



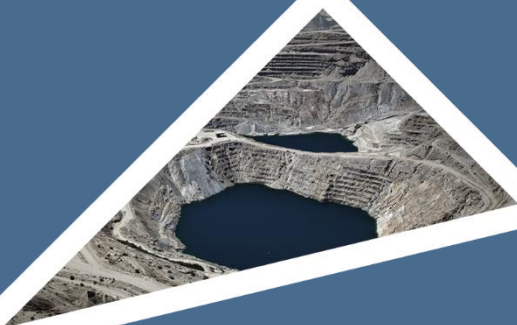
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## ENVIRONMENTAL SENSITIVITY REPORT

THE PROPOSED ZIBULO NORTH SHAFT OVERHEAD 132KV  
POWERLINE PROJECT, IN THE NKANGALA DISTRICT MUNICIPALITY,  
WITHIN VICTOR KHANYE AND EMALAHLENI LOCAL  
MUNICIPALITIES, MPUMALANGA PROVINCE

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## LIST OF ABBREVIATIONS / ACRONYMS

CA	Competent Authority
CBA	Critical biodiversity area
CMA	Catchment Management Agency
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989)



EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
ESA	Ecological Support Area
ESR	Environmental Sensitivity Report
GA	General Authorisation
Ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
kV	Kilovolt
MDARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MW	Megawatt
MVA	Megavolt Amperes
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NERSA	The National Energy Regulator of South Africa
RI&APs	Registered Interested and Affected Parties
NWA	National Water Act (Act No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
TRFR	Transformer

## GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report and, or other documents drafted for the project.

*Table 1: Glossary of terms*

Term	Definition	Reference
<b>Clearing/Clearance</b>	Clearing/Clearance refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g., fire- breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated'.	Department of Environmental Affairs, 2017. Clearance of Indigenous Vegetation Explanatory Document
<b>Competent Authority</b>	In respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity.	National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as





Term	Definition	Reference
		amended, NEMA 1998 hereafter
<b>Critical Biodiversity Area</b>	Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection.	SANBI
<b>Decommissioning</b>	means 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 recommissioned;	NEMA, EIA Regulations, 2014, as amended
<b>Environment</b>	the surroundings within which humans exist and that are made up of— 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.	National Environmental Management Act 1998 (Act No. 107 of 1998), as amended, NEMA hereafter
<b>Environmental Authorisation</b>	This is a decision by a Competent Authority to authorise a listed activity in terms of the National Environmental Management Act (NEMA). The authorisation means that a project, either in totality or partially, can commence subject to certain conditions. The Competent Authority has a right to refuse to grant authorisation for a project in totality or partially.	NEMA, EIA Regulations, 2014, as amended
<b>Environmental Assessment Practitioners</b>	The individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmers or any other appropriate environmental instruments introduced through regulations.	NEMA, 1998
<b>Fatal Flaw</b>	An environmental or social negative impact that is not possible to mitigate and significant enough to prevent the scheme from being able to be implemented.	NEMA, 1998
<b>Fauna</b>	Animal life that occurs in a specific geographical region and/habitat.	SANBI
<b>Flora</b>	plant life that occurs in a specific geographical region and/habitat.	SANBI
<b>Indigenous vegetation</b>	Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.	NEMA, EIA Regulations, 2014, as amended
<b>Interested and Affected Parties (IAPs)</b>	a) any person, group of persons or organisation interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.	NEMA, 1998
<b>Protected Area</b>	A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.	International Union for Conservation of Nature (IUCN)
	These are areas aimed at the protection and conservation of areas which are ecologically viable and have high biodiversity. Example of Protected Areas include but are not limited to	National Environmental Management:



Term	Definition	Reference
	National Parks, Nature Reserves, world heritage sites and marine protected areas	Protected Areas Act, 2003 (Act No. 57 of 2003)
<b>Public Participation Process</b>	In relation to the assessment of the environmental impact of any application for an environmental authorisation, means a process by which potential Interested and Affected Parties are given opportunity to comment on, or raise issues relevant to, the application.	NEMA, 1998, as amended
<b>Regulated Area of a watercourse</b>	An area for which a General Authorisation or a Water Use Licence would need to be obtained prior to undertaking any activities.	National Water Act 36 of 1998
<b>Screening</b>	Screening determines whether or not a development proposal requires environmental assessment, and if so, what level of assessment is appropriate Screening is therefore a decision-making process that is initiated during the early stages of the development of a proposal.	NEMA, EIA Regulations, 2014, as amended
<b>Species of Conservation Concern</b>	IUCN Red List definition: Threatened species, and other species of significant conservation importance: Extinct, Extinct in the Wild, Near Threatened, Data Deficient. In South Africa, the following additional categories are added: Rare, Critically Rare.	SANBI
<b>Watercourse</b>	Watercourse refers to: (a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.	National Water Act 36 of 1998
<b>Wetland</b>	land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil	National Water Act 36 of 1998

## AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I **Vukosi Mabunda**, a Registered EAP (EAPASA Registration Number: 2019/867) employed by **Environmental Impact Management Services (Pty) Ltd** declare that the information provided in this report is correct and relevant to the activity / project, that comments from interested and affected parties have been incorporated into this report that the information was made available to interested and affected parties for their comments.

  
 \_\_\_\_\_  
 SIGNATURE OF EAP

07 November 2023  
 \_\_\_\_\_  
 DATE



# 1. INTRODUCTION

## 1.1 Project Background

Anglo American Inyosi Coal (Pty) (the Applicant) has appointed Environmental Impact Management Services (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the necessary registration and authorisation processes, including compiling the necessary reports and undertaking the statutory consultation processes, in support of the proposed project as described herein. The proposed development is approximately 6.6 km south of Kendal Power Station and approximately 14.5 km Southwest of Ogies. The proposed project entails the establishment of a 125m powerline corridor situated within Nkangala District Municipality, extending between Victor Khanye and Emalahleni Local Municipalities, Mpumalanga Province. The entirety of the proposed powerline project falls within the Electrical Generation Infrastructure (EGI) International Corridor as defined in the Department of Forestry, Fisheries and the Environment (DFFE), 2022 Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas (Revision 2).

Based on the information provided to EIMS, Zibulo North Shaft requires a 20 Megavolt Amperes (MVA) electricity supply for the mining operations by 2025. The following assets will be established for the supply:

- A new Zibulo North Shaft 132/11kV 2x20MVA Substation for the Zibulo North Shaft Point of Supply (POS). Two (2) x 20MVA Transformers (TRFR's) will be installed in phase 1 with an open TRFR bay for the installation of the third TRFR in 2032 should it be required.
- Establish 132 kilovolt (kV) Feeder Bay at the existing Cologne Substation.
- Build 7km (option 1 & 2) Kingbird 132kV line from Cologne Substation to Zibulo North Shaft Substation.
- Establish 132kV Feeder Bay at the existing Modiri Substation.
- Build 10.5km (option 1) or 15km (option 2) Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. The route options will be assessed during the course of this environmental application process.

A review of the National Environmental Management Act, 1998 (Act No. 107 of 1998, NEMA), Environmental Impact Assessment (EIA) Regulations, 2014 as amended revealed that the proposed development would typically require an Environmental Authorisation (EA) through a Basic Assessment process due to the following triggered activities:

- GNR 983 (2014, as amended): Activities 11: The development of facilities or infrastructure for the transmission and distribution of electricity;
- GNR 983 (2014, as amended): Activities 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
- GNR 985 (2014, as amended): Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan; and
- GNR 985 (2014, as amended): Activity 14: The development of - (ii) infrastructure or structures with a physical footprint of 10 square metres or more;

However, a review of the Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas, promulgated on 27 July 2022 ('the Standard') published under GNR 2313, 27 July 2022 found that the proposed development falls under the ambit of developments specifically excluded from the requirements of an EA. **Therefore, the proposed development is only required to undertake the registration process guided by the Standard and not an EA application process.**



The proposed development also triggers Section (c) and (i) of the National Water Act – NWA (Act 36 of 1998). As such, a Water Use Authorisation (WUA) process is required prior to commencing with construction. A pre-application meeting with the Department of Water and Sanitation to confirm the Water Use Licence (WUL) or General Authorisation (GA) registration process to be followed was held on the 21<sup>st</sup> of August 2023. The Department (DWS) confirmed that the process to be followed will be through a GA registration in terms of GN 509 of 26 August 2016. The General Authorisation application was submitted on the 24<sup>th</sup> of October 2023 and feedback is expected within 30 days of submission.

## 1.2 Purpose of the Report

The overarching objective of the Environmental Sensitivity Report (ESR) is to ensure that the sites that have been identified for development are appropriately located in terms of both technical and environmental requirements. The process is conducted in a manner that allows for the minimisation of infrastructure, operation, and maintenance costs, as well as social and environmental impacts in line with the Environmental Management and sustainability principles. EIMS undertook the environmental sensitivity assessment process based on information collected through a desktop review as well as relevant specialist assessments. This report presents the findings of the ESR for the proposed Zibulo Colliery 132kV Overhead Powerline Project.

The purpose of this report is to present the results of the ESR for the proposed development by presenting the following:

- The details and relevant expertise of the EAP and specialists preparing the report;
- The project description and locality;
- The status quo of the environmental conditions of the site;
- Legislative framework governing the site;
- The outcome of the National Web-Based Environmental Screening Tool Report;
- The outcome of specialist's site verification;
- The potential impacts and recommendations; and
- The public participation undertaken for the project.

This report further highlights areas within legislation that may require the attention of the applicant and consider the applicable legislative requirements, technical requirements (design, accessibility, operational requirements; etc.), environmental considerations (environmental sensitivity, specialist requirements, land ownership, local site conditions, access constraints, environmental legislative requirements etc.), to ensure that the development will be optimally placed. It is acknowledged that a proactive identification of a location of the proposed development would enhance the viability of the project and inform the scope of the applicable Environmental processes.

## 1.3 Assessment Methodology

The Environmental Sensitivity Report made use of available information, GIS-Desktop studies, National Web-Based Environmental Screening Tool Report and specialist site assessments. With regards to the Screening Tool Report, it is important to mention that it is compulsory (effective from the 4<sup>th</sup> of October 2019), to use the tool when pre-screening a site and must be attached to all EA Applications (including this Standard Registration).

## 1.4 Assumptions Gaps and Limitations

The following assumptions have been made in the compilation of this ESR:

- The assessment is limited to the proposed Zibulo North Shaft 132kV 125m powerline corridor site;
- The information presented in this report was the most relevant and accurate at the time of compilation;



- The information provided by the applicant is assumed to be accurate, adequate, unbiased, and no information that could change the outcome of the assessment has been withheld;
- The information obtained from the specialist studies are assumed to be accurate, adequate, unbiased, and no information that could change the outcome of the assessment has been withheld;
- Detailed assessment of the positive and negative environmental impacts of the proposed development are not applicable as the report is an ESR and not a Basic Assessment Report nor an Environmental Impact Assessment Report. The content of this report is guided by the Standard as promulgated under GNR 2313 of 27 July 2022;
- Both the Draft and the Final ESR were be provided to registered I&APs, but public review and commenting was only be accepted on the Draft ESR;
- In accordance with the Protection of Personal Information Act (Act 4 of 2013), personal information (names, emails, contact numbers, address, etc. of I&APs) are excluded during the Public Participation and only provided to the competent authority officials; and
- Personal information of I&APs made available to the competent authority shall only be used by the authorities to confirm or obtain information regarding this specific project.

## 1.5 Project Locality and Description

### 1.5.1. Project Locality

The proposed Zibulo North Shaft entrance is located at 26°8'55.0"S, 28°57'10.32"E, approximately 6.6 km south of Kendal Power Station and approximately 14.5 km Southwest of Ogies, off the N12 national highway in the Nkangala District Municipality, Mpumalanga (**Figure 1**). The source and load substations with reference to the power lines are located at:

- Cologne - 26°7'24.26"S, 28°59'46.03"E,
- Modiri SS - 26°12'11.37"S, 29° 1'17.01"E and
- Zibulo North Shaft SS - 26° 8'56.88"S, 28°57'22.38"E

The entirety of the proposed powerline project falls within the Electrical Generation Infrastructure (EGI) International Corridor as defined in the Department of Forestry, Fisheries and the Environment (DFFE), 2022 Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas (Revision 2). The site locality details are indicated in **Table 2** below and the final list of properties has been updated in February 2024 due to certain portions recorded by the Surveyor General on the latest cadastral layer not in fact being registered or recorded in the Deeds Office. Therefore the list of properties contained in this application has been aligned where actual title deeds have been registered or where registration in the Deeds Office has been confirmed within the next 3-4 months.

*Table 2: Site property details*

Item	Details
Farm Name / Portion	<p>The proposed 125m powerline corridor is located on the following farms and portions:</p> <p><b>ZONDAGSFONTEIN 253 IR</b></p> <ul style="list-style-type: none"><li>• Remaining Extent</li><li>• Portion 3</li><li>• Portion 5</li><li>• Portion 6</li><li>• Remaining Extent of Portion 7 (a portion of portion 2)</li></ul>



	<ul style="list-style-type: none"> <li>• Remaining Extent of Portion 8 (a portion of portion 2)</li> <li>• Portion 9 (a portion of portion 2)</li> <li>• Portion 12</li> <li>• Portion 14 (a portion of portion 7)</li> <li>• Portion 16 (a portion of portion 8)</li> <li>• Portion 17 (a portion of portion 2)</li> <li>• Portion 18</li> </ul> <p><b>OLGA 35 IS</b></p> <ul style="list-style-type: none"> <li>• Portion 1</li> </ul> <p><b>SMITHFIELD 44 IS</b></p> <ul style="list-style-type: none"> <li>• Portion 1</li> <li>• Portion 2</li> <li>• Portion 3</li> <li>• Remaining Extent of Portion 5</li> <li>• Portion 9 (a portion of portion 5)</li> </ul> <p><b>RIETVLEI 64 IS</b></p> <ul style="list-style-type: none"> <li>• Remaining Extent</li> <li>• Remaining Extent of Portion 1</li> <li>• Remaining Extent of Portion 4</li> <li>• Portion 7 (a portion of portion 1)</li> </ul> <p><b>LEEUFONTEIN 219 IR</b></p> <ul style="list-style-type: none"> <li>• Remaining Extent</li> <li>• Portion 13</li> <li>• Portion 24</li> <li>• Portion 35</li> </ul>
Powerline Corridor characteristics	<ul style="list-style-type: none"> <li>• 125m powerline corridor</li> <li>• 7km Kingbird 132kV line from Cologne Substation to Zibulo Substation</li> <li>• 15km (route option 2) Kingbird 132kV line from Zibulo Substation to Modiri Substation</li> </ul>
Distance from closest town	14.5 km Southwest of Ogies
GPS coordinates	Start point: 26° 7'23.76"S; 28°59'45.41"E Midpoint: 26° 9'30.44"S; 29° 1'10.93"E Endpoint: 26°10'23.97"S; 29° 2'52.99"E
Local Municipality	Victor Khanye and Emalahleni Local Municipalities
District Municipality	Nkangala District Municipality



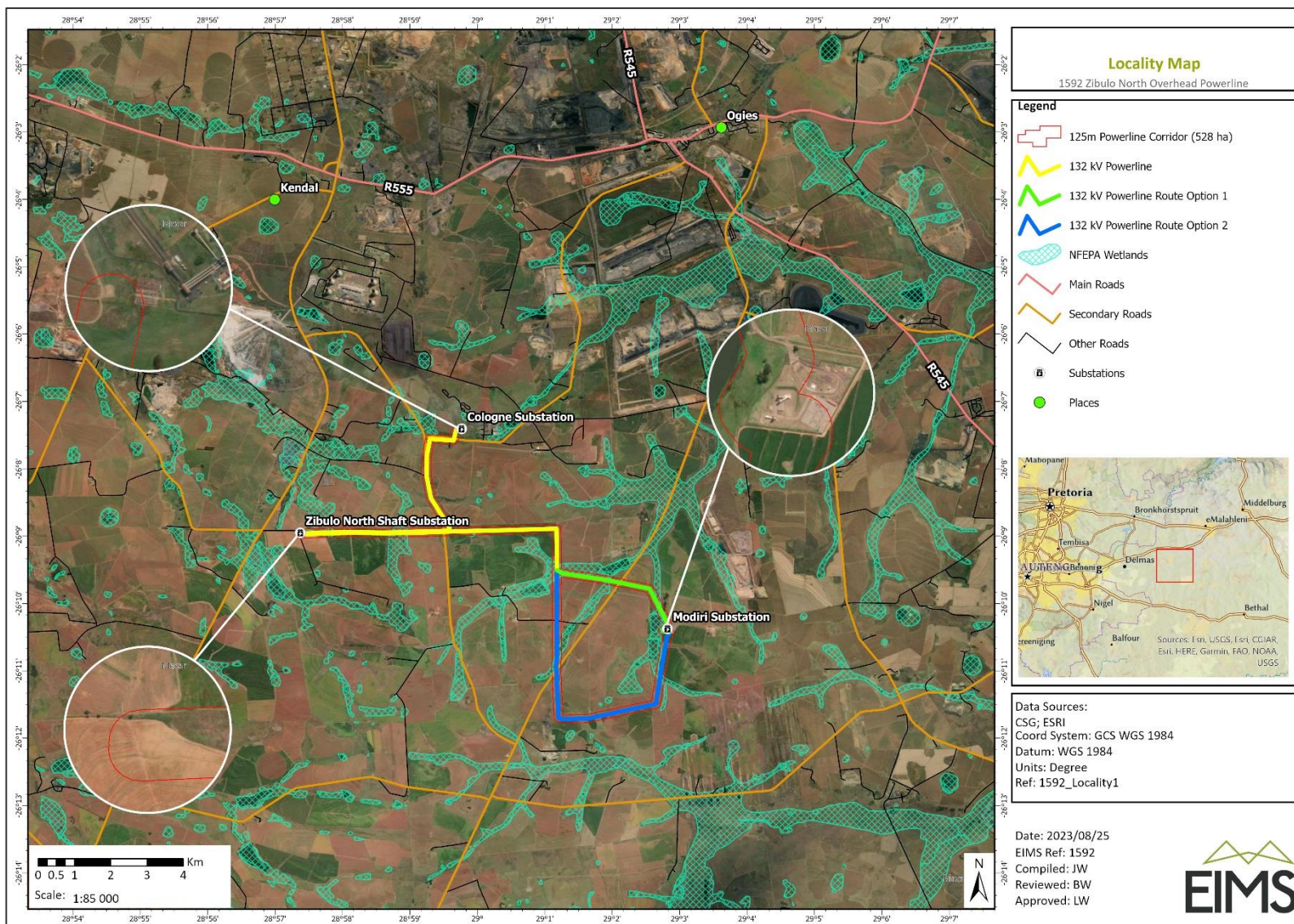


Figure 1: Site locality map



### 1.5.2. Project Description

Based on the information provided to EIMS, Zibulo North Shaft requires a 20MVA electricity supply for the mining operations by 2025. The following assets will be established for the supply:

- A new Zibulo North Shaft 132/11kV 2x20MVA Substation for the Zibulo North Shaft Point of Supply (POS). 2x20MVA TRFR's will be installed in phase 1 with an open TRFR bay for the installation of the third TRFR in 2032 should it be required.
- Establish 132kV Feeder Bay at the existing Cologne Substation.
- Build 7km (option 1 & 2) Kingbird 132kV line from Cologne Substation to Zibulo North Shaft Substation.
- Establish 132kV Feeder Bay at the existing Modiri Substation.
- Build 10.5km (option 1) or 15km (option 2) Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. The route options will be assessed during the course of this environmental application process.

Transmission lines carry electrical energy from one point to another in an electric power system. They can carry alternating current (AC) or direct current (DC), or a system can be a combination of both. Also, electrical current can be carried by either overhead or underground lines. The main characteristics that distinguish transmission lines from distribution lines are that they are operated at relatively high voltages, they transmit large quantities of power and they transmit the power over large distances. The types of transmission lines are;

- Overhead Transmission Lines
- Subtransmission Lines
- Underground Transmission Lines

The proposed Zibulo North project is an overhead transmission line (OHL) development. The OHL share one characteristic, they carry 3-phase current. The voltages vary according to the particular grid system they belong to. Transmission voltages vary from 69kV up to 765kV. The DC voltage transmission tower has lines in pairs rather than in threes (for 3-phase current) as in AC voltage lines. One line is the positive current line and the other is the negative current line. The proposed development is an 132kV AC steel monopoles OHL. An example of the proposed infrastructure is indicated in **Figure 2** (refer to **Appendix A2** for the detailed designs).



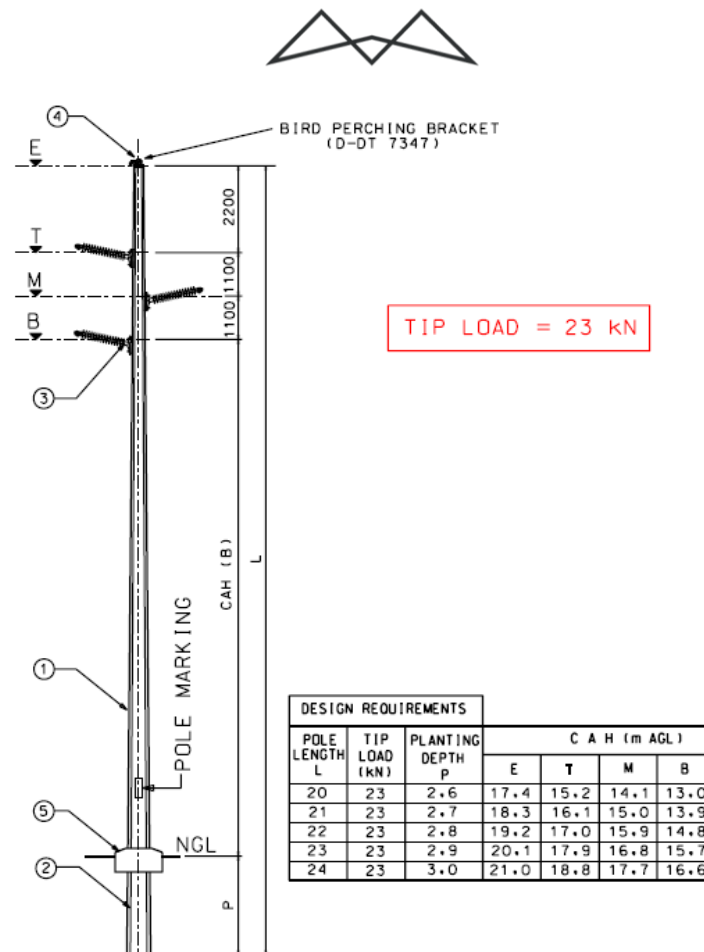


Figure 2: Structural design of some of the proposed infrastructure

Before the start of overhead transmission line (OHL) construction, the Contractor will carry out preparatory works, such as cutting of trees and construction of temporary access roads for specialized machinery. Construction of transmission tower foundations will be the next stage in constructing OHL. As a rule, metal transmission towers (angle-tension and suspension ones) are erected on reinforced concrete foundations of various types and structures (precast or monolith). The following step in the power line construction is installation of transmission towers itself. Installation of towers is rather sophisticated technological process. In most cases, the Contractor will install transmission towers by two methods: the rotation method or the build-up method. This is followed by the installation of conductors. To install conductors and ground wires, the Contractor uses an innovative pulling method that does not require lowering the wires to the ground surface, thus preventing mechanical damage. This will reduce future electricity losses during operation of the transmission line. This stringing method also facilitates crossing of transport routes and engineering facilities. The stringing process which will be followed is indicated in the next section of the report.

### 1.5.3. Stringing procedure

- a) Step 1: Running out of the conductor:
  - Secure swivel onto the strain structure (anchor end).
  - Terminate the conductor with the compression dead-end onto the swivel.
  - Use a conductor drum carrier to run out the conductor along the line and lock the conductor onto the running blocks. (light pilot wires can be used)
  - All unnecessary slack shall be eliminated to prevent conductor friction during tensioning.
  - The conductor must never be dragged on the ground, if it is not possible to achieve this, the conductor must be protected with wooden planks from damaging.



- Under no circumstances shall any vehicle be allowed to drive over conductors.

