmission infrastructure.

Table 4.5: Applicable Legislation, Policies and/or Guidelines associated with the development of the project

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	<p>In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that:</p> <p><i>“Everyone has the right –</i></p> <ul style="list-style-type: none"> » <i>To an environment that is not harmful to their health or well-being, and</i> » <i>To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</i> <ul style="list-style-type: none"> * <i>Prevent pollution and ecological degradation,</i> * <i>Promote conservation, and</i> * <i>Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i> 	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the “right to an environment clause” includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326).</p> <p>In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>A Basic Assessment Process is required to be undertaken for the proposed project.</p>	DEA – Competent Authority KwaZulu-Natal EDTEA – Commenting Authority	The listed activities requiring authorisation triggered by the proposed project have been identified and are being assessed as part of the BA process for the 132kV transmission infrastructure. The BA process will culminate in the submission of a final BA Report to the Competent Authority in support of the Application for Environmental Authorisation.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>In terms of the “Duty of Care and Remediation of Environmental Damage” provision in Section 28(1) of NEMA every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> <p>In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	DEA KwaZulu-Natal EDTEA	While no permitting or licensing requirements arise directly by virtue of the 132kV transmission infrastructure in terms of this section, this general duty of care finds application through the consideration of potential cumulative, direct and indirect impacts.
Environment Conservation Act (No. 73 of 1989) (ECA)	<p>The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces.</p> <p>The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties.</p> <p>In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).</p>	DEFF KwaZulu-Natal EDTEA uMhlatuze Local Municipality	Noise impacts are expected to be associated with the construction phase of the project. Considering the location of the alternative corridors in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community.
National Water Act (No. 36 of 1998) (NWA)	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e. is an existing lawful use), is permissible under a GA, or if a responsible authority waives the need for a licence.	Regional Department of Water and Sanitation	The some of the alternative corridors cross wetlands. Should the access road points or underground cables be constructed within a watercourse or within 500m of a wetland, the project proponent would require either a Water Use License (WUL) or General Authorisation

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.</p> <p>Consumptive water uses may include taking water from a water resource (Section 21 (a)), and storing water (Section 21 (b)).</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21 (c)), and altering of bed, banks or characteristics of a watercourse (Section 21 (i)).</p>		<p>(GA) in terms of Section 21 (c) and (i) of the National Water Act (Act No. 36 of 1998).</p>
<p>Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)</p>	<p>In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit. Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA.</p> <p>Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.</p>	<p>Department of Mineral Resources</p>	<p>No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA is not required to be obtained in this regard.</p> <p>In terms of Section 53 of the MPRDA, approval is required from the Minister of Mineral Resources to ensure that the proposed project does not sterilise a mineral resource that might occur in the corridor, if approval under section 53 has not been sought and obtained for the town-planning scheme</p>
<p>National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)</p>	<p>The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas, and provide a standard for acceptable dustfall rates for residential and non-residential areas.</p>	<p>KwaZulu-Natal EDTEA / King Cetshwayo District Municipality</p>	<p>In the event that the construction of the underground cables, ravine crossings, access road points or switching station results in the generation of excessive emissions of dust, the possibility could exist that a dust fall monitoring programme would be required for the project, in which case the dust fall monitoring results</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dustfall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme.</p> <p>Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.</p>		<p>from the monitoring programme would need to be included in the dust fall monitoring report and a dust management plan would need to be developed.</p>
<p>National Heritage Resources Act (No. 25 of 1999) (NHRA)</p>	<p>Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance.</p> <p>Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.</p> <p>Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.</p> <p>Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.</p> <p>Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.</p>	<p>South African Heritage Resources Agency</p> <p>AMAFA</p>	<p>A Heritage Impact Assessment (including field survey) has been undertaken as part of the BA process (refer to Appendix G of this BA Report). Potential for graves within the area has been identified. Relevant procedures, as detailed in the EMP, are required to be implemented should any graves be encountered during construction.</p> <p>The area is in an area of very low palaeontological sensitivity. It thus has no or very low, palaeontological value. Should fossil finds be made within the Cretaceous deposits 4m+ below the surface, the Fossil Finds Procedure as included in the EMP must be implemented.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process.</p> <p>Three government notices have been published in terms of Section 56(1) of NEM:BA as follows:</p> <ul style="list-style-type: none"> » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). <p>It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).</p>	<p>DEFF KwaZulu-Natal EDTEA</p>	<p>Under NEM:BA, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.</p>
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out.</p> <p>Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).</p>	<p>DEFF KwaZulu-Natal EDTEA</p>	<p>Alien plant species listed in terms of Chapter 5 of NEM:BA were identified within the grid connection route alternatives or proposed switching station location as per the findings of the Ecological Impact Assessment (Appendix D of the BA Report).</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Restricted activities and the respective requirements applicable to persons in control of different categories of listed invasive species are contained within the Alien and Invasive Species Regulations (GNR 598) published under NEM:BA, together with the requirements of the Risk Assessment to be undertaken.</p>		
<p>Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)</p>	<p>Section 05 of CARA provides for the prohibition of the spreading of weeds.</p> <p>Regulation 15 of GNR 1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur.</p> <p>Regulation 15E of GNR 1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.</p>	<p>Department of Agriculture, Forestry and Fisheries (DAFF)</p>	<p>CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>The permission of DAFF will be required if the project requires the draining of vleis, marshes or water sponges on land outside urban areas. However, this is not anticipated to be relevant for the project.</p> <p>In terms of Regulation 15E (GNR 1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods:</p> <ul style="list-style-type: none"> » Uprooting, felling, cutting or burning. » Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer. » Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation. » Any other method of treatment recognised by the executive officer that has as its object the control

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			<p>of plants concerned, subject to the provisions of sub-regulation (4).</p> <p>» A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.</p>
<p>National Forests Act (No. 84 of 1998) (NFA)</p>	<p>According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734.</p> <p>The prohibitions provide that “no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister”.</p>	<p>DAFF</p>	<p>A licence is required for the removal of protected trees listed under the National Forests Act of 1998 (No 84 of 1998). It is therefore necessary to conduct a walkthrough survey of the grid connection route alternatives and switching station location that will determine the number and relevant details pertaining to protected tree species present within the preferred route and switching station site that cannot be reasonably avoided for the submission of relevant permits to authorities prior to the commencement of construction activities. The following NFA-listed tree species were identified within the grid connection corridor alternatives for the 132kV Transmission Infrastructure: : The protected tree species, <i>Barringtonia racemose</i> and <i>Ficus trichopoda</i>, has been identified on site..</p>
<p>National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)</p>	<p>Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is</p>	<p>DAFF</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the 132kV underground cables, switching station and access road points, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and personnel for firefighting purposes.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.</p>		
<p>Hazardous Substances Act (No. 15 of 1973) (HAS)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <ul style="list-style-type: none"> » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. 	<p>Department of Health (DoH)</p>	<p>It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the Department of Health (DoH).</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p>		
<p>National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)</p>	<p>The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unfit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and » Pollution of the environment and harm to health are prevented. 	<p>DEFF – hazardous waste KwaZulu-Natal EDTEA – general waste</p>	<p>No waste listed activities are triggered by the project and therefore no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard, if more than 100m³ of general waste or 80m³ for hazardous waste is to be generated by the project. .</p>
<p>National Road Traffic Act (No. 93 of 1996) (NRTA)</p>	<p>The technical recommendations for highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance</p>	<p>South African National Roads Agency</p>	<p>An abnormal vehicle permit may be required to transport various components of the transmission</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>	<p>(SANRAL) – national roads</p> <p>KwaZulu-Natal Department of Transport (DoT)</p>	<p>infrastructure to site for construction. These may include road clearances for vehicles carrying abnormally dimensioned loads (transport vehicles exceeding the dimensional limitations (length) of 22m).</p>
Provincial Policies / Legislation			
<p>KwaZulu-Natal Systematic Conservation Plan (KZNSCP, 2012)</p>	<p>The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats.</p>	<p>KwaZulu-Natal EDTEA EKZN Wildlife</p>	<p>Sensitivity mapping and ground truthing and assessment is to be undertaken for the alternative corridors and proposed switching station site to determine the vegetation types and species data. Plant species of special concern observed within the study area, but not necessarily within the development footprint include <i>Crinum stuhlmannii</i> in the <i>Helichrysum –Chrysanthemoides</i> coastal grasslands and <i>Ficus trichopoda</i> and <i>Barringtonia racemosa</i> individuals in the swamp forest.</p> <p>The following CBA were identified along the 132kV corridor alternatives and at the switching station site:</p>

CHAPTER 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This Chapter provides a description of the environment that may be affected by the development of the 132kV transmission infrastructure associated with the 450MW RMPP. The information is provided in order to assist the reader in understanding the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical and social environment that could be directly or indirectly affected by the development or could affect the transmission infrastructure have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this BA process is being conducted.

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report.

Requirement	Relevant Section
(h) (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	<p>The environmental attributes associated with the grid connection corridor of the 132kV underground cabling, switching station and access road points are included within this chapter. The environmental attributes that are assessed within this chapter include the following:</p> <ul style="list-style-type: none"> » The regional location of the 132kV transmission infrastructure is described in section 5.2. » The climatic conditions of Alton, Richards Bay and the surrounding area are included in section 5.3. » Biophysical characteristics (including climatic conditions, geology, soil and land types, hydrology, ecology and avifauna) of the corridor and the surrounding area are included in section 5.3. » Heritage resources, including the archaeology and palaeontology associated with the proposed underground cabling routes, access road points and switching station and the surrounding area are described in section 5.4. » The visual quality of the affected area surrounding the assessed corridors is described in section 5.5. » Social characteristics of the surrounding area and the grid connection corridor are described in section 5.6. » A description of the site accessibility of the corridor route alternatives and the surrounding area is included in section 5.7.

A more detailed description of each aspect of the affected environment is included in the specialist reports contained within **Appendix D – H**

5.2 Regional Setting

The KwaZulu-Natal Province is situated in the north-eastern portion of South Africa. The province shares boundaries with the Mpumalanga, Free State and Eastern Cape Provinces. The proposed development falls under the jurisdiction of the City of uMhlathuze Local Municipality and within the greater King Cetshwayo District Municipality in the KwaZulu-Natal Province. The City of uMhlathuze Local Municipality is situated on the coast of the Indian Ocean in KwaZulu-Natal, South Africa. It is one of five local municipalities that form part of the King Cetshwayo District Municipality. In 2002 Richards Bay and Empangeni, as well as the surrounding rural and tribal areas merged to form the "City of uMhlathuze" covering an area of approximately 800 km² and supporting approximately 334 459 people.

The proposed cable routes commence within the Alton Industrial area and proceed south. The identified alternatives start at the proposed 450MW RMPP site (Remainder of Erf 1854 and Portion 4 of Erf 1854) and terminate at the existing unutilised Bayside power lines at the proposed 132kV switching station site located on Remainder of Erf 5333. The proposed underground cable routing traverses have been aligned as far as practically possible to be along existing gas pipelines, road servitudes, railway lines and ravines. .

The zoning of the proposed underground cabling routes site and switching station site is 'general industrial'. The broader area is characterised by intense past land-use modifications from agriculture, mining, tourism, residential, recreational and industrial development activities. The greater study area is within the Alton Industrial area and is bordered by mixed-use industrial developments. Railway lines are located close to the terminus of the underground cables adding to the industrial nature of the area. Natural features also occur within the surrounding areas, including Lake Nsezi, located approximately 3km north-west of the project site. Agricultural activities, mainly relating to plantations are located ~2km of the project site.

All four (4) of the route alternatives proposed for the underground cabling cross the regional road (R34), which is also known as the John Ross Highway. The majority of the length of the alternative cable routes will be accessed via existing road servitudes. It is intended that there will be up to six (6) access road points along the preferred underground cable route that will consist of 4m wide unsurfaced roads/tracks for the construction phase of the project.

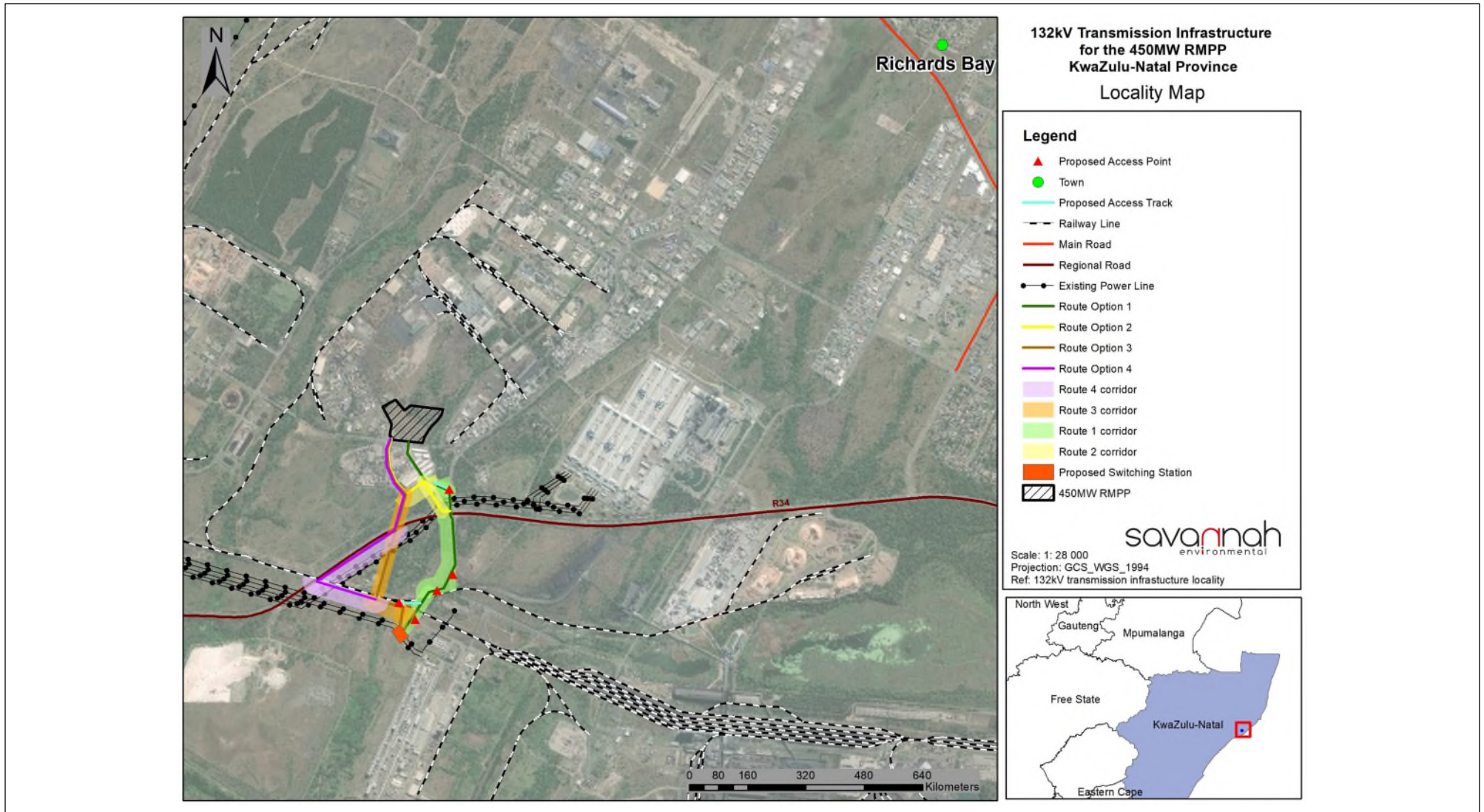


Figure 5.1: A regional locality map indicating the location of the proposed 132kV corridor alternatives, switching station and access road points for the project and its regional context.

5.3. Climatic Conditions

The Richards Bay area is characterised by a subtropical climate. Summers are warm and wet, and winters are mild, moist to dry and do not experience frost conditions. The average annual rainfall of the area is 1128mm, with an average annual temperature of 21.5 °C. Day time temperatures peak from January to March at 29°C. Day time highs in winter from June to August are 23°C, with minimum temperatures of 12°C. Long-term climatic data has been summarised in **Figure 5.1** below.

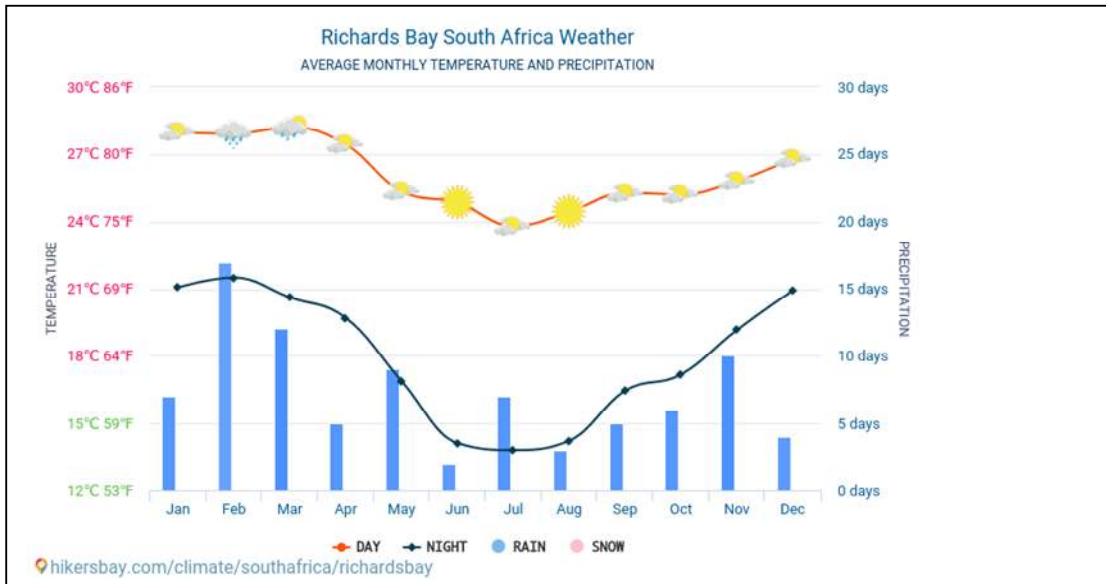


Figure 5.1: Average minimum and maximum temperatures and monthly rainfall for Richards Bay (<https://cdn.hikb.at/charts/meteo-average-weather/richardsbay-meteo-average-weather.png>).

5.4. Biophysical Characteristics of the Study Area

5.4.1 Topography

The topography of the study area is described as plains of the eastern coastal foreland. The region has an even slope with elevation ranging from sea level at the Indian Ocean to approximately 130m above sea level to the north-west. The flat topography is dominated by wetlands and water bodies (e.g. the Nsezi and Mzingazi lakes, the harbour bay and its numerous channels) while the Mhlathuze River meanders to the south of the study area. The route is considered to be relatively flat with maximum and minimum elevations of between 32 and 18m above sea level from the 450MW RMPP site to the proposed switching station site.

5.4.2 Geology, Soils and Agricultural Potential

The larger study area is underlain by unconsolidated, Quaternary-age sediments. These redistributed cover sands are underlain by recent clays and sands of the upper Port Durnford Formation of the Maputaland Group. The Port Durnford Formation rests unconformably on either Cretaceous sediments or partially calcified / lithified sediments of the Uloa or Umkwelane Formations. It comprises a succession of carbonaceous muds and sands, with basal sandstones, black muds and lignite in evidence. Nearer the surface however, white and orange mottled clayey sands are overlain by younger dune sands, which cover much of the coastal plain.

Soil parent materials have been identified by reference to the Council for GeoScience geological survey map no. 2732, St Lucia. Although these maps are on a scale of 1: 250 000 they do provide useful indicators of the quality of soils that are likely to be encountered within the study site. The soil parent material is described as "Yellowish redistributed sand" code Qs.

Two Soil Forms were found along the alternative corridor routes the Fernwood and Hutton Clansthal Soil Forms Fernwood which cannot be categorised as arable agricultural land due to their inherent physical limitations. Fernwood soil is referred to as Grey Recent Sands, the Fernwood Soil Form parentage is fine sandy sediments deposited along the KZN coast and further northwards at the time of the great flood, 10 000 years ago. It is far too young to have developed any structure or nutritional value. It is highly susceptible to both wind and sand erosion. The Hutton Clansthal Soil form is a geologically immature soil which has devolved from sand dunes formed along our coast 10 million years ago when the sea level was a lot higher. It is also unstructured and has a high erosion risk. It has developed a small clay fraction and a limited nutrient.

28 soil profiles were examined, all consisted of non-arable land (LCCVI) and Agricultural Sensitivity Theme 1 to 5, probably 2 to 3 and 3 to 4.

5.4.3 Hydrology

The study area falls within the Pongola to Mtamvuna Water Management Area (WMA, GN 1056 in GG 40279 of 16 September 2016). This WMA includes major rivers such as the Pongola, Mhlathuze, Mkuze, Thukela, Mvoti and Umgeni Rivers amongst various others, within the quaternary catchment W12F. The major water resources of the uMhlathuze Catchment is uMhlathuze and Nseleni rivers, Goedertrouw dam and several irrigation dams and impoundments, several lakes and pans (such as Lake Cubhu, Mzingazi Lake, Nhlabane Lake and Nsezi Lake), riparian areas along most of the riverine habitat, hillslope seepages, valley bottom wetland systems and Mhlathuze River Floodplain and Estuary. The most important wetland systems within the Umhlathuze Catchment are Mzingazi, Qhubu and Nhlabane Lake (as it supplies water to Richards Bay and surroundings), Mhlathuze Floodplain, Mhlathuze Estuary and its associated valley bottom wetland feeding into it, and Mountainous seeps in the upper reaches of Mhlathuze River (DWA, 2014).

The National spatial data (November, 2017) identifies several non-perennial and perennial rivers, lakes, vleis and open reservoirs in Alton, of which two non-perennial rivers run directly through the proposed alternative corridor routes (Figure 5.6). Historically, stormwater drainage was constructed in some of these surrounding river channels to mitigate flooding and enable development in the Alton industrial area. Although some of these river systems have historically been artificially channelled, the channel bed is earthen and therefore now functions, as a river and associated wetland unit.

5.4.4 Ecological Profile

According to the National Vegetation Map of SANBI (2018) and Ezemvelo KZN Wildlife (EKZNW, 2011), the proposed project is located within the Maputaland Wooded Grassland, the Maputaland Coastal Belt, and the Northern Coastal Forest vegetation types. The databases identify *Ficus trichopoda* swamp forest approximately 200 m to the west, outside of the proposed development area. According to EKZNW (2011) all three vegetation types are classified as endangered, while according to SANBI (2018) the Maputaland Wooded Grassland and the Maputaland Coastal Belt of the Indian Ocean Coastal Belt Biome is classified respectively as endangered and vulnerable while the Northern Coastal Forest of the Forest Biome is classified

as Least Concern. According to the Ecosystem Threat Status of the National Biodiversity Assessment (NBA, SANBI 2018) the Maputaland Wooded Grassland and the Maputaland Coastal Belt is classified as Endangered while the Northern Coastal Forest is classified as Least Concern. It was determined that most of the impacted area was identified as grassland.