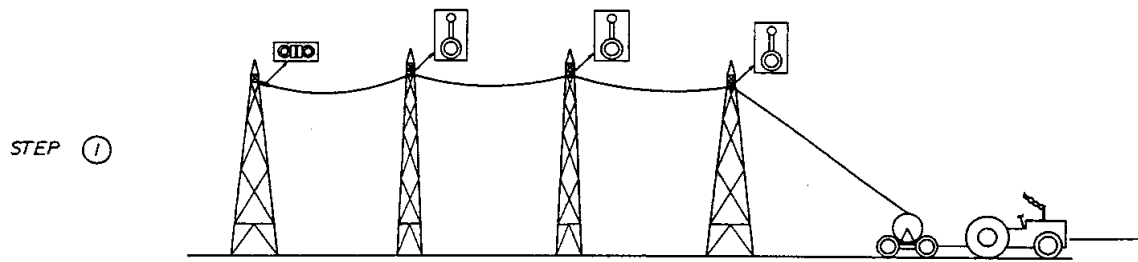


Figure 3: Procedure for running out of the conductor

b) Step 2: Unwinding of the conductor:

- Cut the conductor.
- Install a swivel and dynamometer at the pulling end.
- Tighten conductor slightly and give the conductor time to unwind.

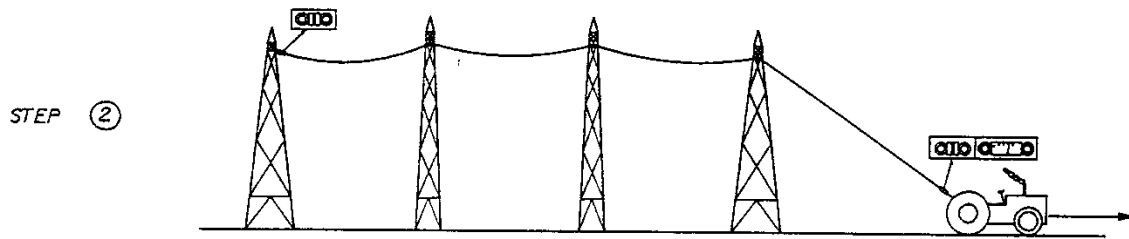


Figure 4: Procedure for unwinding of the conductor

c) Step 3: Slacking of conductor:

- Conductor to be slacked after it has unwound.

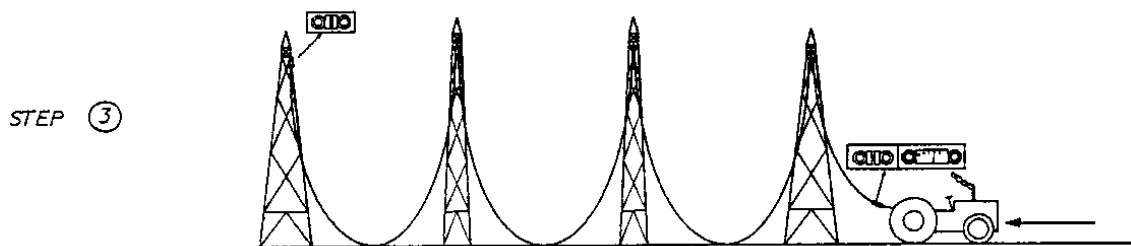


Figure 5: Procedure for slacking of conductor

d) Step 4: Sagging:

- Remove the swivel at the anchor end.
- Install the strain insulator.
- Sag conductor according to the provided Sag and Tension Chart.
- Ensure that conductor has not snagged on any of the running blocks.

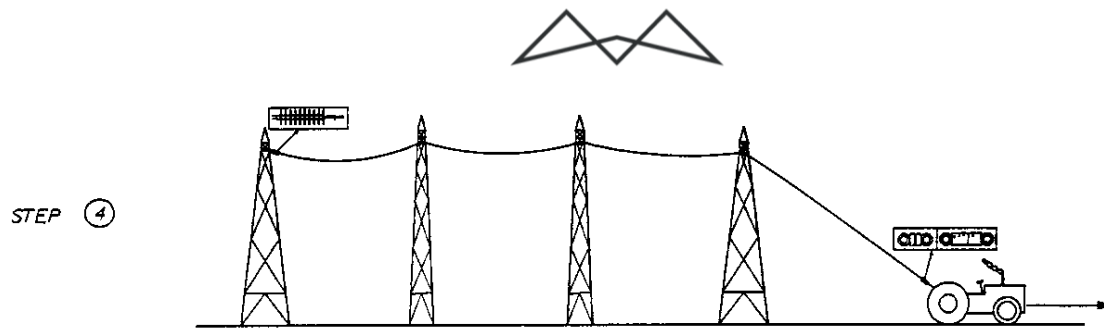


Figure 6: Procedure for Sagging

#### 1.5.4. Substation Construction Methodology

Substations are a complex facility involved in the transmission and distribution of electricity. There are many types of substations including distribution, transmission, collector, converter, etc. Their complex technical structure implies the presence of many basic and auxiliary elements. The construction of electrical substations, like the construction of any other industrial facility, consists of several stages namely: survey, design, civil works, electrical work, testing and commissioning. This process is carried out by a multidisciplinary team of specialists using modern equipment, extensive experience and technical knowledge in various fields. The construction of an electrical substation typically includes several stages which are explained below:

- Survey & Geotechnical Studies
- Site Clearing & Grading
- Substation Pad Construction
- Below Grade Facilities
- Foundations
- Structural Steel Support
- Electrical Equipment
- Electrical Bus Work
- Cable Pulling & Terminating
- Testing & Commissioning

The process commences with Step 1 with survey crews staking or flagging the locations for the station using predetermined GPS coordinates. In the second step, the ground is cleared in preparation for construction of the substation pad. This stage may consist of logging, mulching, burning, and clearing of debris, as well as building access trails to the site. The third step involves the topsoil on site being stripped to remove any unsuitable native material. Imported fill is then brought in and placed to build up the substation pad. This is completed with heavy equipment. Heavy equipment is used to install below grade facilities such as conduits, ground grids and cable trenches in the fourth step. In Step 5, foundations are layered. There are three types of foundations typically installed in a substation: helical piles installed with an excavator; driven piles installed with a large piling rig; and concrete cast-in-place type foundations where carpenters frame up forms and pour concrete to create the foundation. Step 6 involves the installation of structural steel support. Structural steel will come in two styles: H-beam, which is large, made of fewer pieces and easier to install; and tubular, which is very similar to h-beam but tubular in form. The steel is then secured to the foundations. Major electrical components are installed on the structural steel and foundations during step 7. This includes power transformers, breakers, reactors and control buildings trucked in and installed with large cranes. Once all electrical equipment is installed, and depending on the design of the station, the crew will install the flexible and rigid bus during step 8. This is a labour-intensive process, performed manually with manlifts and cranes. Lastly, during the final step, all previously installed major equipment is wired to bring the system online and functionally operational. Cables are pulled to each piece of equipment from the control building and terminated.



## 1.6 Servitude Requirements

Generally, 132 kV power lines require a servitude width of between 30m and 52m. The proposed power line will require a servitude width of at least 30m (15m either side of the centre line of the power line). It is understood that the powerline route option 2 which is the route being applied for, falls within an existing Eskom servitude. The exact details of the servitude requirements will be discussed with the affected landowners during the route negotiations. A total of ~123 towers are planned for the entire powerline route. The final positions of the steel monopoles will be identified and verified using a ground survey. Any extra area required outside the servitude owned/controlled by Eskom, shall be negotiated with the relevant land occupiers, and approved by the owner in control of that servitude (i.e., Eskom). All areas marked as areas of increased environmental sensitivity (i.e., medium sensitive) located inside the servitude shall be treated with the utmost care and responsibility from an environmental management perspective.

## 1.7 Line Clearances

High voltage power lines require a large clearance area for safety precautions. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances. If any tree or shrub in other areas were to interfere with the operation and/or reliability of the OHL it will be trimmed or completely cleared during the regular maintenance of the servitude. The clearing of vegetation shall take place, with the aid of a surveyor, along approved profiles and in accordance with the EMPr, and in accordance with the relevant minimum standards (**Table 3**) for vegetation clearing for the construction of the proposed new OHL.

*Table 3: Minimum standards to be used for vegetation clearing for the construction of a new line*

Item	Standard	Follow up
Centre line of the proposed powerline.	Vegetation to be cut within 50mm of the ground. Treat stumps with herbicides.	Re-growth shall be cut within 50mm of the ground and treated with herbicides, as necessary.
Access/service roads.	Clear a maximum (depending on tower type) 4m wide strip for vehicle access within the maximum 8m width, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil.	Re-growth to be cut at ground level and treated with herbicide as necessary.
Proposed tower position and proposed support/stay wire position.	Clear all vegetation within proposed tower position and within a maximum (depending on tower type) radius of 4m around the position, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil. Allow controlled agricultural practices, where feasible.	Re-growth to be cut at ground level and treated with herbicide as necessary.
Indigenous vegetation within servitude area (outside of maximum 8m strip).	Area outside of the maximum 8 m strip and within the servitude area, selective trimming or cutting down of those identified plants posing a threat to the integrity of the proposed distribution line.	Selective trimming.
Alien species within servitude area (outside of maximum 8m strip).	Area outside of the maximum 8m strip and within the servitude area, remove all alien vegetation within servitude	Within the wetlands: no herbicide may be used, only physical removal of the alien species.



Item	Standard	Follow up
	area and treat with appropriate herbicide.	Outside of wetlands: may cut and treat with appropriate herbicide.

## 1.8 Required Services

### 1.8.1. Access Road

A vehicle access road is usually required to be established to allow access along the entire length of the servitude. Access is required during both the construction and operation/maintenance phases of the line life cycle. The existing gravel and surfaced roads will be used as the access roads.

### 1.8.2. Construction Site Camps

Normally the power line Contractor would set up at least one site camp, but this does not necessarily need to be near the power line construction site. The Contractor may, however, prefer to use a fully serviced site in another location. It is the EAPs opinion that only one construction camp will be required for the project and it should ideally be located within an already disturbed and less environmental sensitive area such as the Cologne, Modiri or Zibulo North Shaft Substations or alternatively similar transformed areas agreed to by the landowner.

### 1.8.3. Sewage

A negligible sewage flow is anticipated for the duration of the construction period. Onsite pre-treatment can be undertaken using chemical toilets. The toilets shall be serviced periodically by a registered waste service provider and disposed at a registered waste facility.

### 1.8.4. Solid Waste Disposal

All solid waste shall be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site by a registered waste service provider.

### 1.8.5. Electricity

Diesel generators will likely be utilised for the provision of electricity during construction (if and where required).

## 1.9 Motivation and Need for the Development

### a) Need and Desirability

Although a discussion of the need and desirability for a proposed project is only required for an EA Process and in terms of 3(1)(f) of Appendix 1 of NEMA 2014 EIA Regulations and not for a registration process with the Standard, it is considered relevant for I&APs to understand the need and desirability of the proposed project. In addition, needs and desirability support the Environmental Rights as set out in Section 24 of the Constitution, as well the relevant municipal plans such as Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). Needs and desirability supports Sustainable development by ensuring that the proposed activity is ecologically, economically and socially sustainable.

Zibulo North Shaft requires a 30MVA electricity supply for the mining operations by 2030. The Zibulo Colliery operates both underground and opencast operations located about 100 km east of Johannesburg and approximately 60 km southwest of Emalahleni in the Mpumalanga province of South Africa. The Zibulo Colliery was formed in 2010. The underground operation is a mechanised bord and pillar mining operation. Surface operations consist of a truck and shovel open cast operation operated by contractors. Coal mined at Zibulo underground is transported via overland conveyor to the Phola Coal Processing Plant (PCPP) with the surface operations delivering coal to the PCPP by road. Zibulo produces a premium product for sale into the export



market and is an important role player in the mining sector contributing to local and regional economy as well as national GDP. Therefore, it is important that required 30MVA electricity supply for the mining operations by 2030 is realised to ensure that the operations continue at an optimal level. The project will improve and strengthen power supply required for the operations.

#### b) Local Benefits

Zibulo colliery's philosophy is based on Anglo American's pursuit to preserve and uplift the socio-economic well-being of its host communities. This commitment is clearly set out in a statement made by the company's founder, Sir Ernest Oppenheimer, 94 years ago. He said: *"The aim of this Group is, and will remain, to make profits for our shareholders, but to do this in such a way as to make a real and lasting contribution to the communities in which we operate."* The local community will benefit from the activity through temporary job creation in the construction phase as well as where possible, for maintenance during the operational phase of the development. During the construction phase of the development, local labour will be sourced and where possible socially responsible local service providers will be used in order to benefit the maximum amount of people. Local small and medium-sized enterprises or small and medium-sized businesses may be contracted for maintenance purposes during the operational phase. It is important to bear in mind that for a project of this small size and construction duration, the actual number of jobs will be relatively small.

### 1.10 Details of the Environmental Assessment Practitioner

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS is an independent specialised environmental consulting firm offering the full spectrum of environmental management services across all sectors within the African continent. EIMS has successfully completed many hundreds of assignments over the years with an excess of 30 years' experience in conducting EIA's for both the government and private sector. Please refer to the EIMS website ([www.eims.co.za](http://www.eims.co.za)) for examples of EIA documentation currently available. In terms of Chapter 2(2) of the Standard, an independent EAP, must be appointed by the applicant to manage the registration application process. EIMS and the compiler of this report are compliant with the definition of an EAP as defined in Regulations 1 and 13 of the NEMA EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The contact details of the EIMS consultant (EAP) who compiled this Report are presented in **Table 4**.

*Table 4: Details of the Environmental Assessment Practitioner*

EAP	Mr. Vukosi Mabunda
<b>Tel No:</b>	+27 11 789 7170
<b>Fax No:</b>	+27 86 571 9047
<b>E-mail:</b>	vukosi@eims.co.za
<b>Professional Registrations:</b>	<ul style="list-style-type: none"><li>• Registered Environmental Assessment Practitioner with Environmental Assessment Practitioner Association of South Africa – EAPASA (Reg. No: 134178)</li><li>• Professional Natural Scientist with the South African Council for Natural Scientific Professions – SACNASP (Reg. No: 2019/867).</li></ul>



This Environmental Sensitivity Report (ESR) was prepared by Vukosi Mabunda, a Registered Environmental Assessment Practitioner (EAP) employed by EIMS. His CV is included as **Appendix G** of this report. Mr Vukosi Mabunda is currently an Environmental Assessment Practitioner and a Geographic Information Systems (GIS) Specialist with 5 years' working experience. Vukosi is a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA). He is one of the few dual registered professionals with SACNASP as a Professional Geospatial Scientist and Professional Environmental Scientist. Vukosi has dual professional background in Geographic and Environmental Sciences with a Master of Science Degree in Geography obtained in 2021 from the University of Johannesburg. In addition to his experience in Environmental Compliance Monitoring and applications for Water Use License Applications, Vukosi has successfully completed numerous environmental impacts assessments for both linear and footprint developments as indicated in his CV (**Appendix G**).

## 1.11 Report Structure

This report has been compiled in accordance with the Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas, promulgated on 27 July 2022 ('the Standard'). A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in **Table 5** below.



Table 5: Report structure

Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
<b>Chapter 1(3):</b>	<p><b>1.3 Scope of this Standard</b></p> <p>The provisions of this Standard are applicable:</p> <ul style="list-style-type: none"> <li>• within the strategic transmission corridors as identified in Government Notice No. 113 in Government Gazette No. 41445 of 16 February 2018 and Government Notice No. 1637 in Government Gazette No. 45690 of 24 December 2021;</li> <li>• in areas identified by the national web based screening tool (screening tool) as being of medium or low environmental sensitivity and confirmed to be such by the EAP or the relevant specialist for the identified environmental theme; and</li> <li>• for the following activities, including the associated activities necessary for the realisation of the infrastructure, as identified in the EIA Regulations: <ul style="list-style-type: none"> <li>➤ Listing Notice 1: Activity 116 and 47; and</li> <li>➤ Listing Notice 2: Activity 9;</li> </ul> </li> </ul> <p>In addition to the activities identified above, the following activities and infrastructure are required for the realisation of transmission and/ or distribution power lines and/ or substations which could trigger additional listed or specified activities. Should any of the associated activities undertaken trigger an identified activity, it is regarded as being included in this Standard;</p>	<p><i>This report was prepared based on the provisions outlined in the Standard.</i></p>
<b>Chapter 1(4):</b>	<p><b>1.4 Exclusions</b></p> <p>This Standard and exclusions do not apply in the following instances:</p> <ul style="list-style-type: none"> <li>• Where any part of the infrastructure occurs on an area for which the environmental sensitivity for a relevant environmental theme is identified as being very high or high by the screening tool and confirmed to be such by the EAP or the relevant specialist for the identified environmental theme;</li> <li>• Where the site verification for a specific theme identifies that the low or medium sensitivity rating of the screening tool is in fact high or very high; or</li> <li>• Where the greater part of the proposed infrastructure fall outside of any strategic transmission corridor.</li> </ul>	<p>The proposed project meets the requirements of the Standard in that all environmental themes have been rated as low to medium. Route Option 2 is preferred due to the non-viability of Option 1 based on the exclusion. Refer to <b>Section 4</b>.</p>
<b>Chapter 1(5):</b>	<b>1.5 Applicability of the Generic Environmental Management Programme</b>	





Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
	As part of the 2016 EGI SEA, a Generic Environmental Management Programme (EMPr) was compiled for the development and expansion of: (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. The two Generic EMPrs were gazetted for implementation in Government Notice No. 435 published under Government Gazette No. 42323 of 22 March 2019. The Generic EMPrs apply within South Africa as a whole, and need to be applied for the development of all overhead and substation electricity transmission and distribution infrastructure (as contained in the EIA Regulations Listing Notices 1 – 3 published in Government Notices R9827, R9838, R9849 and R98510).	<i>The pre-approved Generic EMPr is included in <b>Appendix E</b></i>
<b>Chapter 1(6):</b>	<p><b>1.6 General</b></p> <p>The provisions of the National Appeal Regulations, 2014, as amended, are applicable to decisions taken based on this Standard and an appeal against any registration decision related to this Standard may be lodged.</p> <p>Compliance with this Standard does not negate the need for the proponent to comply with all other applicable legislation.</p>	<b>Section 6.8</b>
<b>Chapter 2(1):</b>	The proponent must identify a preliminary corridor and/or the proposed substation sites using the screening tool and additional relevant spatial datasets where available. The provincial department responsible for the environment and local municipality in the area should be contacted in relation to possible additional fine scale data.	<b>Section 1.5</b> <b>Appendix B</b>
<b>Chapter 2(2):</b>	The proponent must appoint an independent Environmental Assessment Practitioner (EAP) and must ensure that the EAP fulfils the requirements to register the proposed development in accordance with this Standard.	<b>Section 1.10</b> <b>Appendix G</b>
<b>Chapter 2(3):</b>	<p>The proponent must ensure that the EAP, as a minimum, follows the public participation process required in Chapter 6 of the EIA Regulations for a linear development during the route determination process, excluding the following requirements which would not be relevant to the Standard:</p> <ul style="list-style-type: none"> <li>• Obtaining written consent from the owner or person in control of the land on which the proposed development is to be undertaken for the powerline development;</li> <li>• Timeframes pertaining to comment periods for basic assessment reports, EMPr, scoping reports, EIA reports, and closure plans;</li> <li>• Notification along alternative routes in the form of notice boards; and</li> <li>• Giving notice of the process being applied (basic assessment or scoping and environmental impact report).</li> </ul>	<b>Appendix C</b>
<b>Chapter 2(4):</b>	As part of the interested and affected parties (I&APs) the EAP must ensure that relevant Non- Governmental Organisations (NGOs) and Community-Based Organisations (CBOs) are effectively consulted during the public participation process.	<b>Appendix C</b>



Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
<b>Chapter 2(5):</b>	The proponent assisted by the EAP must appoint a specialist team to undertake the site verification of the relevant environmental themes where relevant as well as a walkthrough of areas that need verification in the opinion of the EAP and specialist. Should a particular specialist not be required, the EAP must motivate their exclusion from the team and include this motivation in the BID.	<b>Section 3.9</b> <b>Appendix D</b> <b>Appendix F</b>
<b>Chapter 2(6):</b>	<p>The BID must include as a minimum the following information:</p> <ul style="list-style-type: none"> <li>(a) Purpose of the BID;</li> <li>(b) Legal context;</li> <li>(c) Background and project description;</li> <li>(d) Process and timeline;</li> <li>(e) The screening report generated from the screening tool for the <i>Preliminary Corridor</i> and/or proposed substation site;</li> <li>(f) Location of the <i>Preliminary Corridor</i> and/or proposed substation site, including a map generated at an appropriate scale that displays the extent of the <i>Preliminary Corridor</i> and/or proposed substation as detailed as possible. Where an electronic copy of the BID is distributed, the spatial data of the <i>Preliminary Corridor</i> and/or proposed substation site must be made available;</li> <li>(g) Contact details of the EAP; and</li> <li>(h) I&amp;AP registration forms.</li> </ul>	<b>Appendix C</b>
<b>Chapter 2(7):</b>	<p>The proponent must ensure that the EAP and specialists identify through their specialist knowledge and site verifications/walkthrough as necessary, a <i>proposed route</i> and/or the substation location/s (where a substation or substations are relevant) within the <i>preliminary corridor</i> based on:</p> <ul style="list-style-type: none"> <li>(a) consideration and implementation of the mitigation hierarchy</li> <li>(B) environmental sensitivity identified using the methodologies or processes as stipulated in Chapter 3 of the Standard, and</li> <li>(c) engineering constraints.</li> </ul>	<b>Appendix D</b>



Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
<b>Chapter 2(8):</b>	As the route is being identified, the initial servitude negotiations are to be undertaken to ensure that the route and/or substation location is not fatally flawed in relation to servitude access.	<b>Appendix C</b>
<b>Chapter 2(9):</b>	The process to identify the proposed route and/or substation location and the outcome of the initial servitude negotiations must be documented in an environmental sensitivity report, which must be subjected to a minimum public comment period of 30 days as part of the public participation process.	<i>This entire report constitutes the Environmental Sensitivity Report</i>
<b>Chapter 2(10):</b>	<p>The environmental sensitivity report must include, as a minimum, the following information:</p> <ul style="list-style-type: none"> <li>(a) The details and relevant expertise of the EAP and specialists preparing the report;</li> <li>(b) The outcome of the screening exercise undertaken using the screening tool, the expert knowledge of the specialists where necessary, results of the site verification, the adoption of the mitigation hierarchy principles and the principles contained in Chapter 3 of this Standard;</li> <li>(c) Location map of the proposed route and/or proposed location of the substation at a scale not more than 1:15000 to identify environmental features;</li> <li>(d) Details of the public participation process undertaken;</li> <li>(e) A discussion by the specialists and/or EAP of the process used to confirm that the proposed route and/or substation location has applied the principles stipulated in Chapter 3, and the process used to confirm that the site sensitivity of the proposed route and/or substation location is of low or medium environmental sensitivity;</li> <li>(f) If applicable, a site specific EMPr as per Part C of the Generic EMPr for overhead power lines and/or substations gazetted in Government Notice 43519 published in Government Gazette No. 42323 of 22 March 2019;</li> <li>(g) The completed generic EMPr pre-approved template which is Part B – Section 1 of the Generic EMPr for overhead power lines and/or substations, and where applicable Part C, gazetted in Government Notice 435 published in Government Gazette No. 42323 of 22 March 2019, for display on the websites of the proponent and the EAP; and</li> <li>(h) The confirming statement by the various specialists in the format as identified in Appendix B.</li> </ul>	<p><b>Appendix F &amp; Appendix G</b></p> <p><b>Appendix B &amp; Appendix D</b></p> <p><b>Figure 1</b></p> <p><b>Appendix C</b></p> <p><b>Appendix D</b></p> <p><b>Not Applicable</b></p> <p><b>Appendix E</b></p> <p><b>Appendix D</b></p>



Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
<b>Chapter 2(11):</b>	The proposed route must be finalised to become the final pre-negotiated route and where relevant the final location/s of the substation/s, by taking into consideration comments received during the public participation process and refining the route as relevant.	<b><i>Applicable in Final ESR Phase. Route Option 2 is preferred at this stage.</i></b>
<b>Chapter 2(12):</b>	A final environmental sensitivity report must be prepared by the EAP supported by the specialists, which locates the final pre-negotiated route and/or the substation location on a map which includes the location of any mitigation devices such as bird flight diverters, a record of comments and responses and, where applicable, Part C of the Generic EMPr and the final confirming statements by the various specialists in the format as identified in Appendix B.	<b><i>Applicable in Final ESR Phase</i></b>
<b>Chapter 2(13):</b>	All registered I&APs must be notified of the availability of the final environmental sensitivity report for information.	<b><i>All registered I&amp;APs have been notified</i></b>
<b>Chapter 2(14):</b>	The proponent must submit the relevant registration form contained in Appendix F of this Standard.	<b><i>Submitted to the DARDLEA</i></b>
<b>Chapter 2(15):</b>	The registration form must be accompanied by:  (a) The final pre-negotiated route and the signed declaration by the proponent of commitment to implement the Standard (included as Appendix 9 to the registration form);  (b) A signed statement from the proponent that initial servitude negotiations have been concluded;  (c) The signed declaration that the proponent will comply with the pre-approved Generic EMPr templates and site specific EMPr if relevant; and  (d) All supporting documents stipulated in the registration form.	<b><i>Attached to the Application Form</i></b>
<b>Chapter 2(16):</b>	On receiving the relevant information identified above, <b>the competent authority must issue a registration number within 30 days of receipt of the information submitted</b> or if the information is incomplete, indicate to the proponent that the submission is incomplete and identify the outstanding information. A register of all registrations must be kept by the competent authority.	<b><i>Note for DARDLEA</i></b>
<b>Chapter 2(17):</b>	Upon receipt of a registration number, the proponent must inform all registered I&APs within 14 days of the registration and the opportunity to appeal.	<b><i>Applicable after registration</i></b>



Section of the Standard	Description in the Standard (27 July 2022)	Section in Report / Comment
<b>Chapter 2(18):</b>	Registration contemplated above will be valid for a period of 10 years from receipt of the registration number in order for commencement to take place (validity period). If commencement does not take place within the validity period, the process contemplated in Chapter 2 will apply afresh in such instances.	<b><i>Noted for applicant</i></b>
<b>Chapter 2(19):</b>	The proponent must provide written notice to the compliance monitoring unit within the competent authority 14 days prior to the date on which the first of the activities contemplated in the scope of this Standard, including site preparation, will commence in order to facilitate compliance inspections.	<b><i>Noted for applicant</i></b>
<b>Chapter 2(20):</b>	Proof of registration must be:  (a) lodged by the proponent with the relevant Local Municipality, as well as the relevant provincial department responsible for the environment, if the national department responsible for the environment is the CA, prior to commencement;  (b) made available by the proponent on request by any member of the public or Authority; and  (c) made available,	<b><i>Noted for applicant</i></b>
<b>Chapter 2(21):</b>	Where change of ownership of a development registered in terms of paragraph 16 occurs during the pre-construction or construction phases of the infrastructure, the registration number is retained by the new owner, however the new owner must submit to the competent authority for re-registration, the declaration by the proponent of commitment to implement the Standard (included as Appendix 9) and the declaration to implement Part B – Section 1 of the Generic EMPr for overhead power lines and/or substations, and where applicable Part C (Appendix 10), within 30 days upon finalisation of such change. There is no requirement for re-registration once the infrastructure has been constructed as the operation of a power line or substation is not an identified activity in terms of the Act.	<b><i>Noted for applicant</i></b>



## 2. DESCRIPTION OF THE EXISTING ENVIRONMENT

This Chapter describes the environmental conditions of the study area and the surrounding environment. A description of the environment that may be affected by the activities proposed and the manner in which the biophysical, social, economic and cultural aspects of the environment may be affected by the proposed development is presented in this chapter. The information provided in this section was compiled in consultation with specialists that were undertaken to support the environmental screening process. The key environmental aspects that have been considered include Climate and Topography, Geology and Soils, Conservation Plan Areas, Protected Areas, Flora and Fauna (Biodiversity and Vegetation Areas), Wetlands and Aquatics, Heritage, Palaeontology and Agriculture.

### 2.1. General Site Conditions

The study area is characterized by primarily level areas south of the N12 between Pretoria and Ogies. Existing surrounding land uses associated with the project area are mostly agricultural farming. Overall, the accessibility of the project footprint area was fairly good. According to Weather Spark (2023), The area within 3km of the site is covered by cropland (49%), grassland (29%), and artificial surfaces (22%). Several photographs below (**Figure 7 to Figure 12**) provide general views of the study area and the landscape within which it is located (taken from the Heritage Impact Assessment Report, 2023).



*Figure 7: View of the landscape on the western side of the proposed area near the Zibulo North Offices*



*Figure 8: View of excavations and dumping along the most northern section of the proposed area*



*Figure 9: General vegetation and infrastructure on the eastern part of the proposed area*



*Figure 10: View of agricultural fields*





Figure 11: View of wetland areas on the eastern side of the proposed area.



Figure 12: View of mining infrastructure on the eastern side of the proposed area

## 2.2. Climate

According to Weather and Climate (2023), the area has a Temperate highland tropical climate with dry winters climate (Classification: Cwb). The area is considered as a moderate climate. There is a lot of rainfall in the summer, and in the winter, it is quite dry again. The district's yearly temperature is 22.15°C and it is 0.93% higher than South Africa's averages. The area typically receives about 71.11 mm of precipitation and has 119.09 rainy days (32.63% of the time) annually. Refer to **Figure 13** for the overview of the site's climatic conditions.

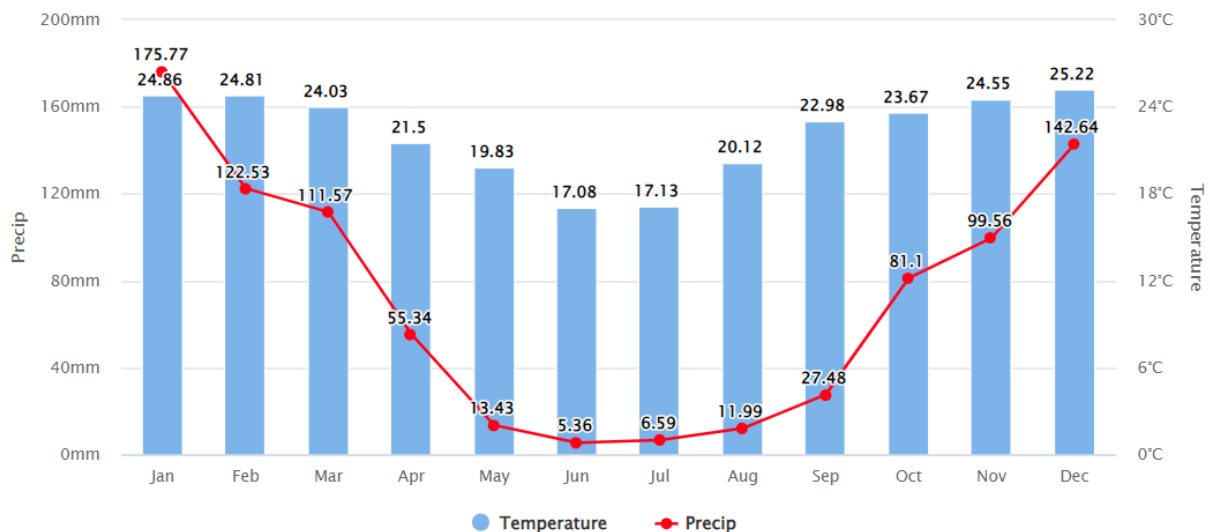


Figure 13: The study area's climate graph (Weather and Climate, 2023)

## 2.3. Topography

The topography within 3km of Ogies contains only modest variations in elevation, with a maximum elevation change of 58 meters and an average elevation above sea level of 1,562 meters. Within 16km contains only modest variations in elevation (190 meters). According to the Biodiversity Company (2023), most of the area is characterised by a slope percentage between 0 - 5% with some few irregularities in areas with slopes reaching above 21%. This illustration indicates a uniform topography with occurrence of a few steep sloping areas being present associated to the tailings stockpiles. The Digital Elevation Model (DEM) of the project area indicates an elevation of 1 578 to 1 636 Metres Above Sea Level (MASL) as indicated in **Figure 14**.

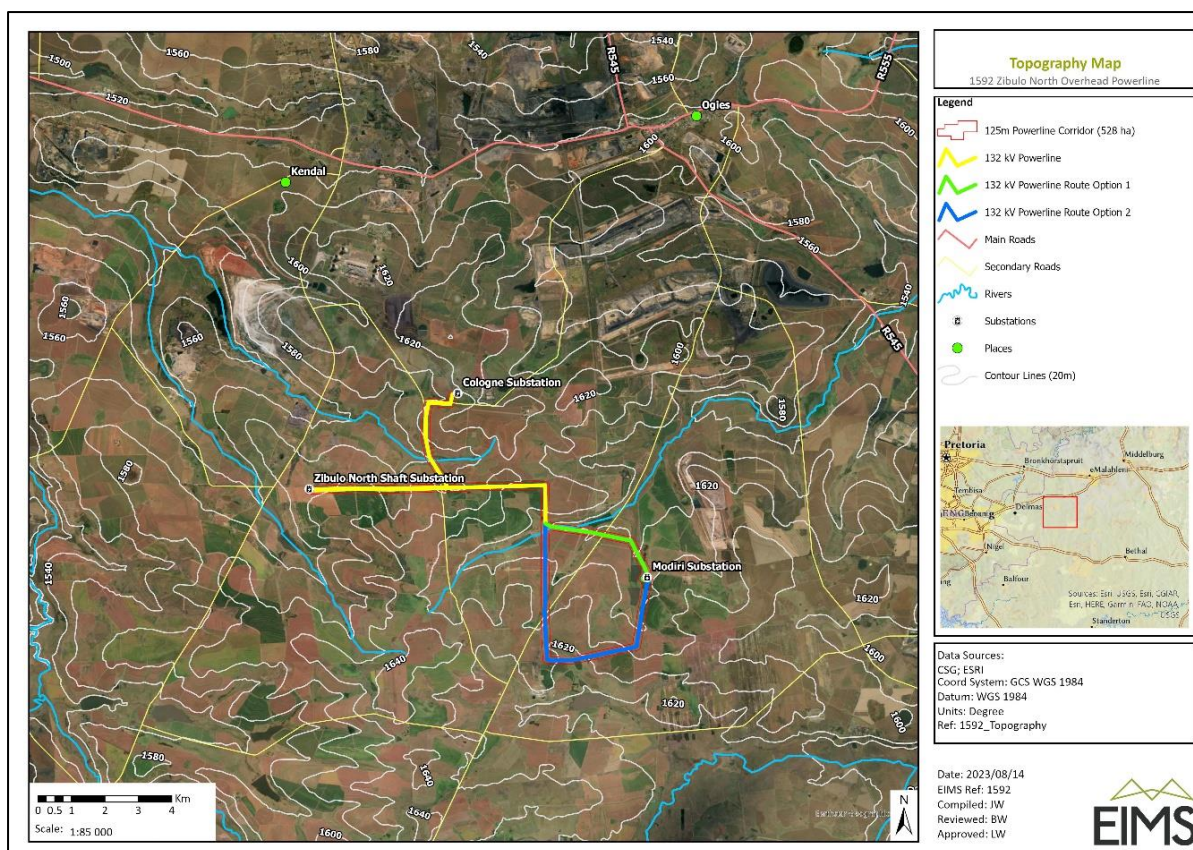


Figure 14: Topography of the proposed development site

## 2.4. Socio-Economic Environment

According to the National Environmental Management Act (NEMA, 1998), environment refers to the surroundings in which humans exist. When viewing the environment from a socio-economic perspective the question can be asked what exactly the social environment is. Different definitions for social environment exist, but a clear and comprehensive definition that is widely accepted remains elusive. Barnett & Casper (2001) offers the following definition of human social environment:

“Human social environments encompass the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labour markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the arts; religious institutions and practices; and beliefs about place and community. The social environment subsumes many aspects of the physical environment, given that contemporary landscapes, water resources, and other natural resources have been at least partially configured by human social processes. Embedded within contemporary social environments are historical social and power relations that have become institutionalized over time. Social environments can be experienced at multiple scales, often simultaneously, including households, kin networks, neighbourhoods, towns and cities, and regions. Social environments are dynamic and change over time as the result of both internal and external forces. There are relationships of dependency among the social environments of different local areas, because these areas are connected through larger regional, national, and international social and economic processes and power relations.”

Environment-behaviour relationships are interrelationships (Bell et al., 1996). The environment influences and constrains the behaviour of people, but behaviour also leads to changes in the environment. The impacts of a project on people can only be truly understood if their environmental context is understood. The baseline description of the social environment includes a description of the area within a provincial, district and local





context that will focus on the identity and history of the area as well as a description of the population of the area based on a number of demographic, social and economic variables.

#### 2.4.1. Description of the Area

The proposed project is located approximately 6.6 km south of Kendal Power Station and approximately 14.5 km southwest of Ogies in the Mpumalanga Province. The proposed project overlaps between Victor Khanye and Emalahleni Local Municipality (LM) within Nkangala District Municipality (Nkangala DM). The study area is sited in a coal-mining and agricultural farming area.

#### 2.4.2. Local Municipality

Victor Khanye LM is strategically located in the Highveld in Mpumalanga province on the border line of Gauteng province, less than 100km from Pretoria, Johannesburg and Emalahleni. The municipality is linked by a major freeway, the N12, that was declared a Maputo Corridor. There is a railway line running through to the inner Mpumalanga province and to Mozambique. The municipality is regarded as a gateway to inner Mpumalanga province. The Emalahleni Municipal area, which means the “place of coal”, consists inter alia of the towns of Emalahleni, Kwa-Guqa, Ga-Nala and Ogies. The town of Emalahleni was established in 1903. It was named after a ridge of white rock located near the present railway station. Emalahleni is probably the most industrialised municipal area in Nkangala and its landscape features mainly underground and opencast coalmines. This area has the largest concentration of power stations in the country. Its mining and industrial history is reflected in the area’s heritage places. This includes elements of industrial history, military history, architectural/engineering and graves which should be protected and conserved.

#### 2.4.3. District Municipality

The Nkangala DM is a Category C municipality in the Mpumalanga Province. It is one of the three districts in the province, making up 22% of its geographical area. It is comprised of six local municipalities: Victor Khanye, Emalahleni, Steve Tshwete, Emakhazeni, Thembisile Hani, and Dr JS Moroka. The district’s headquarters are in Middelburg. Nkangala DM is at the economic hub of Mpumalanga and is rich in minerals and natural resources. The district is host to the Maputo corridor which brings increased potential for economic growth and tourism development. Nkangala district neighbours’ provinces like Limpopo (north), Gauteng (west), Free State and KwaZulu-Natal (south). The proximity to Gauteng opens up opportunities to a larger market, which is of benefit to the district’s agricultural and manufacturing sectors. The district’s economy is dominated by electricity, manufacturing and mining. These sectors are followed by community services, trade, finance, transport, agriculture and construction. Nkangala DM is not exempt from the difficulties facing all municipalities in South Africa as poverty and unemployment in the rural areas are a major threat to socioeconomic growth.

#### 2.4.4. Population Trends

The baseline description of the population will take place on two levels, namely, district and local municipality level. Impacts can only truly be comprehended by understanding the differences and similarities between the different levels. The baseline description will focus on the Emalahleni and Victor Khanye Local Municipalities and Nkangala District Municipality in Mpumalanga Province (referred to in the text as the study area), as these are the areas that will be most affected by the proposed project. The data used for the socio-economic description was sourced from Census 2016. Census 2016 was a de facto census (a census in which people are enumerated according to where they stay on census night). The results should be viewed as indicative of the population characteristics in the area and should not be interpreted as absolute.

According to the Community Survey 2016, the population of South Africa was approximately 55,7 million and has shown an increase of about 7.5% since 2011. Based on the same data, Nkangala DM had a population of 1 445 624. In the same period, Victor Khanye LM had a population of just over 80 000 people, less than 10 percent of the figure in Nkangala DM and less than 10% of the figure in Mpumalanga Province (4 335 963 people). Emalahleni LM on the other hand, had a population of 455 227 people, which was about one-third of the figure in Nkangala DM and about 10 percent of the figure in the province. Population density refers to the number of people per square kilometre and the population density on a national level has increased from 42.45 people per km<sup>2</sup> in 2011 to 45.63 people per km<sup>2</sup> in 2016. In the study area the population density has increased since 2011



on all levels with the highest density increase in Emalahleni LM. Refer to **Table 6** for the population dynamics of the area.

*Table 6: Population density and growth estimates (sources: Census 2011, Community Survey 2016)*

Area	Size in km <sup>2</sup>	Population 2011	Population 2016	Population density 2011	Population density 2016	Population Growth (%)
Nkangala DM	16 899.2	1 308 129	1 445 624	77.4	85.5	9.5
Emalahleni LM	2 682.7	395 466	455 227	147.4	169.7	13.1
Victor Khanye LM	1 570.7	75 453	84 150	48.0	53.6	10.3

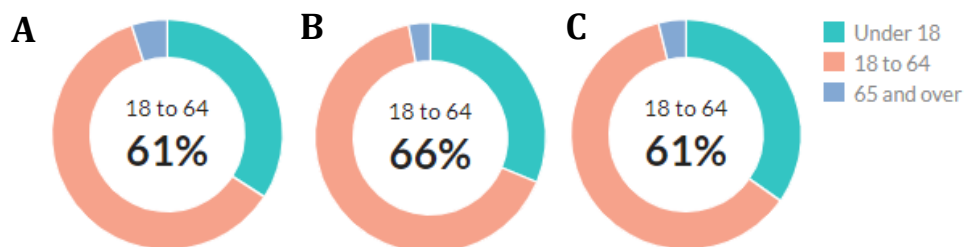
#### 2.4.5. Population Composition

In all the areas under investigation, the majority of the population belongs to the Black population group, but the proportions differ. Based on the population characteristics of the area, the Black – African group is the dominant group in all levels of analysis as indicated in **Table 7**. The White population group also shares a significant amount of the population structure, followed by the Coloured and lastly the Indian / Asian groups.

*Table 7: Population groups of the area (sources: Census 2011 and Community Survey 2016)*

Area	Black African	Coloured	Indian or Asian	White	Other
Nkangala DM	1,150,240	14,871	9,549	129,656	3,813
Emalahleni LM	391,982	5,450	3,762	54,033	-
Victor Khanye LM	72,106	417	75	11,552	-

In 2016, the district had an average age of 25, about 10 percent higher than the figure in Mpumalanga (23 years) and about the same as the average in South Africa (25). Emalahleni had an average age of 27 years, slightly higher than the average for the district and about 10 percent higher than the provincial average (24 years). Victor Khanye LM had an average age of 26 years, with a similar age distribution as its administrative district, Nkangala DM as indicated in **Figure 15**. It can be concluded that majority of the population on all levels is made up of the working class (18 – 64 years). Therefore, the study area can be considered as an economically active / driven population.



*Figure 15: Age distribution in Nkangala DM (A), Emalahleni LM (B) and Victor Khanye LM (C) levels (Source: Community Survey 2016)*

The three most common languages in the study area are IsiNdebele, IsiZulu and Afrikaans as indicated in **Figure 16**. Home language should be taken into consideration when communicating with the local communities and based on the profile of the area communication should take place in the above languages.

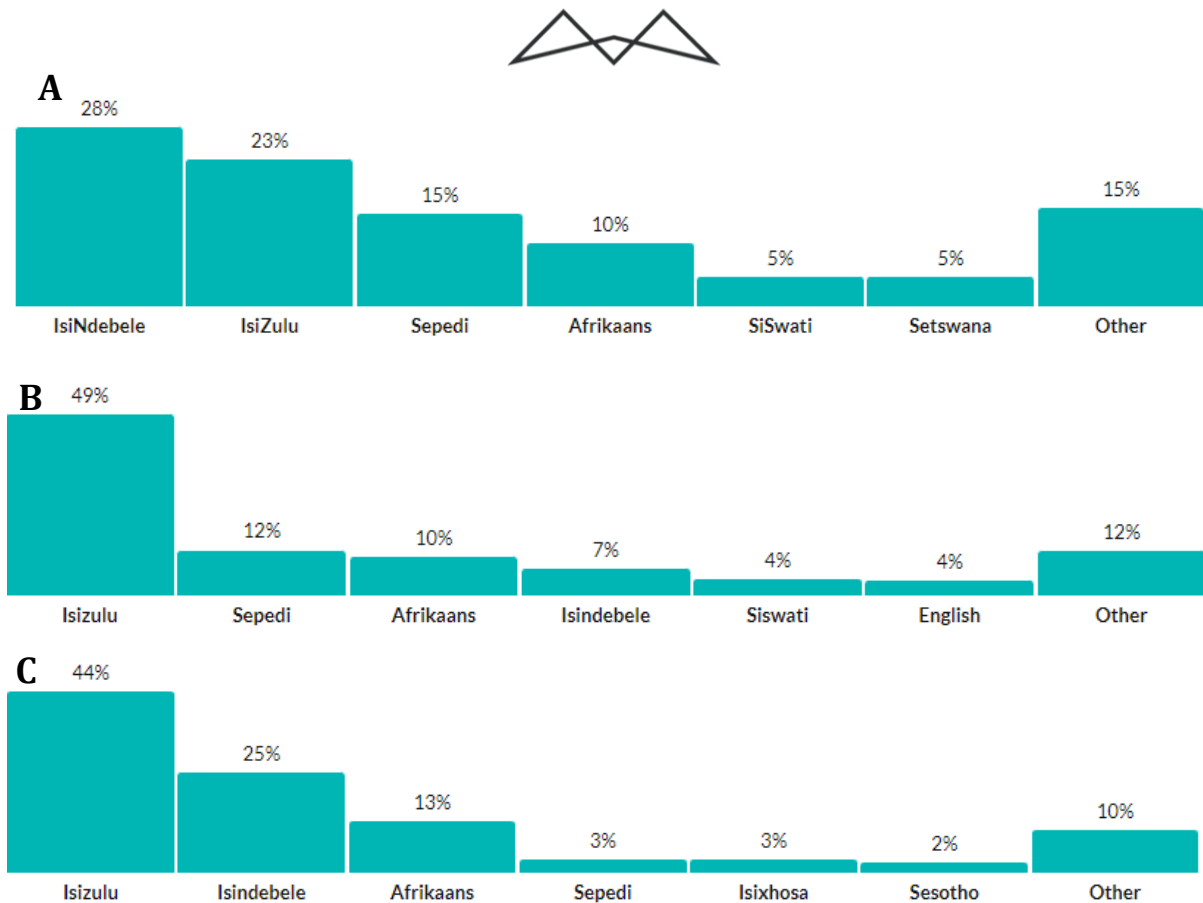


Figure 16: Population by language most spoken at home in Nkangala DM (A), Emalahleni LM (B) and Victor Khanye LM (C) levels (Source: Community Survey 2016)

Employment Rate in South Africa averaged 42.28 percent from 2000 until 2023, reaching an all-time high of 46.17% in the fourth quarter of 2008 and a record low of 35.93% in the third quarter of 2021. Based on Community Survey Data (2016), the Nkangala DM had an employment rate of 41% (**Table 8**), about 10% higher than the rate in province (37.45%) and a little higher than the rate in South Africa (38.87%). Emalahleni had an employment rate of just under 50% (49.2%), about 20% higher than the rate in the district and about 1.3 times the rate in Mpumalanga. Victor Khanye had an employment rate of 43.2%, also higher than the district and provincial employment rates respectively. The additional job opportunities which will emanate from the development will further add to the overall acceptable employment rate at local and regional levels.

Table 8: Population by Employment Rate (source: Community Survey 2016)

	Nkangala DM		Emalahleni LM		Victor Khanye LM	
	%	Number	%	Number	%	Number
Discouraged work-seeker	4.9%	42,554	3.4%	9,612	4.9%	2,477
Employed	40.9%	355,478	49.2%	138,548	43.2%	21,843
Other not economically active	36.7%	319,641	28.9%	81,494	35%	17,712
Unemployed	17.5%	152,250	18.5%	52,114	16.9%	8,573
Unspecified	0%	0	0%	0	0%	0

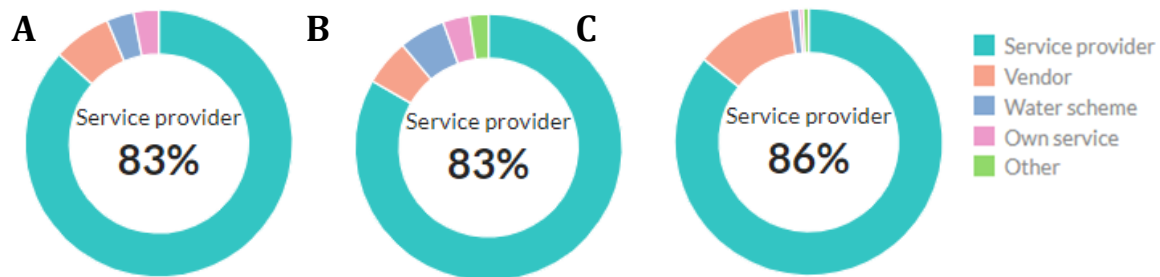
#### 2.4.6. Service Delivery

Effective and reliable service delivery is one of the biggest challenges South Africa faces. This is largely due to the municipalities across the country not having the required resources to fulfil the delivery of basic services to



communities within which they operate. By lacking in resources, it derails economic development and growth opportunities in poor communities. Access to piped water, electricity and sanitation relate to the domain of Living Environment Deprivation as identified by Noble et al., (2006).