It was confirmed that the proposed transmission infrastructure corridors and termination site resembles that of Maputaland Coastal Grassland, with portions associated with the river channel resembling the Maputaland Wooded Grassland. No protected species characteristic of this grassland was found within the development footprint. This vegetation type within the development footprint is impacted by various anthropogenic activities, such as above-ground powerlines, cattle grazing, dumping and an existing Sasol gas pipeline corridor servitude.

i) Protected and other conservation areas

Protected areas considered include National Parks, Provincial Nature Reserves, Local Authority Nature reserves, Wildlife Management Areas, Private Nature Reserves, Important Bird Areas (IBA) Areas, Game Farms, Game Reserves, Nationally Protected Forest Patches and NPAES focus areas. The following protected areas are located within a 30 km radius of the project site (refer to **Figure 5.3**):

- » Richards Bay Nature Reserve and IBA located 4 km to the south
- » Enseleni Nature Reserve located 6 km to the north
- » Ngoye Nature Reserve and IBA located 23.3 km to the south west
- » Thukela NPAES focus area located 22.9 km to the west

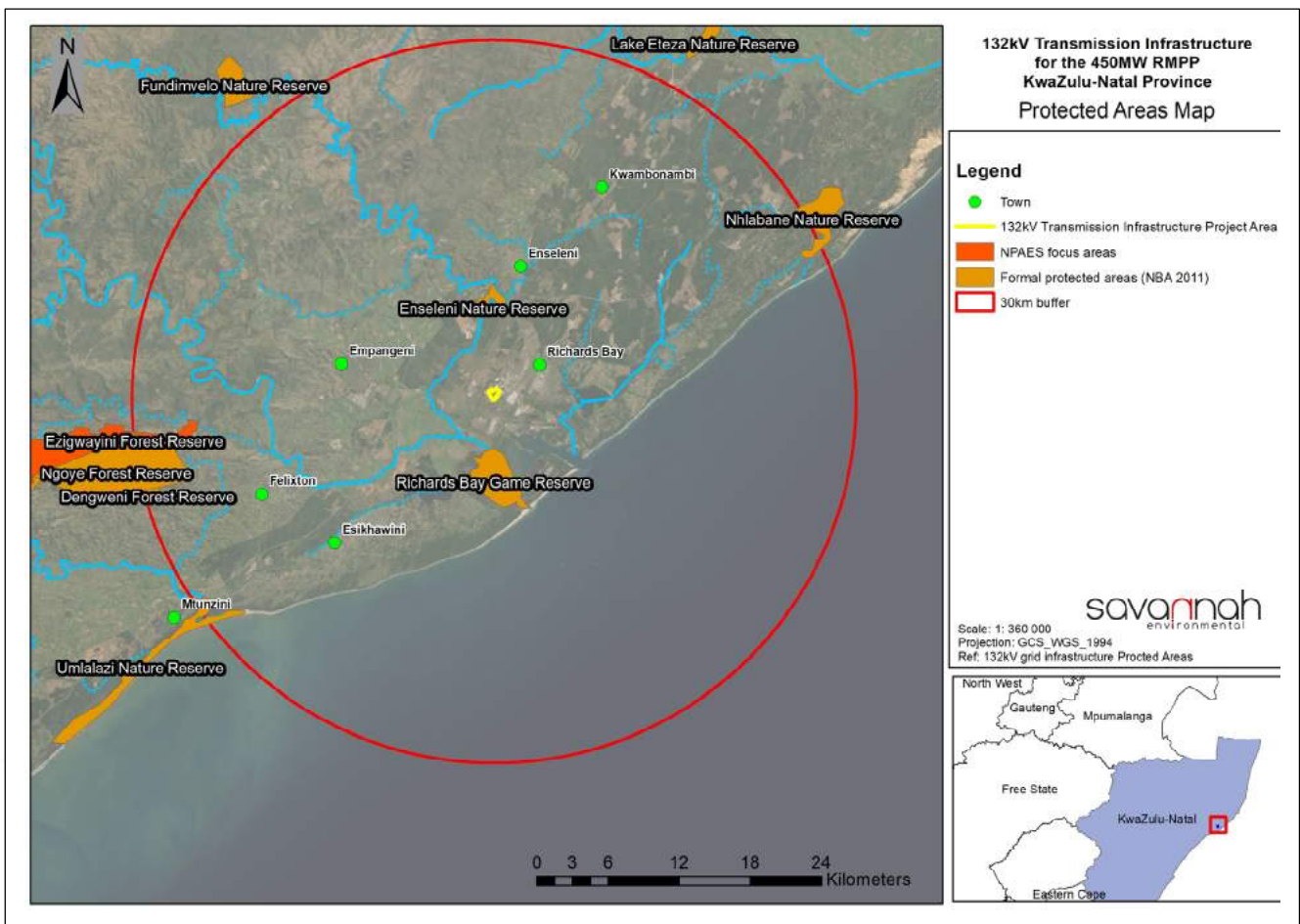


Figure 5.3: Protected and other conservation areas in relation to the project site

ii) Threatened Ecosystems

According to the Ecosystem Threat Status of the National Biodiversity Assessment (NBA, SANBI 2018) and EKZNW (2011) the Maputaland Wooded Grassland is classified as Endangered. Following ground truthing, the vegetation confirmed on the development site resembles that of Maputaland Wooded Grassland.

Potential plant species within the region include *Crinum stuhlmannii* in the *Helichrysum – Chrysanthemoides* coastal grasslands and *Alsophila dregei*, *Boophone disticha*, *Ficus trichopoda* and *Barringtonia racemosa* individuals in the *Phragmites – Typha* channelled valley bottom wetlands (as detailed below). No protected species were observed during the site visit, however searches for the potential species will be continued during follow-up site visits.

iii) Critical Biodiversity Areas

According to EKZNW (2016), the planning units (PU) identified in these CBA's represents the localities for one or more biodiversity feature for which conservation targets can be achieved. The distribution of the biodiversity features is not always applicable to the entire extent of the PU but is more often confined to a specific niche habitat e.g. a forest or wetland reflected as a portion of the PU. Generally CBAs are terrestrial (land) and aquatic (water) features (e.g. vleis, rivers and estuaries) in the landscape and/or indicates the potential for the occurrence of protected species that are critical for conserving biodiversity and maintaining ecosystem functioning in the long term. As seen by the pixelated blocks and inclusion of transformed industrial areas in Figure 5.4, these CBA areas are provincially mapped at a large scale. The site must be assessed for its potential to be rehabilitated and/or its role as part of a landscape corridor and the potential presence of protected species. Further, the proposed activity at the site must be investigated in terms of its potential impact on adjacent correctly classified CBA. Following ground truthing, no protected species were observed during the site visit, however searches for protected species will be conducted after the proposed route has been surveyed. Due to the linear nature of the proposed activities, impacts to this mapped critical biodiversity area is expected to be negligible.

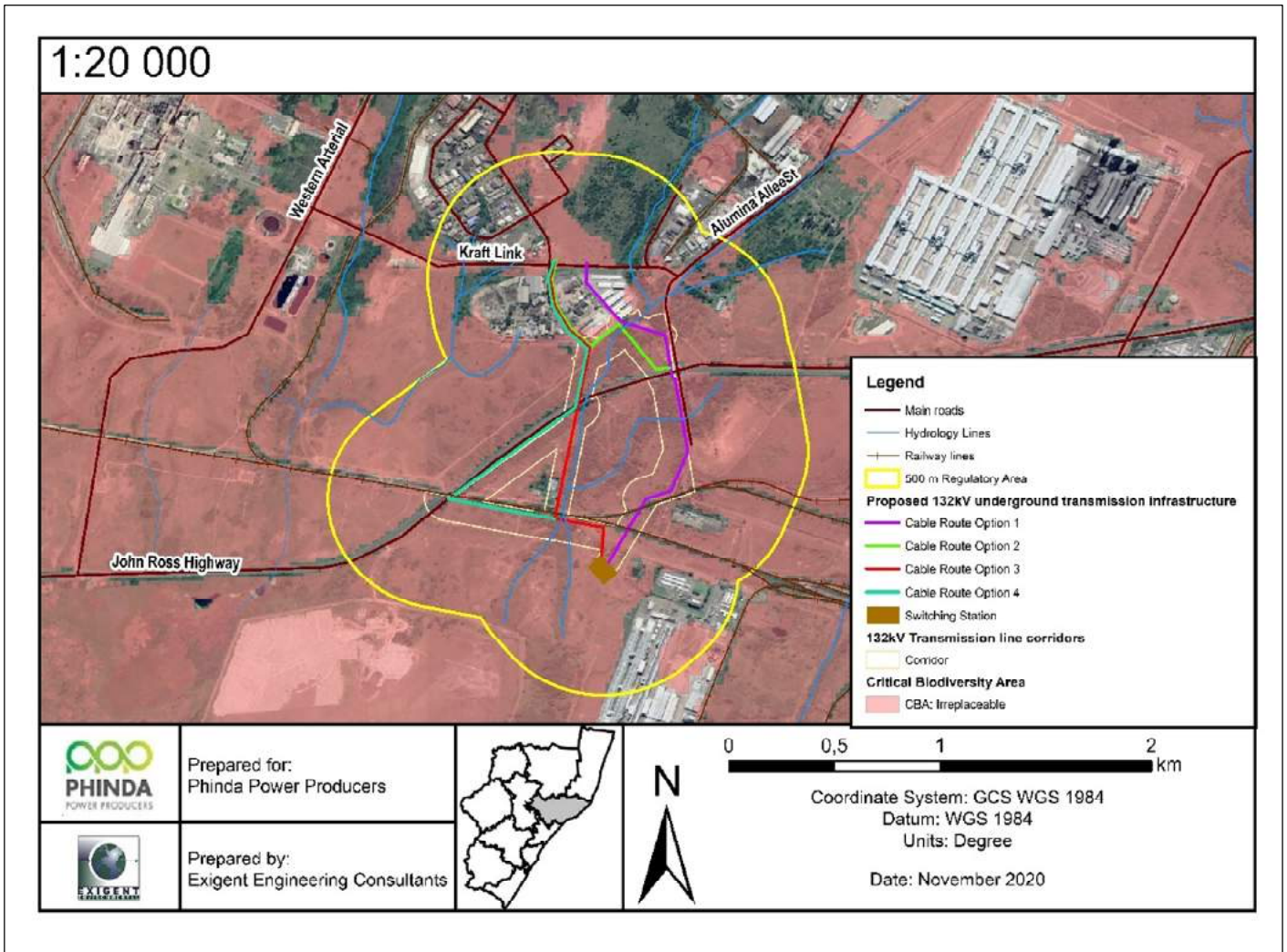


Figure 5.4: Critical Biodiversity Areas present in the study area

iv) **Vegetation of the Project Site**

The vegetation is broadly classified into four terrestrial vegetation communities - namely *Helichrysum - Chrysanthemoides* coastal grasslands, Closed coastal woodland, Eucalyptus plantations and Mixed broadleaved woodland - and three wetland vegetation communities - namely *Typha capensis - Cyperus papyrus* mixed marshland channelled valley bottom wetlands, *Phragmites-Typha* channelled valley bottom wetlands and *Imperata cylindrica* depression wetlands. Various sections of the proposed routes have been impacted by infill during the railway line construction or adjacent construction activities, or dumping. The area is also impacted by various footpaths, tracks, informal and more formal roads traversing all habitat types. The largest part of the infrastructure corridors traverse the *Helichrysum - Chrysanthemoides* coastal grasslands. It is dominated by shrubs such as *Helichrysum krausii* and *Chrysanthemoides monolifera* subspecies *rotundata*. Invaders such as *Psidium guajava*, *Cuscuta campestris*, *Chromolaena odorata* and *Lantana camara* were recorded in close proximity to and along disturbances such as dirt and railway tracks and road verges. Several *Crinum stuhlmannii* individuals, protected in terms of the KZN Nature Conservation Ordinance, were located in this vegetation community outside of the proposed development footprint.

None were recorded in the proposed infrastructure corridors or the switching state site; however searches for this species will be conducted after surveying of the preferred route.

A Closed coastal woodland vegetation community was identified south of the proposed LPG Storage Terminal and will therefore be directly impacted by the proposed transmission cable route options 1 and 2. This community's natural undergrowth vegetation is mostly replaced by an alien, invasive and ruderal species within the corridor alternatives. Species such as *Brachylaena discolor*, *Bridelia micrantha*, *Salacia kraussii*, *Phoenix reclinata*, *Rhus natalensis*, *Trema orientalis* and *Ziziphus mucronata* were recorded. No fauna or flora species protected in terms of the KZN Ordinance were confirmed within this vegetation type along the proposed infrastructure corridors and switching station site. The majority of the proposed routes run within or adjacent to existing developed rail or road corridors.

Figure 5.5 provides a map of the associated vegetation types located within the project site.

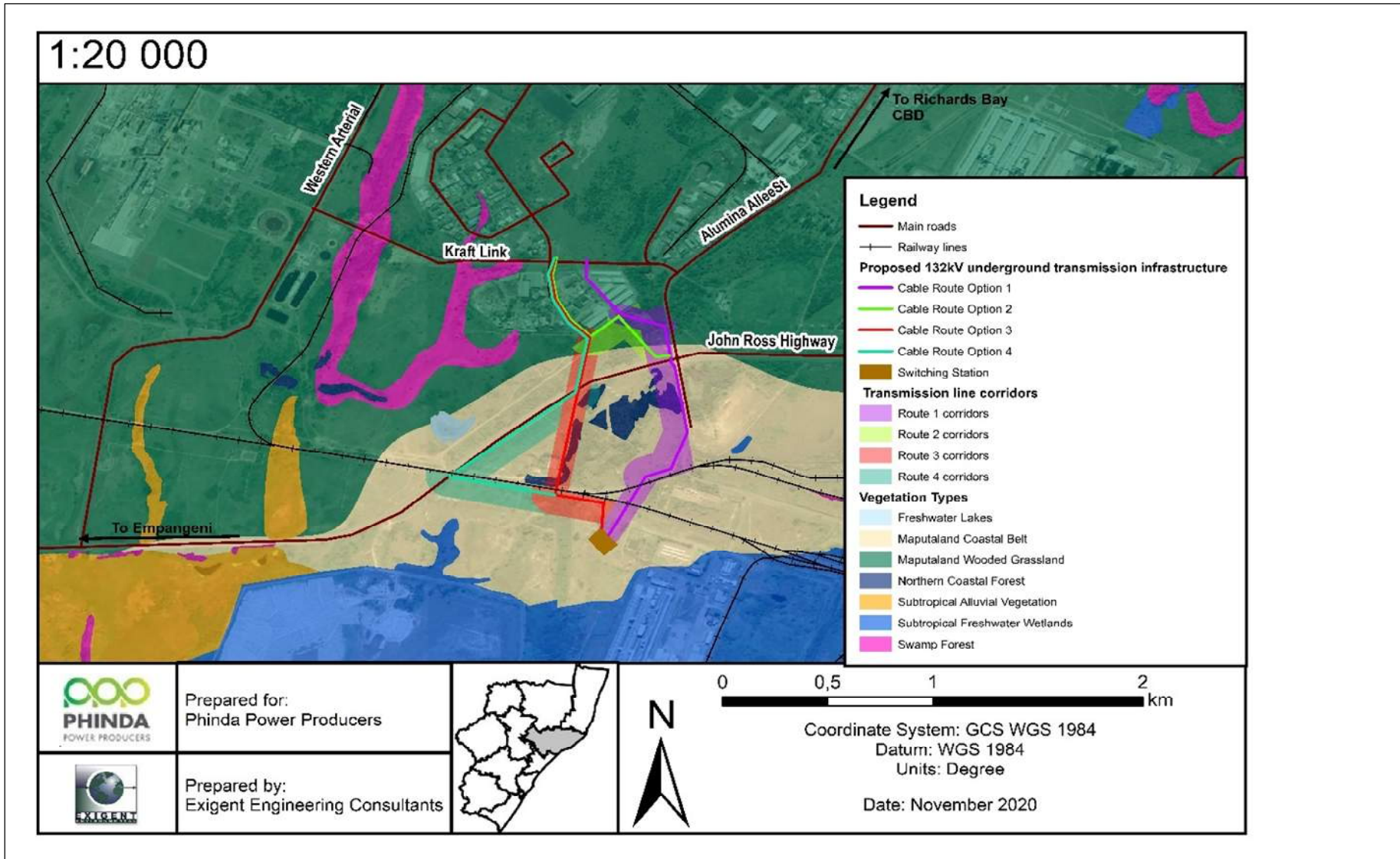


Figure 5.5: Vegetation map of the proposed infrastructure corridors and switching station site (EKZNW, 2011).

Flora species of Conservation Concern

Although the project site is in poor ecological condition, some natural vegetation is still present and the presence of Red Listed/Protected flora species is still possible. Species of special concern could potentially occur on the proposed infrastructure routes, such as the plant species, *Crinum stuhlmannii*, confirmed in the surrounding *Helichrysum – Chrysanthemoides* coastal grasslands vegetation community. No protected species were observed within the development footprint during the site visit; however searches for protected species will be continued during site surveys during the final design of the project.

Invasive Plant Species

Invasive alien plants (IAPs) are widely considered as a major threat to biodiversity, human livelihoods and economic development. A Closed coastal woodland vegetation community was identified south of the proposed LPG Storage Terminal for the 450MW RMPP and will therefore be directly impacted by the proposed transmission cable route options 1 and 2. This community's natural undergrowth vegetation is mostly replaced by an alien, invasive and ruderal species. The edges of this community comprise of dense thickets of *Chromolaena odorata* and *Lantana camara*. Other dominant alien species include *Melia azedarach*, *Solanum mauritianum* and *Ricinus communis*.

v) Sensitive Aquatic Ecosystems

The National spatial data (November, 2017) identifies several non-perennial and perennial rivers, lakes, vleis and open reservoirs in Alton of which two non-perennial river runs directly through the site (Figure 5.6). Historically, stormwater drainage was constructed in some of these surrounding river channels to mitigate flooding and enable development in the Alton industrial area. Three wetland units were identified within the NWA's 500 m regulated area namely, *Typha capensis - Cyperus papyrus* mixed marshland channelled valley bottom; *Phragmites-Typha* channelled valley bottom and *Imperata cylindrica* depression wetland.

The largest portion of the wetlands within the study area were classified as *Phragmites - Typha* channelled valley bottom wetlands. The *Phragmites - Typha* channelled valley bottom wetland is largely modified, and therefore a large change in ecosystem processes and loss of natural habitat and biota has occurred. Sections of this wetland have undergone changes due to encroachment of anthropogenic activities such as gabion baskets, tracks, dumping, clearing of road servitudes, infestation of alien and invasive species and subsistence farming within the active channels and along the banks. Typical species in the active channels includes *Colocasia esculenta* (amadumbe or also known as taro) and *Musa* species (banana trees), while the banks comprises of a range of fruit and vegetables. These include *Carica papaya* (papaya), *Cucurbita* species (a range of pumpkin), *Zea mays* (maize) and *Solanum tuberosum* (potatoes). Although *Phragmites australis* and *Typha capensis* are the dominant plant species, several pockets of swampy *Barringtonia racemosa* and *Ficus trichopoda* are imbedded in the channel with *Cyperus* also present in very dense stands.

One *Imperata cylindrica* depression wetland is located to the west and upstream of the proposed route option 4. This wetland will not be affected as none of the four main wetland drivers, viz. habitat, biota, flow and water quality will be impacted on by the proposed linear routes.

An existing Sasol gas pipeline servitude crosses the *Phragmites - Typha* channelled valley bottom wetland and the *Typha capensis - Cyperus papyrus* mixed marshland channelled valley bottom, and has caused a

change in the wetland vegetation type. This existing gas pipeline servitude has been exposed due to regular cutting of vegetation, impacting on the flow and leading to the change in species composition and functionality.

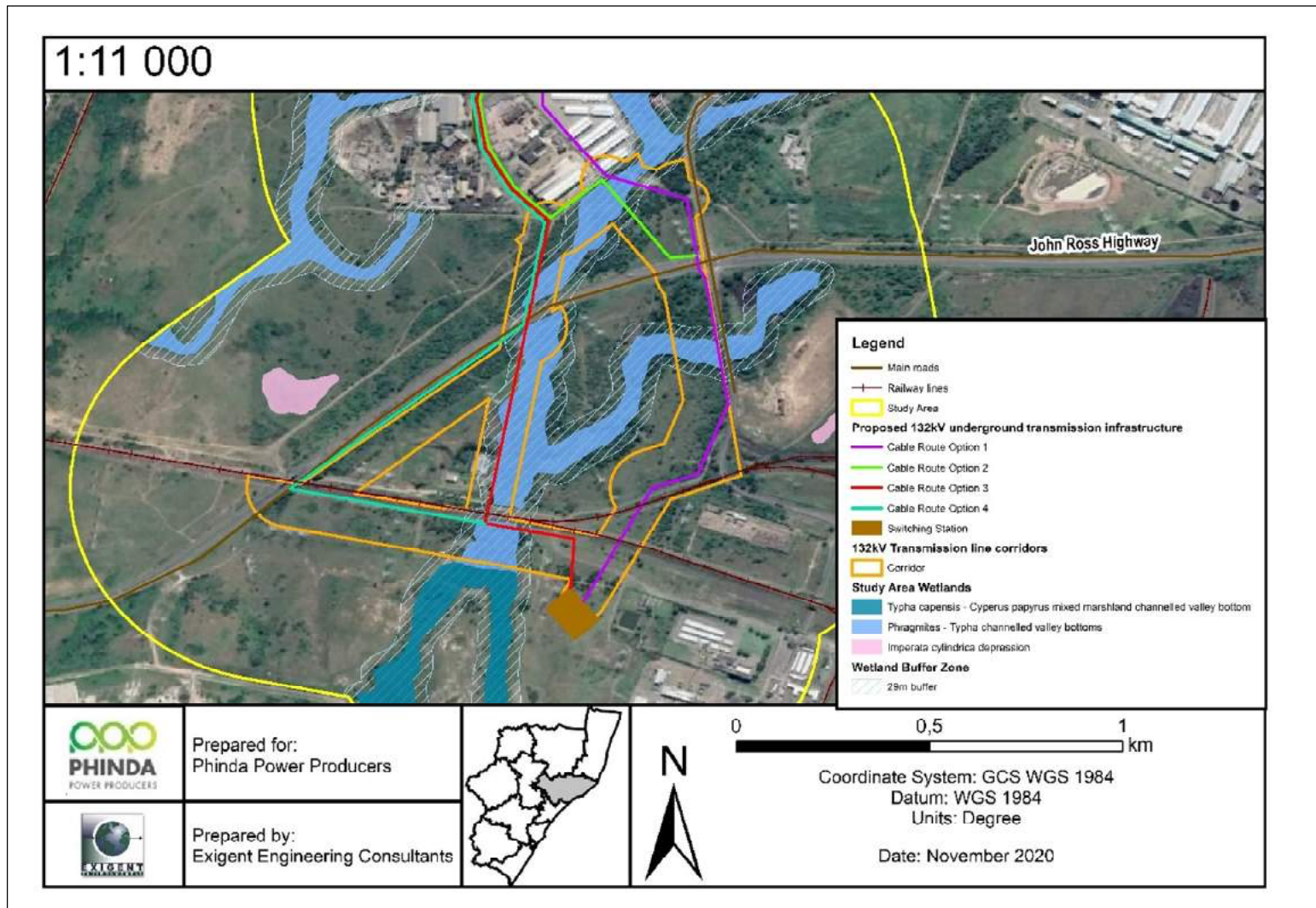
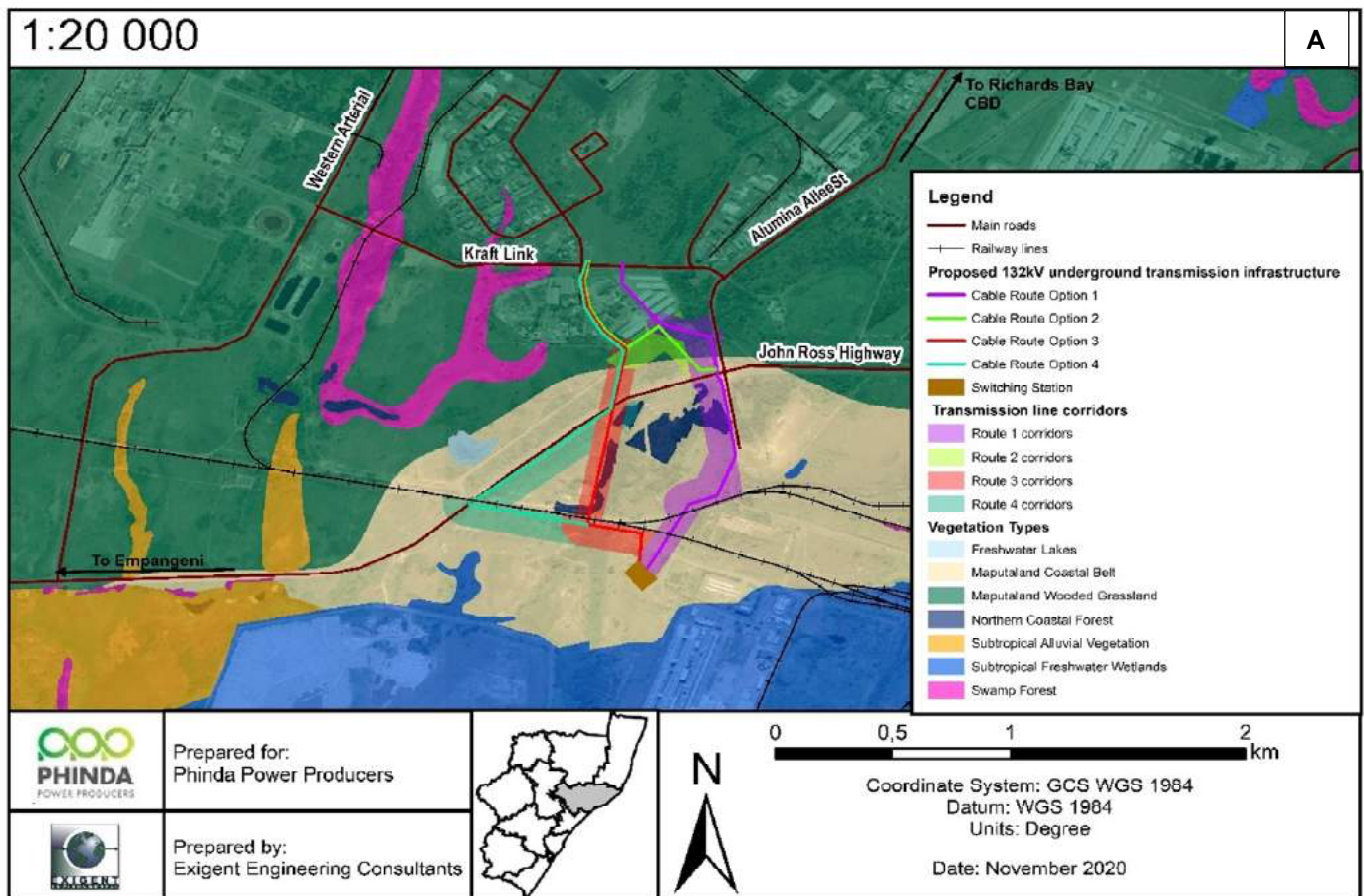


Figure 5.6 The extent of the wetland areas and buffers in relation to the proposed 132kV route options

vi) Provincial and District Level conservation Priorities

The proposed project site includes areas designated as a Critical Biodiversity Area (CBA Irreplaceable). CBA Irreplaceable Areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. (https://conservationcorridor.org/cpb/Ezemvelo_KZN_Wildlife_2015_Zululand.pdf). This rating is due to threatened vegetation types, i.e. the Maputaland Coastal Grassland and *Ficus trichopoda* Swamp Forest. Refer to **Figure 5.7 (A)**. Maputaland Coastal grassland is made up of *Helichrysum – Chrysanthemoides*. No protected species characteristic of this vegetation type were observed during the site visit, however searches for protected species should be conducted after surveying the preferred route.