As South Africa is a water scarce country, water supply is a significant factor to consider in any development for the construction as well as the operational phase of the project. Based on the Community Survey data (2016), 83.5% of the Nkangala DM population were obtaining water from a regional or local service provider, about 10% higher than the rate in Mpumalanga (73.58%) and South Africa (76.89%). 88.9% of the Emalahleni population were receiving water from a regional or local service provider, which was similar rates to the district and province levels. Similarly, to its neighbour, 86% of the Victor Khanye LM population were receiving water from a regional or local service provider as indicated in **Figure 17**.



*Figure 17: Population by water source in Nkangala DM (A), Emalahleni LM (B) and Victor Khanye LM (C) levels (Source: Community Survey 2016)*

The proposed project is an electrical infrastructure project for mining related activities. In South Africa, approximately 85% or 42,000MW, of the nation's electricity is generated via coal-fired power station which is mainly transmitted to municipalities and distributed to various locations. The Nkangala DM economy is dominated by electricity, manufacturing, and mining. According to the Community Survey data (2016), 9.5% of the Nkangala population had no access to electricity, slightly higher than provincial rate which was at 6.7%. Victor Khanye LM had almost half the district's rate of population without access to electricity at 5%, whereas Emalahleni had a significantly high rate with 20% of the population having no access to electricity as indicated in **Table 9**.

*Table 9: Population by electricity access (source: Community Survey 2016)*

	Nkangala DM		Emalahleni LM		Victor Khanye LM	
	%	Number	%	Number	%	Number
In-house prepaid meter	75.8%	1,095,810	57.7%	262,723	64%	53,842
In-house conventional meter	11.9%	172,500	18.6%	84,668	27.5%	23,167
No access to electricity	9.5%	136,961	20%	90,944	5%	4,234
Other source (not paying for)	1.1%	16,096	1.5%	6,724	1.3%	1,112
Other	1.7%	24,257	2.2%	10,169	2.1%	1,795

Access to proper sanitation is a battle South Africa faces daily, with disadvantaged and impoverished areas being affected the most. Water and sanitation are basic human rights but may feel like luxuries to those who need them most, and the great inequality regarding accessing water cannot be ignored. Besides the obvious yet important reasons such as good health, clean water and sanitation can also help in improving the economy. To promote socio-economic development, especially in rural areas, the government is required to effectively provide and manage water and sanitation. According to the Community Survey (2016), 52.3% (191 639) of the Nkangala DM population had access to flush or chemical toilets, about 20% higher than the rate in Mpumalanga



(45.47%) and about 80% of the rate in South Africa (62.52%). Emalahleni LM had a population of 78.1% while Victor Khanye LM had a population of 86% with access to flush or chemical toilets as indicated in **Figure 18**. The proposed development will have toilet facilities for the employees.

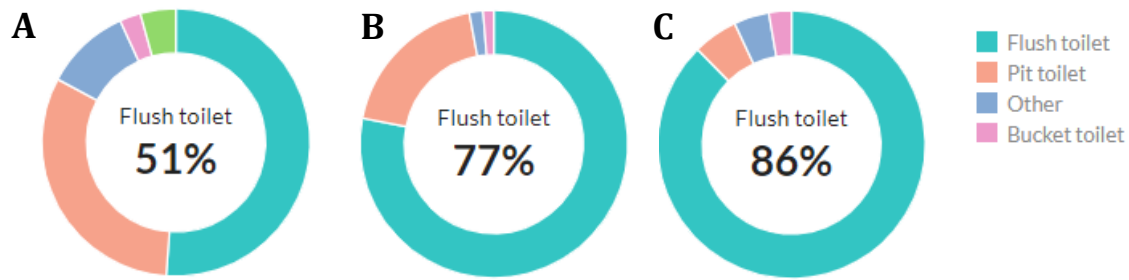


Figure 18: Population by toilet facilities in Nkangala DM (A), Emalahleni LM (B) and Victor Khanye LM (C) levels  
(Source: Community Survey 2016)

Waste as per the NEMWA Act refers to any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered. General waste in South Africa is usually managed by municipalities. In the case of developments, the developer is expected to appoint registered service providers to manage the Waste Management Service - collection, transportation and safe disposal of all waste streams associated with the development. It is anticipated that the proposed development will not produce excessive waste and the generation of waste will largely be during the construction phase. The waste generated on site and associated with the development must be managed accordingly and disposed at a registered facility.

## 2.5. Geology and Soils

Based on information taken from the Soil Compliance Statement Report by the Biodiversity Company (2023), the geology of the area is characterised with shales and sandstones of the Madzaringwe formation (Karoo Supergroup). According to the land type database (Land Type Survey Staff, 1972 - 2006) the assessment corridor to be focused on falls within the Ab 9 and Ba 4 land type (see **Figure 19**). The Ab 9 land type mostly consist of Hutton and Rensburg soil forms and rocky areas according to the SA soil classification working group (1990) with the possibility of other soils occurring throughout. The Ba 4 land type is characterised with Hutton, Longlands and Katspruit soil forms with also the occurrence of other associated soil forms found the terrain. The Ab land types is commonly associated to red and yellow, freely drained soils. These soils have a dystrophic and mesotrophic base status. The Ba land types mainly have plinthic catena in the terrain and usually duplex and marginalitic soils are rare in the upper lying landscapes. These soils are also characterised by a dystrophic and mesotrophic base status. The terrain units and expected soils for the Ab 9 land type is illustrated in **Figure 19** and the Ba 4 land types in **Figure 20** respectively.

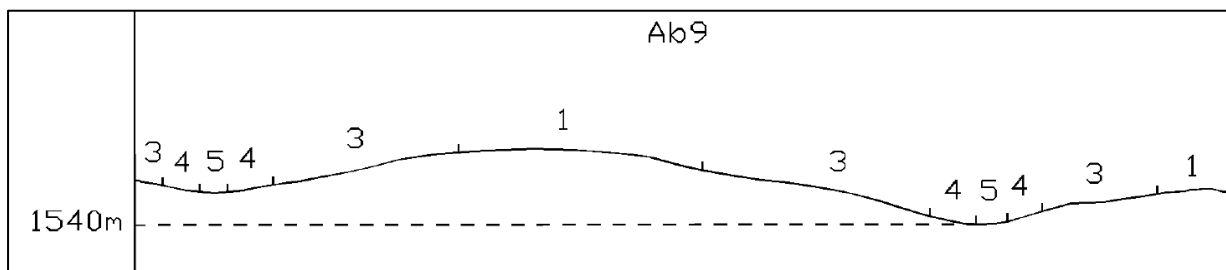


Figure 19: Illustration of land type Ab 9 terrain units (Land Type Survey Staff, 1972 – 2006)

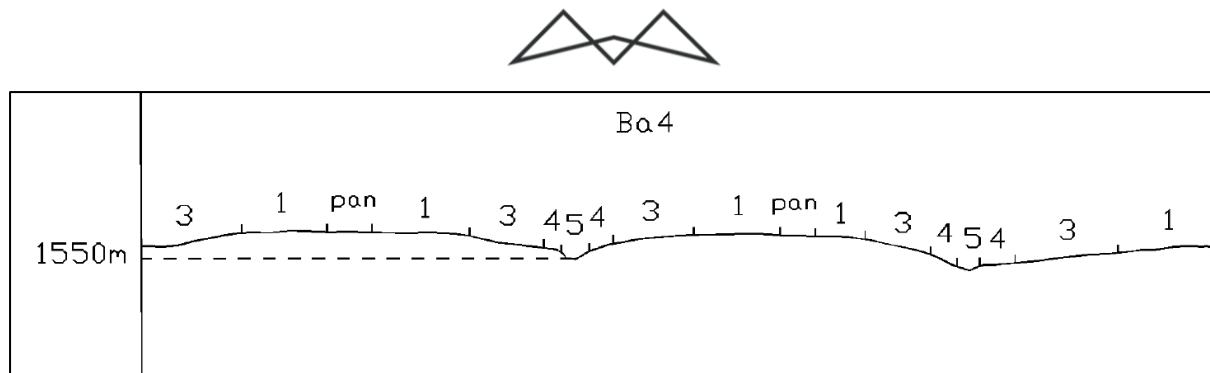


Figure 20: Illustration of land type Ba 4 terrain units (Land Type Survey Staff, 1972 – 2006)

According to the review of available geotechnical information in the area and specialist studies, there are no foreseeable geotechnical risks to development of the site. In terms of soils, three dominant soil forms were identified in the proposed project area, the more sensitive forms identified within the assessment area include, the Hutton, Bainsvlei and Avalon soil forms. Other associated soils which were identified within the project area includes, the Sepane, Valsrivier, Swartland, Westleigh and Katspruit soil forms (The Biodiversity Company, 2023). The baseline findings and land capability sensitivity concur with each other, in most areas indicating a “Moderate to Moderate High” land capability sensitivity. The specialist disputes, some areas which were identified with a “High to Very High” sensitivity to a revised classification being “Moderate” sensitivity as these soils are characterized with soils with a restricted potential for cropping activities following the verified soil baseline findings. Overall, the area can be classified as “Medium” following the verified soil baseline findings on site (The Biodiversity Company, 2023).

## 2.6. Agricultural and Land Potential

Agricultural Potential Areas are based on four main pillars which are Agricultural Hubs, Important Agricultural Sites, Existing Agriculture and Remaining high Potential Agricultural Land. According to the Biodiversity Company (2023), the three most sensitive soils forms which were identified in the proposed project area include, Hutton, Bainsvlei and Avalon soil forms. The Hutton soil form consists of an orthic topsoil horizon on top of a thick red apedal horizon below. The Bainsvlei soil form consists of an orthic topsoil horizon on top of a thick red apedal horizon with a soft plinthic horizon below. The Avalon soil form has an orthic topsoil with a yellow-brown apedal subsurface horizon with a soft plinthic horizon below. Other associated less sensitive soils identified in the project area includes the Sepane, Valsrivier, Swartland, Westleigh and Katspruit soil forms. The Valsrivier soil form has an orthic topsoil horizon on top of a thick pedocutanic horizon. The Sepane soil form has an orthic topsoil horizon underlain with a pedocutanic horizon with a gley horizon below. The Swartland soil form has an orthic topsoil horizon with a pedocutanic horizon with a lithic horizon below. The Westleigh soil form has an orthic topsoil on top of a soft plinthic horizon with a gley horizon below. The Katspruit soil form has an orthic topsoil horizon with a gley horizon below. The project area is dominated by apedal soils, which are characterised with freely drained red and yellow soils and duplex soils with high clays contents. The high clay soils are usually hard to work with for most activities.

The above-mentioned most sensitive soil forms have been determined to have a land capacity class of “III”, “IV” and “V” with a climate capacity level 7 given the Low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capability class and climate capability results in land potential “L5” and “Vlei”. The “L5” land potential level is characterised by restricted potential due to the severe limitations because of the soil, slope, temperature, or rainfall. This area is characterised with a “Low to Medium” land capability sensitivity (refer to **Figure 21**).



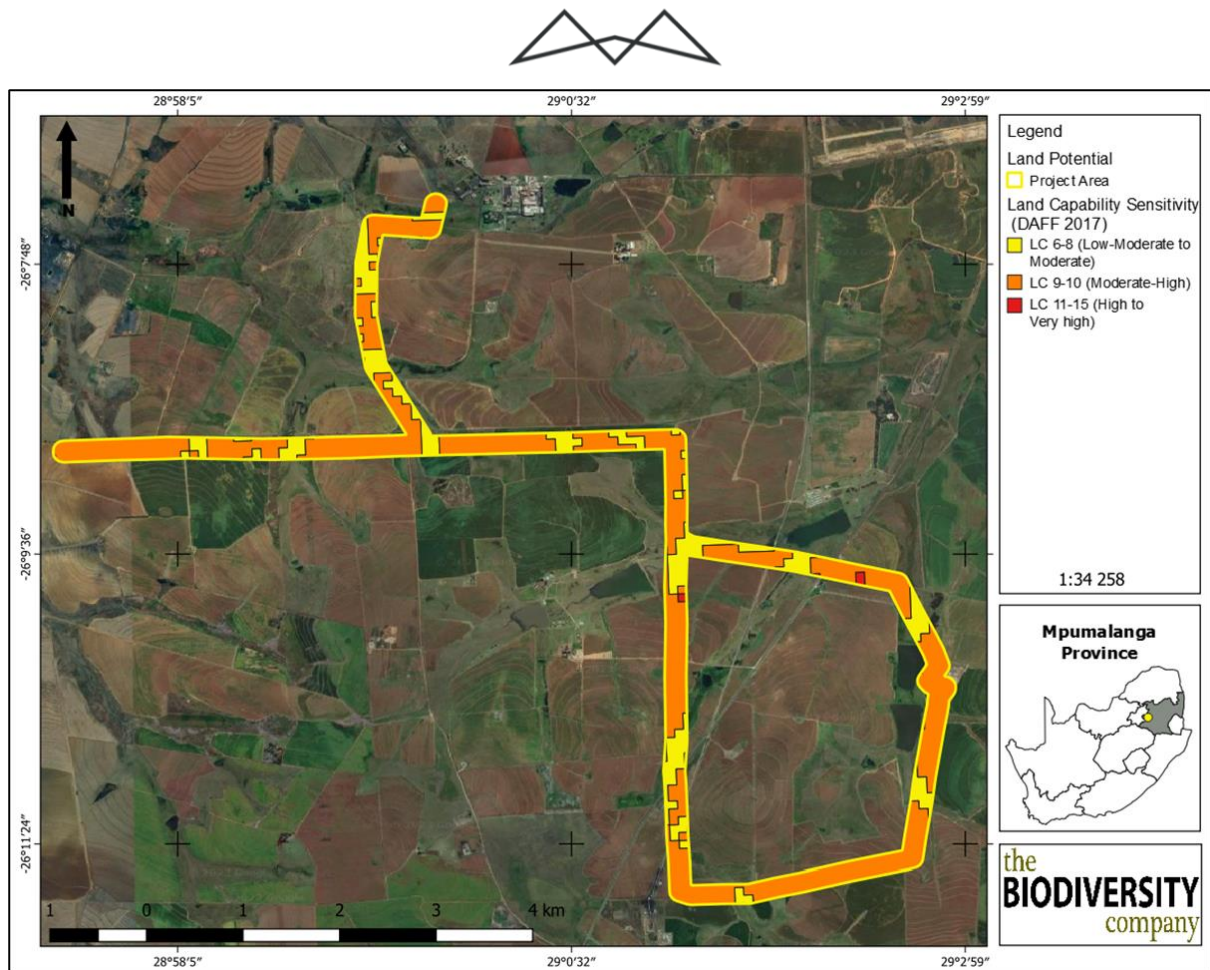


Figure 21: The land capability sensitivity for the proposed project area (The Biodiversity Company, 2023)

Overall, the area can be classified as “Medium” following the verified soil baseline findings on site (The Biodiversity Company 2023). Furthermore, the available climate also limits crop production significantly. The climatic conditions are associated with low annual precipitation and high evapotranspiration potential demands of the area, which might not be favourable for most cropping practices. Considering the low-to-moderate high sensitivities associated with the land potential resources and linear development of the project, it is the specialist’s opinion that the proposed activities will have an acceptable impact on agricultural activities. Such impacts as soil erosion losses, loss of potential land capability, spillages and soil compaction will be limited. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is restricted to pylon bases with a limited impact. It must be noted that areas with actively cultivated areas with high production agricultural resources were also identified in the corridors by the specialist. However, such areas can be treated as no-go areas to preserve these active agricultural crop fields, associated with soils with high potentials. If relocating is not feasible, then appropriate compensation can be agreed upon during a route negotiation process.

## 2.7. Terrestrial Biodiversity

Terrestrial biodiversity is the variety of life forms on the land surface of the Earth. High biodiversity is an indicator of a healthy ecosystem, which is directly linked to human health. Animals and plants are responsible for many vital services our lives depend on, including:

- oxygen production;
- water regulation;
- soil retaining; and
- providing flood protection.



Biodiversity is both a part of nature and affected by it. Some biodiversity loss is because of events such as seasonal changes or ecological disturbances (wildfires, floods, etc.), but these effects are usually temporary, and ecosystems have managed to adapt to these threats. Human-driven biodiversity loss, in contrast, tends to be more severe and long-lasting. The human-made climate crisis is leading to environmental destruction, habitat loss, and species extinction. Terrestrial biodiversity is decreasing rapidly through habitat loss: a process where a natural habitat becomes incapable of supporting its native species, which are consequently displaced or killed. In the recent past, there have been increased efforts implemented to prevent further loss of terrestrial biodiversity and the ecosystem services they provide. The characteristics and implications of the terrestrial biodiversity within the development site are discussed below.

### 2.7.1. Ecologically Important Landscape Features

The following features describe the general area and habitat, this assessment is based on the Terrestrial Biodiversity Compliance Statement and Wetlands Compliance Statement Report undertaken by the Biodiversity Company (2023).

*Table 10: Spatial relevance of the Project Area to local ecologically important landscape features.*

Desktop Information Considered	Relevant/Irrelevant
Strategic Transmission Corridors (EGI)	Relevant. The project area falls within the International EGI corridor.
Provincial Conservation Plan (Terrestrial)	Relevant. The project area mostly overlaps with 'Heavily Modified' areas. Some 'Moderately modified' and 'Other Natural Areas' also occur within the project area. Several fragmented CBA: Optimal sites occur within the 2 km avifauna survey buffer.
NBA 2018: Ecosystem Threat Status	Relevant. Project area situated within a 'Vulnerable' ecosystem
NBA 2018: Ecosystem Protection Level	Relevant. Project area situated within a 'Poorly Protected' ecosystem.
2022 Red List of Ecosystems	Relevant. Project area situated within an 'Endangered' ecosystem
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant. Two 'Critically Endangered' rivers and multiple extensive 'Critically Endangered' wetlands cross the project area.
Protected and Conservation Areas (SAPAD & SACAD)	Irrelevant. Areas occur within 10 km of the project area.
Important Bird and Biodiversity Areas (IBA)	Irrelevant. IBA sites occur within 10 km of the project area.
National Freshwater Ecosystem Priority Areas (NFEPA)	Irrelevant. No NFEPA systems occur within the project area.
Strategic Water Source Areas	Irrelevant. No SWSA sites occur within 10 km of the pipeline.
National Protected Areas Expansion Strategy (NPAES)	Irrelevant. NPAES priority areas exist nearby (within at least the 2 km buffer).

### 2.7.2. The Mpumalanga Biodiversity Sector Plan

Mpumalanga is a province well known for its globally important biodiversity, its wealth of natural resources and spectacular natural vistas. Its terrestrial ecosystems are characterised by high levels of both plant and animal diversity and a significant number of unique species that are not known to occur anywhere else outside the province. Mpumalanga's freshwater ecosystems are also home to important biodiversity and represent high value ecological infrastructure for delivering water for human use. Mpumalanga's biodiversity and ecological infrastructure is a valuable, though vulnerable, asset that could be a rich source of natural solutions to the challenges posed by poverty, unemployment, and climate change. But, for this potential to be realised, there is a need for accurate and up-to-date scientific information that is effectively interpreted and made available to end-users. Well-informed policies and legislation that safeguards important biodiversity and ecological





infrastructure, together with well-capacitated institutions that are responsible for effective management and governance of biodiversity assets are also needed.

The Mpumalanga Biodiversity Sector Plan (MBSP) is such a spatial tool which serves to provide such information to end-users and guide decision making to ensure that the biodiversity objectives are achieved. The MBSP covers the whole province, which is divided into three District Municipalities: Ehlanzeni, Gert Sibande, and Nkangala, and forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. The MBSP is based on an objective planning approach which considers national and provincial biodiversity targets while trying to avoid conflict with competing land uses. Planning for climate change is a common thread throughout the MBSP where it has been explicitly considered and incorporated into the spatial priorities. It supports the principles of integrated development planning and integration with Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs). It comprises a set of maps of biodiversity priority areas accompanied by contextual information and land-use guidelines that make the most recent and best quality biodiversity information available for use in land-use and development planning, environmental assessment and regulation, and natural resource management.

Both terrestrial and freshwater biodiversity priority areas are identified in the MBSP, either as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). These CBA and ESA areas must be considered and taken into account in processes that will result in a change in land use and will also form part of the geographic areas in which certain activities will require environmental authorisation in terms of Listing Notice 3 of the NEMA EIA Regulation, 2014 as amended. According to the MBSP, the project area mostly overlaps with 'Heavily Modified' areas. Some 'Moderately modified' and 'Other Natural Areas' also occur within the project area. Several fragmented CBA: Optimal sites occur within the 2 km avifauna survey buffer (**Figure 22**).

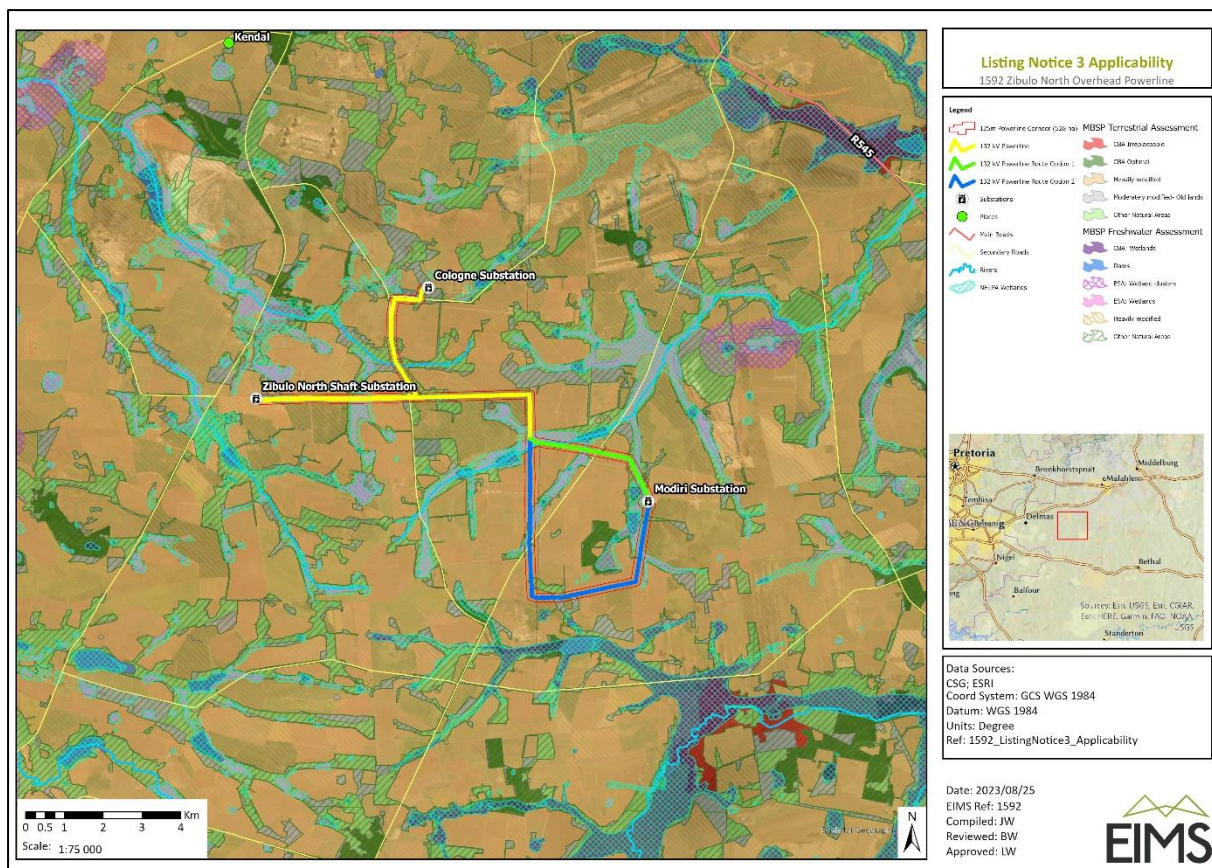


Figure 22: Site Conservation Plan Map

Other Natural Areas (ONAs) are areas that have not been identified as a priority in the latest systematic biodiversity plan, but they do retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions. The overall management objective should be to ensure ecosystem



functionality and minimise the loss of natural habitat and species through strategic landscape planning. Whereas Moderately or Heavily Modified Areas are areas that have been heavily modified by human activity such that they are no longer natural, and no longer contribute to biodiversity targets. Some of these areas may still provide limited biodiversity and ecological infrastructural functions but their biodiversity value has been significantly or sometimes irreversibly compromised. Land-use should be managed in a biodiversity-friendly manner, aiming to maximise ecological functionality where possible.