The Biodiversity Sector Plan for the area has not been updated with the municipal ESMP, which is undertaken on a more detailed site-specific basis. While there is a great deal of information on conservation priorities at a provincial level, it is recognised that this is undertaken at a provincial scale and that there is a need to ensure that local biodiversity priorities are identified and provincial scale information verified.



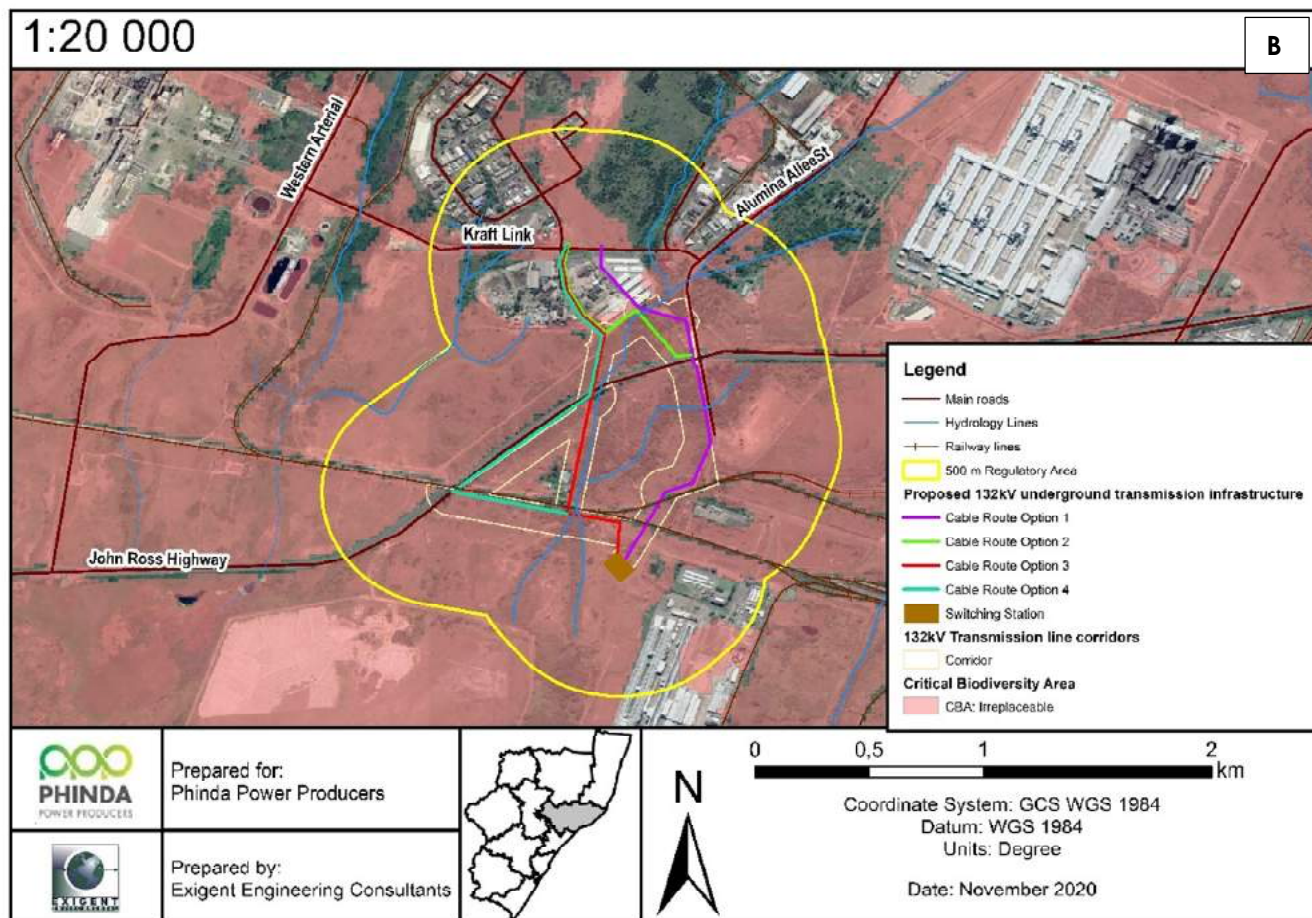


Figure 5.7: Critical Biodiversity Areas located within the project site.

- » A – Threatened Vegetation types (SANBI, 2018).
- » B – CBA: Irreplaceable area (KZNBSPP, 2014).

vii) uMhlatuze Environmental Services Management Plan (ESMP)

The uMhlatuze Environmental Services Management Plan (ESMP) provides the municipality with a clear understanding of activities that need to be undertaken to protect and enhance the supply of environmental services in the area. Based on the final 2016/2017 uMhlatuze Spatial Development Framework (SDF), the two critical goals of the ESMP are:

- » ‘To define cohesive and functional spatial management units within the municipal area that need to be managed in order to optimise the delivery of environment services.’
- » ‘To develop management plans for each management unit that identify the management activities required to secure environmental services supply.’

The areas that provide environmental services to the City are spatially defined, and the following “Levels” of protection were determined:

Nature Reserves (Level 1): These are areas of high biodiversity and environmental significance that require a high level of legal protection. Included are unique habitats or areas that are considered important at International, National or Provincial level; estuaries, lakes, major wetlands, natural forests, coastal buffers and critically endangered habitats that are protected in terms of international or national legislation and/or

treaties. It is recommended that these areas be proclaimed as nature reserves in terms of relevant legislation such as the National Environmental Management Protected Areas Act.

Conservation Zone (Level 2): Areas of biodiversity / environmental significance, which are not viable for proclamation as nature reserves, but that require some form of legal protection. Included are unique or regionally important natural habitats; wetland and forest areas that are protected in terms of national legislation; and all areas that fall within the 1:100-year flood line. No transformation of the natural assets or the development of land for purposes other than conservation should be permitted in this zone. Sustainable use of renewable resources is permitted.

Open Space Linkage Zone (Level 3): Included in the open space linkage zone are areas that provide a natural buffer for Level 1 and 2 Zones, areas that provide a natural link between Level 1 and 2 Zones and areas that supply, or ensure the supply of, significant environmental services. Transformation of natural assets and the development of land in these zones should only be permitted under controlled conditions.

Development Zone (Level 4): Includes all areas that are not included in Level 1, 2 and 3 zones. Areas in this zone are either already developed or transformed and contain land and natural assets that are not critical for environmental service supply. However, it is recognised that the development of these zones can impact on environmental services supply. As such, they should be developed in a manner that supports, or at least does not adversely impact on, the sustainability of environmental service supply in Level 1, 2 and 3 zones.

The proposed alignment of alternative cable routes remain mostly within the municipal development zone (Level 4). Routes 3 and 4 extend briefly into the ESMP Conservation zone (Level 2) south of the railway line where the proposed transmission infrastructure reaches the Bayside switching station. Route options 1 and 2 intersect the ESMP at two river crossings and the buffer linkage (Level 2 and 3) adjacent to the John Ross Highway, and briefly extend into the conservation zone (Level 2) at the location of the proposed switching station.

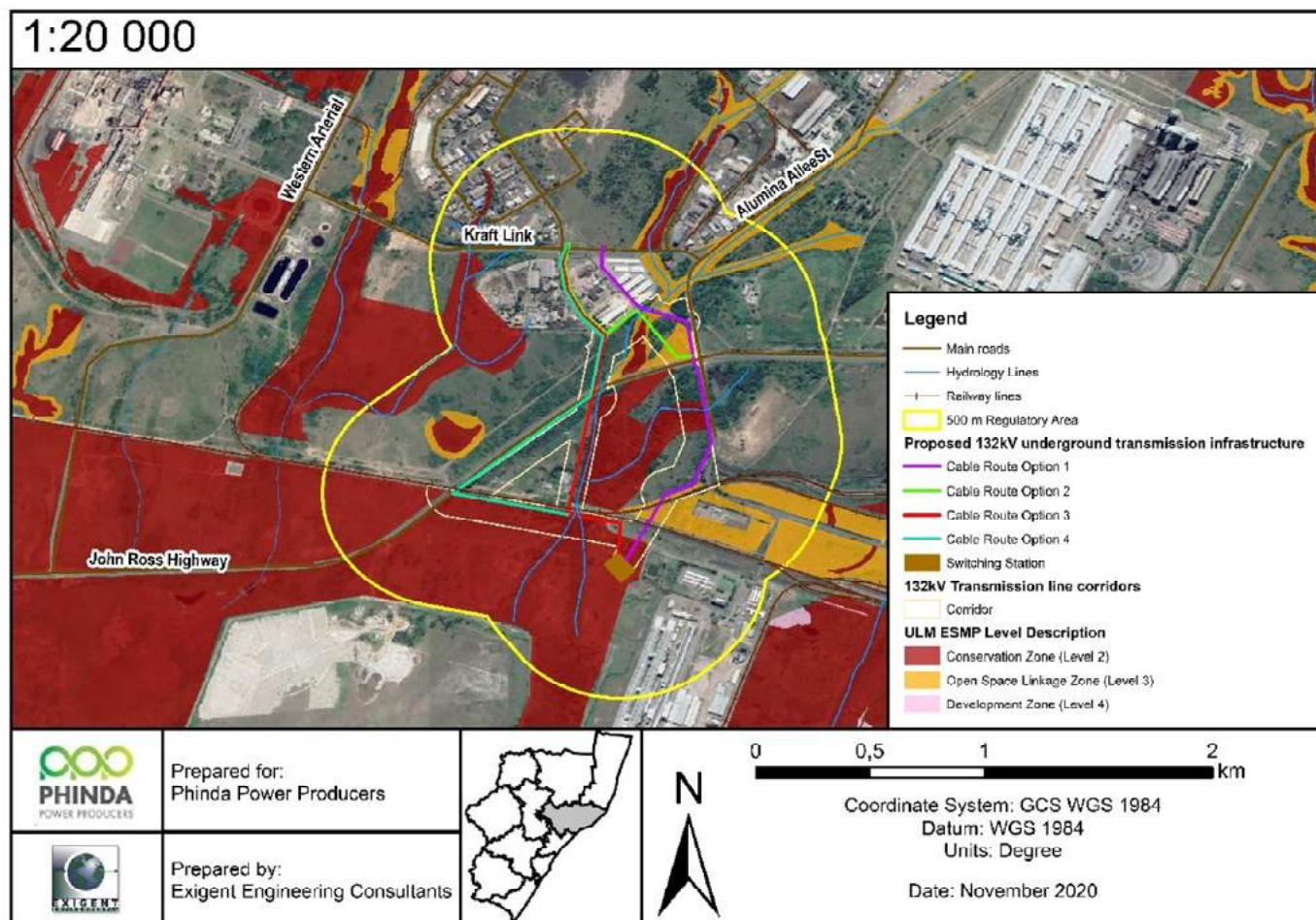


Figure 5.8. ESMP conservation zones and open space linkages associated located outside the project footprint.

viii) Faunal Communities

Mammals

The project site offers three major mammal habitats, i.e. terrestrial, arboreal and wetland/aquatic. The terrestrial habitat is the most abundant and provides habitat to a vast variety of small mammals such as rodents, shrews, mongooses etc. At present, large mammals are only expected in protected and privately owned reserves and are therefore generally excluded in mammal assessments for urban developments. Arboreal habitat is represented by trees, often used by bats, while shrews occasionally find refuge in vegetation associated with water bodies of aquatic habitats. Approximately 48 species have the potential to use the development site and its surrounding areas.

The majority of the species of the resident diversity are common and widespread, all with wide habitat tolerances. The reason for their survival success lies predominantly in their remarkable reproductive success and wide habitat tolerance.

Table 5.1 lists fifteen (14) species previously observed in the Degree Grid 2832CC and recorded on the MammalMap.

Table 5.1: Mammal species previously recorded in Degree Grid 2832CC (MammalMAP.)

Group name	Group Species	Species Name	Observation
Monkey	Vervet Monkey	<i>Chlorocebus pygerythrus</i>	MammalMap (2012, 2013, 2015, 2016, 2018, 2019)
Leopard	Leopard	<i>Panthera pardus</i>	MammalMap (2016)
Hippopotamus	Common Hippopotamus	<i>Hippopotamus amphibius</i>	MammalMap (2016)
Otter	African Clawless Otter	<i>Aonyx capensis</i>	MammalMap (2016)
Mongoose	Marsh Mongoose	<i>Atilax paludinosus</i>	MammalMap (2015, 2018)
Mongoose	Slender Mongoose	<i>Herpestes sanguineus</i>	MammalMap (2017)
Mongoose	Banded Mongoose	<i>Mungos mungo</i>	MammalMap (2015, 2016, 2017, 2018, 2019)
Mouse	Natal Multimammate mouse	<i>Mastomys natalensis</i>	MammalMap (2016) Phragmites – Typha channelled valley bottom wetland
Mouse	South Africa pouched mouse	<i>Saccostomus campestris</i>	MammalMap (2016) Phragmites – Typha channelled valley bottom wetland
Mouse	South African pygmy mouse	<i>Mus (Nannomys) minutoides</i>	MammalMap (2003)
Shrew	Reddish-grey musk shrew	<i>Crocidura cyanea</i>	MammalMap (2016)
Rat	Greater cane rat	<i>Thryonomys swinderianus</i>	MammalMap (2011)
Genet	Cape large spotted genet	<i>Genetta tigrina</i>	MammalMap (2016)
Bat	Epauletted fruit bats	<i>Epomophorus sp.</i>	MammalMap (2015)
Bat	Egyptian free-tailed bat	<i>Tadarida aegyptiaca</i>	Phragmites – Typha channelled valley bottom wetland

Herpetofauna

The project site offers three major reptile habitats, i.e. terrestrial, arboreal and fossorial. Several herpetofauna species have a distribution range in the area. 23 reptile species and 53 frog species were previously observed in the grid cell 2832CC and recorded on the South African Reptile Conservation Assessment (SARCA) and South African Frog Atlas databases respectively.

Approximately 23 reptile species and 53 frog species have the potential to use the development site and its surrounding areas. The majority of the reptile and frog species of the resident diversity are common and widespread. No reptiles or frogs were observed during the screening site visit. No Red Listed/Protected reptile species are expected to be present within the project site.

The Pickersgill's Reed Frog (*Hyperolius pickersgilli*) is endemic to a narrow and extremely fragmented range within 16 km of the KZN coastline. The International Union for Conservation of Nature (IUCN) lists them as Endangered (IUCN 2016), meaning that the frog is considered to be facing a very high risk of extinction in the wild (IUCN 2012). The Biodiversity Management Plan (BMP) for the *Hyperolius pickersgilli*, (GN.423 in GG.40883, 2017) identified wetlands within KZN that have confirmed frog populations or the probability of occurrence (50% probability and more). This frog requires perennial wetlands of very dense reedbeds in

coastal bushveld-grassland and an understudy of thick vegetation such as *Persicaria attenuata* (snakeroot), *Typha capensis* (bulrushes) and sedges on which to lay its eggs. Although this habitat is available in the general area, the proposed infrastructure corridors do not cross through habitat of this nature and therefore an impact to this species is unlikely.

Table 5.2. Herpetofaunal species confirmed in the general area following ground trutting.

Group name	Group Species	Species Name	Observation
Reptiles			
Skink	Eastern coastal skink	<i>Trachylepis depressa</i>	Phragmites – Typha channelled valley bottom wetland
Frogs			
Tree Frog	Brown-backed tree frog	<i>Leptopelis mossambi-cus</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Tree frog	Natal tree frog	<i>Leptopelis natalensis</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Rain frog	Plaintive Rain frog	<i>Breviceps verrucosus</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Toad	Raucous Toad	<i>Sclerophrys rangeri</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Reed frog	Tinker reed frog	<i>Hyperolius tuberilinguis</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Reed frog	Painted reed frog	<i>Hyperolius mar-moratus</i>	Vocalisation: Phragmites – Typha channelled valley bottom wetland
Grass frog	Plain grass frog	<i>Ptychadena anchietae</i>	Sighting: Phragmites – Typha channelled valley bot-tom wetland

Avifauna

Approximately 358 bird species have been recorded in pentads 2840_3200 and 2845_3200 of which 16 were observed during this study's site investigation (Table 5.3). The diversity is expected to be high due to the Richards Bay Game Reserve Important Bird Area (IBA) located approximately 3.4 km south of the development site. Given that most of the infrastructure is underground, the proposed development is however unlikely to impact on any individuals of the area.

Table 5.3: Bird species observed in the infrastructure corridors and switching station site

Group name	Group Species	Species Name	Observation
Barbet	Black-collared	<i>Lybius torquatus</i>	Typha capensis – Cyperus papyrus mixed marshland
Barbet	White-eared	<i>Stactolaema leucotis</i>	Typha capensis – Cyperus papyrus mixed marshland
Bishop	Southern Red	<i>Euplectes orix</i>	Typha capensis – Cyperus papyrus mixed marshland

Group name	Group Species	Species Name	Observation
Bulbul	Dark-capped	<i>Pycnonotus tricolor</i>	All habitats
Buzzard	Steppe	<i>Buteo vulpinus</i>	Helichrysum - Chrysanthemoides coastal grasslands
Crow	Pied	<i>Corvus albus</i>	Helichrysum - Chrysanthemoides coastal grasslands
Ibis	Hadedda	<i>Bostrychia hagedash</i>	Helichrysum - Chrysanthemoides coastal grasslands
Lark	Rufous-naped	<i>Mirafra africana</i>	Helichrysum - Chrysanthemoides coastal grasslands
Long-claw	Yellow throated	<i>Macronyx croceus</i>	Helichrysum - Chrysanthemoides coastal grasslands
Mousebird	Speckled	<i>Colius striatus</i>	Closed coastal woodland community
White-eye	Cape	<i>Zosterops capensis</i>	Typha capensis - Cyperus papyrus mixed marshland
Myna	Indian	<i>Acridotheres tristis</i>	All habitats
Turaco	Purple crested	<i>Gallirex porphyreolophus</i>	Closed coastal Woodland community
Camaropectera	Green-backed	<i>Camaropectera brachyura</i>	Closed coastal Woodland community
Drongo	Forktailed	<i>Dicrurus adsimilis</i>	All habitats
Goose	Spurwinged	<i>Plectropterus gambiensis</i>	Helichrysum - Chrysanthemoides coastal grasslands

5.5. Heritage features of the region

5.5.1. Heritage and archaeology

Anderson and Anderson (2009, 2010a-b, 2015, 2004 – 2018, 2005 - 2014) have undertaken several surveys in the general area where a variety of sites have been recorded, sampled and/or excavated. These cover the Early, Middle and Late Stone Ages, Early and Late Iron Ages, Historical Period and the 20th century. One site occurs within the study area: RBP03 (**Figure 5.9**). This is not a site per se, rather an occurrence of a few Middle Stone Age (MSA) and Later Stone Age (LSA) tools. These types of artefacts occur all over Richards Bay. The 1937 map indicates that the study area was mostly used as agricultural fields surrounded by wetlands (**Figure 5.9**). Seven settlements are noted to occur within 100m of the corridors. Of these seven, only three occur within the corridors (A1, A2 and A4). Human graves could be associated with these settlements. Corridors 1, 2 and 4 each have one settlement.

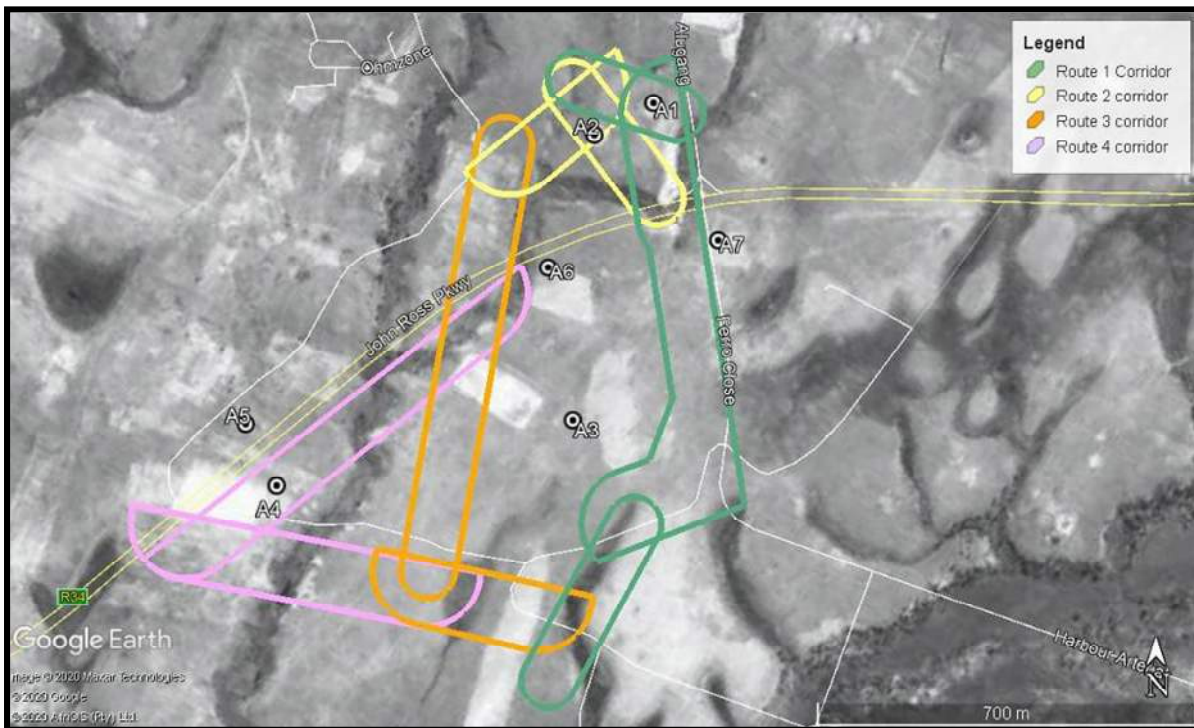


Figure 5.9: location of settlements in relation to the corridors in 1937

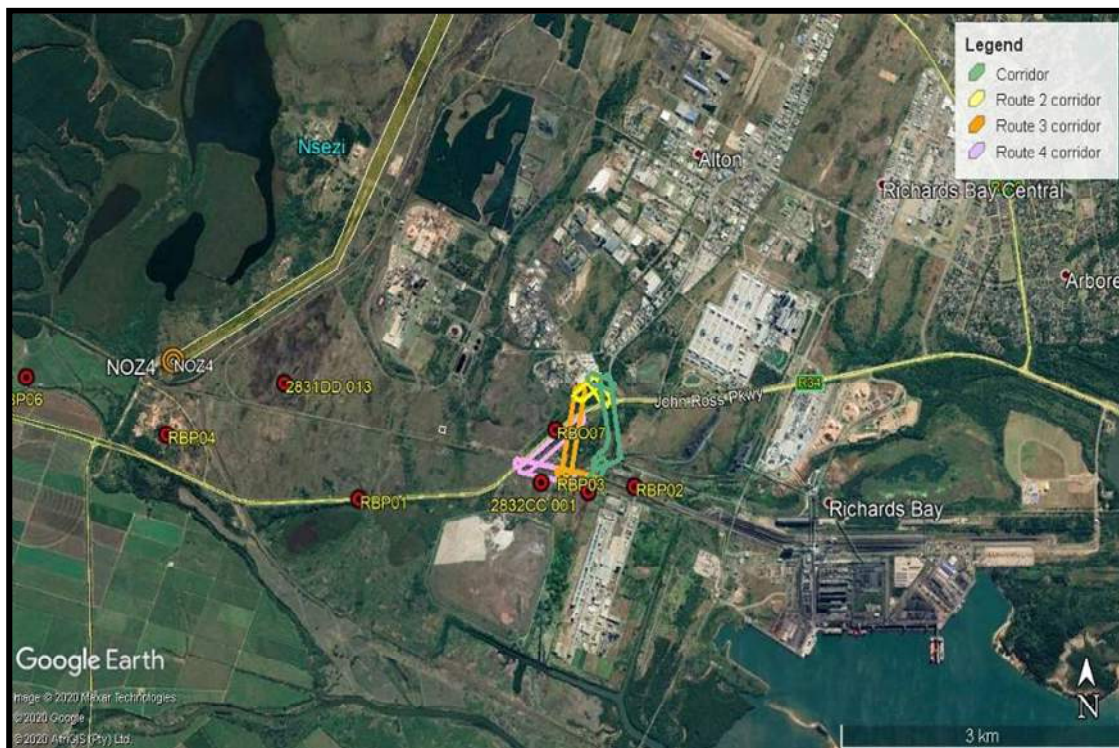


Figure 5.10. Location of known heritage sites in the general area

By 1983, there were no settlements in the general area (**Figure 5.11**), as this was after the forced removals of the Mandlazini people in the late 1960s (Griffiths 1996; Ntuli 2019).