### 2.7.3. The National Biodiversity Assessment

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period. The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level which are discussed in more detail in the sub-sections below.

#### 2.7.3.1. Ecosystem Threat Status

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition. The proposed area overlaps within the Grassland Biome (Mucina & Rutherford, 2006). The study site overlaps with the Mesic highveld Grassland Bioregion. The vegetation type associated with the study site is the Eastern Highveld Grassland (Gm 12) vegetation type (**Figure 23**).

The Eastern Highveld Grassland is recorded on the plains between Belfast in the east and the eastern side of Johannesburg in the west, extending southwards to Bethal, Ermelo and west of Piet Retief within the Mpumalanga and Gauteng Provinces of South Africa (Mucina & Rutherford, 2006). The altitude varies between 1 520 and 1 780m, but also as low as 1 300m. The Eastern Highveld Grassland is found on slightly to moderately undulating plains, including some low hills and pan depressions and consist of short, dense grassland, dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya*, etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (Mucina & Rutherford, 2006). Woody species include *Senegalia caffra*, *Celtis africana*, *Diospyros lycioides subsp. lycioides*, *Parinari capensis*, *Protea caffra* and *Searsia magalismontana*.

According to Mucina and Rutherford (2006) and the Government Gazette 47526 (Notice No.689) on 18 November 2022 in terms of the National Environmental Management: Biodiversity Act (NEMBA), the Eastern Highveld Grassland vegetation type is classified as Endangered, with a target of 24%. A small fraction is statutorily conserved in the Nooitgedacht Dam and Jericho Dam Nature Reserves. Approximately 44% of the Eastern Highveld Grassland has been transformed, primarily by cultivation, plantations, mining, urbanization and building of dams (Mucina & Rutherford, 2006). Erosion is very low, and no serious alien infestation is reported, although species such as *Acacia mearnsii* can become dominant in disturbed places.



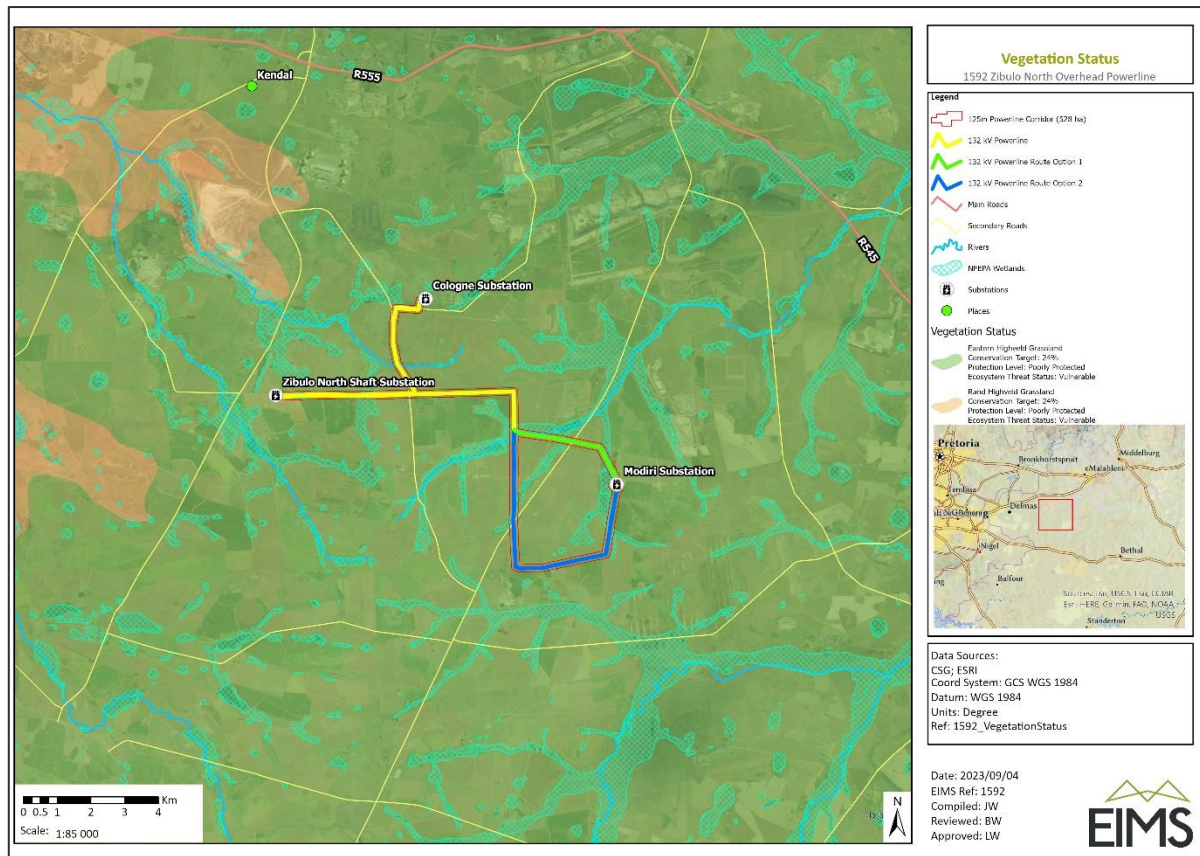


Figure 23: Site Vegetation Map

### 2.7.3.2. Ecosystem Protection Level



Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected (NP), poorly protected (PP), moderately protected (MP) or well protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act. The project area was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystem associated with the development (**Figure 23**). The proposed development area is situated within a 'Poorly Protected' ecosystem.

### 2.7.3.3. Floral Species

Three (3) terrestrial habitat units were encountered namely, Modified Habitat (**Figure 24**), Degraded Grassland (**Figure 25**) and Wet Grassland (**Figure 26**) which are described in detail **Table 11** below. The vegetation was found to be dominated by pioneer graminoids and exotic and alien invasive flora species, however some of the most predominant indigenous flora species recorded in the area (21 species) is available the Terrestrial Biodiversity Compliance Statement Report (**Appendix D**). No SCC or protected flora species were observed by the specialist. Eleven (11) Exotic and Alien Invasive Species (AIS) were recorded throughout the project area (**Table 12**). Five (5) of these are listed as Category 1b invasive species and according to legislation these must be controlled according to an AIS management plan.



Table 11: Habitat and Sensitivity summary of the Project Area Vegetation Profile (The Biodiversity Company, 2023)

Habitat	Description and Vegetation Details	SEI	Photographs
<b>Modified</b>	<p>This habitat unit characterises those portions of the landscape that have been cleared of most vegetation for agriculture or development activities of some kind. Roads and road verges are included in this unit, however not all of these features were delineated by the specialist.</p> <p>Only very limited ecological services are provided by this unit, including some habitat connectivity and basic foraging for common mammal and herpetofauna species.</p> <p>Dominant flora includes:</p> <ul style="list-style-type: none"> <li>• <i>Cynodon dactylon</i></li> <li>• <i>Erigeron canadensis</i></li> <li>• <i>Melinis repens</i></li> <li>• <i>Tagetes minuta</i></li> <li>• <i>Verbena bonariensis</i></li> </ul>	<b>Very Low</b>	 <p>Figure 24: View of the Modified Habitat Unit (The Biodiversity Company, 2023)</p>
<b>Degraded Grassland</b>	<p>Most portions of this habitat were comprised of either old lands in recovery, regularly mowed portions of grazing land, and fragmented grassland areas adjacent to wetlands. The unit is characterised by degraded and poor condition grassland vegetation that experiences a high level of ongoing anthropogenic impacts, which include human and vehicle ingress, presence of domestic animals, grazing of livestock, water pollution, and invasion by alien and invasive plant species. This habitat state may be contributed to the significant levels of nearby agricultural and roadway development that occurs throughout the local region, as well as the resulting low levels of ecological connectivity within the landscape.</p> <p>These impacts have resulted in an indigenous flora vegetation profile that is highly fragmented, generally invaded and of a low diversity. The areas were instead characterised by a variety of pioneer grasses and invasive plants and exotic weeds.</p> <p>Some of the key ecosystem services provided include erosion control which encourages groundwater seepage and percolation, as well as foraging and coverage for fauna species.</p> <p>Dominant flora includes:</p> <ul style="list-style-type: none"> <li>• <i>Agrostis sp</i></li> <li>• <i>Cymbopogon excavates</i></li> </ul>	<b>Low</b>	 <p>Figure 25: View of the Degraded Habitat Unit (The Biodiversity Company, 2023)</p>




	<ul style="list-style-type: none"> <li>• <i>Eragrostis curvula</i></li> <li>• <i>Hyparrhenia hirta</i></li> <li>• <i>Pogonarthria squarrosa</i></li> <li>• <i>Sporobolus spp.</i></li> </ul>		
<b>Wet Grassland</b>	<p>These portions of habitat include those areas delineated by the terrestrial ecologist as representing seasonally or permanently wet grassland areas. Other than four artificial dams, the majority of the water resource areas are made up of seep wetlands.</p> <p>Other than the numerous important water management services provided by these areas, they are also important fauna movement corridors and support unique flora and aquatic dependant fauna.</p> <p>Dominant flora includes:</p> <ul style="list-style-type: none"> <li>• <i>Cyperus bipartitus</i></li> <li>• <i>Imperata cylindrica</i></li> <li>• <i>Juncus effusus</i></li> <li>• <i>Typha capensis</i></li> </ul> <p>Note: This habitat unit is both limited and highly fragmented within the project area, and the detrimental effects/impacts of pylon construction is considered minor as these can largely span the water resource areas (where they occur close to or within these habitats, they generally occur within/near to a road verge). Additionally, the disturbance caused by a single pylon placement is limited to a small area no larger than 3 m in diameter.</p>	<b>Medium</b>	 <p><i>Figure 26: View of the Wet Grassland Habitat Unit (The Biodiversity Company, 2023)</i></p>





Table 12: Invasive and exotic flora recorded within the local project area (The Biodiversity Company, 2023).

Family	Scientific Name	Common name	Invasive Status
Fabaceae	<i>Acacia mearnsii</i>	Black wattle	Category 2 invader
Asteraceae	<i>Cirsium vulgare</i>	Bull thistle	Category 1b invader
Poaceae	<i>Cortaderia selloana</i>	Pampas grass	Category 1b invader
Solanaceae	<i>Datura stramonium</i>	Jimsonweed	Category 1b invader
Asteraceae	<i>Erigeron canadensis</i>	Horseweed	Naturalized invader
Myrtaceae	<i>Eucalyptus camaldulensis</i>	River red gum	Category 2 invader
Myrtaceae	<i>Eucalyptus sp.</i>		
Juncaceae	<i>Juncus tenuis</i>	Poverty rush	Naturalized exotic
Solanaceae	<i>Solanum mauritianum</i>	Bugweed	Category 1b invader
Asteraceae	<i>Tagetes minuta</i>	Southern cone marigold	Naturalized invader
Verbenaceae	<i>Verbena bonariensis</i>	Tall verbena	Category 1b invader

The three delineated habitat types were allocated a sensitivity category, or Site Ecological Importance (SEI), and this breakdown is presented in **Table 13**. It must be noted that the following guidelines should be considered when interpreting SEI in the context of any proposed development or disturbance activities (noted in conjunction with provincial guidelines for CBA/protected areas):

- Very Low: Minimisation mitigation – Development activities of medium to high impact acceptable and restoration activities may not be required.
- Low: Minimisation and restoration mitigation – Development activities of medium to high impact acceptable followed by appropriate restoration activities.
- Medium: Minimisation and restoration mitigation – Development activities of medium impact acceptable followed by appropriate restoration activities.

Table 13: Sensitivity summary of the floral habitat types within the project area (The Biodiversity Company, 2023).

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
<b>Modified</b>	Low	Low	<b>Low</b>	High	<b>Very Low</b>
<b>Degraded Grassland</b>	Medium	Medium	<b>Medium</b>	High	<b>Low</b>
<b>Wet Grassland</b>	Medium	Medium	<b>Medium</b>	Medium	<b>Medium</b>

#### 2.7.3.4. Faunal Species

Mammal and herpetofauna activity were found to be low during the survey, and the majority of these species are expected to only occasionally occur within the water resource areas – utilising them as movement corridors and foraging habitat. The high level of regular disturbance means that few species would remain in the areas for long periods of time, other than those adapted to anthropogenic activities. Six (6) mammal species were recorded (**Table 14**), and no herpetofauna species were observed during the survey.





Table 14: Mammals recorded within the local project area (The Biodiversity Company, 2023).

Family	Scientific Name	Common name	National Red List Status
Canidae	<i>Canis mesomelas</i>	Black-backed jackal	LC
Herpestidae	<i>Cynictis penicillata</i>	Yellow mongoose	LC
Muridae	<i>Gerbilliscus brantsii</i>	Highveld Gerbil	LC
Hystricidae	<i>Hystrix africaeustralis</i>	Cape porcupine	LC
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	LC
Sciuridae	<i>Xerus inauris</i>	Cape ground squirrel	LC

### 2.7.3.5. Avifauna



Four (4) avifauna habitats namely, Transformed (**Figure 27**), Agriculture (**Figure 28**), Grasslands (**Figure 29**) and Water Resources (**Figure 30**) were defined for the 2 km buffer region of the project area (refer to **Table 15**). During this assessment, performed in the winter, 68 species including the *Phoeniconaias minor* (Lesser Flamingo) and *Phoenicopterus roseus* (Greater Flamingo) were recorded in the point counts and 55 during incidental records, with a total of 85 unique species observed. The results are deemed sufficient to draw a conclusion on the risk of the development. Four (4) SCC were recorded during the survey.

Table 15: Habitats specific to avifauna and the 2 km avifauna buffer (The Biodiversity Company, 2023).

Habitat and SEI	Description and Likely SCC	Photo
<b>Transformed (Very Low SEI)</b>	<p>Roads and buildings that do not provide much habitat for avifauna, except for common (usually urban) species which are able to tolerate the disturbance (FIG).</p> <p>No SCC are likely to occur here.</p>	 <p>Figure 27: Transformed Avifauna Habitat Unit (The Biodiversity Company, 2023)</p>
<b>Agriculture (Very Low SEI)</b>	<p>Agricultural areas used for crop management. This habitat includes past and current agricultural areas. These provide foraging for Avifauna species.</p> <p>SCC that could occur here include: Secretarybird, Blue Korhaan and White-bellied Korhaan.</p>	 <p>Figure 28: Agriculture Avifauna Habitat Unit (The Biodiversity Company, 2023)</p>





<b>Grasslands (Low SEI)</b>	<p>Grasslands, in some cases seasonally inundated. These areas have likely not been cleared for agriculture or development in the past.</p> <p>SCC that could occur here include: Secretarybird, Blue Korhaan, Lanner Falcon, European Roller and White-bellied Korhaan.</p>	 <p><i>Figure 29: Grasslands Habitat Unit (The Biodiversity Company, 2023)</i></p>
<b>Water resources (Low SEI)</b>	<p>Wetlands and dams that provide habitat for various bird species. These also function as crucial water supplies in the area.</p> <p>SCC that could occur here include: Greater-painted Snipe, Greater Flamingo, Lesser Flamingo, African Marsh Harrier and African Grass-Owl.</p>	 <p><i>Figure 30: Water Resources Avifauna Habitat Unit (The Biodiversity Company, 2023)</i></p>

A priority species list (Ralston Paton et al., 2017) was developed initially for use with Wind Energy Facilities. However, the collision, electrocution and habitat loss risks are considered appropriate for powerline developments. Also utilised by the specialist was the Eskom and EWT poster: Birds and Powerlines (Eskom and EWT, Date unknown), which identifies birds most prone to collision and electrocution from powerlines. Some birds are not included in these lists but were considered by the avifauna specialists as risk species for collisions, electrocutions and habitat loss as a result of powerline infrastructure. Refer to **Table 16** for the avifauna risk species.

*Table 16: Summary of Risk Species recorded within and around the proposed project area (The Biodiversity Company, 2023).*

Scientific Name	Common Name	Collisions	Electrocutions	Habitat Loss
<i>Alopochen aegyptiaca</i>	Egyptian Goose	x	x	
<i>Anas sparsa</i>	African Black Duck	x		
<i>Anas undulata</i>	Yellow-billed Duck	x		
<i>Ardea cinerea</i>	Grey Heron	x	x	
<i>Ardea intermedia</i>	Yellow-billed Egret	x	x	
<i>Ardea melanocephala</i>	Black-headed Heron	x	x	
<i>Asio capensis</i>	Marsh Owl	x	x	x
<i>Bostrychia hagedash</i>	Hadada Ibis	x	x	



Scientific Name	Common Name	Collisions	Electrocutions	Habitat Loss
<i>Circus ranivorus</i>	African Marsh Harrier	x	x	x
<i>Corvus albus</i>	Pied Crow		x	
<i>Corvus capensis</i>	Cape Crow		x	
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	x		
<i>Numida meleagris</i>	Helmeted Guineafowl	x		
<b><i>Phoeniconaias minor</i></b>	<b>Lesser Flamingo</b>	x		
<b><i>Phoenicopterus roseus</i></b>	<b>Greater Flamingo</b>	x		
<i>Plectropterus gambensis</i>	Spur-winged Goose	x		
<i>Sarkidiornis melanotos</i>	Knob-billed Duck	x		
<i>Tadorna cana</i>	South African Shelduck	x		
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	x	x	

## 2.8. Wetlands and Aquatics

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 (NWM5) includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018. According to the NWM5 dataset, two wetlands types are expected to overlap with the PAOI. These are channelled valley bottom and seep wetlands. According to the Inland water areas data, Perennial streams, non-perennial streams, marsh vleis and earth dams are expected to overlap with the PAOI (see **Figure 31**).

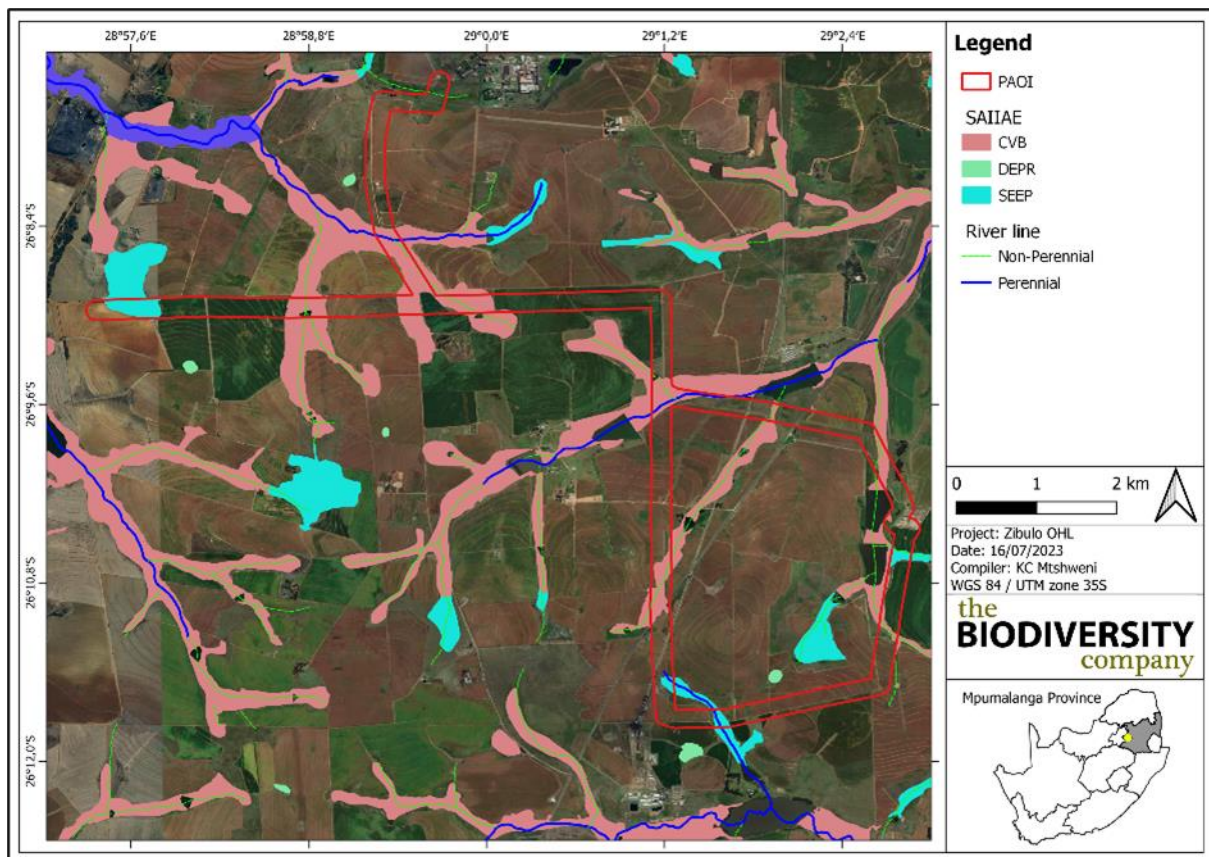


Figure 31: Site Hydrological Conditions (The Biodiversity Company, 2023)



According the Wetlands Compliance Statement Report by the Biodiversity Company (2023), two (2) hydrogeomorphic (HGM) HGM units were identified within the 100m of the study area, namely, 14 seep (HGM1 – HGM 14) wetlands and four (4) unchannelled valley bottom (HGM15 – HGM18) wetlands (see **Figure 32**). These systems differ from one another regarding ecological importance and sensitivity, modification, ecological state, impacts and the general setting. HGM1 to HGM5 and HGM15 were noted to be part of the same catchment which flow Northwest into the perennial Wilge River west of Ogies. The wetlands were observed to be saturated and located within extensively cultivated fields. Vegetation was mostly dominated by terrestrial graminoids. Considering that these systems were also located within cultivated fields, the wetlands were also dominated by alien plants and naturalized exotic weeds such as *Phragmites australis*, *Typha capensis*, *Verbena bonariensis* *Targeted minuta* and *Bidens Pilosa*.

HGM 6 to HGM14 and HGM 19 to HGM 19, similar to what was noted above, were part of their own catchment flowing North-eastwards into the Klippoortjiespruit, South of Ogies. These systems compared to those in the preceding paragraph, were observed to be inundated, owing to their relative location close to farm dams. Considering that impacts within the project area were similar, plant species composition was similar to what was mentioned above, with the exception of tall growing wetland plants such as *Typha capensis* and *Phragmites australis*.

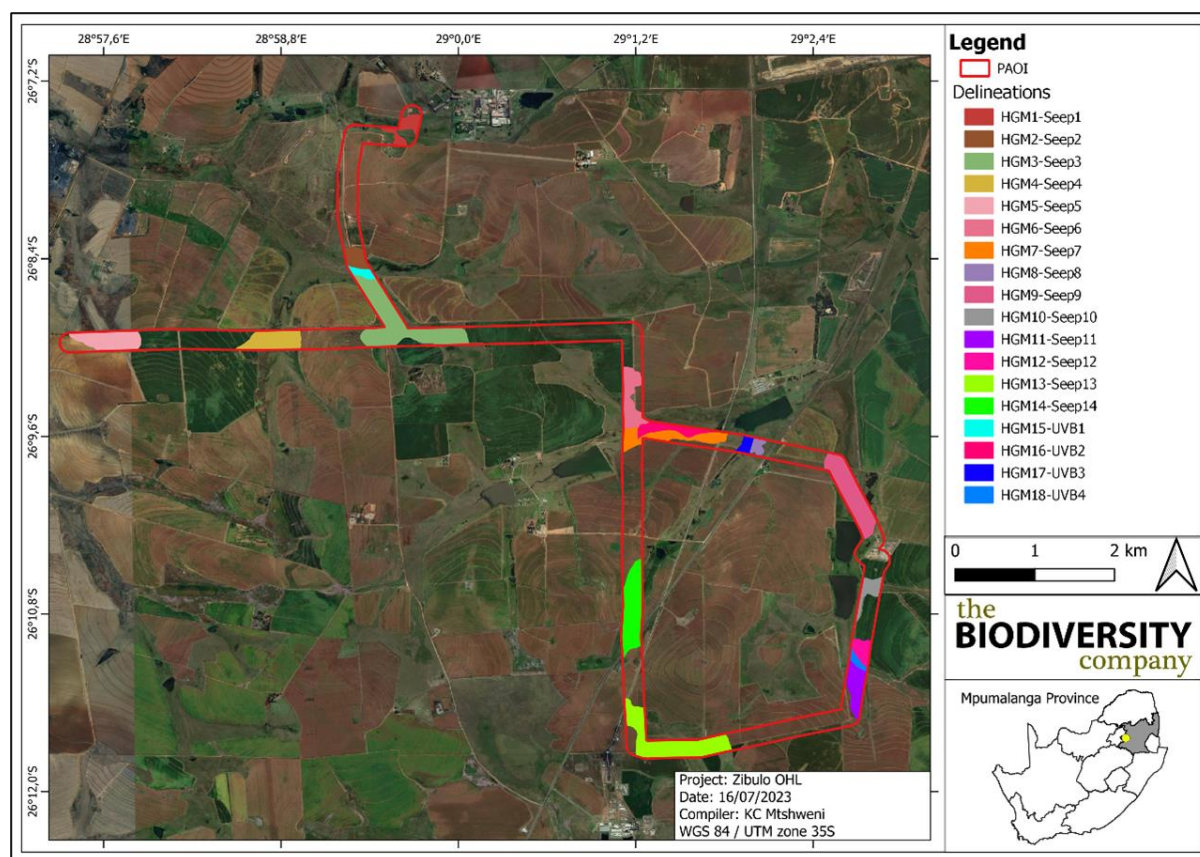


Figure 32: Delineation of watercourses within the study area (The Biodiversity Company, 2023)

Several Seepage and UVB wetland were identified on site and are dominated by moist grassland vegetation. These moist grasslands are known to provide essential ecosystem services and support agricultural activities but are poorly conserved. Many of the assessed wetlands showed a great loss in basal cover due to land use activities within the region. These include mining and mostly deliberate attempts by farmers to plant crops (maize and soyabean) and palatable graminoids (*Eragrostis spp*) for pasture purposes. With the above being taken into consideration, wetland plants were dominated by terrestrial graminoids (*Eragrostis spp*), naturalised exotic (*Erigeron canadensis*), pioneer and rudimentary (*Verbena bonariensis*) species, particularly within and around





crop fields. Some of the true wetland hydrophytes identified within the permanent zones include *Juncus effusus*, *Imperata cylindrica*, *Juncus torreyi*, *Typha capensis* and *Cortaderia selloana*.