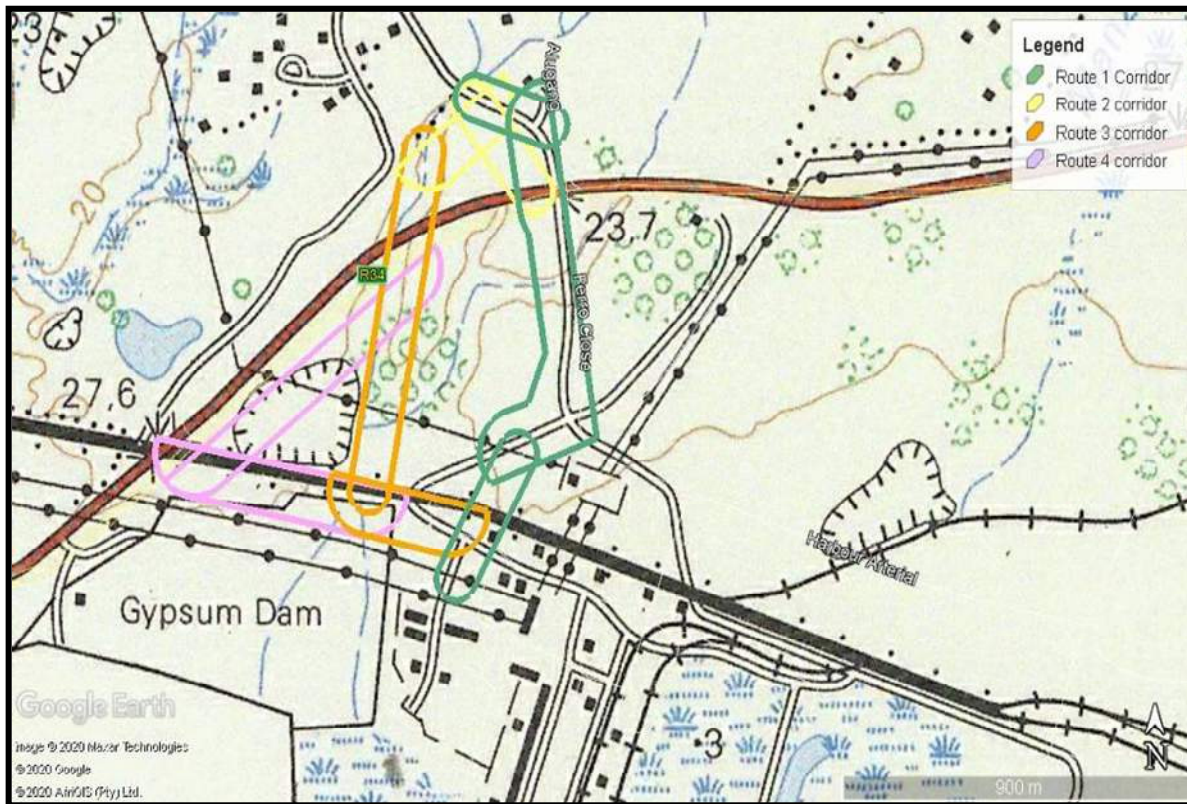


Figure 5.10: Location of settlements in relation to the corridors in 1983

5.5.2. Palaeontology (Fossils)

The study area is coded blue according to the SAHRIS palaeosensitivity map, indicating no or very low palaeontological value. However, this is slightly misleading as there are Cretaceous deposits 4m+ below the surface. These deposits are noticeable for their megalodon teeth, large ammonites, and other shell species. The general area is of low palaeontological sensitivity. However Cretaceous deposits could occur at 4m+ below the surface. It is unlikely that excavations will extend to these depths. Any excavations reaching these layers would need to inform KZNARI and have a qualified palaeontologist assess the samples. This would include an assessment of the deposits and possible sampling. The sampling of these deposits will not affect the construction phase of the project. No further palaeontological studies are required however a protocol for finds is required and provided.



Figure 5.11. Palaeontological sensitivity map (The study area is coded blue according to the SAHRIS palaeosensitivity map indicating no or very low, palaeontological value.)

5.3. Current Social and Economic Characteristics of the Project Site and Surrounding Areas

Between 2001 and 2011 the City of uMhlathuze Local Municipality (LM) experienced an annual population increase of 1.5%, with the population in 2011 reported to be 362 778 people. According to the 2016, Community Survey 2016 population within the uMhlathuze LM reported to be 410 465 persons, indicating a growth rate of 2.81% annually between 2011 and 2016, significantly higher than previously experienced.

For the period 1996 to 2016, the percentage of the total population within the City of uMhlathuze Local Municipality classified as 'potentially economically active' (ages of 15 and 64) has been consistently higher than the percentage of the population within this age group in the District Municipality and KZN province. Access to education within uMhlathuze Local Municipality improved between 2001 and 2011, with the percentage of the population over the age of 20 reported to have never received formal education dropping from 18% to 8%. While the same trend was experienced within the DM (a drop of 32% to 16% reporting no access) and province (a drop of 22% to 11% reporting no access), access was better within the LM.

Despite improvements between 2001 and 2016, unemployment within the uMhlathuze Local Municipality remains high at 30% however, this is below the level of unemployment reported for the King Cetshwayo DM 34% and KwaZulu-Natal 33.

The Gross Value Added (GVA) of City of uMhlathuze LM was valued to be R36 122 million in 2019 current prices as shown in the table below. This is equal to a GDP per capita of R102 152 which is significantly higher than the national and provincial economies with a GDP-R per capita of R75 205 and R61 174 respectively.

Access to electricity for lighting (the most basic level of access) within the uMhlathuze LM is better than access on a district and provincial level. Access to piped water improved significantly within the uMhlathuze

LM between 2001 and 2016, with 94% of all households reported to have access to piped water either within their household or within their yard.

From a social perspective, there are 8 zones considered to be affected by the proposed development and should be assessed i.e. Zone 1: Industry; Zone 2: Harbour; Zone 3: Business; Zone 4: Tourism; Zone 5: Agriculture; Zone 6: Natural; Zone 7: Forestry and Zone 8: Residential

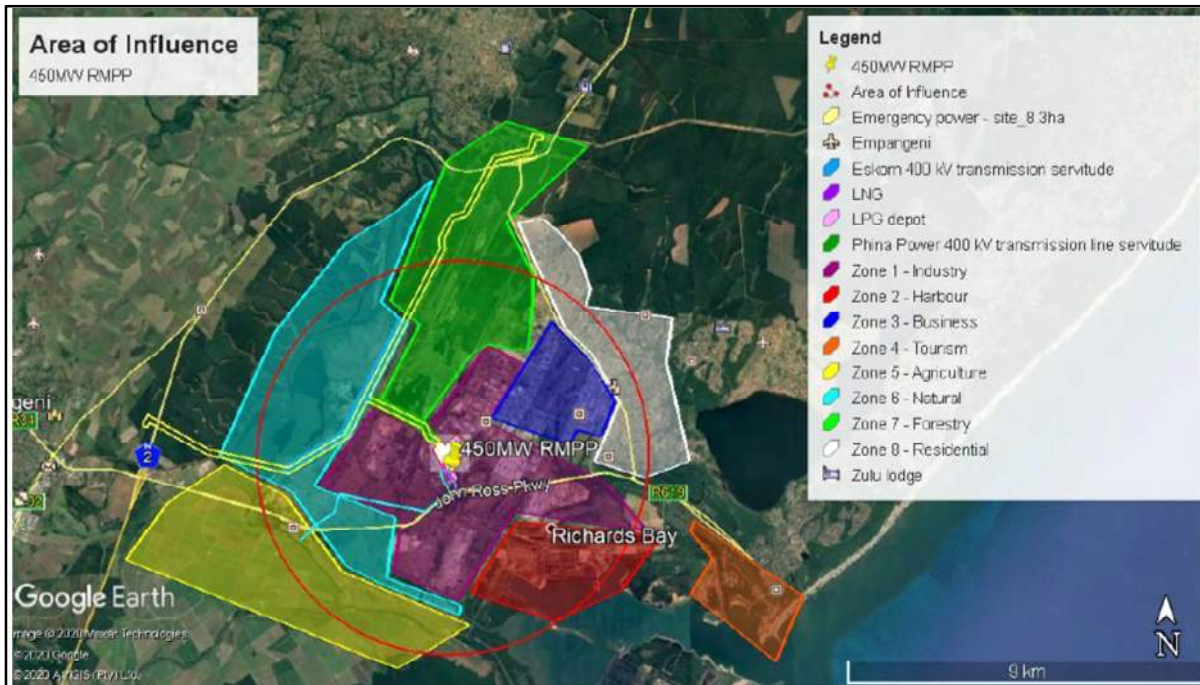


Figure 5.11. Area of Impact and the Zones of Influence

ZONES OF IMPACT	SHORT DESCRIPTION OF THE AREA OF IMPACT
# 1 INDUSTRY	<p>Consists mainly of industrial land uses, these include general industry as well as noxious industries. The R34 provides access to Richards Bay, the Harbour and divide the industrial area, harbour and the agricultural zones.</p> <p>Some of the industries include Mondi, Steelplate Solutions, South32 Aluminium, Lafarge, Grindrod Simunye, Macsteel, Bell Equipment and Foskor.</p>
# 2 HARBOUR	<p>This zone consists mainly of the harbour precinct and lies towards the south east of the site for the power plant.</p> <p>Some of the businesses and institutions residing within the harbour precinct include Transnet National Port Authority, Richards Bay Harbour, Fermentech, Vanguard, SGS South Africa, Kingston Park, Bayview and the Richards Bay Seafarers Club.</p>
# 3 BUSINESS	<p>Consists of the central business district (CBD) of Richards Bay and includes mainly retail, commercial and business uses.</p> <p>The zone includes the University of Zululand, City of uMhlathuze Municipality, Boardwalk Inkwazi Shopping Centre, Netcare The Bay Hospital, Lakeside Mall as well as numerous retail and commercial facilities.</p>
# 4 TOURISM	<p>Although this zone falls outside of the 5km area of immediate impact, it was decided that due to the strong strategic importance of establishing this zone as a tourism destination in Richards Bay it should not be excluded</p>

	<p>from this assessment. The area includes high-end residential housing, numerous restaurants, and the main beach area for Richards Bay.</p> <p>Some of the tourism facilities include Bon Hotel Waterfront, Richards Bay Small Crafts Harbour, Pelican Island, Meerensee Boat Club, Richards Bay Ski Boat Club, Richards Bay Skate Park, Alkantstrand as well as numerous restaurants and tourism accommodation and lodging facilities.</p>
# 5 AGRICULTURE	<p>Zone 5 consists mainly of sugarcane farming and lies to the south and south west of the project site. The sugarcane industry is a well-established industry that provides numerous jobs to the local communities and forms an integral part of the local economy.</p>
# 6 NATURAL	<p>Zone 6 consists of natural land and green conservation areas that act as a buffer zone between the industrial areas and the agriculture land. This zone lies between zone 1 and zone 5 to the south as well as to the west of zone 1.</p> <p>To the south it is mostly wetlands and to the western portion of the zone there is the Nseleni River and the Nsezi dam. The water treatment works are located within this zone as well as the Richards Bay Radio Flyers Club and the Bay Saddle Club.</p>
# 7 FORESTRY	<p>Zone 7 is the forestry areas to the north of the proposed power plant and zone 1.</p> <p>This zone also includes the Life Occupational Health Transnet Insezi Wagon Clinic and the Nsezi Transnet Engineering Depot.</p>
# 8 RESIDENTIAL	<p>Zone 8 consists mainly of the residential neighbourhoods to the north and north east of Richards Bay, these include Wild en Weide, Arboretum, Veld en Vlei and Brackenham.</p>

CHAPTER 6: ASSESSMENT OF POTENTIAL IMPACTS

This Chapter serves to assess the significance of the positive and negative environmental impacts (direct and indirect) expected to be associated with the development of the 132kV transmission infrastructure. This assessment has considered the construction of the underground cables with a capacity of up to 132kV and a servitude of 20m, within a 100m-50m wide and 2km long grid connection corridor, as well as a switching station with a footprint of 0.8ha (within the 80m wide Eskom power line servitude). The infrastructure associated with the underground cable development will include six (6), 4m wide unsurfaced access roads/tracks to be utilised along the underground cable route during the construction phase of the project.

The full extent of the underground cable route corridor alternatives were considered through the BA process by independent specialists and the EAP. On-site sensitivities were identified through the review of existing information, desk-top evaluations and field surveys. The corridor alternatives assessed for the development of the transmission infrastructure was proposed by the proponent through the consideration of the sensitive environmental features and areas identified prior to the commencement of the BA process. The corridors assessed within this BA were considered to be compatible for the development in terms of topography and the availability of existing servitudes to work within. The assessed corridors were therefore considered as the most feasible options for the development of the transmission infrastructure. The impact assessment considers the 4 alternative corridor routes in order to determine the preferred corridor route which will avoid environmentally sensitive areas as far as possible and be considered least intrusive on the environment and most suitable for development within the surrounding area.

The proposed development of the 132kV Transmission infrastructure will comprise the following phases:

- » *Pre-Construction and Construction* - will include pre-construction surveys; site preparation; establishment of the access roads/tracks; and other required infrastructure; excavation of cable route;; construction of switching station foundations involving excavations, the transportation of components/construction equipment to site, manoeuvring and operating vehicles for unloading and installation of equipment; and commissioning of new equipment and site rehabilitation. The construction phase for the proposed transmission infrastructure is expected to be up to 6 months.
- » *Operation* – will include the operation of the transmission infrastructure and the undertaking of maintenance activities on the underground cabling and switching station as and when required for the duration of its operational lifespan which is anticipated to be 20 years.
- » *Decommissioning* – the transmission infrastructure will be decommissioned at the end of the 450MW RMPP's economic life. At the end of the transmission infrastructure's lifespan, decommissioning would be in accordance with legislation in place at the time. Where the components cannot be reused or recycled, these will be disposed of in accordance with the regulatory requirements at the time of decommissioning.

Environmental impacts associated with the pre-construction, construction (and decommissioning) of the 132kV transmission infrastructure will include, amongst others loss of vegetation and terrestrial habitat; impacts on faunal species and species of special concern; habitat fragmentation; infestation of alien species; disturbance to wetland habitat; erosion; hydrological impacts and impacts on surface and groundwater due to chemical, oil and fuel spills. In addition, impacts anticipated for the operation phase of the underground 132kV cabling and switching station, among others include visual impacts and sense of place, economic and social upliftment, improvement in Energy Sector Generation, increased Government Revenue, employment creation and increased production.

» **6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report**

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(h)(v) the impacts and risks identified 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.	The impacts and risk associated with the development of the 132kV Transmission Infrastructure for the 450MW RMPP including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impact can be reversed and cause an irreplaceable loss of resources are included in 6.3.3, 6.4.3, 6.5.3, 6.6.3 and 6.7.3 .
3(h)(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	The positive and negative impacts associated with the development of the 132kV Transmission Infrastructure are included in sections 6.3.2, 6.4.2, 6.5.2, 6.6.2 , and 6.7.2 .
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The mitigation measures that can be applied to the impacts associated with the 132kV Transmission Infrastructure are included in sections in 6.3.3, 6.4.3, 6.5.3, 6.6.3 and 6.7.3 .
3(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	A description of all environmental impacts identified for the 132kV Transmission Infrastructure during the BA process, and the extent to which the impact significance can be reduced through the implementation of the recommended mitigation measures provided by the specialists are included in sections in 6.3.3, 6.4.3, 6.5.3, 6.6.3 and 6.7.3 .
3(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts, (ii) the nature, significance and consequences of the impact and risk, (iii) the extent and duration of the impact and risk, (iv) the probability of the impact and risk occurring, (v) the degree to which the impact and risk can be reversed, (vi) the degree to which the impact and risk may cause irreplaceable loss of resources and,	An assessment of each impact associated with the development of the 132kV Transmission Infrastructure, including the nature and significance, the extent and duration, the probability, the reversibility, and the potential loss of irreplaceable resources, as well as the degree to which the significance of the impacts can be mitigated are included in sections in 6.3.3, 6.4.3, 6.5.3, 6.6.3 and 6.7.3 .

Requirement	Relevant Section
(vii) the degree to which the impact and risk can be avoided, managed or mitigated.	
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Mitigation measures recommended by the various specialists for the reduction of the impact significance are included in sections 6.3.3, 6.4.3, 6.5.3, 6.6.3 and 6.7.3 .

» **6.2. Quantification of Areas of Disturbance within the grid connection corridor and switching station site**

Site-specific impacts associated with the construction and operation of the 132kV transmission infrastructure include the clearance of vegetation which will lead to the limited loss of current habitat; disturbance on fauna and a loss of habitat during the construction phase; a loss of wetland habitat systems due to the construction activities along the cable route; and an impact on the localised surface water quality. In order to quantitatively assess the impacts associated with the development the transmission infrastructure, it is necessary to consider the extent of the identified grid connection corridor (i.e. 50m-100m wide and 2km long) and the extent of the 20m servitude to be affected by the construction and operation activities of the proposed underground cable route.

6.3. Assessment of Impacts on Ecology (Fauna and Flora)

The construction and operation phase of the transmission infrastructure will have an impact on the ecological resources identified within the corridor. The proposed switching station will be located outside freshwater resources within the existing Eskom servitude. The resources include vegetation, protected and listed plant species, fauna, habitat and broad-scale ecological processes. A summary of the ecological impacts identified and the significance thereof for the proposed infrastructure are included below. Reference should be made to **Appendix D** for more detail.

6.3.1 Results of the Ecological Impact Assessment

Various sections of the proposed routes were impacted by infill, during the railway line construction or adjacent construction activities, or dumping. The proposed alignment of cable route options 3 and 4 remain mostly within the municipal development zone (Level 4). These two options extend briefly into the ESMP Conservation zone (Level 2) south of the railway line where the proposed transmission infrastructure corridors enter the Bayside switching station. The proposed alignment of cable route options 1 and 2 cross conservation (Level 2) and buffer/linkage zones (Level 3) at two river crossings and the buffer linkage (Level 3) corridor adjacent to the John Ross Highway, extending briefly into the conservation zone (Level 2) at the location of the proposed switching station. Several *Crinum stuhlmannii* individuals, protected in terms of the KZN Nature Conservation Ordinance, were located in this vegetation community outside of the proposed development footprint. None were recorded in the proposed infrastructure corridors or the PPP Bayside switching station site. A Closed coastal woodland vegetation community was identified south of the proposed LPG Storage Terminal and will therefore be directly impacted by the proposed transmission cable route options 1 and 2. This community's natural undergrowth vegetation is mostly replaced by alien, invasive and ruderal species. A small, isolated patch of woodland is located south of the railway line within the 132kV underground transmission route option 4 alignment.

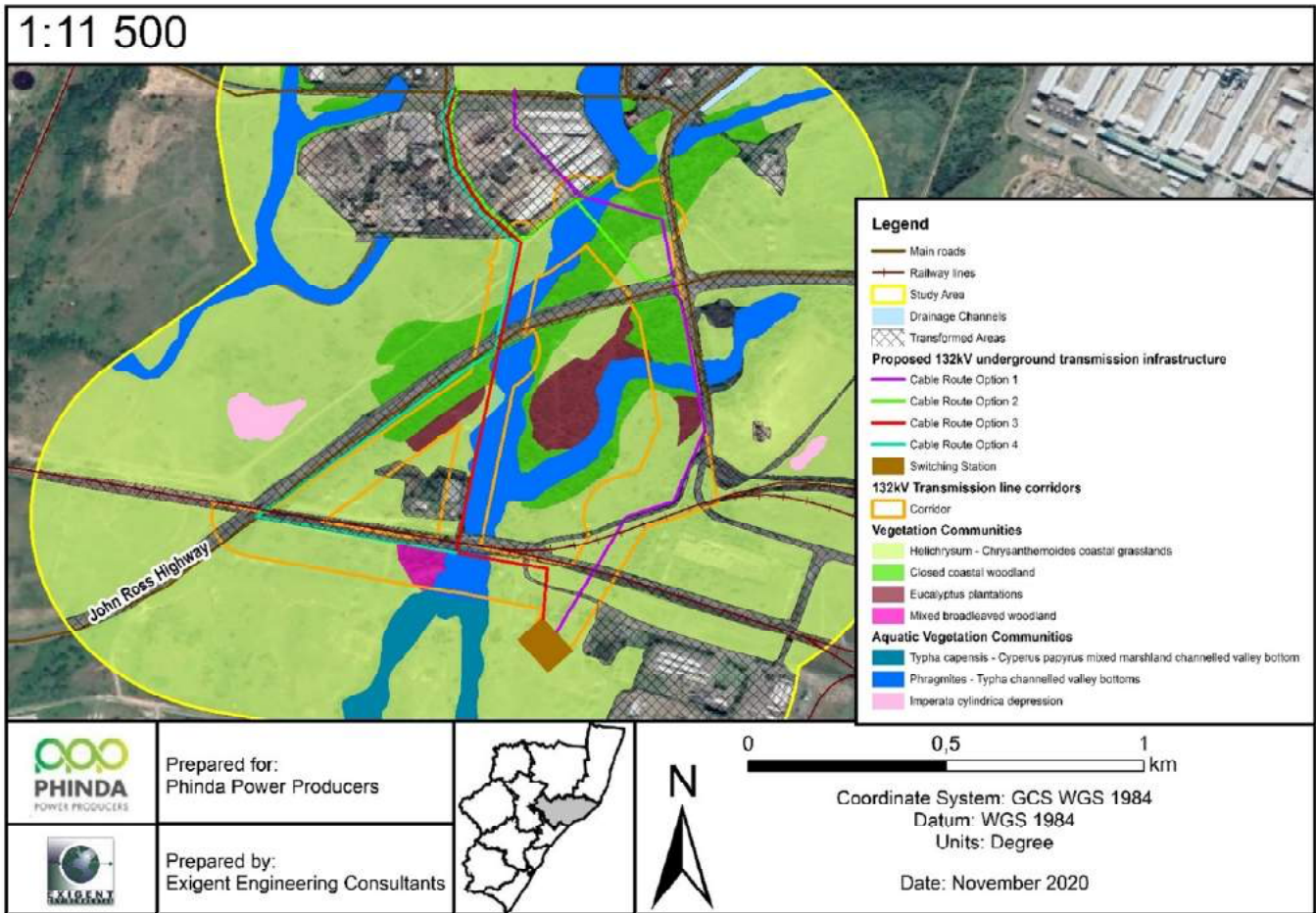


Figure 6.1. Vegetation map of the proposed infrastructure corridors and termination site (EKZNW, 2011)

6.3.2 Description of Ecological Impacts

The following ecological impacts have been identified for the development of the 132kV transmission infrastructure:

Loss of vegetation and terrestrial habitat

Vegetation plays an important part in the functioning of ecosystems, as well as maintaining biological processes in the soil, reducing the loss of topsoil and nutrients, and recycling of nutrients. The removal of natural vegetation results in a loss of habitat for fauna and flora species. As the preferred cable option(s) will be underground – the vegetation will only be temporarily removed. Through rehabilitation, natural vegetation in the form of grasslands will be able to recover for the underground cable route, whereas the switching station and access road represent permanent structures.

The vegetation present along the proposed four options of linear routes to the PPP Bayside termination site was broadly classified into four terrestrial vegetation communities namely *Helichrysum - Chrysanthemoides* coastal grasslands, Closed coastal woodland, Eucalyptus plantations and Mixed broadleaved woodland and three wetland vegetation communities namely *Typha capensis - Cyperus papyrus* mixed marshland channelled valley bottom wetlands, *Phragmites-Typha* channelled valley bottom wetlands and *Imperata cylindrica* depression wetlands.

Potential loss of faunal species.

The removal of natural vegetation results in a loss of habitat for faunal species. Terrestrial habitat is the most abundant and provides habitat to a vast variety of small mammals such as rodents, shrews, mongooses etc. Approximately 48 mammal species, 23 reptile species and 53 frog species have the potential to use the proposed infrastructure corridors and termination site and its surrounding areas. Species typically resident in and around urban and industrial areas are commonly generalists with a wide range of habitat types. It is therefore unlikely that the proposed development will have lasting adverse impact on the faunal species of the area.

Approximately 358 bird species have been recorded in the area. Given the proposed development is largely underground is unlikely to impact on any avifaunal individuals of the area.

Potential loss of species of special concern

Barringtonia racemosa and *Ficus trichopoda* species were confirmed in the Phragmites - Typha channelled valley bottom wetlands. Other species of special concern whilst not observed within the development site, could potentially also occur on the proposed infrastructure routes, such as the plant species, *Crinum stuhlmannii*, confirmed in the surrounding *Helichrysum – Chrysanthemoides* coastal grasslands vegetation community. Faunal species of conservation concern with a high potential to occur on the proposed infrastructure corridors and switching station site such as the *Zoothera guttata* (spotted ground thrush), and *Hyparolius pickersgilli* (Pickersgill's Reed Frog) were not observed during the site investigations.

Further searches for any species of special concern will be undertaken by a specialist ecologist continued after surveying the preferred route alternative during final design, prior to construction.

Habitat fragmentation (loss of corridors)

Habitat fragmentation will occur mainly during the construction of the preferred cable route option(s). Migration of fauna and dispersal of flora seeds across the alignment will still be possible once construction is completed, once rehabilitation of the disturbed areas has taken place.

Infestation of alien invasive species

The disturbance of the natural vegetation by the proposed activities may accelerate exotic species growth. Utmost care should be taken to manage the dispersal and colonisation of these species.

6.3.3 Impact tables summarising the significance of impacts on ecology during the construction (including decommissioning phase) and operation phases (with and without mitigation)

The impacts assessed below apply to the grid connection corridor alternatives assessed for the development of the 132kV transmission infrastructure including the switching station and access road points. Based on the grid corridor routes, the significance of the impacts with the implementation of the recommended mitigation measures is low-medium, which is considered to be acceptable from an ecological perspective.

Construction Phase Impacts

Nature: Loss of vegetation and terrestrial habitat		
<p>The vegetation present that will be impacted by the proposed four options of linear routes to the switching site was broadly classified into four terrestrial vegetation communities namely <i>Helichrysum - Chrysanthemoides</i> coastal grasslands, Closed coastal woodland, Eucalyptus plantations and Mixed broadleaved woodland. Two of the three identified wetland vegetation communities will be directly impacted, namely <i>Typha capensis - Cyperus papyrus</i> mixed marshland channelled valley bottom wetlands and <i>Phragmites-Typha</i> channelled valley bottom wetlands.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	Medium (60)	Medium (60)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact. » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems. » No indigenous vegetation may be collected or used for firewood. » Topsoil is to be removed separately to subsoil and be safely stockpiled for use in rehabilitation of areas of disturbance. » Bare surfaces should be grassed as soon as possible after construction to minimise time of exposure. Locally occurring, indigenous grasses should be used. » Progress of vegetation establishment must be monitored monthly by EO, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability; » Where construction occurs close to any plants of high conservation value, these must be suitably and visibly demarcated and cordoned off by the EO prior to, and during the construction phase. » A search and rescue operation will be required prior to construction for <i>Crinum stuhlmannii</i> and any other protected species that have a high probability of occurrence. This operation must be undertaken by a qualified ecologist or botanist based on a rescue relocation plan approved by the relevant competent authority. » Where clearing is required outside of permanent infrastructure areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Impact on fauna migration corridors due to change in land use; and » Loss of habitat for terrestrial fauna and flora species. 		

Nature: Potential loss of faunal species.		
<p>Terrestrial habitat is the most abundant and provide habitat to a vast variety of small mammals such as rodents, shrews, mongooses etc. Approximately 48 mammal species, 23 reptile species and 53 frog species have the potential to use the proposed infrastructure corridors and switching station site and its surrounding areas and approximately 358 bird species have been recorded in the area. The proposed development is however unlikely to impact on any faunal individuals of the area.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)

Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium (30)	Low (20)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact as faunal habitat. » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems. » Intentional killing of any faunal species (including snakes) should be avoided by means of awareness programs and toolbox talks presented to construction labourers. Any person found deliberately harassing any animal in any way must face disciplinary measures; » If any faunal species are recovered during the construction phase, these species must be relocated to the nearest natural open space with suitable habitat for the particular species to survive; and » All construction activities must be limited to daylight hours. 		
Residual impacts:		
» None		

<u>Nature: Potential loss of species of special concern</u>		
Potential loss of protected species and species of special concern within the terrestrial biodiversity habitats in the proposed infrastructure corridors and switching station site.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	High (8)
Probability	Probable (3)	Probable (3)
Significance	Medium (42)	Medium (42)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Searches for the potential species will be required after surveying the preferred route alternative. » Species located within the alignment must be rescued based on the instruction of a relocation plan approved by the relevant competent authority. The rescue operation must be undertaken by a qualified ecologist or botanist.. » Should any species of concern be impacted during the detail design phase of the route alignment, relevant permits must be obtained in terms of the NEMBA, NFA or the KZN Nature Conservation Ordinance, as required. Most often this can be avoided by careful consideration of protected species on site during detail design phase. » Should any of these species of concern be identified during construction, the ECO should be informed and appropriate action taken. 		
Residual impacts:		
» None		

<u>Nature: Habitat fragmentation (loss of corridors)</u>		
Temporary loss of migration corridors for terrestrial fauna and flora species		
	Without mitigation	With mitigation

Extent	Local (1)	Local (1)
Duration	Short term (1)	Short-term (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (24)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems. » Progressive reinstatement of bare areas must occur. The rehabilitation of these disturbed areas must facilitate natural processes, allow migration, provide habitat for pollinators and reduce edge effects, retaining the connectivity with adjacent natural open spaces. 		
Residual impacts:		
<ul style="list-style-type: none"> » Edge effects resulting in loss of habitat for terrestrial species. 		

Nature: Infestation of alien invasive species		
Increase in the invasions by alien and invasive species through loss of natural vegetation and disturbance soil.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly - probable (4)	Probable (3)
Significance	Medium (36)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Natural open spaces outside the development footprint must not be disturbed by the construction activities or workers. » Any existing or new exotic vegetation within the proposed infrastructure corridors and switching station site must be eradicated. » A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction and operational phases. » Within, and in proximity to all the identified wetland units, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis. 		
Residual impacts:		
<ul style="list-style-type: none"> » Invasion and replacement of natural vegetation by ruderal weed species, hence a loss of in loss of habitat for terrestrial species. 		

Operation Phase

Nature: Infestation of alien invasive species		
Increase in the invasions by alien and invasive species through loss of natural vegetation and disturbance soil.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly - probable (4)	Probable (3)
Significance	Medium (36)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Natural open spaces outside the development footprint must not be disturbed by the construction activities or workers. » Any existing or new exotic vegetation within the proposed infrastructure corridors and switching station site must be eradicated. » A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction and operational phases. » Within, and in proximity to all the identified wetland units, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis. 		
Residual impacts:		
<ul style="list-style-type: none"> » Invasion and replacement of natural vegetation by ruderal weed species, hence a loss of in loss of habitat for terrestrial species. 		

6.3.4 Comparison of Alternatives

Four possible routes have been identified for the underground 132KV power transmission cable system all terminating at the same switching station site. All are capable of being developed, with varying degrees of mitigation, and none represent a fatal flaw. From an ecological resource perspective, the most preferred routes would be either route 1 or route 4 as these routes are mostly situated along the existing road reserve and railway line servitudes. Although these two routes cross the Phragmites - Typha channelled valley bottoms wetlands (once in respect of route 4 and twice in respect of route 1), the impacts can be mitigated by ensuring that these routes are within the road and railway reserves to extent possible to reduce the impact on the natural vegetation.

6.3.5 Implications for Project Implementation

The significance of impacts was determined to be of low-medium significance with the implementation of mitigation measures, which is considered to be acceptable from an ecological perspective. No fatal flaws were identified. From the outcomes of the ecological impact assessment, it is concluded that the 132kV transmission infrastructure can be developed with the implementation of the recommended mitigation measures. The preferred alternatives for implementation would be either route 1 or route 4.

6.4 Assessment of Impacts on Aquatic Resources

The construction and operation phase of the transmission infrastructure will have an impact on the aquatic resources identified within the corridor. The resources include *Phragmites - Typha* channelled valley bottom wetlands, and aquatic protected and listed plant species, habitat and broad-scale aquatic processes. A summary of the freshwater impacts identified and the significance thereof for the proposed infrastructure are included below. Reference should be made to **Appendix E** for more detail.

6.4.1 Results of the Aquatic Impact Assessment

Three wetland units were identified within the NWA's 500 m regulated area, namely; 1) *Typha capensis - Cyperus papyrus* mixed marshland channelled valley bottom; 2) *Phragmites-Typha* channelled valley bottom and 3) *Imperata cylindrica* depression. The largest portion of the wetlands within the study area were classified as *Phragmites - Typha* channelled valley bottom wetlands. The *Phragmites - Typha* channelled valley bottom wetland is largely modified, and therefore a large change in ecosystem processes and loss of natural habitat and biota has occurred. Sections of this wetland have undergone changes due to encroachment anthropogenic activities such as gabion baskets, tracks, dumping, clearing of road servitudes, infestation of alien and invasive species and subsistence farming within the active channels and along the banks. *Phragmites australis* and *Typha capensis* are the dominant plant species, with several pockets of swampy *Barringtonia racemosa* and *Ficus trichopoda* imbedded in the channel with *Cyperus* also present in very dense stands.

One *Imperata cylindrica* depression wetland is located to the west and upstream of the proposed route option 4. This wetland will not be impacted upon by the linear routes as none of the four main wetland drivers will be impacted on, viz. habitat, biota, flow and water quality..

Threats to watercourses from adjacent activities includes increases in sedimentation and turbidity, increased nutrient inputs, increased inputs of toxic organic and heavy metal contaminants and pathogen inputs as well as loss of habitat for aquatic to semi-aquatic species (Macfarlane et. al, 2017). A 29m buffer is determined for the *Phragmites - Typha* channelled valley bottom wetland. This buffer takes into consideration general information for industrial developments, the characteristics of the channelled valley bottom wetland and the buffer areas. Some sections of the linear route options will impact on the buffer zones and specific mitigation has been proposed for these areas.

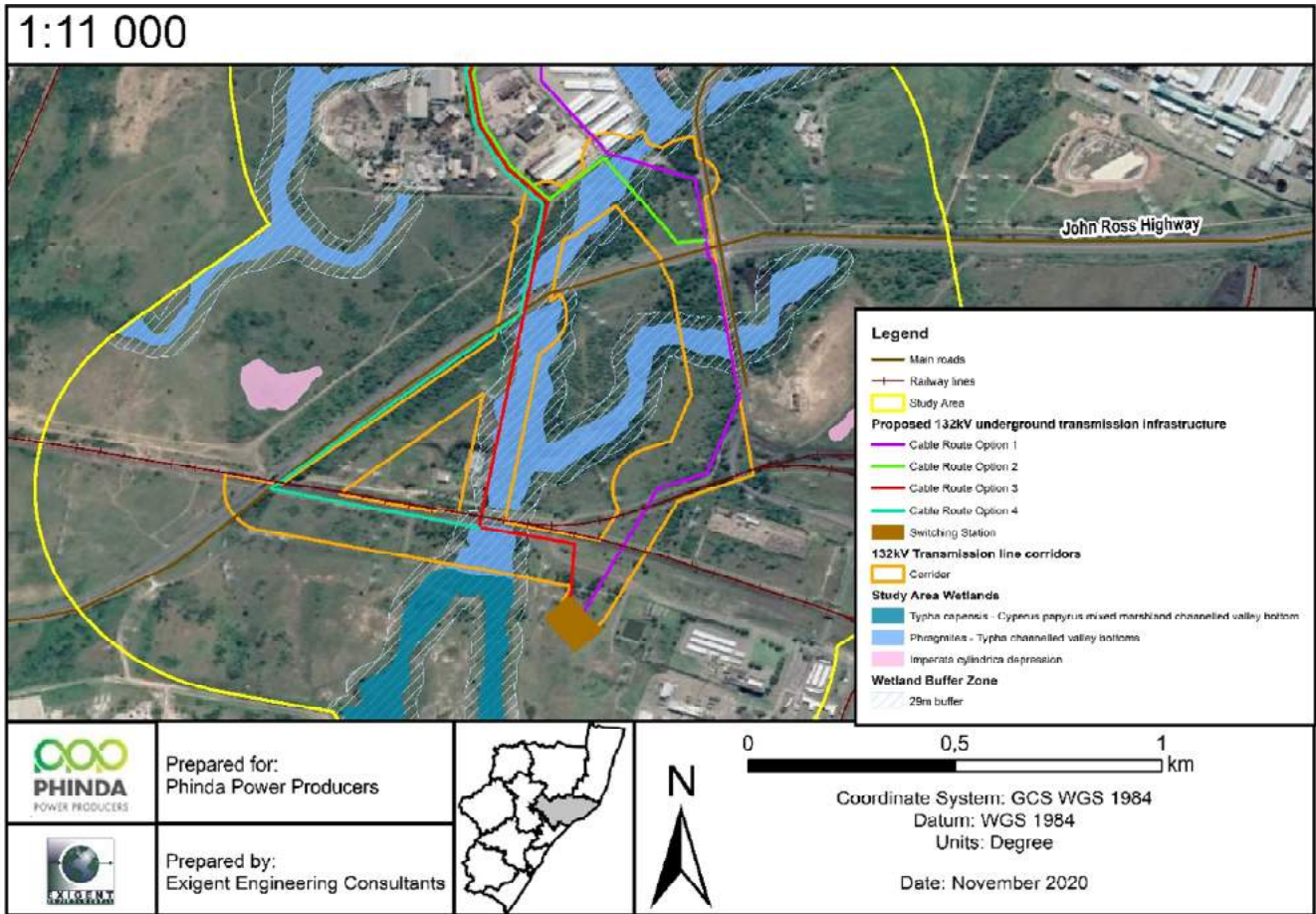


Figure 6.2. The route options including the buffer wetland zone.

6.4.2 Description of Aquatic Impacts

The following aquatic impacts have been identified for the development of the 132kV transmission infrastructure:

Destruction of natural habitat –wetland habitat

The various route options have been assessed and the wetlands mapped in terms of the four route options. A 29 m buffer has been set for the wetland from the DHSWS guidelines for the determination of buffer zones for rivers, wetlands and estuaries by Macfarlane et al. (2017). Buffer zones are required to protect natural resources and limit the negative adverse effects of activities on the sensitive watercourse habitats. Threats to watercourses from adjacent proposed activities includes increases in sedimentation and turbidity, increased nutrient inputs, increased inputs of toxic organic and heavy metal contaminants and pathogen inputs as well as loss of habitat for aquatic to semi-aquatic species (Macfarlane et. al, 2017). Specific mitigation measures has been proposed for the impacted areas within the buffer of the wetland.

Potential loss of Species of Special Concern

Pockets of *Barringtonia racemosa* and *Ficus trichopoda* species were recorded in the *Phragmites – Typha* channelled valley bottom wetland adjacent to the proposed development activities. However, the

proposed linear routes will have limited impact on these species as the impact of the routes will be minimal on the areas where these species of concern occur. The *Barringtonia* and *Ficus* do not occur throughout all the drainage areas. The impact on species of special concern will be negligible and the relevant permit applications will be submitted in terms of the NEMBA, NFA or the KZN Nature Conservation Ordinance, as well as Water Use License requirements, as required.

Habitat fragmentation (loss of corridors)

Loss of migration corridors for aquatic and semi-aquatic fauna and dispersal of flora will occur during construction.

Infestation of alien invasive species

The disturbance of the natural vegetation by the proposed activities may aid exotic species to invade. Utmost care should be taken not to disperse and increase the colonisation of these species.

Hydrological Impacts

Vegetation clearance may result in sheet erosion and will further reduce the capacity of the land surface to retard the flow of surface water, thus, decreasing infiltration, and increasing both the quantity and velocity of surface water runoff and erosion. Hydrological impacts relate to any alterations in the quantity, timing and distribution of water inputs and through flows within the wetlands. Construction activities associated with bulk earthworks (such as excavations, stockpiling, reshaping, back-filling and compaction) in the catchment area feeding downstream watercourses can alter natural patterns of surface runoff reaching water resources downslope/downstream. Excavations may impound and redirect water, thus starving downstream water resources. Infilling, compaction and rutting of soils caused by construction vehicles working outside the wetlands also alter the patterns of diffuse surface and sub-surface flows by altering micro-topography and the permeability of soil profiles. Changes in flow patterns reaching aquatic ecosystems does not only affect hydrological functionality and thus ecosystem integrity but may lead to erosion and sedimentation through increased runoff velocities linked to concentrated flow paths created during construction.

Pollution of surface and groundwater due to chemical, oil and fuel spills

Contaminants such as hydrocarbons, solids and pathogens will be generated from several potential sources (examples include petrol/diesel, oil/grease, cement/concrete and other hazardous substances). These contaminants have the capacity to negatively affect aquatic ecosystems including sensitive or intolerant species of flora and fauna. Where significant changes in water quality occur, this will ultimately result in a shift in aquatic species composition, favouring more tolerant species, and potentially result in the localised exclusion of sensitive species. It is expected that any pollution of this nature will be during construction and will be of limited extent and duration.

6.4.3 Impact table summarising the significance of the impacts on aquatic resources, during the construction phase (with and without mitigation)

The impacts assessed below apply to the grid connection corridor alternatives assessed and switching station site for the development of the 132kV transmission infrastructure. Based on the grid corridor routes,

the significance of the impacts with the implementation of the recommended mitigation measures is low-medium, which is considered to be acceptable from an ecological perspective.

Construction Phase Impacts

Nature: Destruction of natural habitat –wetland habitat.		
Buffer zones are required to protect natural resources and limit the negative adverse effects of activities on the sensitive watercourse habitats. Threats to watercourses from adjacent activities includes increases in sedimentation and turbidity, increased nutrient inputs, increased inputs of toxic organic and heavy metal contaminants and pathogen inputs as well as loss of habitat for aquatic to semi-aquatic species (Macfarlane <i>et. al</i> , 2017).		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (5)	Probable (5)
Significance	Medium (60)	Medium (35)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Medium
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » By following the preferred route options 1 or 4, the impact on wetlands will be minimised. » A minimum impact approach must be adopted. Only vegetation in the project footprint, outside the buffer must be removed, leaving buffer vegetation intact as far as possible; » Demarcation of the wetland buffer by an ecologist/botanist prior to the commencement of construction activities. No construction activities, or movement of construction vehicles must be allowed within the buffer zone, except where approved as per the final route layout. » No indigenous vegetation may be collected or used for firewood; » Excavated soils must be placed on the upslope side of the proposed development site, minimizing the risk of erosion and excess sediment entering the ecosystems; » No chemical toilets or hazardous substances/chemical storage areas must be located within the buffer zone or 100 m from the channelled valley bottom wetlands; » No rubble may be temporarily stockpiled or dumped within the buffer zone. 		
Residual impacts:		
» None		

Nature: Potential loss of Species of Special Concern		
Potential loss of protected species and species of special concern within the aquatic and semi-aquatic habitats in the study area.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	High (8)
Probability	Improbable (1)	Improbable (1)
Significance	Low (14)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes, route selection to be verified upon detail design phase.	

<p>Mitigation:</p> <ul style="list-style-type: none"> » Should any species of concern be impacted during the detail design phase of the route alignment, a protected species removal permit will be obtained. Most often this can be avoided by careful consideration of protected species on site during detail design phase.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » None

Nature: Loss of migration corridors for aquatic and semi-aquatic fauna and dispersal of flora.		
	Without mitigation	With mitigation
Extent	Immediate Area (2)	Immediate Area (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (10)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent buffer vegetation intact. » No rubble may be temporarily stockpiled or dumped within the buffer zone. » Preferred routes are Option 1 and 4. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Edge effects resulting in loss of habitat for aquatic to semi-aquatic species 		

Nature: Increase in the invasions by alien and invasive species through loss of natural vegetation and disturbance soil.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly - probable (4)	Probable (3)
Significance	Medium (40)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	Yes	No
Can impact be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Natural open spaces outside the development footprint should be left in their undeveloped state. » Any existing or new exotic vegetation within the proposed development site must be eradicated. » A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction. » In proximity to the wetlands, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis in these areas. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Invasion and replacement of natural vegetation by ruderal weed species, hence a loss of habitat for aquatic to semi-aquatic species. 		

Nature: Hydrological impacts by altering natural patterns of surface runoff, diffusion of surface and sub-surface flows and erosion and sedimentation of watercourses.		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	Highly - probable (4)
Significance	High (80)	Medium (56)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Medium
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » As the slopes are draining towards the freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion; » "Trench-breakers", which are in-trench barriers, should be installed within any trench excavations to intercept and minimise the accumulation of surface runoff water from upslope areas running down the trenches; » Erosion control structures must be put in place where soil may be prone to erosion; » Multiple discharge points that are reasonably spread out across the working areas adjoining the wetland habitat to allow a diffuse spread of surface runoff, maximising the amount of infiltration; » Bare areas where vegetation has been removed pose a risk of becoming a sediment load into the adjacent watercourses during heavy rainfall, this must be managed by placing it on the upslope side of the development site; » Temporary stormwater management structures must be used during construction. Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated immediately; and » During rehabilitation, prompt and progressive reinstatement of bare areas is required. During reinstatement, the topsoil layer is to be replaced last, to simulate the pre-construction soil conditions. 		
Residual impacts:		
<ul style="list-style-type: none"> » An increase in hardened surfacing at the switching station will result in an increase in surface water runoff especially during precipitation events and if uncontrolled, will potentially entrain suspended and dissolved sediments from stockpiles (during construction), hydrocarbons, and other chemicals (construction and operation), potentially affecting water quality of the nearby wetlands. 		

Nature:		
During the construction phase of the proposed project, the potential for spills and leakages will occur. Contaminants will include mainly oil/ grease and petrol/ diesel. These pollutants may result from leakages from operating equipment, vehicles, or from spills as a result of incorrect handling of substances or equipment.		
	Without mitigation	With mitigation
Extent	Area (2)	Area (2)
Duration	Short-term (2)	Short-term (1)
Magnitude	Minor (2)	Minor (81)
Probability	Highly probable (4)	Improbable (2)
Significance	Low (24)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Yes
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	
Mitigation:		

- » *Extra care must be taken to prevent any potentially hazardous substances from entering the watercourse during heavy rainfall events;*
- » *The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil;*
- » *All rubble and other types of waste must be disposed at a licensed waste disposal site to prevent it from entering the watercourse;*
- » *Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed;*
- » *A spill kit must be available in the event of a hydrocarbon or chemical spill;*
- » *No chemical toilets or hazardous substances/chemical storage areas must be located within the buffer zone or 100 m from the channelled valley bottom wetlands;*
- » *If an incident occurs, the following actions needs to be taken immediately:*
 - *Stop the source of the spill;*
 - *Contain and clean up the spill immediately and remediate or appropriately dispose of the contaminated material;*
 - *If outside an impermeable surface, the affected area should be scraped off to the depth of contamination using a spade (small area) or a front-end loader or scoop (large area), absorbent materials such as sawdust or sand must be used to absorb and clean up any fuel or oil spills;*
 - *The contaminated substrate must be stored in a suitable container for further appropriate disposal to an accredited landfill site. Hazardous waste disposal must be accompanied by a safe disposal certificate.*
 - *Report all spills in the onsite environmental incident book, including: the date, time and location, quantity and type of material spilled, circumstances that caused the spill, damage caused, description of the clean-up;*
 - *If remedial action is required, this must be taken in consultation with the DHSWS;*
 - *In the event that the spill cannot be contained the following departments must be informed of the incident within 48 hours:*
 - *Local Municipality;*
 - *DHSWS;*
 - *DEDTEA; and*
 - *Any other affected departments.*

Residual impacts:

- » *Potential spillage from overflowing of bunded areas during high rainfall events;*
- » *Groundwater pollution through hazardous substance leakages of construction vehicles;*

6.4.4 Comparison of Alternatives

Four possible routes have been identified for the underground 132KV power transmission cable system, all termination at the same proposed switching station site. All are capable of being developed, with varying degrees of mitigation, and none represent a fatal flaw. From an aquatic resource perspective, the most preferred routes were identified as either route 1 or 4 as these routes are mostly situated along the existing road reserve and railway line reserves. Although these two routes cross the Phragmites - Typha channelled valley bottoms wetlands (once in respect of route 4 and twice in respect of route 1), the impacts can be mitigated by ensuring, to the extent possible, that these routes are within the road and railway servitudes to reduce the impact on the natural vegetation and wetland habitat.