### 2.8.1. Present Ecological Status

Three modules, namely hydrology, geomorphology and vegetation, were assessed as a single unit for the HGM Units and subsequently an area weighted score was obtained for the HGM Units by the specialist. The potential impacts of activities such as agriculture, drought, prospecting, mining, altered hydrological functions and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment. Based on the Wetland Compliance Statement (The Biodiversity Company, 2023), the overall Present Ecological Status (PES) Category for HGM1, 3, 4, 9, 15, and 16 was determined to be a C which means that the functionality of the wetlands is Moderately modified, with some loss of natural habitats. Moderate change in ecosystem processes and loss of natural habitat has occurred but the natural habitat remains intact. Major impacts within the wetlands result from agricultural activities (cultivation and cattle grazing) within the wetland area. A decrease in the PES is likely to occur over the next few years if the proposed activities occur within the exclusion zones, further road construction takes place, and if degradation occurs due to human activities.

The overall PES Category for HGM2, 6, 7, 8, 13, 14 and 17 was determined to be D which means that the functionality of the wetlands is Largely modified, a large loss of natural habitat and basic ecosystem function has occurred. Major impacts within these systems were observed to be similar to those determined to be moderate. These wetlands presented a lower PES score due to the impacts occurring over larger portions of the wetlands as compared to those mentioned above. A decrease in the PES is likely to occur over the next few years if the proposed activities occur within the exclusion zones, further road construction takes place, and if degradation occurs due to human activities (The Biodiversity Company, 2023).

The overall PES Category for HGM5, 10, 11 and 12 was determined to be E, which means that the functionality of the wetlands is Seriously modified, and that the change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable. This PES score is attributed to the existing impacts observed during the sight assessment. Road construction, substrate disturbance and construction has resulted in the disconnection of historically linked systems, and the proliferation of non-wetland alien plant species. Due to the existing impacts and their degree of wetland disturbance, the proposed activity will not result in a decrease of the determined PES score (The Biodiversity Company, 2023).

### 2.8.2. Site Ecological Importance

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts). The SEI assessment was applied to all wetland features within the study area in order to ascertain the levels of sensitivity and ecological importance of the features, as well as to assist in informing a suitable Recommended Management Objective (RMO) for each. The results of these assessments from the aquatic specialist are summarised in the **Table 17** below.

Table 17: The SEI results for the delineated HGM types (The Biodiversity Company, 2023)

Very High (A)	High (B)	Moderate (C)	Low (D)
HGM4	HGM1	HGM2	HGM10
	HGM3	HGM5	
	HGM6	HGM11	
	HGM7	HGM12	
	HGM8	HGM15	
	HGM9	HGM18	
	HGM13		
	HGM14		



	HGM16		
	HGM17		

The results indicate that the seep (HGM1) wetland was calculated to fall within SEI Category A – Very High. It is an indication that this system, at different levels, presents ecological importance and sensitivity on a provincial and/or local scale. The importance of services supplied by this system is Very High relative to that supplied by other wetlands. This is attributed the fact that this system presented the greatest intact natural buffer with the least agricultural impacts, compared to the other assessed HGM units. This was also noted in the diversity of hydrophytes and birds noted within this HGM unit.

The results indicate that HGM1, 3, 6, 7, 8, 9, 13, 14, 16 and 17 were calculated to fall within SEI Category B – High. It is an indication that this system, at different levels, presents ecological importance and sensitivity on a provincial and/or local scale. The importance of services supplied by this system is High relative to that supplied by other wetlands. The biodiversity of these wetlands may be sensitive to substrate and habitat modifications. The in-situ analysis presented all the wetlands to be affected by cultivation and cattle grazing. These activities have resulted in the encroachment of alien invasive plant species such as *Bidens pilosa* and *Tagetes minuta*. The preservation and improvement of the assessment unit is of great importance, due to the potential ecological services provided.

HGM2, 5, 11, 12, 15 and 18 were calculated to fall within SEI Category C – Moderate. It is an indication that this system presents moderate ecological importance and sensitivity on a provincial and/or local scale. The importance of services supplied by this system is Moderate relative to that supplied by other wetlands. The moderate SEI category is attributed to the fact that these systems are used, to their entirety, as cultivated fields and therefore making them sensitive to substrate disturbance.

HGM10 wetland was calculated to fall within SEI Category D – Low. It is an indication that this system presents low ecological importance and sensitivity on a provincial and/or local scale. The importance of services supplied by this system is low relative to that supplied by other wetlands. The biodiversity of the wetland is potentially sensitive to substrate modifications and erosion due to the occurrence of small gullies and collapsing road crossings. The wetland was observed to be a historically cultivated area dominated by alien plant species (The Biodiversity Company, 2023).

## 2.9. Archaeological and Cultural Heritage

The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The Act defines a 'heritage resource' as any place or object of cultural significance (aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance). The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. This section of the report presents the heritage status of the proposed Zibulo 132kV powerline project. According to the Heritage Impact Assessment (PGS Heritage, 2023), a total of four heritage features and resources were identified within the study area. These consist of three burial grounds (Z001, Z002, Z003) and one locality with a recent historic structure (Z004). See **Figure 33** and the detailed site descriptions as contained in the Heritage Impact Assessment Report (**Appendix D3**).

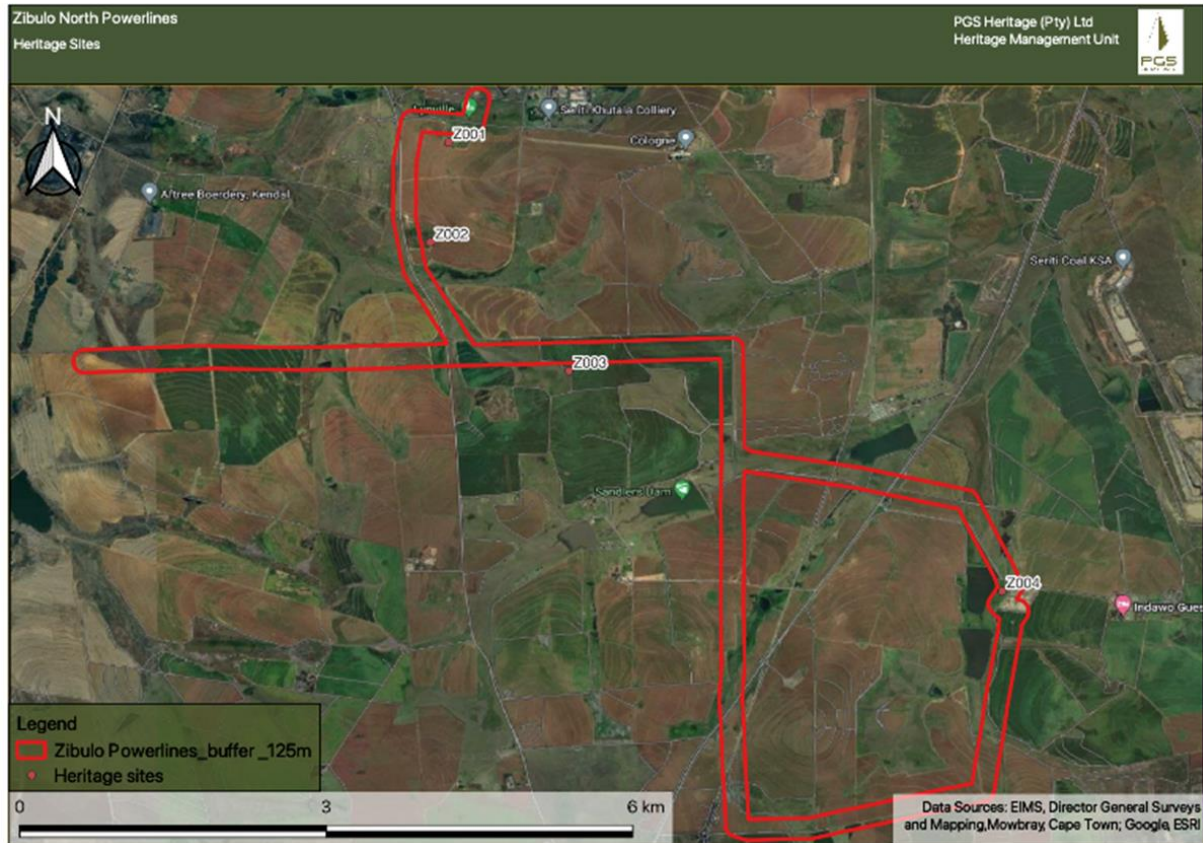


Figure 33: Identified heritage resources within the study area (PGS Heritage, 2023)

The recent historic structure is younger than 60 years. The structure and remains of structures are not conservation worthy and contain no cultural or scientific value and is consequently graded as not conservation worthy. Three burial grounds consisting of approximately 14 graves (Z001), 6 graves (Z002) and 45 graves (Z003) were identified, refer to figures **Figure 34**, **Figure 35** and **Figure 36** respectively. Some of the graves are still identifiable and consist mainly of stone packed or stone lined grave dressings, some have formal granite dressings. An inscribed concrete headstone at Z003 was also found with an inscription date of 1946 (**Figure 38**). Due to the cultural and religious significance of burial grounds the sites have a high heritage significance and graded as Grade 3A.



Figure 34: View of the burial ground at Z001 (PGS Heritage, 2023)



Figure 35: View of the burial ground at Z002 (PGS Heritage, 2023)





Figure 36: View of the burial ground at Z003 (PGS Heritage, 2023)



Figure 37: The structure at Z004 (PGS Heritage, 2023)



Figure 38: Grave dated 1946 at Z003 (PGS Heritage, 2023)

## 2.10. Palaeontology

Cultural Heritage in South Africa, including all heritage resources, is protected by the National Heritage Resources Act (Act 25 of 1999) (NHRA). Heritage resources as defined in Section 3 of the Act include “all objects recovered from the soil or waters of South Africa, including archaeological and **palaeontological objects** and material, meteorites and rare geological specimens”. Palaeontological heritage is exceptional and non-renewable and is protected by the NHRA. Palaeontological resources and may not be unearthed, broken moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

A Palaeontological Impact Assessment was undertaken Banzai Environmental in August 2023 (**Appendix D4**). According to the study, the geology of the proposed development site as depicted on the 1: 250 000 East-Rand 2628 (1986) Geological Map (Council for Geosciences, Pretoria) indicates that the study area is underlain by the Vryheid Formation (Ecca Group) with small areas of Jurassic dolerite. The PalaeoMap of the South African



Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High, while that of Jurassic dolerite is Zero (**Figure 39**) (Almond et al, 2013; SAHRIS website). The suggested location is classified as having a Very High Palaeontology Theme Sensitivity in the DFFE Screening Tool Report.

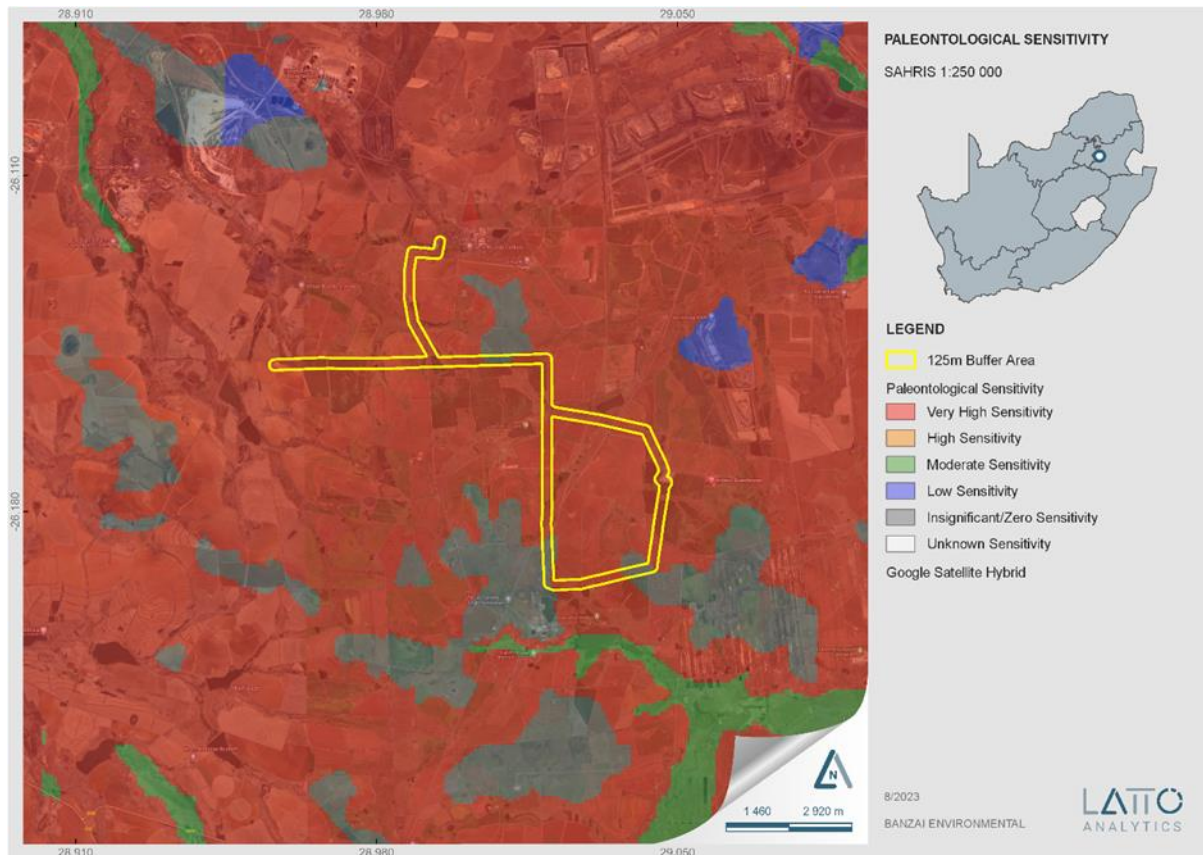


Figure 39: Extract of the SAHRIS PalaeoMap map (Banzai Environmental, 2023)

A site-specific field survey of the development footprint was undertaken in August 2023 by Banzai Environmental. The survey found no fossiliferous outcrops in the area where construction is planned. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. In contrast, the SAHRIS Palaeosensitivity Map and DFFE Screening Tool assigned a Very High Sensitivity to the development region. A Medium Palaeontological value was assigned to the proposed development prior to mitigation and a Low value after mitigation by the specialist. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.



### 3. POLICY AND LEGISLATIVE REQUIREMENTS

This section provides an overview of the governing legislation identified which may relate to the proposed project. The discussion in this chapter is by no means an exhaustive list of the legal obligations of the applicant in respect of environmental management for the proposed project. Only a selected number of policy and legislation are discussed in this report as it is for a registration through the Standard and not through an EA process. The primary legal requirement for this project stems from the need for a registration to be granted by the competent authority, which is the MPDARDLEA, in accordance with the requirements of the Standard “Standard for the Development of Powerlines and Substations within Identified Geographical Areas” adopted in terms of section 24(10)(a) of NEMA. In addition, there are numerous other pieces of legislation governed by many acts, regulations, standards, guidelines and treaties on an international, national, provincial and local level, which should be considered in order to assess the potential applicability of these for the proposed activity. The key legislation applicable to this project is discussed in the subsections below.

#### 3.1. Constitution of the Republic of South Africa

The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act No. 108 of 1996) makes provisions for environmental issues and declares that: *“Everyone has the right -*

- a) to an environment that is not harmful to their health or well-being; and*
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*
  - i. prevent pollution and ecological degradation;*
  - ii. promote conservation; and*
  - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.*

The State must therefore respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate. The application for registration via the Standard for the proposed Zibulo 132kV powerline project will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and social environment.

#### 3.2. The National Environmental Management Act, 1998

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In South Africa, EIAs became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended several times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are the current regulations.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed



decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels. In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIAs in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity.

Based on review on the NEMA EIA Regulations, 2014 as amended, the applicant would be required to appoint an EAP to undertake a Basic Assessment process for the proposed project, which includes conducting the public participation process towards an application for EA. However, with the adoption of the Standard “Standard for the Development of Powerlines and Substations within Identified Geographical Areas” adopted in terms of section 24(10)(a) of NEMA in June 2022, certain activities in certain geographic areas were excluding from the EA process and are only required to registered the project through the requirements indicated in the standard and discussed in **Sections 3.3** and **3.4**.

### 3.3. The Strategic Transmission Corridors

In 2026, the Department of Forestry, Fisheries and the Environment (DFFE) appointed the Council for Scientific and Industrial Research (CSIR) and the South African National Biodiversity Institute (SANBI) to complete a series of Strategic Environmental Assessments (“SEAs”) to determine the environmental implications of the Government’s renewable energy policies and plans. Through the SEAs, the CSIR identified eight Renewable Energy Development Zones (“REDZs”) across South Africa that are of strategic importance for large-scale wind and solar PV energy development as well as five Strategic Transmission Corridors that are important for the rollout of the large-scale electricity infrastructure required for the energy projects within these areas. The corridors are representative of South Africa’s future transmission backbone up to 2040. The corridors were identified to support Strategic Integrated Project 10 (SIP 10), which pertains to electricity transmission and distribution. Given the strategic importance of these corridors in balancing the country’s future generation and load requirements, the SEA was advocating that electricity grid infrastructure development inside of the corridors benefit from improved regulatory treatment in the form of faster and more efficient environmental authorisation and permitting procedures.

In order to encourage the development of large-scale wind and solar PV projects and the associated large-scale electricity infrastructure, DFFE published Government Notices 113 and 114 on 16 February 2018 which provide that wind and solar PV projects that take place within a REDZ and electricity infrastructure that takes place within a Strategic Transmission Corridor only require a Basic Assessment (“BA”) and do not need to undergo the longer and more comprehensive Scoping and Environmental Impact Reporting (“S&EIR”) process in order to obtain an EA. This is because these areas have already been scoped for environmental risks as part of the SEA process. In addition, DFFE reduced the timeframe for the processing of these applications from 107 days to 57 days to help fast-track EA applications. It must be noted that any large-scale wind and solar PV or electricity infrastructure development activities that take place outside these specified areas are subject to the normal NEMA EIA Regulations.

The SEA processes identified geographical areas which are of strategic importance for the rollout of electricity transmission and distribution infrastructure in terms of SIP 10. These geographical areas consist of seven (7) strategic transmission corridors for the development of transmission and distribution infrastructure (**Figure 40**) that have been pre-assessed for environmental sensitivities.

- 2016 EGI SEA:
  - Central Corridor;
  - Eastern Corridor;
  - International Corridor;
  - Northern Corridor; and





- Western Corridor.
- 2019 Expanded EGI SEA:
  - Expanded Eastern Corridor; and
  - Expanded Western Corridor.

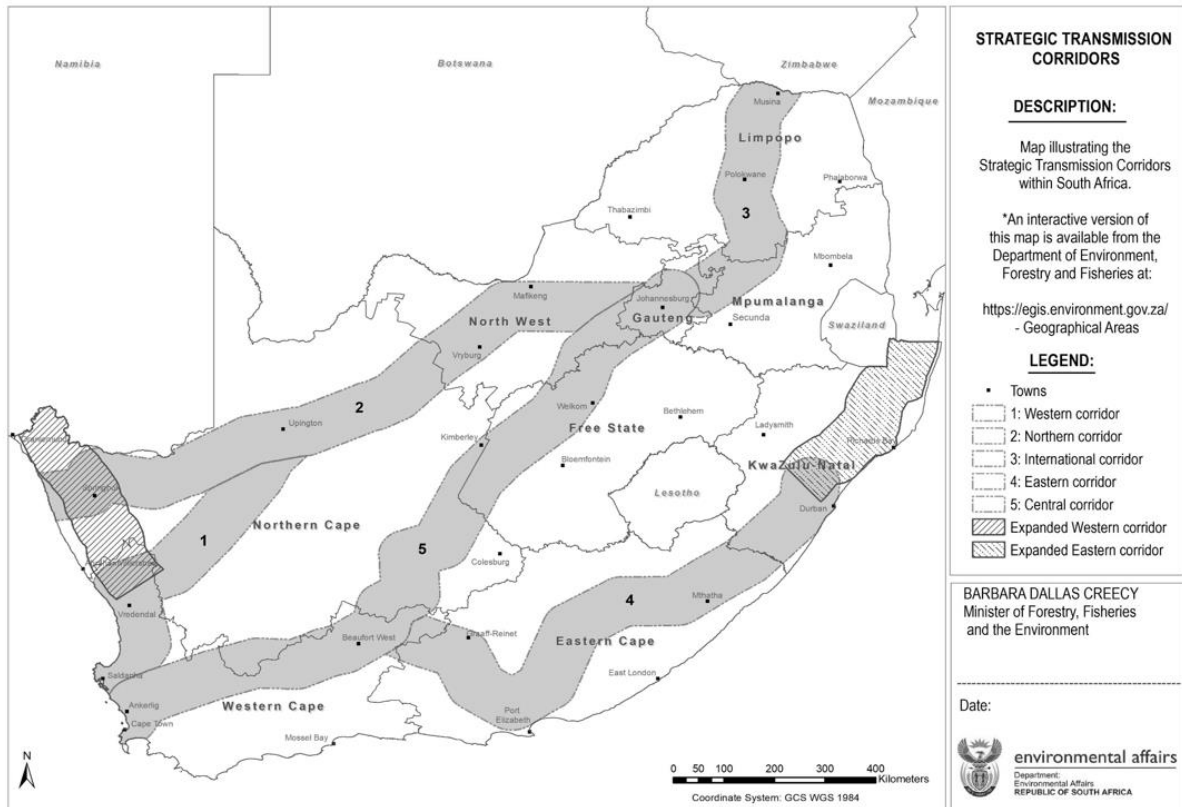


Figure 40: SA Strategic Transmission Corridors (DFFE, 2022)

A review of the strategic transmission corridors map found that the proposed Zibulo 132kV powerline project is located within the International Transmission Corridor (ITC). As the proposed development is an electrical infrastructure project and falls within the ITC, the proposed development would only require a Basic Assessment process and the timeframe for the processing of these applications would only be up to a maximum of 57 days in terms of DFFE Government Notices 113 and 114. In July 2020, however, DFFE published draft Government Notice 835 which provided that where 90% or more of the electricity transmission and distribution infrastructure or the expansion of such infrastructure is to take place within a Strategic Transmission Corridor, an EA will not be required. This ultimately led to the adoption of the “Standard for the Development of Powerlines and Substations within Identified Geographical Areas” adopted in terms of section 24(10)(a) of NEMA in June 2022, discussed below.