6.4.5 Implications for Project Implementation

The significance of impacts was determined to be of low-medium significance with the implementation of mitigation measures, which is considered to be acceptable from an aquatic perspective. No fatal flaws were identified. From the outcomes of the aquatic impact assessment, it is concluded that the 132kV

transmission infrastructure can be developed with the implementation of the recommended mitigation measures. The preferred alternatives for implementation would be either route 1 or route 4.

6.5 Assessment of Impacts on Soils and Agricultural Potential

The construction phase of the 132kV transmission infrastructure will have an impact on soils and agricultural resources in the area. The potential impacts and the relative significance are summarised below (refer to **Appendix F** for more details).

6.5.1 Results of the Soil and Agricultural Potential Impact Assessment

The desktop assessment relied partly on data furnished by the KZN DARD Directorate of Natural Resources and specifically the data for BioResource Unit Za10, Nhlabane and partly on data gathered from an assessment of over 60 sites within the same ecosystem within a 20 km radius of the target site.

This was followed by a site verification process along the lines stipulated by the KZN DARD Directorate of Natural Resources and DEA notice No. 320 of 20 March 2020. Both assessments were carried out against the background of the author's extensive and intensive knowledge of the KZN Coastal Sands and Coastal Lowlands Soil Systems.

Most of the land along the proposed cable routes is vacant and often rough land owned mainly by the Umhlatuze uMhlatuze Local Municipality. It never has been arable land, nor will it become arable land before the end of the current 10 000 year deglaciation cycle. There are a few hectares of open rangeland covered by low quality grasses with little nutritional value between and alongside the proposed cable routes. The proposed routes comply with the definition "Moist Coast Forest, Thorn and Palm Veld", commonly referred to as Lala Palm Savannah. No remnants of Lala Palm savannah were found. No food or industrial crops are grown near or along the proposed routes.

Perennial watercourses and streams have formed wetland areas. Due to the weak structure of the soils these streams have cut ravines measuring up to 4 m in depth and up to 12 m in width. These converge at and flow under the rail line and emerge where the Sasol pipeline passes.

The fringes of these wetlands are generously populated with typical Zululand Swamp Forest species.

The land within the Richards Bay area is flat and low lying. Areas that are not wetlands nearly all have a water table within a meter or two of the surface, right through to the Mozambique border and beyond. In most of the rural areas domestic water is drawn from wells dug two or three meters deep, dug by hand and lined with cement blocks

6.5.2 Description of Soil and Agricultural Potential Impacts

Impacts to soil and agricultural potential were identified as short term, restricted to the cables route footprint and fully reversible as per the specialist findings. Any impacts to ground water due to potential spillage of oil and lubricants during construction would already have been impacted on by already existing gas pipelines, roads, rail lines and overhead national power networks serving Richards Bay and along the proposed transmission routes.

6.5.3 Impact table summarising the significance of the impacts on soil and agricultural potential, during the construction phase (with and without mitigation)

Construction Impacts

Nature: Impact will be short term, restricted to the cables route footprint and fully reversible. The entire operation takes place within the context of presently vacant, unutilized land or scattered areas of wetland.		
Any impact that might be had on groundwater movement would already have been impacted on by already existing gas pipelines, roads, rail lines and overhead national power networks serving Richards Bay. The power cables routes pass through vacant land.		
Defining the Impact	Without Mitigation	With Mitigation
Extent	Immediate Area(1)	Immediate Area(1)
Duration	Short(2)	Short(2)
Magnitude	Minor(2)	Minor(2)
Probability	Improbable(2)	Improbable(2)
Significance	10 (very low)	10 (very low)
Status	Positive	Positive
Reversibility	Irrelevant	Irrelevant
Irreplaceable Loss of Resources?	No	No
Can Impacts be Mitigated?	Irrelevant	Irrelevant
Mitigation: The only possible mitigation is to follow the practice of backfilling as each section of cable route is laid.		
Residual Impacts: The is no residual impact.		

6.5.4 Comparison of Alternatives

Four possible routes have been identified for the underground 132KV power transmission cable system. . In view of the route being made up of vacant, unused non-arable land already traversed by various forms of infrastructure, there is no distinction between the routes and they all can be developed equally from an a soil and agricultural and agronomic agribusiness perspective, and there is no stated preference. It can therefore be informed by on civil engineering considerations

6.5.5 Implications on Project Implementation

The development of the 132kV transmission infrastructure will not have a negative impact on the soil and agricultural potential located within the proposed 4 alternative corridors as impacts are short term and reversible during the construction phase of the project. The impact for the construction phase of the transmission infrastructure and access road points was determined to be of very low significance with the implementation of mitigation measures. No impacts were identified for the operational phase of the transmission infrastructure. Of the 28 soil profiles that were examined, all consisted of non-arable land (LCCVI) and Agricultural Sensitivity Theme 1 to 5, probably 2 to 3 and 3 to 4. In view of the route being made up of vacant, unused non-arable land already traversed by an existing gas pipelines, two railway systems, a multilane highway, a network of local service roads, existing underground municipal electricity transmission infrastructure and a multi-pylon powerline transmission systems, all serving a major industrial hub, the specialist has recommended that the application for the proposed land use be approved. All proposed alternatives are considered to be acceptable.

6.6 Assessment of Impacts on Heritage, including Archaeology and Palaeontological Resources

The construction and operation phase of the 132kV transmission infrastructure may have an impact on archaeological and palaeontological resources in the area. The potential impacts and the relative significance are summarised below (refer to **Appendix G** for more details).

6.6.1 Results of the Heritage Impact Assessment

The desktop study indicated that the study area was mostly used as agricultural fields surrounded by wetlands. Seven settlements were noted to occur within 100m of the corridors. Of these seven, only three occur within the corridors (A1, A2 and A4). Corridors 1, 2 and 4 each have one settlement. Human graves would generally be associated with these settlements. A1 appears to have been partially destroyed by a pipeline. A7 no longer exists due to development.

The field survey was undertaken on 20 October 2020. The original route outlines were surveyed where possible. Where possible sites identified by the desktop study were visited. The vegetation was too dense to adequately view most of the sites. The vegetation consisted of thick grasses or coastal forest, resulting in minimal visibility. For example:

- » Corridor 1 occurs mostly alongside the road but portions of the corridor are covered by dense coastal forest
- » Corridor 2 was covered by dense coastal forest except where a gas pipeline occurs.
- » Corridor 3 was mostly in dense coastal forest.
- » Corridor 4 was mostly dense grass and coastal forest.

Therefore, it is recommended that the final route is surveyed after it has been cleared of vegetation prior to construction as this will be the only time an accurate assessment can be undertaken.

The area is in an area of very low palaeontological sensitivity (**Figure 6.3**) mapped as blue. It thus has no or very low, palaeontological value. However, there are Cretaceous deposits 4m+ below the surface. These deposits are noticeable for their megalodon teeth, large ammonites, and other shell species. Any excavations reaching these layers would need to inform KZNARI and have a qualified palaeontologist assess the samples. The sampling of these deposits will not affect the project.



COLOUR	SENSITIVITY	REQUIRED ACTION
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 6.3. Palaeontological sensitivity map and key.

6.6.2 Description of Heritage Impacts, including Archaeology and Palaeontology

The impacts identified for archaeological and palaeontological resources associated with the proposed development area only for the construction. The development of the 132kV transmission infrastructure will not have a negative impact on significant heritage resources identified within the vicinity of the grid connection corridors 1,2 and 4 and the surrounding area. Any potential grave sites are anticipated along corridor 4 as per the settlements mapped (**Figure 6.3**). In general, the proposed development will have a low significance on archaeological and palaeontological resources following the implementation of the recommended mitigation measures.

The impact of the development to palaeontological resources will also be low subject to the implementation of the recommended mitigation measures. There is however an opportunity for fossils to be found within the Cretaceous deposits 4m+ below the surface. Therefore, a Chance Fossil Finds Procedure/Protocol has been included as **Appendix G** in the Environmental Management Programme.

6.6.3 Impact table summarising the significance of the impacts on heritage, including archaeological and palaeontological resources, during the construction phase (with and without mitigation)

Construction Impacts

Nature: Impact of the proposed 132kV transmission infrastructure on archaeological and cultural heritage resources.		
No archaeological resources of significance were identified during the field assessment for archaeology within the grid connection corridor; however, two (2) unmarked graves were identified within corridor 4 and a 50m buffer (no-go) should be implemented around these sites.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long-term (5)	Long-term (5)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium (30)	Low (20)
Status (positive or negative)	Neutral with mitigation	
Reversibility	Any impacts to archaeological and cultural heritage resources that do occur area irreversible.	
Irreplaceable loss of resources?	Unlikely with mitigation	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » The final layout can be assessed at a desktop level following final design. » The specific route should be resurveyed after vegetation clearance has occurred prior to construction phase. » Site visits by a heritage specialist must occur around sensitive areas upon removal of vegetation prior to the comment of construction. 		
Residual Impacts:		
Should any significant resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific heritage resources.		

6.6.4 Comparison of Alternatives

Due to human settlements located in Corridor 4 that could have associated human graves, the specialist recommended Corridor 1, 2 or 3 for development of the underground transmission cables, switching station and proposed access roads.

6.6.5 Implications on Project Implementation

The development of the 132kV transmission infrastructure will not have a negative impact on the heritage, including archaeological and palaeontological resources, if located within corridors 1,2 or 3 and the surrounding area subject to the implementation of the recommended mitigation measures. A higher potential exists for the presence of graves in corridor 4. The significance of the negative impacts on heritage and palaeontological resources expected within the grid connection corridor has been assessed as low, following the implementation of the recommended mitigation measures. From the outcomes of the heritage impact assessment, it is concluded that the 132kV transmission infrastructure can be developed and impacts on archaeological and palaeontological resources can be managed by taking the following into consideration:

- » If human remains are located then all work in that area must cease and KZNARI (0333946543) and the SAPS would need to be informed. The area needs to be cordoned off

- » Once the final corridor and route has been finalised, it can be re-assessed at a desktop level. Thereafter, the route should be surveyed after vegetation clearance has occurred.
- » A Chance Find Protocol (Appendix K of the EMPr) must be developed and implemented in the event that archaeological or palaeontological resources are found. In the case where the proposed development activities bring these materials to the surface, work must cease and SAHRA must be contacted immediately.

Alternatives 1, 2 and 3 are the preferred alternatives for implementation.

6.7. Assessment of Social Impacts

Impacts on the social environment are expected during both the construction and operation phases. Potential social impacts and the relative significance of the impacts associated with the development of the 132kV transmission infrastructure are summarised below (refer to **Appendix H**).

6.7.1 Results of the Social Impact Assessment

The majority of negative social impacts associated with the project are anticipated to occur during the construction phase of the development and are typical of the type of social impacts generally associated with construction activities. These impacts will be temporary and short-term (~6 months) but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in nuisance and permanent social impacts associated with the ill-placement of project components or associated infrastructure or result in the mis-management of the construction phase activities.

It is anticipated that the 132kV transmission infrastructure will operate for at least 20 years (for the lifespan of the 450MW RMPP). The transmission infrastructure will be largely self-sufficient and periodic maintenance activities will be required during the operational phase. It must be noted that the ownership of the grid connection infrastructure could be transferred to Eskom following completion of construction if not retained by the project proponent, who would then be responsible for the operation and maintenance of the infrastructure.

Positive impacts include the initial investment spend on the project that will inject significant business sales/production for the local and regional economy, increased GDP, employment creation and skills development. More importantly, the 132kV transmission infrastructure is essential to the development of the 450MW RMPP, the economic benefits of which are significant.

6.7.2 Description of the Social Impacts

The positive and negative social impacts identified and assessed for the construction phase includes:

- » Direct and indirect employment opportunities
- » Economic multiplier effects
- » Influx of jobseekers and change in population
- » Safety and security impacts
- » Impacts on daily living and movement patterns
- » Nuisance impacts, including noise and dust

- » Visual impacts and sense of place impacts

The potential positive and negative social impacts that could arise as a result of the operation of the proposed project include the following:

- » Direct and indirect employment opportunities
- » Visual impact and sense of place impacts

6.7.3 Impact tables summarising the significance of the social impacts

Construction Phase

<u>Nature: Increased Production</u>		
The initial investment spend on the project will inject significant business sales/ production for the local and regional economy. The economic impact arising from the initial investment will be felt throughout the economy with windfall effects benefitting related sectors in the economy. The effect is allocated according to direct, indirect and induced impacts, together forming the "multiplier effect".		
	Without mitigation	With mitigation
Extent	Local- Regional (3)	N/A
Duration	Short term (1)	N/A
Magnitude	Moderate (6)	N/A
Probability	Definite (5)	N/A
Significance	Medium (50)	N/A
Status (positive or negative)	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No	
Mitigation:		
» N/A		
Residual impacts:		
» None		

<u>Nature: Impact on GDP</u>		
Temporary increase in country's GDP due to capital expenditure during construction. The primary method of expanding GDP levels is through investment into infrastructure and enterprises that generate goods and services. Investment into the creation of new and improved goods and services, creates heightened levels of value added within the economy. Industries that will experience the largest temporary growth in value added, as a result of this, will include the building and construction, manufacturing and trade and accommodation sectors.		
	Without mitigation	With mitigation
Extent	Local- Regional (3)	N/A
Duration	Short term (1)	N/A
Magnitude	Moderate (6)	N/A
Probability	Highly probable (4)	N/A
Significance	Medium (40)	N/A
Status (positive or negative)	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No	

Mitigation:
» N/A
Residual impacts:
» None

<u>Nature: Employment Creation</u>		
The construction of the 132kV transmission infrastructure will positively impact on the community and beyond by creating a number of job opportunities (albeit temporary).		
The unemployment rate in the City of uMhlathuze is 30% and the number of employed individuals has been increasing in the past six years (Urban Econ Calculations based on Quantec). The development of this power plant and associated transmission infrastructure will create significant employment opportunities during the construction period.		
	Without enhancement	With enhancement
Extent	Local- Regional (3)	Local- Regional (3)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (32)	Medium (50)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No	
Enhancement:		
» The employment of local residents and workforce as far as possible should be a requirement during the construction phase.		
Residual impacts:		
» Positive impact on the local economy		

<u>Nature: Positive Impact on Skills Development</u>		
Employees will develop and enhance skills thereby increasing experience and knowledge.		
Skills are imperative for satisfying job requirements and adequately performing tasks that ultimately boost the economy. The construction of the 132kV transmission infrastructure requires a variation of skill sets ranging from semi-skilled construction workers to highly skilled engineers.		
	Without enhancement	With enhancement
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (44)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No	
Enhancement:		
» Skills development programmes should be implemented for construction workers.		
Residual impacts:		
» Improving local workforce by adding to their labour skills		

Nature: Positive impact on household income and improved standard of living

Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.

Over a third of the population of the City of uMhlatuze Municipality are classified as low-income earners. The employment creation during the construction period will temporarily increase affected households' income

	Without enhancement	With enhancement
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (36)	Medium (45)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No	

Enhancement:

- » Employment of local residents and workforce as far as possible should be a requirement during the construction phase.

Residual impacts:

- » Positive impact on local economy and households

Nature: Demographic shift due to influx of migrant labour

An impact on the demographics of the area as a result of in-migration in response to job opportunities will occur. Increased pressure on infrastructure and basic services, and social conflicts during construction as a result of in-migration of people. The additional workforce is insignificant, no additional infrastructure should be required.

	Without mitigation	With mitigation
Extent	Local (1)	N/A
Duration	Short term (1)	N/A
Magnitude	Minor (2)	N/A
Probability	Improbable (2)	N/A
Significance	Low (8)	N/A
Status (positive or negative)	Negative	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	Impact is too minor to determine any loss of resources.	
Can impacts be mitigated?	N/A	

Mitigation:

- » N/A

Residual impacts:

- » None

Nature: Safety and Security

Safety and security impacts. Temporary increase in safety and security concerns associated with the influx of people during the construction phase. The in-migration of job seekers to the area could be perceived to result in increased criminal activity. The perception exists that an influx of jobseekers, and / or construction workers to an area is a contributor to increased criminal activities in an area, such as increased safety and security risk for neighbouring properties and damage to property, increased risk of veld fire, stock theft, and crime etc. The impact is likely to be

negative, local in extent, short-term, and of low significance due to the number of jobs expected to accrue to the non-local workforce.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Minor (2)
Probability	Low Likelihood (2)	Low Likelihood (2)
Significance	Low (12)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	N/A	N/A
Irreplaceable loss of resources?	Impact is to minor to determine.	
Can impacts be mitigated?	N/A	
Mitigation:		
» Ensure that safety and security is up to standard at the construction sites.		
Residual impacts:		
» Lower probabilities for criminal activities		

<u>Nature: Impacts on daily movement patterns</u>		
Impacts on daily living and movement patterns. Temporary increase in traffic disruptions and movement patterns during construction. An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users. Increased traffic due to construction vehicles and heavy vehicles could cause disruptions to road users and increase safety hazards. The use of local roads and transport systems may cause road deterioration and congestion. The impact is likely to be negative, local in extent, short-term, and of medium significance given the Craft Link road will need to be fixed after cables have been put underground.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short term (1)	Short term (1)
Magnitude	Moderate (6)	Low - Moderate (5)
Probability	Definite (5)	Highly probable (4)
Significance	Medium (40)	Low (28)
Status (positive or negative)	Negative	Negative
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:		
» Comply with traffic regulations and management to ensure minimal impact on traffic.		
» Have designated access to construction sites.		
» Limit travelling times of construction vehicles in peak times.		
Residual impacts:		
» None.		

<u>Nature: Nuisance Impacts</u>
Nuisance impacts (noise and dust). Nuisance impacts in terms of temporary increase in noise and dust, and wear and tear on access roads to the site.
The impact will negatively impact sensitive receptors and could cause disruptions for neighbouring properties.

Impacts associated with construction related activities include noise, dust and disruption or damage to adjacent properties. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact on adjacent properties. The impact is likely to be negative, local in extent, short-term, and of low significance.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Minor (2)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Low (24)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:		
» Comply with policies regarding noise and dust regulation methods close to roads and other existing infrastructure.		
Residual impacts:		
» None.		

Operation Phase

Nature: Increased Production

Expenditure associated with the operation of the proposed development will have a positive impact on production. The transmission infrastructure will provide distribution, this will increase production for the surrounding areas. The operational spend on the project will inject business sales/ production for the local and regional economy. The operational expenditure will provide a minor injection into the local and regional economies with an annual operating budget of R1 Million a year. The power plant will have to acquire inputs from a variety of sectors such as fuel , trade and accommodation, transport and storage, and government services. Considering that the RMPP and it associated transmission infrastructure will be located in the City of uMhlatuze Municipality and assuming that the entire production value will be accounted as part of the output of the municipality, the size of the City of uMhlatuze Municipality's economy is expected to increase significantly. The impact will be positive, long term, local and regional in extend with a low significance.

	Without mitigation	With mitigation
Extent	Local (2)	N/A
Duration	Long term (4)	N/A
Magnitude	Minor (2)	N/A
Probability	Probable (3)	N/A
Significance	Low (24)	N/A
Status (positive or negative)	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	
Mitigation:		
» N/A		
Residual impacts:		
» N/A		

Nature: Impact on GDP

Positive impact on GDP due to operating expenditure during operations. The primary method of expanding GDP levels is through investment into infrastructure and enterprises that generate goods and services. Industries that will

experience the largest growth in value added, as a result of this, will include the transport, storage and manufacturing sectors. The operational spend on the project will create value added for the local and regional economy. The operational expenditure of the power plant, and the transmission line infrastructure will create value added to the local and regional economy. The exact value of that impact of the power plant will be determined during the EIA phase of the impact assessment of the power plant. The operation of the power plant is dependent upon the establishment and operation of the transmission infrastructure. The impact will be positive, long term, local and regional in extent with a low significance.

	Without mitigation	With mitigation
Extent	Local (2)	N/A
Duration	Long term (4)	N/A
Magnitude	Minor (2)	N/A
Probability	Probable (3)	N/A
Significance	Low (24)	N/A
Status (positive or negative)	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	
Mitigation:		
» N/A		
Residual impacts:		
» N/A		

Nature: Employment Creation

The unemployment rate in the City of uMhlatuze is 30% and the number of employed individuals has been increasing in the past six years (Urban Econ Calculations based on Quantec). The operation of this grid connection will create minor employment opportunities during the operational period. It is likely that Eskom will be using their staff for maintenance.

	Without enhancement	With enhancement
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (27)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	
Enhancement:		
» Employ local labour to help with maintenance as far as possible.		
Residual impacts:		
» Improvement of local economy.		

Nature: Positive impact on household income and improved standard of living

Employed individuals will increase the income of their respective households and therefore improve their standard of living. Over a third of the population of the City of uMhlatuze Municipality are classified as low-income earners. The employment creation during the operational period will increase affected households' income for 20 years.

The increased income earned during the operational phase for workers will improve their standard of living as well as those of their households.

	Without enhancement	With enhancement
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Highly probability (4)
Significance	Low (27)	Medium (32)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	
Enhancement:		
» Employ local labour force		
Residual impacts:		
» Improve of local economy and household income		

<u>Nature: Improvement in Energy Sector Generation</u>		
Improved energy security and energy sector will result due to the development of the RMPP. The grid connection will provide the important national service of providing new electricity capacity into the national grid. Strategically, the proposed project will assist in improving electricity security and reducing transmission losses in the national grid and assist in alleviating load shedding.		
	Without mitigation	With mitigation
Extent	National (5)	N/A
Duration	Long Term (4)	N/A
Magnitude	Moderate (6)	N/A
Probability	Highly Probable (4)	N/A
Significance	High (60)	N/A
Status (positive or negative)	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	
Mitigation:		
» N/A		
Residual impacts:		
» N/A		

6.7.4 Comparison of Alternatives

From a socio-economic perspective all four the routes have similar impacts and as they are more or less the same length and have to cross the same social terrain and obstacles.

6.7.5 Implication for Project Implementation

The significance of the *negative impacts* associated with the social aspects that will be affected by the 132kV transmission infrastructure are of low to medium significance with the implementation of the recommended mitigation measures. The mitigation measures include:

- » Ensure that safety and security is up to standard at the construction sites;
- » Comply to traffic regulations and management to ensure minimal impact on traffic.

- » Have designated access to construction sites.
- » Limit traveling times of construction vehicles in peak times.
- » Comply to policies regarding noise and dust regulation methods close to roads and other existing infrastructure.

The significance of the *positive impacts* associated with the social aspects that will be affected by the 132kV transmission infrastructure are of low to high significance with the implementation of the recommended mitigation measure. Enhancement measures include the following:

- » The employment of local residents and workforce;
- » Skills development programmes for construction workers and
- » Employ local labour to help with maintenance

A number of potential positive and negative social impacts have been identified for the project. The positive impacts greatly outweigh the negative impacts. Based on the findings of this Socio-Economic Impact Assessment basic assessment report, no red flags or fatal flaws have been identified from a socio-economic perspective which could preclude the development of 132kV transmission infrastructure. From a socio-economic perspective all four the routes have similar impacts and as they are more or less the same length and have to cross the same terrain and obstacles.

6.8. Assessment of the 'Do Nothing' Alternative

The 'do-nothing' alternative (i.e. no-go alternative) is the option of not constructing the 132kV Transmission Infrastructure. This means that the status quo of the environment would remain unchanged and no impacts would occur. However, the implementation of the 'Do Nothing' alternative will result in a situation where the proponent will not be able to evacuate power from the 450MW RMPP to the national grid. This will result in the loss of the opportunity to develop the 450MW RMPP, which could have impacts at a national scale. Ultimately, the aim of the project is to evacuate dispatchable power from the proposed 450MW Emergency Risk Mitigation facility to alleviate the current electricity supply constraints in South Africa. Should the 450MW RMPP be selected as a preferred bidder and should adequate transmission infrastructure not be provided to evacuate power to the national grid, South Africa's electricity will remain constrained and risk of load shedding will remain.

As there are no negative impacts of high significance associated with the proposed transmission infrastructure on the alternative corridors proposed, the implementation of the project is considered acceptable. The negative impacts of the 'Do Nothing' alternative are considered to outweigh the positive impacts of this alternative. The 'Do Nothing' alternative is therefore not preferred.

CHAPTER 7: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

As identified and assessed in Chapter 6, the development of the transmission infrastructure may have impacts (positive and negative) on natural resources, the social environment and on the people living in the area surrounding the project. The preceding impact assessment chapter has reported on the assessment of the impacts associated with the 132kV transmission infrastructure in isolation (from other similar developments).

This chapter assesses the potential for the impacts associated with the transmission infrastructure to become more significant when considered in combination with the other existing or proposed projects within the area.

The location of the grid corridor is in close proximity to a number of other proposed, approved, and operational transmission infrastructure that are in most cases overhead lines and substations in the area, which in some cases is associated with the industrial nature of the Richards Bay IDZ, Port of Richards Bay and the Alton industrial area.

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the Basic Assessment Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(j)(i) an assessment of each identified potentially significant impact and risk, including cumulative impacts.	The cumulative impacts associated with the development of the 132kV transmission infrastructure are included and assessed within this chapter.

7.2 Approach taken to Assess Cumulative Impacts

The cumulative impacts of the proposed transmission infrastructure have been assessed through the consideration of other existing grid connection infrastructure located within the vicinity of the corridor alternatives, as well as other industrial type infrastructure which have resulted in vertical and/or horizontal disturbance within the landscape surrounding the proposed project.

It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For the development of the proposed transmission infrastructure, the existing infrastructure and transformation in the directly surrounding areas will be considered which includes the following (refer to **Figure 7.1 & Table 7.1**):

- » The proposed Phinda Power 3000MW Gas to Power Facility;
- » The proposed 1060MW Gas to Power Facility;
- » Richards Bay CCPP (Authorised);
- » Bayside Aluminium (existing);
- » Fermentech Fertilizer (existing);

- » Mondi Richards Bay (existing)
- » Port of Richards Bay;
- » Richards Bay Coal Terminal (existing);
- » South32 Alluminium;
- » Tata Steel;
- » 400MW Richards Bay G2P

Existing grid infrastructure in the Richards Bay area includes:

- » Impala/Nseleni 1 132kV Line Overhead Line
- » Alusaf Bayside/Impala 1 132kV Line Overhead Line
- » Alusaf Bayside/Impala 2 132kV Line Overhead Line
- » Athene/Hillside 1 132kV Line Overhead Line
- » Athene/Hillside 2 132kV Line Overhead Line
- » Athene/Hillside 3 132kV Line Overhead Line
- » Impala Substation
- » Hillside Substation
- » Athene Substation
- » Bayside Substation
- » Polaris Substation
- » Newside Substation

Grid connection developments (authorised and proposed) located within the surrounding area of the 132kV transmission corridor alternatives and the proposed switching station are detailed in **Table 7.1**.

Table 7.1: Grid connection developments (authorised and proposed) located within the surrounding area of the 132kV transmission corridor alternatives and the proposed switching station.

Project Name	Project Status
Richards Bay CCPP (Grid)	Authorised
Richards Bay G2P (Grid)	Proposed
Phinda Power 400kV (Grid)	Proposed

The cumulative impacts of the other known existing transmission infrastructure and the proposed 132kV transmission infrastructure for the 450MW RMPP are qualitatively assessed in this Chapter, and has been considered within the specialist studies (refer to **Appendices D - H**) The following potential impacts are considered:

- » Cumulative impacts on ecological processes;
- » Cumulative impacts on freshwater resources;
- » Cumulative impacts on heritage resources;
- » Cumulative social impacts

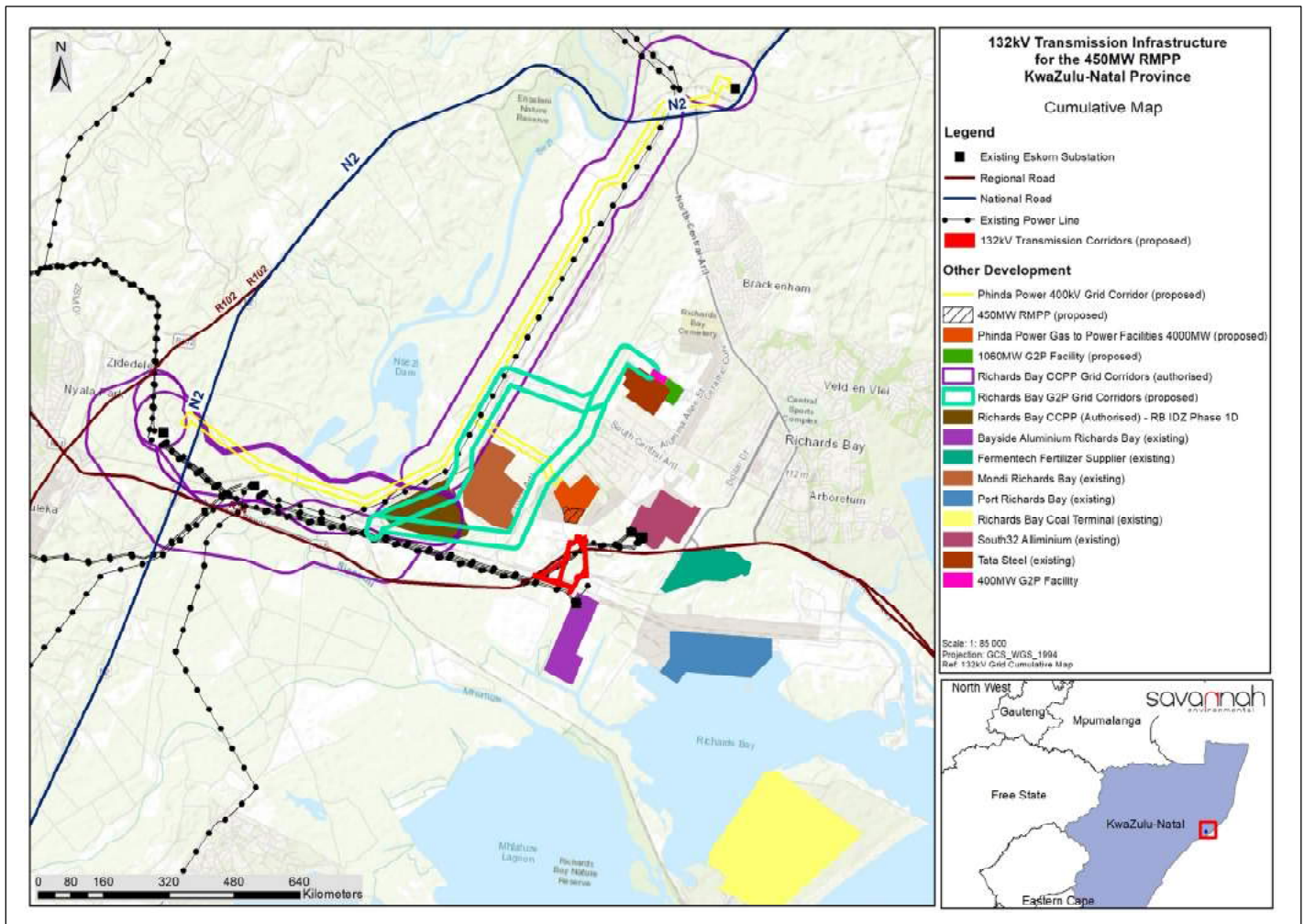


Figure 7.1: Identified grid connection infrastructure developments located within the surrounding areas of the 132kV Transmission Infrastructure corridor alternatives, switching station and access road points considered as part of the cumulative impact assessment

7.3 Cumulative Impacts on Ecological Processes

The following cumulative issues have been identified within ecological biodiversity impact assessment:

- Loss of vegetation and terrestrial habitat;
- Potential loss of faunal species;
- Potential loss of species of special concern;
- Habitat fragmentation (loss of corridors); and
- Infestation of alien species.

Nature: Cumulative loss of vegetation and terrestrial habitat

Vegetation plays an important part in the functioning of ecosystems, as well as maintaining biological processes in the soil, reducing the loss of topsoil and nutrients, and recycling of nutrients. Due to the proposed route selections and preferred options, the cumulative impact will be minimal in terms of vegetation and terrestrial habitat destruction.

	Overall mitigated impact of proposed project	Cumulative impact
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Highly probable (4)
Significance	Medium (60)	Medium (48)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	Yes
Can impact be mitigated?	Yes	Yes

Mitigation:

- » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact.
- » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems.
- » No indigenous vegetation may be collected or used for firewood.
- » Topsoil is to be removed separately to subsoil and be safely stockpiled for use in rehabilitation of areas of disturbance.
- » Bare surfaces should be grassed as soon as possible after construction to minimise time of exposure. Locally occurring, indigenous grasses should be used.
- » Progress of vegetation establishment must be monitored monthly by ECO, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability;
- » Where construction occurs close to any plants of high conservation value, these must be suitably and visibly demarcated and cordoned off by the EO prior to, and during the construction phase.
- » A search and rescue operation will be required prior to construction for *Crinum stuhlmannii* and any other protected species that have a high probability of occurrence. This activity must be undertaken by a qualified ecologist or botanist based on a rescue relocation plan approved by the relevant competent authority.
- » Where clearing is required outside of permanent infrastructure areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure.

Residual impacts:

- » Impact on fauna migration corridors due to change in land use; and
- » Loss of habitat for terrestrial fauna and flora species.

Nature: Potential loss of faunal species

The removal of natural vegetation results in a loss of habitat for faunal species. Species typically resident in and around urban and industrial areas are commonly generalists with a wide range of habitat types. Due to the proposed route selections and preferred options, the cumulative impact will be minimal in terms of vegetation and terrestrial habitat destruction therefore limiting the impact on faunal habitat consequently faunal species.

	Overall mitigated impact of proposed project	Cumulative impact
Extent	Local (1)	Local (1)

Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (20)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	Yes
Can impact be mitigated?	Yes	Yes
Mitigation:		
<ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact as faunal habitat. » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems. » Intentional killing of any faunal species (including snakes) should be avoided by means of awareness programs and toolbox talks presented to construction labourers. Any person found deliberately harassing any animal in any way must face disciplinary measures; » If any faunal species is recovered during the construction phase, this species must be relocated to the nearest natural open space with suitable habitat for the particular species to survive; and » All construction activities must be limited to daylight hours. 		
Residual impacts:		
» None		

<u>Nature: Potential loss of protected species and species of special concern within the terrestrial biodiversity habitats in the proposed infrastructure corridors and switching station site.</u>		
<p><i>Barringtonia racemosa</i> and <i>Ficus trichopoda</i> species were confirmed in the <i>Phragmites - Typha</i> channelled valley bottom wetlands. Other species of special concern could potentially also occur on the proposed infrastructure routes, such as the plant species, <i>Crinum stuhlmannii</i>, confirmed in the surrounding <i>Helichrysum – Chrysanthemoides</i> coastal grasslands vegetation community. Faunal species of conservation concern with a high potential to occur on the proposed infrastructure corridors and switching station site such as the <i>Zoothera guttata</i> (spotted ground thrush), and <i>Hyparolius pickersgilli</i> (Pickersgill's Reed Frog) were not observed during the site investigations however searches for these species will be continued after surveying the preferred route alternative and their cumulative impact limited through rescue and relocation, where possible.</p>		
	Overall mitigated impact of proposed project	Cumulative impact
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	High (8)
Probability	Improbable (1)	Probable (3)
Significance	Low (14)	Medium (42)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes, but no mitigation required	Yes

<p>Mitigation:</p> <ul style="list-style-type: none"> » Searches for the potential species will be required after surveying the preferred route alternative. » Species located within the alignment must be rescued based on the instruction of a relocation plan approved by the relevant competent authority. The rescue operation must be undertaken by a qualified ecologist or botanist based. » Should any species of concern be impacted during the detail design phase of the route alignment, relevant permits must be obtained in terms of the NEMBA, NFA or the KZN Nature Conservation Ordinance, as required. Most often this can be avoided by careful consideration of protected species on site during detail design phase. » Should any of these species of concern be identified during construction, the ECO should be informed and appropriate action taken.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » None

<p><u>Nature: Temporary loss of migration corridors for terrestrial fauna and flora species.</u></p> <p>Habitat fragmentation will occur mainly during the construction of the preferred cable route option(s). Migration of fauna and dispersal of flora seeds across the alignment will still be possible once construction is completed, once rehabilitation of the disturbed areas has taken place. Due to the proposed impact being of linear nature, the impact on the habitat fragmentation and loss of corridors, will be limited. Limited cumulative impact is expected.</p>		
	Overall mitigated impact of proposed project	Cumulative impact
Extent	Local (1)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (16)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	No	Yes
Can impact be mitigated?	Yes	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent vegetation intact » Minimum servitude width must apply where the proposed infrastructure corridors transect the natural wetland systems. » Progressive reinstatement op bare areas must occur. The rehabilitation of these disturbed areas must facilitate natural processes, allow migration, provide habitat for pollinators and reduce edge effects, retaining the connectivity with adjacent natural open spaces. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Edge effects resulting in loss of habitat for terrestrial species. 		

Nature: Increase in the invasions by alien and invasive species through loss of natural vegetation and disturbance soil.		
The disturbance of the natural vegetation by the proposed activities may accelerate exotic species growth. Utmost care should be taken manage disperse and colonisation of these species. This impact may be cumulative due to the existing high level of infestation of alien and invasive species in disturbed areas along the proposed routes.		
	Overall mitigated impact of proposed project	Cumulative impact
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Short-term (2)	Short-term (2)
<i>Magnitude</i>	Low (4)	Moderate (6)
<i>Probability</i>	Probable (3)	Highly – probable (4)
<i>Significance</i>	Low (21)	Medium (36)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	High	Medium
<i>Irreplaceable loss of resources?</i>	No	Yes
<i>Can impact be mitigated?</i>	Yes	Yes
Mitigation:		
<ul style="list-style-type: none"> » Natural open spaces outside the development footprint must not be disturbed by the construction activities or workers. » Any existing or new exotic vegetation within the proposed infrastructure corridors and switching station site must be eradicated. » A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction and operational phases. » Within, and in proximity to all the identified wetland units, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis. 		
<i>Residual impacts:</i>		
<ul style="list-style-type: none"> » Invasion and replacement of natural vegetation by ruderal weed species, hence a loss of in loss of habitat for terrestrial species. 		

7.5 Cumulative Impacts on Aquatic Resources

Nature:		
Buffer zones are required to protect natural resources and limit the negative adverse effects of activities on the sensitive watercourse habitats. Threats to watercourses from adjacent proposed activities includes increases in sedimentation and turbidity, increased nutrient inputs, increased inputs of toxic organic and heavy metal contaminants and pathogen inputs as well as loss of habitat for aquatic to semi-aquatic species (Macfarlane <i>et. al</i> , 2017).		
	Overall impact of proposed project	Cumulative impact
Extent	Local (1)	Regional (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Medium (4)
Probability	Probable (5)	Probable (5)

Significance	Medium (35)	Medium (45)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	Yes
Mitigation: A minimum impact approach must be adopted. Only vegetation in the project footprint, outside the buffer must be removed, leaving buffer vegetation intact as far as possible; Demarcation of the wetland buffer by an ecologist/botanist prior to the commencement of construction activities. No construction activities, or movement of construction vehicles must be allowed within the buffer zone, except where approved as per the final route layout. No indigenous vegetation may be collected or used for firewood; No herbicides may be used on any vegetation, particularly within proximity to the Phragmites – Typha channelled valley bottom wetland; Excavated soils must be placed on the upslope side of the proposed development site, minimizing the risk of erosion and excess sediment entering the ecosystems; No chemical toilets or hazardous substances/chemical storage areas must be located within the buffer zone or 100 m from the channelled valley bottom wetlands; No rubble may be temporarily stockpiled or dumped within the buffer zone.		
Residual impacts: » None		

<u>Nature: Potential loss of protected species and species of special concern within the aquatic and semi-aquatic habitats in the study area.</u>		
	Overall impact of proposed project	Cumulative impact
Extent	Local (1)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	High (8)
Probability	Improbable (1)	Improbable (1)
Significance	Low (14)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes, route selection to be verified upon detail design phase.	Yes
Mitigation: » Should any species of concern be impacted during the detailed design phase of the route alignment, a protected species removal permit will be obtained. Most often this can be avoided by careful consideration of protected species on site during detail design phase.		
Residual impacts: » None		

Nature: Loss of migration corridors for aquatic and semi-aquatic fauna and dispersal of flora.

	Overall impact of proposed project	Cumulative impact
Extent	Local (2)	Regional (3)
Duration	Short-term (2)	Permanent (5)
Magnitude	Low (4)	High (8)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (8)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	Yes
Mitigation:		
<ul style="list-style-type: none"> » A minimum impact approach must be adopted. Only vegetation in the project footprint must be removed, leaving adjacent buffer vegetation intact; » No rubble may be temporarily stockpiled or dumped within the buffer zone. 		
Residual impacts:		
<ul style="list-style-type: none"> » Edge effects resulting in loss of habitat for aquatic to semi-aquatic species 		

Nature: Increase in the invasions by alien and invasive species through loss of natural vegetation and disturbance soil.

	Overall impact of proposed project	Cumulative impact
Extent	Local (1)	Regional (3)
Duration	Short-term (2)	Medium term (4)
Magnitude	Low (4)	Medium (6)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	High	Medium
Irreplaceable loss of resources?	No	Yes
Can impact be mitigated?	Yes	Yes
Mitigation:		
<ul style="list-style-type: none"> » Natural open spaces outside the development footprint should be left in their undeveloped state. » Any existing or new exotic vegetation within the proposed development site must be eradicated. » A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction. 		
Residual impacts:		
<ul style="list-style-type: none"> » Invasion and replacement of natural vegetation by ruderal weed species, hence a loss of habitat for aquatic to semi-aquatic species. 		

Nature:

Hydrological impacts by altering natural patterns of surface runoff, diffusion of surface and sub-surface flows and erosion and sedimentation of watercourses.

	Overall impact of proposed project	Cumulative impact
Extent	Local (1)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	High (5)
Probability	Highly - probable (4)	Highly probable (4)
Significance	Medium (48)	Medium (52)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> » As the slopes are draining towards the freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion; » "Trench-breakers", which are in-trench barriers, should be installed within any trench excavations to intercept and minimise the accumulation of surface runoff water from upslope areas running down the trenches; » <i>Erosion control structures must be put in place where soil may be prone to erosion;</i> » <i>Multiple discharge points that are reasonably spread out across the working areas adjoining the wetland habitat to allow a diffuse spread of surface runoff, maximising the amount of infiltration;</i> » <i>Bare areas where vegetation has been removed pose a risk of becoming a sediment load into the adjacent watercourses during heavy rainfall, this must be managed by placing it on the upslope side of the development site;</i> » <i>Temporary stormwater management structures must be used during construction. Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated immediately; and</i> » <i>During rehabilitation, prompt and progressive reinstatement of bare areas is required. During reinstatement, the topsoil layer is to be replaced last, to simulate the pre-construction soil conditions.</i> 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » An increase in hardened surfacing at the switching station will result in an increase in surface water runoff especially during precipitation events and if uncontrolled, will potentially entrain suspended and dissolved sediments from stockpiles (during construction), hydrocarbons, and other chemicals (construction and operation), potentially affecting water quality of the nearby wetlands. 		

Nature:		
<p>During the construction phase of the proposed project, the potential for spills and leakages will occur. Contaminants will include mainly oil/ grease and petrol/ diesel. These pollutants may result from leakages from operating equipment, vehicles, oil changes during the servicing of equipment and vehicles or, or from spills as a result of incorrect handling of substances or equipment.</p>		
	Overall impact of proposed project	Cumulative impact
Extent	Local (1)	Region (4)
Duration	Medium - term (4)	Long-term (4)

Magnitude	High (8)	High (5)
Probability	Improbable (2)	Probable (3)
Significance	Low (26)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Yes	Yes
Can impact be mitigated?	Yes	Yes

Mitigation:

- » Extra care must be taken to prevent any potentially hazardous substances from entering the watercourse during heavy rainfall events;
- » The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil;
- » All rubble and other types of waste must be disposed at a licensed waste disposal site to prevent it from entering the watercourse;
- » Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed;
- » A spill kit must be available in the event of a hydrocarbon or chemical spill;
- » No chemical toilets or hazardous substances/chemical storage areas must be located within the buffer zone or 100 m from the channelled valley bottom wetlands;
- » If an incident occurs, the following actions needs to be taken immediately:
 - Stop the source of the spill;
 - Contain and clean up the spill immediately and remediate or appropriately dispose of the contaminated material;
 - If outside an impermeable surface, the affected area should be scraped off to the depth of contamination using a spade (small area) or a front-end loader or scoop (large area), absorbent materials such as sawdust or sand must be used to absorb and clean up any fuel or oil spills;
 - The contaminated substrate must be stored in a suitable container for further appropriate disposal to an accredited landfill site. Hazardous waste disposal must be accompanied by a safe disposal certificate.
 - Report all spills in the onsite environmental incident book, including: the date, time and location, quantity and type of material spilled, circumstances that caused the spill, damage caused, description of the clean-up;
 - All significant spills must be reported to the DEDTEA (Waste Management) and other relevant authorities;
 - If remedial action is required, this must be taken in consultation with the DHSWS;
 - In the event that the spill cannot be contained the following departments must be informed of the incident within 48 hours:
 - Local Municipality;
 - DHSWS;
 - DEDTEA; and
 - Any other affected departments.

<p>Residual impacts:</p> <ul style="list-style-type: none"> » Potential spillage from overflowing of bunded areas during high rainfall events; » Groundwater pollution through hazardous substance leakages of construction vehicles;
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7.6 Cumulative Impacts on Soil and Agricultural Potential

The 132kV transmission infrastructure is not expected to contribute to the cumulative impacts on soils and agricultural potential in the region (refer to **Appendix F**).

7.7 Cumulative Impacts on Heritage (including archaeology and palaeontology)

The 132kV transmission infrastructure, switching station and access roads are not expected to contribute to the cumulative impact in the area (refer to **Appendix G**).

7.8 Cumulative Social Impacts

The potential Cumulative impacts were considered and investigated (**Appendix H**), but due to the nature of this project and the low level of negative impacts, the contribution of the project to cumulative impact will be insignificant. This project will not influence other existing projects in the area of impact, in addition the construction methodology to install the cables underground and switching station within an existing Eskom servitude, adds to the insignificance of any cumulative impacts to be concerned of.

7.9 Conclusion regarding Cumulative Impacts

The assessment of the cumulative impacts was undertaken through the consideration of the 132kV transmission infrastructure in isolation and compared to other grid connection developments surrounding the proposed transmission infrastructure. Cumulative impacts are expected to occur with the development of the transmission infrastructure throughout all phases of the project life cycle only for ecological aspects. The main aim for the assessment of cumulative impacts considering the 132kV transmission infrastructure is to determine whether the cumulative impact will be acceptable within the landscape proposed for the development, and whether the cumulative loss, from an environmental and social perspective, will be acceptable without whole-scale change.

The significance of the cumulative impacts associated with the development of the 132kV transmission infrastructure are predominately low, and in some instances low to medium, depending on the impacts being considered.

A summary of the cumulative impacts is included in **Table 7.3** below.

Table 7.3: Summary of the cumulative impact significance for the 132kV transmission infrastructure within the development area

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology	Low or Medium (depending on the impact being considered)	Low or medium (depending on the impact being considered)

Aquatic resources	Low or Medium (depending on the impact being considered)	Low or Medium ((depending on the impact being considered)
Soil & Agricultural Potential	Very Low	None
Heritage (archaeology and palaeontology)	N/A	None
Social	N/A	None

The following can be summarised and concluded regarding the cumulative impacts for the 132kV transmission underground lines, switching station and access roads:

- » **Ecological processes:** The development of the 132kV transmission lines, switching station and access roads will not result in an unacceptable cumulative risk to ecological resources (fauna and flora) as impacts can be mitigated to reduce the significance of impacts to low or medium dependent on the impact being considered. Therefore, the proposed development is considered acceptable from an ecological perspective.
- » **Aquatic Resources:** The development of the 132kV transmission lines, switching station and access roads will not result in an unacceptable cumulative risk to freshwater resources as impacts can be mitigated to reduce the significance of impacts. Therefore, the proposed development is considered acceptable from a freshwater perspective.
- » **Soil & Agricultural Potential:** The 132kV transmission infrastructure is not expected to continue to cumulative impacts from an agricultural and agribusiness perspective. The development is therefore considered acceptable.
- » **Heritage (including archaeology and palaeontology):** The 132kV transmission infrastructure is not expected to continue to cumulative impacts from a heritage perspective. Most of the heritage sites identified in the study area are isolated artefacts and thus not considered as sites. In general, the development of the 132kV transmission lines, switching station and access roads are considered acceptable from a heritage perspective subject to the recommended mitigation measures.
- » **Socio -Economic:** Due to the nature of this project and the low level of negative impacts the contribution to cumulative impacts will be insignificant. This project will not influence other existing projects in the area of impact, in addition the construction methodology to install the cables underground and switching station within an existing Eskom servitude, adds to the insignificance of any cumulative impacts. The cumulative positive impacts will be significant. No fatal flaws associated with the cumulative impacts are evident at a social level. Cumulative impacts associated with the development are therefore considered acceptable.