### 3.4. The Standard for Development of Powerlines and Substations Within Identified Geographical Areas

In a media statement issued on 25 August 2020, the DFFE explained that the reason for excluding electricity infrastructure activities that take place within a Strategic Transmission Corridor from the requirement to obtain an EA is because South Africa has been “developing grid infrastructure for many years and the impacts and mitigation measures are well-known” (<https://www.fasken.com/en/knowledge/2021/03/17-minister-of-environment-forestry-and-fisheries>). The DFFE has accordingly developed a standard known as the Standard for Electricity Transmission and Distribution Power Line Development within Identified Geographical Areas (the



“Standard”) which will set out the activities that will not require an EA and the applicable procedures. Although these activities will not require an EA, they were still be subject to public participation and will be subjected to relevant appeal procedures. The Standard aims to reduce the timeframe between conceptualising a grid expansion project to its implementation and means that energy can be provided to the user faster or on time in the case of new renewable energy developments. If more than 10% of the proposed electricity transmission and distribution infrastructure fall outside the Strategic Transmission Corridors, the relevant procedure in terms of the EIA Regulations must be followed to obtain an EA (which may be the S&EIR process).

The registration process through the Standard is subject to the proposed development meeting the following requirements:

- The development is situated in areas identified by the DFFE Screening Tool Report as being of medium or low environmental sensitivity and confirmed to be such by the EAP or the relevant specialist for the identified environmental theme;
- for the following activities, including the associated activities necessary for the realisation of the infrastructure, as identified in the EIA Regulations:
  - Listing Notice 1: Activity 11 and 47; and
  - Listing Notice 2: Activity 9;

Other important supporting documents required as part of the registration process and which must be appended to the Environmental Sensitivity Report (this report) include the following:

- A Generic Environmental Management Programme (EMPr) compiled for the development and expansion of: (a) overhead electricity transmission and distribution infrastructure and (b) substation infrastructure for the transmission and distribution of electricity;
- Proof of public participation process required in terms of Chapter 6 of the EIA Regulations for a linear development during the route determination process, especially consultation with relevant Non-Governmental Organisations (NGOs) and Community-Based Organisations (CBOs);
- Proof of the initial servitude negotiations with landowners;
- Specialist studies and/or Compliances Statements verifying the environmental sensitivity of the site; and
- Project Team details and expertise (CV's, qualifications and registrations).

It must be noted that the Standard and exclusions do not apply in the following instances:

- Where any part of the infrastructure occurs on an area for which the environmental sensitivity for a relevant environmental theme is identified as being very high or high by the screening tool and confirmed to be such by the EAP or the relevant specialist for the identified environmental theme;
- Where the site verification for a specific theme identifies that the low or medium sensitivity rating of the screening tool is in fact high or very high; or
- Where the greater part of the proposed infrastructure fall outside of any strategic transmission corridor.

Where this Standard does not apply, either the requirements of the EIA Regulations, or the requirements of Government Notice No. 113 in Government *Gazette* No. 41445 of 16 February 2018, read with the NEMA EIA Regulations, where relevant, apply to the relevant environmental theme for which the very high or high sensitivity has been identified, in respect of the portion of the development which occurs on the area where the environmental sensitivity is confirmed to be very high or high, or to the entire development where the greater part of the infrastructure falls outside of the strategic transmission corridor.





A review of the Standard (requirements, applicability, and exclusions) found that the proposed Zibulo 132kV powerline project meets the requirements for a registration process through the standard and does not need to go through the EA process. This is based on that the whole proposed development area is located within the ITC, the proposed activity triggers Listing Notice 1: Activity 11 and 47, and the development is situated in areas of medium or low environmental sensitivity as confirmed by the relevant specialists. As such, this report and supporting documents have been prepared for submission to MPDARDLEA for review and registration through the Standard.

### 3.5. The National Water Act, 1998

The National Water Act, 1998 (Act 36 of 1998 – NWA) makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is –

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved and managed in ways that take into account:

- Meeting basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development;
- Providing for the growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and drought.

The NWA defines 11 water uses in Section 21 of the Act. A water use may only be undertaken if authorised by the Department of Water and Sanitation (DWS). The water uses for which an authorisation or licence can be issued include:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);



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

The regulated area of a watercourse for section 21 activities of the Act water uses is similarly defined in terms of the Act as follows:

- a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
- c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

A review of the NWA Section 21 activities was undertaken to assess if the proposed development triggers any activity. Based on the information provided by the applicant and a review of the Wetland Compliance Statement undertaken by the Biodiversity Company (2023), the proposed development triggers NWA Section 21 (c) and (i) activities. A pre-application meeting with the Department of Water and Sanitation to confirm the licencing or registration process to be followed was held on the 21<sup>st</sup> of August 2023. The Department (DWS) confirmed that the process to be followed will be through a General Authorisation application. A General Authorisation application was submitted on the 24<sup>th</sup> of October 2023 and a **positive decision (General Authorisation) with reference number 40229 was issued on the 12<sup>th</sup> of November 2023.**

### 3.6. The National Heritage Resources Act, 1999

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, *“no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...”* The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The MPRDA defines ‘environment’ as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of



the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

A Heritage Impact Assessment for the proposed development was undertaken by PGS Heritage (2023). A total of four heritage features and resources were identified within the study area. These consist of three burial grounds and one locality with a recent historic structure. The findings, impacts and mitigation measures are provided in detail in the specialist report (**Appendix D**). The South African Heritage Resources Agency (SAHRA), the Mpumalanga Provincial Heritage Resources Authority (MHRA) and Association of Southern African Professional Archaeologists (ASAPA) were provided with a copy of the Draft ESR for review and comment. During the time of the compilation of this report, comments were only received from SAHRA. SAHRA indicated that they have no objections against the development (refer to **Appendix C**).

### 3.7. The National Environmental Management Biodiversity Act, 2004

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) aims to provide for the:

- Management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998;
- The protection of species and ecosystems that warrant national protection;
- The sustainable use of indigenous biological resources;
- The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; and
- The establishment and functions of a South African National Biodiversity Institute.

NEMBA is the most recent legislation pertaining to alien invasive plant (AIP) species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24<sup>th</sup> of February 2021. The legislation calls for the removal and / or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

**Note that according to the Alien and Invasive Species Regulations, a person who has under his or her control a category 1b listed invasive species must immediately:**



- Notify the competent authority in writing.
- Take steps to manage the listed invasive species in compliance with:
  - Section 75 of the NEMBA; and
  - The relevant invasive species management programme developed in terms of regulation 4.

Eleven (11) Exotic and Alien Invasive Species were recorded throughout the project area (**Table 12**). Five (5) of these are listed as **Category 1b** invasive species and according to legislation these must be controlled according to an AIS management plan. An AIS management plan for the project has been compiled and attached as **Appendix E**. The alien invasive species management plan must be affected prior the construction phase.

### 3.8. The Conservation of Agricultural Resources Act, 1983

The Conservation of Agricultural Resources (Act 43 of 1983) aims to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. In order to achieve the objectives of this Act, control measures related to the following may be prescribed to land users to whom they apply:

- The cultivation of virgin soil;
- The utilisation and protection of land which is cultivated;
- The irrigation of land;
- The prevention or control of waterlogging or salination of land;
- The utilisation and protection of vleis, marshes, water sponges, water courses and water sources;
- The regulating of the flow pattern of run-off water;
- The utilisation and protection of the vegetation;
- The grazing capacity of veld, expressed as an area of veld per large stock unit;
- The maximum number and the kind of animals which may be kept on veld;
- The prevention and control of veld fires;
- The utilisation and protection of veld which has burned;
- The control of weeds and invader plants;
- The restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;
- The protection of water sources against pollution on account of farming practices;
- The construction, maintenance, alteration or removal of soil conservation works or other structures on land; and
- Any other matter which the Minister may deem necessary or expedient in order that the objects of this Act may be achieved.

Further, different control measures may be prescribed in respect of different classes of land users or different areas or in such other respects as the Minister may determine. Preliminary impacts on the agriculture and soil, biodiversity and water resources have been identified with regards to this project, and mitigation and management measures recommended.



### 3.9. The National Web-Based Environment Screening Tool, 2019

On the 5<sup>th</sup> of July 2019, The Department of Forestry, Fisheries and the Environment (DFFE) issued a Notice of the requirement to submit a report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and Regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when applying for environmental authorisation in terms of Regulation 19 and Regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from the 4<sup>th</sup> of October 2019. The DFFE Screening Tool Report was generated on the 7<sup>th</sup> of July 2023. The Screening report is provided in **Appendix B** of this report. The main findings to be discussed from the screening report are listed below.

The following summary of the study area's environmental sensitivities were identified in the Environmental Screening Report. The environmental sensitivities for the proposed development footprint are indicated on **Table 18**.

*Table 18: Environmental Sensitivity of Project Area*

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme			X	
Defence Theme				X
Palaeontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

The information collected by the specialists and EAP's assessment may be used to confirm or dispute (as may be applicable) the environmental sensitivity ratings identified by the National Screening Tool. The outcome of the verification process by the specialists assessments of the sensitivity ratings identified by the Screening Tool are summarized in **Table 19** below.

Page 7 on the DFFE Screening Report indicates that certain Specialist Assessments must be undertaken for the proposed development. There is however an allowance of the EAP to motivate for the reasons for not including certain assessments in the assessment report. **Table 20** presents these Specialist Assessments/Studies as well as the motivations behind the EAP's decision of recommending or not recommending the undertaking of certain Specialist Assessments.



Table 19: DFFE's Screening Tool Report Sensitivity Verification by Specialist Assessments

Assessment Theme	Sensitivity Rating as per Screening Report	Sensitivity Rating (Specialist Verification)	Specialist's Response
Agriculture Theme	Very High	<b>Medium</b>	According to the Soils and Agricultural Compliance Statement (The Biodiversity Company, 2023), three dominant soil forms were identified in the proposed project area, the more sensitive forms identified within the assessment area include, the <i>Hutton</i> , <i>Bainsvlei</i> and <i>Avalon</i> soil forms. Other associated soils which were identified within the project area includes, the <i>Sepane</i> , <i>Valsrivier</i> , <i>Swartland</i> , <i>Westleigh</i> and <i>Katspruit</i> soil forms. The baseline findings and land capability sensitivity concur with each other, in most areas indicating a "Moderate to Moderate High" land capability sensitivity. The specialist disputes, some areas which were identified with a "High to Very High" sensitivity to a revised classification being "Moderate" sensitivity as these soils are characterized with soils with a restricted potential for cropping activities following the verified soil baseline findings. Overall, the area can be classified as "Medium" following the verified soil baseline findings on site.
Animal Species Theme	High	<b>Low</b>	According to the Terrestrial Biodiversity Compliance Statement (The Biodiversity Company, 2023), The Project Area is defined by grassland habitat which exists in a degraded state, having lost much of its ecological functionality as a result of the ongoing anthropogenic impacts due to its close proximity to extensive and dense agricultural activities and road networks. However, the Project Area is situated within an endangered ecosystem, SCC are confirmed to occur, and numerous water resources occur throughout the area, and therefore it is important that the management outcomes presented above be adhered to in order to properly manage and mitigate the negative environmental impacts that will stem from the project activities.
Plant Species Theme	Medium	<b>Low</b>	
Terrestrial Biodiversity Theme	Very High	<b>Low</b>	Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the Terrestrial Biodiversity Theme sensitivity, as allocated by the National Environmental Screening Tool. The Project Area is assigned an overall sensitivity of 'Low' - largely due to the high levels of persistent anthropogenic disturbance present and the overall low indigenous flora species diversity which is heavily impacted by the dominance of a wide array of weedy species and pioneers. For these reasons, in addition to the fact that the ecological connectivity of the region has been historically severed, the local project area habitat is not currently considered to form a viable constituent of the regional natural endangered ecosystem type.
Aquatic Biodiversity Theme	Very High	<b>Medium</b>	According to the Wetlands Compliance Statement (The Biodiversity Company, 2023), a risk assessment was conducted in line with Section 21 (c) and (i) of the National Water Act, 1998, (Act 36 of 1998) to investigate the level of risk posed by proposed project. A total of 41 towers will be located within the delineated wetlands, posing direct risks to the systems. It was noted that all the wetlands were at risk within the study area. Three levels of risk were considered and determined for the overall risk assessment, these include low, moderate and high risk. No high risks are expected because the placement of powerline towers within a wetland is expected to pose limited impacts to the hydrology of the systems. Further to this, planning and spacing of the towers can achieve minimisation of direct risks of the delineated watercourses. In the event a tower is required to be placed





Assessment Theme	Sensitivity Rating as per Screening Report	Sensitivity Rating (Specialist Verification)	Specialist's Response
			in a watercourse of buffer, the impact is expected to be local and isolated. The significance of all post-mitigation risks was determined to be low. It is of the specialists' opinion that if all mitigation measures are met with the placement of the pylons and use of existing roads, it is expected that the proposed activities will pose low risks on the wetlands and thus no fatal flaw was identified for the project
Archaeological and Cultural Heritage Theme	High	Medium	According to the Heritage Impact Assessment (PGS Heritage, 2023), a total of four heritage features and resources were identified within the study area. These consist of three burial grounds and one locality with a recent historic structure. The burial grounds at sites Z001, Z002 and Z003 has a high local heritage significance with 3A heritage grading. The possibility of the burial ground impacted by the proposed powerlines cannot be excluded and the project can potentially have a MODERATE impact without mitigation. Implementation of the recommended management and mitigation measures can reduce the impact rating to LOW. The impact on the recent historic structure identified during the fieldwork was calculated as having a LOW significance before and after the implementation of the proposed mitigation measures. It is the combined considered opinion of the heritage specialists that the proposed project will not have a direct impact on the identified heritage resources, rated being of low to medium heritage significance.
Civil Aviation Theme	Medium	Low	Relative Civil Aviation Theme Sensitivity was assessed to be Low-Sensitive as the there were no identified aviation facilities or infrastructures within a 10km radius of the site. The closest identified airfield is the Delmas Airfield which is approximately 30km west of the site. The closest civil aviation aerodrome is the SACE Aerodrome which is approximately 15km northeast of the site. Therefore, the construction of the powerline within the proposed development site was assessed to have a low impact on Civil Aviation. The South African Civil Aviation Authority (SACAA) and the Air Traffic Navigation Services (ATNS) were included as specific I&AP and were provided with the opportunity to review and comment on the report and project at large.
Defence Theme	Low	Low	Relative Defence Theme Sensitivity was assessed to be <i>Low-Sensitive</i> as there are no military bases / facilities present within the vicinity of the project site. The nearest military base is the Heidelberg Military Base, located approximately 120 km southwest of the project site.
Palaeontology Theme	Very High	Medium	According to the Palaeontological Impact Assessment (Banzai Environmental, 2023), the Vryheid Formation (Ecca Group, Karoo Supergroup) and Jurassic dolerite underpin the proposed Powerline Project. According to the South African Heritage Resources Information System (SAHRIS), the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group) is Very High, whereas that of Karoo Dolerite is Zero because it is igneous in origin and thus unfossiliferous. A site-specific field survey found no fossiliferous outcrops found in the area where construction is planned. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. In contrast, the SAHRIS



Assessment Theme	Sensitivity Rating as per Screening Report	Sensitivity Rating (Specialist Verification)	Specialist's Response
			Palaeosensitivity Map and DFFE Screening Tool assigned a Very High Sensitivity to the development region. A Medium Palaeontological value was assigned to the development construction phase prior to mitigation and a Low value after mitigation. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages.

Table 20: Summary of discussions regarding the undertaking of specialist Assessments

SPECIALIST ASSESSMENT	DICUSSION AND MOTIVATION
Agricultural Impact Assessment	The DFFE Screening tool indicated that the proposed development is located within a <i>Very High</i> Agricultural Sensitivity theme. The main economic activities in the region are mining, agricultural and manufacturing. There were pre-identified agricultural activities within the proposed development site. However, the proposed project is an electrical infrastructure project within an existing electrical corridor. In addition, powerlines are known to have minimal impacts on agricultural activities compared to footprint development. As such, an Agricultural Compliance Statement was recommended to verify the site agricultural sensitivity and potential impacts associated with the proposed development. A n Agricultural Compliance Statement was undertaken ( <b>Appendix D5</b> ) to verify the site agricultural sensitivity and potential impacts associated with the proposed development.
Landscape/Visual Impact Assessment	A Landscape/Visual Impact Assessment was not undertaken as the proposed project is a powerline and substation development within an existing powerline corridor and will connect onto an existing electrical infrastructure with no new significant visual changes and in the area. The development and its locality do not trigger the need for this specialist study based on the triggers as identified by Oberholzer (2005) and presented in <b>Figure 41</b> . Visual sensitivities would arise from receptors living in and visiting the study area and observing changes to the aesthetic baseline, currently rated low within the context of the sub-region.
Archaeological and Cultural Heritage Impact Assessment	The National Web-Based Screening Tool Report found that the Relative Archaeological and Cultural Heritage Theme Sensitivity is <i>High-Sensitive</i> . The protocols required that a Compliance Statement as a minimum be undertaken to verify the archaeological heritage sensitivity of the area. The EAP recommend the undertaking of a Heritage Impact Assessment due to the known heritage features (graves) within proximity of the site. An Archaeological and Cultural Heritage Impact Assessment was undertaken and attached as <b>Appendix D3</b> . It must be noted that no further archaeological and cultural heritage studies, ground truthing and/or permits (Phase II) are required pending the discovery of any archaeological or cultural heritage features during the construction phase.
Palaeontology Impact Assessment	Based on the 1:250 000 SAHRIS PalaeoMap and the National Web-Based Screening Tool Report, the study area is located within a <i>Very-High Palaeo-Sensitivity</i> area. The protocols required that a Compliance Statement as a minimum be undertaken to verify the palaeontological sensitivity of the area. Due to the known cultural heritage features on site and the high possibility of palaeontological finds, a Palaeontological Impact Assessment was recommended to identify palaeontological heritage features and provided mitigation measures. A Palaeontological Impact Assessment was undertaken and attached as <b>Appendix D4</b> . It is consequently recommended by the specialist that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.



SPECIALIST ASSESSMENT	DICUSSION AND MOTIVATION
Terrestrial Biodiversity Impact Assessment	The National Web-Based Screening Tool Report found that the Relative Terrestrial Biodiversity Impact Assessment Theme Sensitivity is <i>Very High-Sensitive</i> . However, as indicated in <b>Section 2.1</b> , the site is not entirely pristine nor located within priority biodiversity areas (i.e., CBAs or ESA). Therefore, the EAP recommended that a Terrestrial Biodiversity Impact Compliance Assessment be undertaken to confirm if there are no Flora or Fauna, Avifauna SCC, or protected species within the development site, verify site terrestrial biodiversity sensitivity and provide necessary mitigation measures. The Terrestrial Biodiversity Compliance Statement is attached as <b>Appendix D1</b> .
Aquatic Biodiversity Impact Assessment	The Relative Aquatic Biodiversity Theme Sensitivity was assessed to be <i>Very High-Sensitive</i> by the National Web-Based Screening Tool Report. The study area transects watercourses and wetlands as per desktop. The protocols required that a Compliance Statement as a minimum be undertaken to verify the aquatic biodiversity sensitivity of the area. The Aquatic Biodiversity Compliance Statement was undertaken and is attached as <b>Appendix D2</b> .
Avian Impact Assessment	Similarly, to the findings and rationale for Terrestrial Biodiversity Impact Assessment (above), this study was undertaken as part of the Terrestrial Biodiversity Compliance Statement.
Civil Aviation Assessment	Relative Civil Aviation Theme Sensitivity was assessed to be Low-Sensitive as the there were no identified aviation facilities or infrastructures within a 10km radius of the site. The closest identified airfield is the Delmas Airfield which is approximately 30km west of the site. In addition, the closest civil aviation aerodrome is the SACE Aerodrome which is approximately 15km northeast of the site. Therefore, the construction of the powerline within the proposed development site was assessed to have a low impact on Civil Aviation and a specialist study was not deemed necessary.
RFI Assessment	<p>The project site falls outside of the Karoo Central Astronomy Advantage Area (KCAAA). AAAs that have been declared to date are:</p> <ul style="list-style-type: none"> <li>• The Northern Cape Province, excluding Sol Plaatje Municipality;</li> <li>• The Karoo Core AAA (consisting of 13 406 hectares of land owned by the National Research Foundation, 90 km north of Carnarvon); and</li> <li>• The Karoo Central AAAs, as published in the Government Gazette on 12 March 2014.</li> </ul> <p>The South African Radio Astronomy Observatory (SARAO) have been identified as a stakeholder on the project database and was afforded with the opportunity to provide comments during the 30-day review and comment period of the ESR. No further assessment is deemed necessary.</p>
Geotechnical Assessment	Based on the Geological Map Data obtained from the Council for Geosciences, the study area is predominantly underlain rocks from the Vryheid Formation (Ecca Group, Karoo Supergroup) and Jurassic dolerite. Considering that bedrock and the proposed development of powerlines and substation, and founding knowledge of the area from previous geotechnical investigations for the mining and electrical activities, it is the opinion of the EAP that Geotechnical Assessment for this project are not necessary.
Plant Species Assessment	Similarly, to the findings and rationale for Terrestrial Biodiversity Impact Assessment (above), this study was undertaken as part of the Terrestrial Biodiversity Compliance Statement.
Animal Species Assessment	Similarly, to the findings and rationale for Terrestrial Biodiversity Impact Assessment (above), this study was undertaken as part of the Terrestrial Biodiversity Compliance Statement.



## PART B: TRIGGERS AND KEY ISSUES

### 5. TRIGGERS FOR SPECIALIST INPUT

The need for visual input is often determined by issues relating to visual impact that may be raised by local residents or organisations, by the local authority, or on the recommendation of the EIA Practitioner of a project, or the visual specialist.

The following are indicators that could suggest the need for visual input based on the nature of the receiving environment and the nature of the project.

#### The nature of the receiving environment:

- Areas with protection status, such as national parks or nature reserves;
- Areas with proclaimed heritage sites or scenic routes;
- Areas with intact wilderness qualities, or pristine ecosystems;
- Areas with intact or outstanding rural or townscape qualities;
- Areas with a recognized special character or sense of place;
- Areas lying outside a defined urban edge line;
- Areas with sites of cultural or religious significance;
- Areas of important tourism or recreation value;
- Areas with important vistas or scenic corridors;
- Areas with visually prominent ridgelines or skylines.

#### The nature of the project:

- High intensity type projects including large-scale infrastructure;
- A change in land use from the prevailing use;
- A use that is in conflict with an adopted plan or vision for the area;
- A significant change to the fabric and character of the area;
- A significant change to the townscape or streetscape;
- Possible visual intrusion in the landscape;
- Obstruction of views of others in the area.

Figure 41: Triggers for Visual Impact Assessment (Oberholzer, 2005)

### 3.10. Registration with the Standard

As indicated in **Table 19**, the various specialists determined that all the Environmental Sensitivities of Project Area are of “Low” to “Medium” Sensitivity (i.e., no very high or high sensitivities), therefore, a submission for registration in terms of the Standard is applicable and no application for Environmental Authorisation is required. The environmental sensitivity report was made available for a 30-day comment period as part of a public participation process that was undertaken in accordance with Chapter 6 of the EIA Regulations for liner developments. **This Final Environmental Sensitivity Report has also been made available to registered I&APs, however this report serves as an informative report and not for commenting** as per the Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas (GNR 2313; 27 July 2022). The Final submission of the registration form and associated documents has been submitted to the competent authority (the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs) together with this report, and registration is expected within 30 days after final submission. The provisions of the National Appeal Regulations, 2014, as amended, are applicable to decisions taken based on this Standard and an appeal against any registration decision related to this Standard may be lodged. The decision made by the competent authority on the application as well as the NEMA National Appeals Regulations, 2014 as amended will be communicated to registered I&APs.



## 4. PROJECT ALTERNATIVES

Although project alternatives are not stipulated in the Standard, the EAP has compiled this section to provide the competent authority and I&APs with insight on the main project alternatives considered for the project which were also assessed by the various specialists. In terms of the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended, feasible and reasonable alternatives must be identified and considered within the environmental assessment process. An alternative is defined as “...in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

(a) property on which or location where it is proposed to undertake the activity;

(b) type of activity to be undertaken;

(c) design or layout of the activity;

(d) technology to be used in the activity;

(e) operational aspects of the activity; and

(f) Includes the option of not implementing the activity.”

In terms of Section 24 of NEMA, the proponent is required to demonstrate that alternatives have been described and investigated in sufficient detail during the EIA process. It is important to highlight that alternatives must be practical, feasible, reasonable and viable to cater for an unbiased approach to the project and in turn to ensure environmental protection. In order to ensure full disclosure of alternative activities, it is important that various role players contribute to their identification and evaluation.

There are various alternative types that must be considered for each development when applying for an EA, however for purposed of the project and for an application through the Standard, only three common alternatives for powerlines were considered and are discussed, namely, design alternative, route alternative, and No-Go alternative (see **Table 21**). The extent of the applicability of each of these is further presented. It must be highlighted that the alternatives presented in the table are derived from both the the EIA Regulations (2014) as amended as well as the the Department of Environmental Affairs and Tourism’s (now Department of Environmental, Fisheries and Forestry) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA.