Based on the specialist cumulative assessments and findings it can be concluded that the project cumulative impacts the development of the 132kV transmission infrastructure, will be of a low to medium significance and restricted to impacts on vegetation, fauna and aquatic resources. There are no impacts or risks identified to be considered as unacceptable with the development of 132kV transmission infrastructure for the 450MW RMPP within the surrounding area. In addition, no impacts which will result in whole-scale change are expected with the proposed development.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

Phinda Power Producers (Pty) Ltd proposes the construction and operation of the 132kV transmission infrastructure for the proposed 450MW Risk Mitigation Power Plant (RMPP), located in Alton, in the KwaZulu-Natal Province in order to connect the proposed 450MW RMPP facility to the Eskom National Grid at the terminus of the existing unutilised transmission infrastructure at Bayside. The connection infrastructure includes:

- » Underground cables consisting of up to 12 individual cable cores with various layers of insulation and protection.
- » Switching station consisting of steel lattice gantries; Busbars; high voltage circuit breakers and switches; CT and VTs; control Room consisting of protection and telecontrol equipment, battery room; security fencing; lightning protection masts and area security lighting.
- » Laydown areas.
- » Servitude access road points up to 4m in width at strategic locations along the cable route where the cable route cannot be accessed by existing roads.

The 132kV transmission infrastructure is considered as essential infrastructure to the proposed 450MW RMPP Facility in order to enable the operation of the facility within the project site.

Four alternative grid connection corridors were identified for the proposed project, all proposing to originate from the 450MW RMPP at the same point and terminate at the same switching station point at the existing Bayside terminus. Transmission lines within corridors of 50m-100m wide and approximately 2km long each. All alternatives were assessed within this BA process to allow for the optimisation of the transmission infrastructure layout and to accommodate environmental sensitivities. The cables will require a maximum 20 m servitude within this corridor. These alternatives were identified by Phinda Power Producers (Pty) Ltd through the consideration of the use of the existing unutilised 132kV Bayside transmission lines to evacuate power from the 450MW RMPP. These 132 kV Bayside lines were upgraded by Eskom in 2015 and therefore are in good condition and can evacuate >1000MW. In addition, the RMIPPPP specifically mandates that only projects that are able to connect into the national grid with limited or no "deep grid connection costs" will be considered, which evacuation through the Bayside transmission lines achieves. The grid connection solution proposed is therefore considered to be feasible from a technical perspective.

A summary of the recommendations and conclusions for the proposed development as determined through the BA process is provided in this Chapter.

8.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an	A summary of the findings of the specialist studies undertaken for the 132kV transmission infrastructure has been included in section 8.2 .

Requirement	Relevant Section
indication as to how these findings and recommendations have been included in the final report	
3(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts of the 132kV transmission infrastructure has been included as section 8.4 . Sensitive environmental features located within the four alternative 132kV corridor routes and the switching station study area and development area, overlain with the proposed development footprint have been identified and are shown in Figure 8.1, 8.2, 8.3 and 8.4 . A summary of the positive and negative impacts associated with the alternative corridor routes and switching station has been included in section 8.2 .
h (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	A concluding statement indicating the preferred alternatives and the preferred location of the activity is included in section 8.5 .
3(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation of the 132kV transmission infrastructure have been included in section 8.5 .
3(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	A reasoned opinion as to whether the preferred alternative and associated transmission infrastructure should be authorised has been included in section 8.5 .

8.2. Evaluation of the 132kV transmission infrastructure and alternative route options

The preceding chapters of this BA Report together with the specialist studies contained within **Appendices D-H** provide a detailed assessment of the potential impacts that may result from the development of the 132kV underground cabling via four alternative route options and the switching station located within the existing Eskom servitude. This chapter concludes the environmental assessment of the 132kV transmission corridor alternatives and switching station by providing a summary of the results and conclusions of the assessment, and making recommendations regarding a preferred alternative for authorisation. In doing so, it draws on the information gathered as part of the BA process, the knowledge gained by the environmental specialists and the Environmental Assessment Practitioner (EAP) and presents a combined and informed opinion of the environmental impacts associated with the development.

No environmental fatal flaws were identified in the detailed specialist studies conducted, and no impacts of unacceptable or high significance are expected to occur with the implementation of the recommended mitigation measures. These measures include, amongst others, the implementation of a minimum impact approach where only vegetation in the project footprint should be removed (i.e. the approved corridor route and servitude), leaving adjacent vegetation intact, undertaking of a heritage survey following vegetation clearance prior to construction, and the implementation of a plant search and rescue operation to be undertaken prior to commencement of construction.

Impacts identified to be associated with the proposed project and assessed within this report include:

- » Impacts on ecology (including flora and fauna).

- » Impacts on aquatic resources;
- » Impacts on soils and agricultural potential;
- » Impacts on heritage resources, including archaeology and palaeontology.
- » Impacts on the social- economic environment.

» **8.2.1 Impacts on Ecology**

The terrestrial ecology report (**Appendix D**) indicated that several areas within the study area have been transformed for industrial developments, roads, railways and small businesses and identified the following impacts for the proposed transmission infrastructure development across the four (4) alternative corridor route options, development of a switching station and access roads:

- » loss of vegetation and terrestrial habitat;
- » potential loss of faunal species; potential loss of species of special concern;
- » habitat fragmentation (loss of corridors); and
- » infestation of alien species.

Impacts were determined to be of low, and in some instances medium significance with the implementation of the recommended mitigation measures. It is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from an aquatic perspective. The most preferred routes were determined to be route 1 or 4 including the access road points as these routes are mostly situated along the existing road and railway line reserves. Although these two routes cross the Phragmites - Typha channelled valley bottom wetlands, the impacts can be mitigated by ensuring, to the extent possible, that these routes are within the road and railway reserves to reduce the impact on the natural vegetation and wetland habitat.

» **8.2.3 Impacts on Aquatic Resources**

Three wetland units were identified within the NWA 500 m regulated area of the proposed project, namely; 1) Typha capensis - Cyprus papyrus mixed marshland channelled valley bottom; 2) Pragmites-Typha channelled valley bottom; and 3) Imperata cylindrica depression. The largest portion of the wetlands within the study area were classified as Phragmites - Typha channelled valley bottom wetlands. The Phragmites - Typha channelled valley bottom wetland was largely modified, and therefore a large change in ecosystem processes and loss of natural habitat and biota had occurred. The following impacts were identified for the for the proposed transmission infrastructure development across the four (4) alternative corridor route options, development of a switching station and access roads:

- » destruction of natural habitat –wetland habitat;
- » potential loss of Species of Special Concern;
- » habitat fragmentation (loss of corridors);
- » infestation of alien species; hydrological impacts; and
- » pollution of surface and groundwater due to chemical, oil and fuel spills.

Impacts were determined to be a of low to medium significance with the implementation of the recommended mitigation measures. It is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from an aquatic perspective. The most preferred routes were determined to be route 1 or 4 including the access road points as these routes are mostly situated along the existing road and railway line reserves. Although these two

routes cross the Phragmites - Typha channelled valley bottom wetlands the impacts can be mitigated by ensuring, to the extent possible, that these routes are within the road and railway reserves to reduce the impact on the natural vegetation and wetland habitat.

It was concluded that the project could be authorised provided the recommended mitigation measures are implemented.

» **8.2.4 Impacts on Soil and Agricultural Potential**

The Soils & Agricultural Compliance Statement (Appendix F of the BA Report) identified the entire area of the assessment as being permanently transformed to industrial usage and confirmed the two Soil Forms found across the entire site, namely the Fernwood and Hutton Clanshal Soil Forms. These soil forms cannot be categorised as arable agricultural land due to their inherent physical limitations. The anticipated impact to the soil is determined to occur during the construction phase and to be of very low significance. The anticipated impact is associated with a short-term duration, given the short duration of the construction phase, i.e. 6 months. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from a soil, agricultural and land potential perspective. From an agronomic or agribusiness viewpoint there is no stated preference. It can therefore be based purely on civil engineering considerations.

» **8.2.5 Impacts on Heritage (including archaeology and palaeontology)**

Impacts to heritage resources may occur during the construction phase due to the potential to uncover human graves that may be associated with historical settlements in the vicinity of the four alternative corridor routes. Corridors 1, 2 or 3 were determined to be the most feasible options in terms of heritage sites as any aspects of heritage significance may have been destroyed by previous developments. No archaeological resources or significance were identified. However, a 50m buffer around the unmarked graves along corridor route 4 should be implemented should this corridor be considered as the preferred alternative.

The area is of very low palaeontological sensitivity and has no or very low, palaeontological value. The impact to heritage resources was identified to be of low significance with the implementation of the proposed mitigation measures.

No impacts are expected during the operation phase of the project. As such, the development of the 132kV transmission infrastructure and its associated infrastructure along corridor 1 and 3 are not associated with any fatal flaws from a heritage, archaeological and palaeontological perspective, and it is considered to be acceptable. It was therefore concluded that the project can be authorised.

» **8.2.7 Social Economic Impacts**

The Social Impact Assessment (Appendix H) identified that the majority of the negative and immediate positive social impacts associated with the project are anticipated to occur during the construction phase. Long term positive social benefits will occur during the operational phase.

The anticipated duration for the construction phase of the project is approximately 6 months, following which the 132kV transmission lines and switching station could potentially be handed over to Eskom for the

duration of the operation phase, and if not handed over to Eskom would be operated by the project proponent, which is anticipated to be approximately 20 years. These impacts include the creation of direct and indirect employment opportunities; skills development; an influx of jobseekers and a change in the population; safety and security impacts; impacts on the daily living and movement patterns; nuisance impacts; and a sense of place impacts. These impacts will be of a short-term duration with low significance of negative impacts and a medium – high significance on the positive impacts identified.

For the operation phase of the transmission infrastructure, the impacts identified include direct and indirect employment opportunities; increased production; positive impacts on GDP; improved standard of living and increased household income and improvement in the energy generation sector. These impacts are associated with a long-term duration and will be of a low - medium significance following the implementation of the recommended mitigation and enhancement measures.

The development of the transmission infrastructure is unlikely to result in permanent damaging social impacts. From a social perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the 132kV transmission infrastructure and its associated infrastructure can be authorised from a social perspective. From a socio-economic perspective all four the routes have similar impacts and as they are more or less the same length and have to cross the same terrain and obstacles.

» **8.2.8 Assessment of Cumulative Impacts**

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of grid connection infrastructure in South Africa and within the surrounding area of the grid connection corridor route alternatives. The surrounding area is associated with large scale industrial activities within the Port of Richards Bay, Alton industrial area and the Richards Bay IDZ.

These industries have contributed to the transformation and industrialisation of the landscape in the area. The transmission corridor route alternatives and associated infrastructure for the 450MW RMPP are located within an area where several grid connection and overhead transmission line developments are proposed and existing. Existing overhead grid connection infrastructure within the vicinity of the grid connection corridor for the 132kV transmission include the unutilised Bayside transmission infrastructure and the overhead grid infrastructure for South32 Aluminium and proposed grid connection infrastructure for Eskom's Richards Bay CCPP. The 132kV transmission lines are to be cabled underground and therefore considers the existing and proposed infrastructure and eliminates further visual impacts to the Alton industrial area, with the exception of the switching station. The transmission infrastructure and access roads are located as far as possible within existing road and rail servitudes with the proposed switching station located within the existing Eskom's servitude for the Bayside transmission lines. Therefore, considering all aspects, cumulative impacts associated with the 132kV transmission lines, access road points and switching station for the 450MW RMPP have been assessed to be acceptable, with no unacceptable loss or risk expected (refer to **Table 8.1** and **Chapter 7**)

Table 8.1: Summary of the cumulative impact significance for the 132kV transmission infrastructure and its associated infrastructure within the development area

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology	Low or Medium (depending on the impact being considered)	Low or medium (depending on the impact being considered)
Aquatic resources	Low or Medium (depending on the impact being considered)	Low or Medium ((depending on the impact being considered)
Soil & Agricultural Potential	Very Low	Very Low
Heritage (archaeology and palaeontology)	N/A	N/A
Social	N/A	N/A

Based on the specialist cumulative assessments and findings regarding the development of the 132kV transmission infrastructure within the preferred corridor route alternative (route 1) and its contribution to the overall impact within the surrounding area, it can be concluded that there are no cumulative impacts or risks identified as unacceptable with the development of the 132kV transmission line and other grid connection infrastructure within the surrounding area. In addition, no impacts that will result in whole-scale change are expected as a result of the 132kV transmission lines, access road points and switching station.

8.3. Environmental Sensitivity Mapping

As part of the specialist investigations undertaken within the four alternative corridor routes for the 132kV transmission line, access roads and switching station located within the existing Eskom servitude, specific environmental features and areas were identified which will be impacted by the placement of this infrastructure. The current condition of the features identified (i.e. intact or disturbed) informed the sensitivity of the environmental features and the capacity for disturbance and change associated with the proposed development. The environmental sensitive features and areas identified within the four alternative corridor routes and switching station location are illustrated in **Figure 8.1**. The sensitive features identified specifically relate to ecological and freshwater resources. It is the reasoned opinion of the specialist that the 132kV transmission lines, switching station and access roads within the assessed corridors can be authorised from an environmental sensitivity perspective. The most acceptable routes were determined to be routes 1,2 and 4 including the access road points as these routes are mostly situated along the existing roads and railway line reserves. Although these routes cross the Phragmites - Typha channelled valley bottom wetlands the impacts can be mitigated by ensuring, to the extent possible, that these routes are within the road and railway reserves to reduce the impact on the natural vegetation and wetland habitat.

8.4. Nomination of a Preferred Cable Route Alternative

From the specialist studies undertaken, the following was concluded regarding the proposed corridors investigated.

Ecological Assessment findings: The most preferred routes would be either route 1 or route 4 as these routes are mostly situated along the existing road and railway line reserves. Although these two routes cross the Phragmites - Typha channelled valley bottoms wetlands (once in respect of route 4 and twice in respect of route 1), the impacts can be mitigated by ensuring that these routes are within the road and railway reserves, as far as reasonable possible servitudes to reduce the impact on the natural vegetation

Aquatic Assessment findings: The most preferred routes would be either route 1 or route 4 as these routes are mostly situated along the existing road and railway line reserves. Although these two routes cross the Phragmites - Typha channelled valley bottoms wetlands (once in respect of route 4 and twice in respect of route 1), the impacts can be mitigated by ensuring that these routes are within the road and railway reserves, as far as reasonably possible, to reduce the impact on the natural vegetation and wetland habitat.

Soil and Agricultural Potential findings: In view of all four (4) routes being made up of vacant, unused non-arable land already traversed by existing gas pipelines, two railway systems, a multilane highway, a network of local service roads, existing underground municipal electricity transmission infrastructure and a multi-pylon powerline transmission systems, all serving a major industrial hub, the specialist has no option other but to recommend that the application for the proposed land use and preferred route alternative 1 be approved from an agronomic and agribusiness perspective.

Heritage Assessment findings: The specialist recommended that the final route is surveyed after it has been cleared of vegetation prior to commencement of construction. Corridors that were identified to have had human settlements will have the chance of uncovering human graves. If a 50m buffer was placed around these points, then the underground power lines will probably not affect potential graves.

Corridors 1 and 3 appear to be equally the safest option in terms of heritage sites. Both corridors had settlements in their footprints; however, these have likely been destroyed by previous developments. These two corridors are unlikely to yield heritage sites.

Socio-Economic Assessment findings: A number of potential positive and negative social impacts have been identified for the project. The positive impacts greatly outweigh the negative impacts. Based on the findings of this Socio-Economic Impact Assessment basic assessment report, no red flags or fatal flaws have been identified from a socio-economic perspective which could preclude the development of 132kV transmission line, access roads and switching station. From a socio-economic perspective all four routes have similar impacts and as they are more or less the same length and have to cross the same terrain and obstacles.

Specialist assessment	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ecology	Preferred	Acceptable with mitigation	Acceptable with mitigation	Preferred
Aquatic resources	Preferred	Acceptable with mitigation	Acceptable with mitigation	Preferred
Soil & Agricultural Potential	No preference			
Heritage (archaeology and palaeontology)	Preferred	Acceptable with mitigation	Preferred	Acceptable with mitigation
Social	No preference			

Based on the above, all alternatives are considered to be acceptable with the implementation of recommended mitigation measures. However, considering all conclusions, Alternative 1 is considered to be the overall preferred alternative as there are no specific issues highlighted for this route by any of the specialist studies undertaken. As this is also the technically preferred route, this alternative is nominated as the preferred alternative for authorisation.

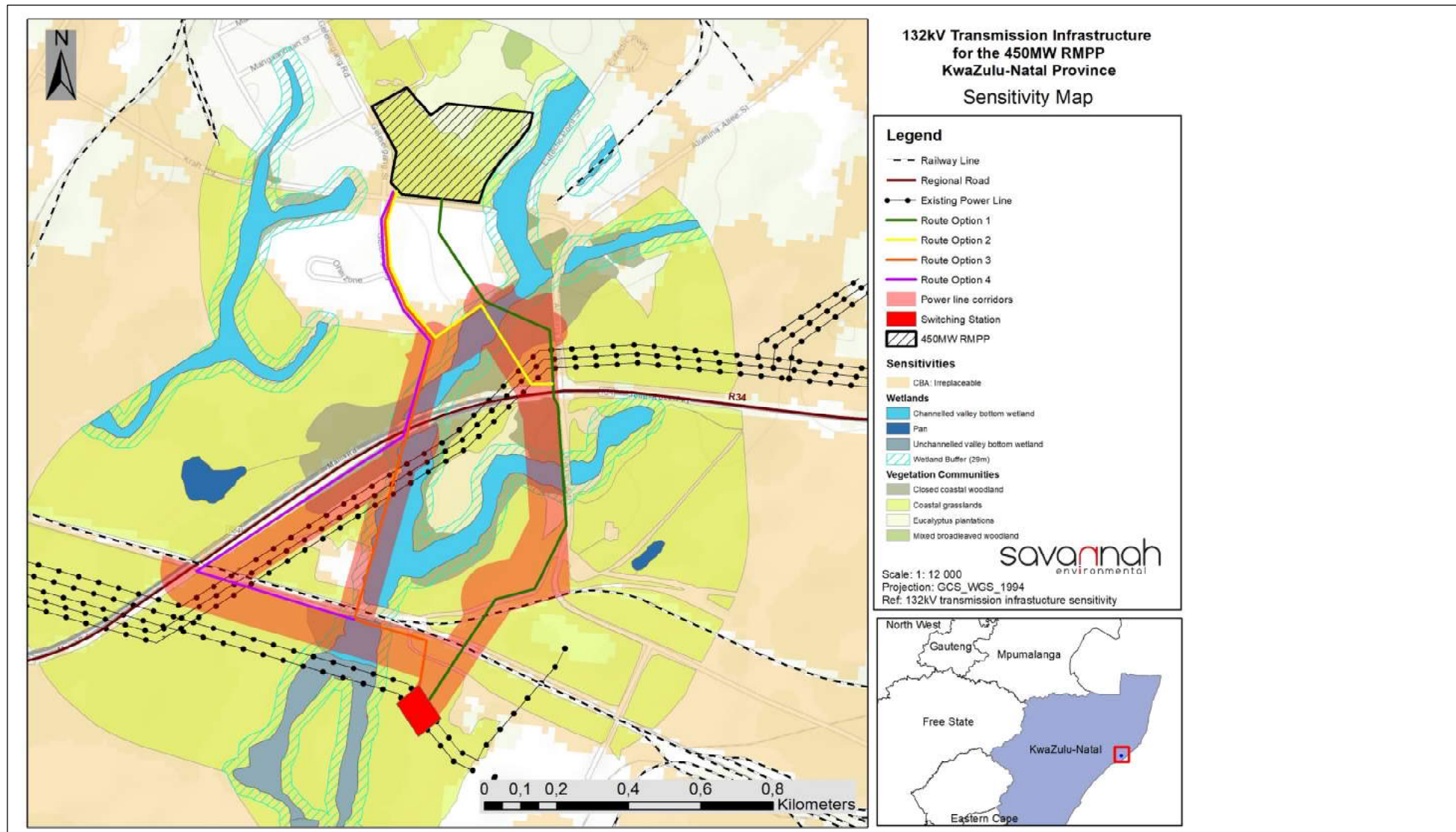


Figure 8.1: Environmental sensitivity and layout map of 132kV transmission infrastructure and associated route alternatives (A3 map is included in Appendix B)

8.5. Environmental Costs Benefits of the transmission infrastructure

Environmental costs (including those to the natural environment, economic and social environment) can be anticipated at a local and site-specific level and are considered acceptable provided the mitigation measures, as outlined in the BA Report and the EMPs, are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

- » *A loss of biodiversity, flora and fauna due to the clearing of land for the construction and utilisation of land for the installation of the underground cables and the switching station* - The cost of loss of biodiversity and species of special concern is considered to be limited due to the short duration of construction and preferred route located as far as possible within existing road reserves and rail reserves associated with the underground cabling infrastructure and the placement of the switching station being located within the existing Eskom servitude, an already disturbed area.
- » *A loss of habitat loss of habitat for aquatic to semi-aquatic species* - The environmental cost is determined as low for the construction of the infrastructure with the implementation of limiting the extent of construction works within wetlands, implementation of the 29m buffer and the selection of route 1 or 4.
- » *Loss of land available for agricultural activities within the grid connection corridor* - The environmental cost is anticipated to be very limited due to the fact that all infrastructure associated with the project does not traverse areas of a high agricultural sensitivity and the area within the vicinity of all four corridor route alternatives has been extensively transformed due to other anthropogenic activities such as pipelines and roads.

Benefits of the 132kV transmission infrastructure include the following:

- » The project will facilitate the connection of the 450MW RMPP Facility to the national grid. The RMPP facility will provide electricity to the national grid which will have a positive impact at a national level.
- » The project contributes towards the Provincial and Local IDP objectives for the provision of electricity.

The benefits of the transmission infrastructure are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level can be largely limited through the appropriate placement of the underground cabling infrastructure within preferred corridor alternative (Route 1) as it is considered to be acceptable for the development of the transmission infrastructure and access road points, as well as the consolidation of transmission infrastructure in the area, the benefits of the project are expected to outweigh the environmental costs of the 132kV transmission infrastructure.

8.6. Overall Conclusion (Impact Statement)

The construction and operation of the 132kV cabling infrastructure with a servitude of 20m, and associated access roads within a 2km long and 50m-100m wide corridor near the town of Alton in the uMhlatuze Local Municipality and the King Cetshwayo District Municipality has been proposed by Phinda Power Producers (Pty) Ltd. Four (4) route alternative connection corridors were assessed as part of this BA process, with the technically viable connection corridor along route alternative 1 selected as the preferred route alternative (as detailed in Section 8.4). The assessment of the four alternative connection corridor options were undertaken by independent specialists and their findings have informed the results of this BA Report. The specialist findings have indicated that there are no environmental fatal flaws associated with the

development of the 132kV underground cabling or access road points within the 4 alternative identified corridor.

No impacts of high sensitivity or fatal flaws were identified for the location of the switching station as it is located within the existing Eskom servitude.

All impacts associated with the preferred alternative (Route 1) corridor for the underground cables and access roads and the location of the switching station can be mitigated to acceptable levels through the implementation of the recommended mitigation measures.

8.7. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, and the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the Environmental Assessment Practitioner (EAP) that the development of the 132kV transmission infrastructure is acceptable within the landscape and can reasonably be authorised. It is further the reasoned opinion of the EAP that the preferred corridor route 1 and switching station proposed by the proponent is the most appropriate option to be authorised.

The following key conditions would be required to be included within the environmental authorisation issued for the 132kV transmission lines, switching station and access roads:

- » The 20m servitude should be located within the assessed preferred corridor route alternative 1. The project footprint for the transmission lines must remain within the assessed and preferred route 1 grid connection corridor.
- » The switching station location should be located within the assessed switching station location comprising a size of 0.8 hectares, all falling within the existing Eskom servitude width of 80m.
- » Existing access roads are to be used as far as possible along the preferred alternative corridor route 1. Where new access roads are required, these are to be up to 4m wide unsurfaced tracks.
- » All mitigation measures detailed within this BA Report, as well as the specialist reports contained within **Appendices D to H**, are to be implemented.
- » The EMPs as contained within **Appendix J and K** of this BA Report should form part of the contract with the Contractor appointed to construct and maintain the 132kV transmission infrastructure in order to ensure compliance with environmental specifications and management measures. The implementation of the EMPs for all life cycle phases of the 132kV transmission infrastructure, switching station and access roads is considered key in achieving the appropriate environmental management standards as detailed for this project.
- » Following the final design of the 132kV transmission infrastructure and its associated infrastructure, the final co-ordinates illustrating the position of cables, switching station and access roads must be submitted to the DEFF.
- » A pre-construction walk-through of the final corridor route, switching station and roads within the grid connection corridor by a specialist ecologist to identify any species of conservation concern that would be affected and that can be translocated must be undertaken prior to the commencement of the construction phase. Permits from the relevant national and provincial authorities, i.e. the Ezemvelo KZN Wildlife and the Department of Agriculture, Forestry and Fisheries (DAFF), must be obtained before the individuals are disturbed.

- » The necessary water use authorisation must be obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) for impacts to a watercourse prior to construction.
- » Rehabilitation should be undertaken on a progressive basis in areas where the cable routing will cross wetlands identified.

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