*Table 21: Specific alternatives considered for the project.*

ALTERNATIVE	COMMENT
<b>No-go Option</b>	The ‘no-go’ alternative is sometimes referred to as the ‘no-action’ alternative (Glasson <i>et al.</i> , 1999) and at other times the ‘zero-alternative’. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. This alternative must be discussed on all projects as it allows for an assessment of impacts should the activity not be undertaken. <b>This alternative is discussed in this report.</b>
<b>Routing alternatives</b>	Consideration of alternative routes generally applies to linear developments such as power lines, transport, and pipeline routes. <b>Therefore, routing alternatives are applicable to this development.</b>
<b>Design alternatives.</b>	This entails the consideration of different designs for aesthetic purposes or different construction materials to optimise local benefits and sustainability would constitute design alternatives. Appropriate applications of design alternatives are applicable in many infrastructure projects such different designs for communication towers, type of powerlines, road designs. etc. In such cases, all designs are assumed to have





ALTERNATIVE	COMMENT
	different impacts. Generally, the design alternatives could be incorporated into the project proposal and so be part of the project description and need not be evaluated as separate alternatives. <b>Design alternatives were available and therefore discussed in this report.</b>

## 4.1. Design Alternatives

Design alternatives are the consideration of different designs for technical efficiency, aesthetic purposes or different construction materials in an attempt to optimise local benefits and sustainability. The following design alternatives (Steel Monopole Structure and Lattice structures) were considered for the project. The applicant prefers the proposed steel monopole structure as the technology to be used. A steel monopole structure is considered as the most appropriate technology, and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by the standard Eskom specifications and best international practice. These monopole structures have already been used in the surrounding powerlines and do not cause significant environmental impacts.

Monopole structures are considered to be cost effective and preferable in any areas with denser population. When compared to underground cables and other overhead structures, the speed and ease of installation of monopoles is significantly better, the impact on land is less, and the economic decisions associated with easier installations and little post-installation maintenance result in low life-cycle costs. The use of monopole structures also allows much more flexibility with respect to width of right-of-way and height requirements for structures.

The impact on the land is much less for monopole structures in comparison to other structures. The reduced time on the space requirements reduces the impact on the landowner's use of his land and allows him to get back sooner to his normal operations. Furthermore, the footprint required for steel monopole structures is much less when compared to other structures. The reduced footprint can require less right-of way, easier operation on the ground during construction, and allow for more natural uses of land after construction. These tower structures proposed have been selected to reduce visual impacts, impact on sensitive vegetation areas, wetlands and sensitive riparian habitats. Lastly, monopole structures are aesthetically more pleasing, have a smaller footprint and requires less steel.

## 4.2. Routing Alternatives

Consideration of alternative routes generally applies to linear developments such as power lines, transport and pipeline routes. In route investigations, various corridors are investigated and compared in terms of their impacts.

### 4.2.1. Longer Proposed Powerline Route (Blue)

The proposed powerline route includes the construction of a 15km (Option 2) Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. This powerline follows the existing Eskom powerline, it will take off at Modiri Substation, head south, turn west, head north and turn west towards Zibulo North Shaft Substation (see **Figure 42**). Although the proposed powerline is longer and likely anticipated to have more environmental impacts, it can be argued that considering that it follows an existing Eskom powerline within a servitude which has been modified, the direct impacts will be lesser compared to a new powerline route. It must be noted that this option was also selected on viability of a registration process via the Standard as there are no exclusions / limitations applicable to this route.

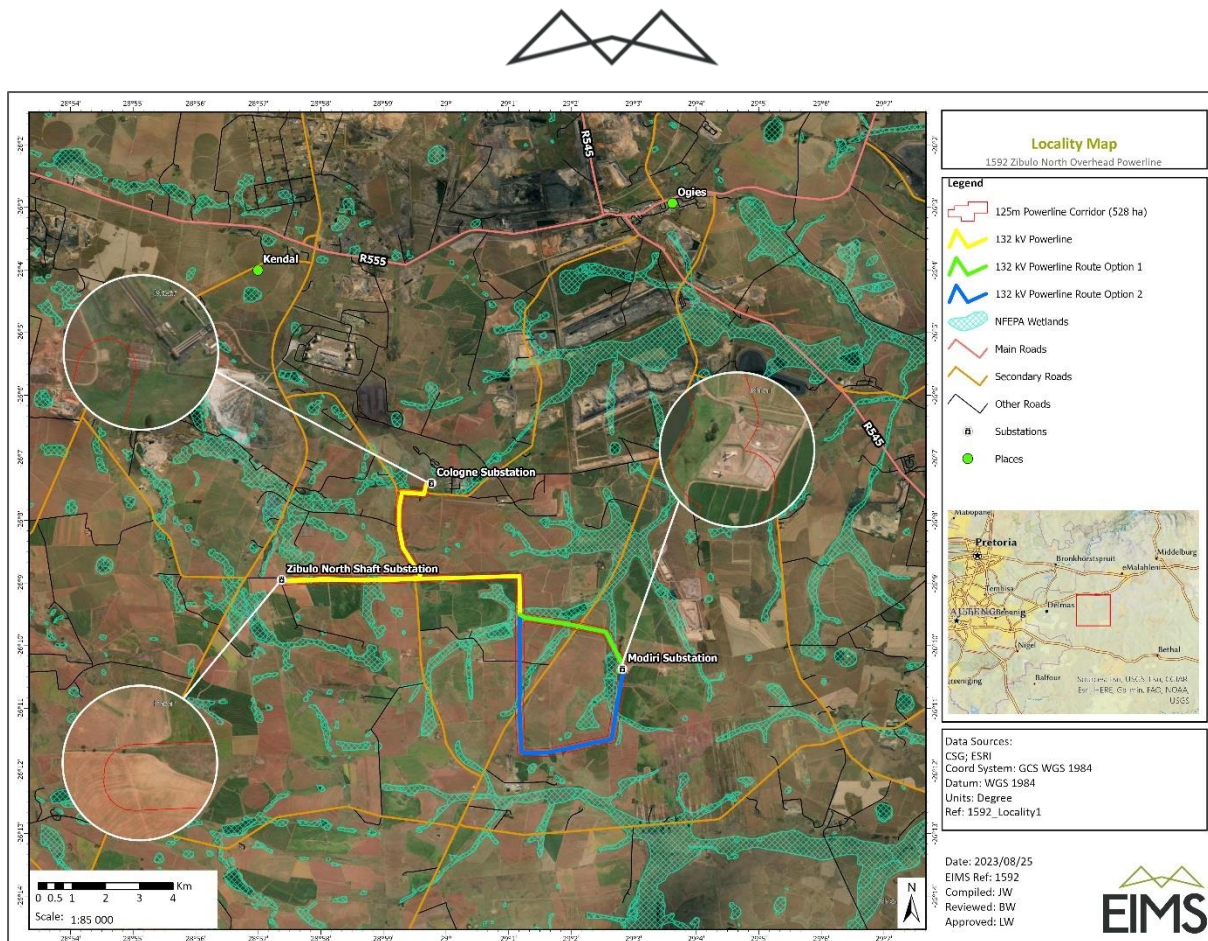


Figure 42: Project Powerline Route Alternatives

#### 4.2.2. Shorter Direct Powerline Route (Green)

The shorter alternative route also known as option 1 powerline route includes the construction of a 10.5km Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. A section of this powerline will be a new route before joining to the existing powerline corridor. This powerline will also take off at Modiri Substation, but will take off at the northern end of the Modiri Substation, heading northwest before joining to the existing Eskom powerline corridor as it heads west towards Zibulo North Shaft Substation (see **Figure 42**). Although this powerline is shorter it is likely anticipated to have more environmental impacts as it consists of a new section within a near natural environment and will also add to the overall cumulative impact of the area. It must be noted that this option is not viable through a registration process via the Standard as the specialist identified the *Phoeniconaias minor* (Lesser Flamingo) and *Phoenicopterus roseus* (Greater Flamingo) species within 500m of the powerline. This is one of the exclusions for the registration process via the Standard.

#### 4.3. No-Go Alternative

The No-go option implies that the Project does not proceed, meaning the applicant not going ahead with the construction of the proposed Zibulo 132kV powerline. Ideally this would be a preferable alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity for the mining operations by 2030, this alternative is preferable. Zibulo produces a premium product for sale into the export market and is an important role player in the mining sector contributing to local and regional economy as well as national GDP. Therefore, it is important that required 30MVA electricity supply for the mining operations by 2030 is realised to ensure that the operations continue at an optimal level. The project will improve and strengthen power supply required for the operations.



## 5. PROJECT IMPACTS AND MITIGATION

This chapter serves to assess the significance of the positive and negative environmental impacts (direct, indirect, and cumulative) expected to be associated with the Zibulo 132kV powerline project. As mentioned, the specialist studies that were conducted were aimed verifying the site environmental sensitivities as identified by the DFFE Screening Tool Report, identify potential impacts, and provide mitigation measure. This section only provides a summary of the findings from the specialist studies, detailed information can be obtained from the specialist studies in **Appendix D**.

### 5.1. Impacts on Flora

The study site overlaps with the Mesic highveld Grassland Bioregion. The vegetation type associated with the study site is the Eastern Highveld Grassland (Gm 12) vegetation type. Three (3) terrestrial habitat units were encountered namely, Modified Habitat, Degraded Grassland and Wet Grassland). The vegetation was found to be dominated by pioneer graminoids and exotic and alien invasive flora species, however some of the most predominant indigenous flora species recorded in the area (21 species). No SCC or protected flora species were observed by the specialist. Eleven (11) Exotic and Alien Invasive Species (AIS) were recorded throughout the project area. Five (5) of these are listed as Category 1b invasive species and according to legislation these must be controlled according to an AIS management plan. Impacts on flora will largely be limited to the construction phase with activities such as clearing for pylons, substation and access roads (if new access is required). Based on the specialist assessment, impacts on flora are estimated to be low negative with mitigation. The applicant must prevent the further loss and fragmentation of indigenous vegetation communities within the Endangered ecosystem, and in the vicinity of the project area. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Minimising the clearing of indigenous vegetation;
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan;
- A qualified environmental control officer must be on site when activities begin;
- A site walk down is recommended prior to any activities taking place by an ecologist or ECO and any flora SSC or protected species should be noted and marked as no-go areas; and
- The powerline construction must follow the guidelines as set out in the “Generic Environmental Management Programme.

### 5.2. Impacts on Fauna

The Mammal and herpetofauna activity were found to be low during the survey, and the majority of these species are expected to only occasionally occur within the water resource areas – utilising them as movement corridors and foraging habitat. The high level of regular disturbance means that few species would remain in the areas for long periods of time, other than those adapted to anthropogenic activities. Six (6) mammal species were recorded, and no herpetofauna species were observed during the survey. Similarly with flora, impacts on fauna will largely be limited to the construction phase with activities such as clearing for pylons, substation and access roads (if new access is required) will disturb the habitats and impact on the faunal presence / activity. Based on the specialist assessment, impacts to mammals and herpetofauna are also expected to be low, due to the minor levels of disturbance expected during all project phases and implementation of mitigation measures. The applicant must reduce the negative fragmentation effects of the development and enable the safe movement of fauna species and prevent the direct and indirect loss and disturbance of indigenous flora and fauna species and communities within the project area. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Minimising the clearing of indigenous vegetation which will destroy habitats and disturb fauna;
- The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna;



- A qualified environmental control officer must be on site when activities begin; and
- The powerline construction must follow the guidelines as set out in the “Generic Environmental Management Programme.

### 5.3. Impacts on Avifauna

Four (4) avifauna habitats namely, Transformed, Agriculture, Grasslands and Water Resources were defined for the 2 km buffer region of the project area. During this assessment, 68 species including the *Phoeniconaias minor* (Lesser Flamingo) and *Phoenicopiterus roseus* (Greater Flamingo) were recorded in the point counts and 55 during incidental records, with a total of 85 unique species observed. Four (4) SCC were recorded during the survey. Avifauna species that tend to fly in flocks increasing the chances of collisions with powerlines as the birds flying in the rear will not be able to detect the powerlines. Impacts on avifauna will largely be limited to the operational phase when birds collide with the powerlines. Based on the specialist assessment. Impacts to avifauna are also expected to be medium-low with mitigation measures. The applicant must reduce the chances of bird-powerline collisions in the project area. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Installing anticollision devices (standard bird flight diverters) in avifauna corridors;
- Energised parts and/or grounded parts can be insulated appropriately to avoid incidental contact by birds; and
- Using perch discouragers as perch guards or spikes.

### 5.4. Impacts on Hydrology

Two (2) hydrogeomorphic (HGM) HGM units were identified within the 100m of the study area, namely, 14 seep (HGM1 – HGM 14) wetlands and four (4) unchannelled valley bottom (HGM15 – HGM18). These systems differ from one another regarding ecological importance and sensitivity, modification, ecological state, impacts and the general setting. The wetlands were observed to be saturated and located within extensively cultivated fields. Vegetation was mostly dominated by terrestrial graminoids. The units ranged from a Present Ecological Importance (PES) of C (Moderately modified) to E (Seriously modified) while the Site Ecological Importance (SEI) ranged from Very High (A) to Low (D). Based on the results and conclusions presented in the report, it is of the specialists’ opinion that if all mitigation measures are met with the placement of the pylons and use of existing roads, it is expected that the proposed activities will pose low risks on the wetlands and thus no fatal flaw was identified for the project. Impacts on hydrology will largely be limited to the construction phase as 41 of the proposed pylon positions are located within wetlands and will have an impact during excavations and installations of the pylons. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Avoid wetlands and buffers where feasible;
- Implement a rehabilitation plan for any disturbed wetlands;
- Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas; and
- Mixing of concrete must under no circumstances take place in any wetland or their buffers.

### 5.5. Impacts on Soils Potential and Agricultural Activities

The project area is dominated by apedal soils, which are characterised with freely drained red and yellow soils and duplex soils with high clays contents. The high clay soils are usually hard to work with for most activities. The three most sensitive soils forms which were identified in the proposed project area include, Hutton, Bainsvlei and Avalon soil forms. Considering the low-to-moderate high sensitivities associated with the land potential resources and linear development of the project, it is the specialist’s opinion that the proposed activities will have an acceptable impact on agricultural activities. Such impacts as soil erosion losses, loss of potential land capability, spillages and soil compaction will be limited. The direct, permanent, physical footprint of the





development that has any potential to interfere with agriculture, is restricted to pylon bases with a limited impact. It must be noted that areas with actively cultivated areas with high production agricultural resources were also identified in the corridors by the specialist. However, such areas can be treated as no-go areas to preserve these active agricultural crop fields, associated with soils with high potentials. If relocating is not feasible, then appropriate compensation can be agreed upon during a stakeholder process.

## 5.6. Impacts on Archaeological and Cultural Heritage Features

A total of four heritage features and resources were identified within the study area. These consist of three burial grounds and one locality with a recent historic structure. The burial grounds are rated as having a high heritage significance and will require further mitigation work before the project can continue if these may be impacted upon. It is the opinion of the heritage specialist that the proposed project will not have a direct impact on the identified heritage resources, rated being of low to medium heritage significance as these are highly visible and can be easily avoided by the construction activities. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- A person or entity, e.g., the ECO, should be tasked to take responsibility to manage the heritage sites;
- Known sites should be located and isolated, e.g., by fencing them off. All residents and their visitors should be informed that these are no-go areas, unless accompanied by the individual or persons representing the ECO as identified above;
- A Chance Find Protocol must be implemented for any new discoveries; and
- Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits must be obtained from the South African Heritage Resources Agency (SAHRA).

## 5.7. Impacts on Palaeontological Features

According to the study, the geology of the proposed development site as depicted on the 1: 250 000 East-Rand 2628 (1986) Geological Map (Council for Geosciences, Pretoria) indicates that the study area is underlain by the Vryheid Formation (Ecca Group) with small areas of Jurassic dolerite. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High, while that of Jurassic dolerite is Zero. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. A Medium Palaeontological value was assigned to the proposed development prior to mitigation and a Low value after mitigation by the specialist. The construction phase will be the only development phase that will have an influence on Palaeontological Heritage, with no significant impacts projected during the operational or decommissioning stages. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- A person or entity, e.g. the ECO, should be tasked to take responsibility to manage palaeontological sites;
- A Chance Find Protocol must be implemented for any new discoveries; and
- Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits must be obtained from the South African Heritage Resources Agency (SAHRA).

## 5.8. Impacts on Dust Pollution

Dust pollution, primarily caused by construction activities, poses severe health risks to both workers and nearby residents (Al-Dousari et al., 2023). Prolonged exposure to high levels of dust can lead to respiratory issues, heart disease, and even cancer. Based on the nature of the proposed activities, it is anticipated that dust pollution will be limited to the construction phase during excavations and backfilling. The dust likely to be produced will





minimal and can be easily managed and/or prevented using dust suppressions and other dust control methods. Therefore, impacts on dust pollution during the construction phase will likely be medium-low negative while during the operational phase, it will likely be insignificant without mitigation and with mitigation respectively.

## 5.9. Impacts on Noise Pollution

Construction sites are synonymous with noise and vibration impacts. High noise levels can have an adverse impact on both site labourers as well as the public, tenants, including occupiers of adjacent land. According to Petric (2020), exposure to prolonged or excessive noise and vibrations has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep to more serious issues such as cardiovascular disease, cognitive impairment, tinnitus and hearing loss. Construction noise and vibration can structurally harm surrounding buildings. Construction works, whether they are residential or commercial, have a set standard for noise and vibration that is acceptable during construction and operation. Most of the noise and vibration is anticipated during the construction phase, however given the proposed shallow excavations (approximately 2m deep) and lack of plans for blasting activities, the development can be associated with low impacts on noise and vibration. Therefore, impacts on noise and vibration will be low negative with mitigation. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Notification of adjacent landowners must be done on any envisaged noisy construction activities, e.g., blasting.
- Provide all equipment and vehicles with standard silencers that are continuously maintained;
- The working hours stipulated in the Construction permit, where applicable, must be adhered to. Where this is not applicable, the following working hours must be adhered to: Monday to Friday 07:00 – 17:00 for weekdays; and
- All construction plant and other equipment must be in a good working order to reduce possible noise pollution.

## 5.10. Impacts on Traffic

All developments despite being major or minor generate traffic. Factors such as type of development, functions carried out by the development, location, size of development and number of persons expected to use the development will govern the vehicular traffic that will be generated due to the proposed development. This additional vehicular traffic generated due to the new development surely affects the surrounding developments and the adjacent transport network. Unless this effect complies with the current classification and functions of the adjoining network, the existing road network may go out of balance overburdening some major links forcing them to carry out the functions of higher classified roads. It is anticipated that the proposed development of the powerline and substation will not largely increase the traffic congestion as minimal construction vehicles will be used during the construction phase and during the operational phase. Based on the number of pylons and required infrastructure for substation, it can be anticipated that no more than five (5) trucks will be using the local road network on a given day. Therefore, impacts on traffic during the construction and operational phases will likely be low negative without mitigation and insignificant with mitigation. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- There must be an erection of signage warning motorists about the presence of construction vehicles;
- Construction activities must be limited to daytime hours;
- Construction vehicles must not exceed speeds on 40km/hr within the construction site; and
- Construction vehicles travelling on public roads must adhere to speed limits.



### 5.11. Impacts on Visual Aesthetics

Construction processes and sites are unsightly and can affect an area's sense of place. Although the clearance of indigenous vegetation will result in a visual impact, the impact will be minimal as clearance will only be required for the base of the steel monopoles and the servitude will be already within an area of degraded vegetation. In addition to this, the proposed development is a powerline project within an existing electrical corridor and within existing powerlines and will therefore blend in within the surrounding land uses. Impacts on visual aesthetics will be low with mitigation. The Impact Management Actions as described in the Generic EMPr (**Appendix E**) are adequate and mitigation measures include:

- Revegetation of all areas disturbed during project construction;
- Dust levels must be kept down by regularly wetting dirt roads and exposed soil areas inside the site;
- The location of the construction site camp must be shielded from the main road away from the view of people visiting or staying in the area; and
- Remove all waste, through authorised service providers, including cleared vegetation from site as soon as possible unless the material will be reused on site;

### 5.12. Impacts on Socio Economics

The proposed development will have a positive impact within the Emalahleni and Victor Khanye Local Municipalities as the operations will continue and expand, creating new job opportunities. Suppliers of construction materials will also experience temporary economic growth during the construction phase. During the construction phase, the creation of skilled and semiskilled jobs will be created. The use of local labour, as far as possible, is recommended as this would have a positive impact on the local economy and would prevent influx of job seekers from outside region. The impact is considered to be positive.



## 6. PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) is a requirement of several pieces of South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their comments are considered, and a record included in the reports submitted to the Authorities. The PPP in terms of Chapter 6 of NEMA EIA activities for linear projects is required for registration process with the Standard. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the proposed project needs to be managed sensitively and according to best practises to ensure and promote:

- Compliance with international best practice options;
- Compliance with national legislation;
- Establishment and management of relationships with key stakeholder groups; and
- Involvement and participation in the environmental study and authorisation/approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project;
- Explain the authorisations required;
- Explain the environmental studies already completed and yet to be undertaken (where applicable);
- Solicit and record any issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&APs and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximize and/or promote positive environmental impacts associated with the project.

### 6.1. Pre-Consultation with the Competent Authority

A pre-application meeting with the competent authority (MPDARDLEA) was held on the 7<sup>th</sup> of September 2023. The purpose of the pre-consultation was to provide the authorities with background information of the proposed project, confirm the applicability of the Standard, and outline important aspects associated with the process.

### 6.2. General Approach to Public Participation

The PPP for the proposed project was undertaken in accordance with the requirements of the NEMA EIA Regulations (2014), and in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs were afforded an opportunity to comment on the project and have their views considered and included as part of project planning.

At the start of the application process, an initial I&AP database was compiled based on known key I&AP's (affected landowners, Organs of State, etc.), Windeed searches and other stakeholder databases. The I&AP database includes amongst others, landowners, communities, regulatory authorities and other special interest groups. The database was continually updated as and when new I&AP's show interest in the application.



### 6.3. List of Pre-Identified Organs of State/ Key Stakeholders Identified and Notified

National, Provincial and Local Government Authorities as well as State Owned Entities (SOE's) were notified of the proposed project and include:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs;
- Department of Forestry, Fisheries and the Environment;
- Emalahleni Local Municipality;
- Victor Khanye Local Municipality;
- Nkangala District Municipality;
- Eskom;
- Air Traffic Navigation Services;
- South African Civil Aviation Authority;
- South African Radio Astronomy Observatory;
- South African National Road Agency;
- South African Resource Heritage Agency;
- Mpumalanga Provincial Heritage Resources Authority.

### 6.4. Project Notification and Request for Comments

The PPP commenced on 28<sup>th</sup> September 2023 with a project notification (call to register) and request for comments on the Draft Environmental Sensitivity Report. The notification and request for comments was undertaken in accordance with the Chapter 6 of the NEMA EIA Regulations and was given in the following manner:

#### 6.4.1. Registered Letters, Faxes and Emails

Notification letters, faxes, and emails were distributed to all pre-identified I&APs including government organisations, NGOs, relevant municipalities, ward councillors, landowners and other organisations that might be interested or affected. The notification letters included the following information to I&APs:

- The purpose of the proposed project;
- High level list of anticipated activities to be authorised;
- Scale and extent of activities to be authorised;
- Information on the intended production operation to enable I&APs to assess/surmise what impact the activities will have on them or on the use of their land;
- Details of the affected properties (including details of where a locality map and other information could be obtained including a Background Information Document (BID);
- Summary of the relevant legislation pertaining to the application process;
- Initial registration period timeframes; and
- Contact details of the EAP.



#### 6.4.2. Newspaper Advertisements / Government Gazette

Advertisement describing the proposed project and registration and/or comment process was published in The Witbank News Newspaper with circulation in the vicinity of the study area. The advertisement was placed in the Newspaper in English, Afrikaans and isiZulu on the 28<sup>th</sup> of September 2023. The newspaper advert included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity and application;
- Where additional information could be obtained; and
- Relevant EIMS contact person and contact details for the project.

#### 6.4.3. Site Notice Placement

A1 Correx board site notices in English, Afrikaans and isiZulu were placed at various locations within and around the application area on the 28<sup>th</sup> of September 2023. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location and alternatives;
- Map of proposed project area;
- Project description;
- Legislative requirements; and
- Relevant EIMS contact person and contact details for the project.

#### 6.4.4. Poster Placement

A3 posters in English, Afrikaans and isiZulu was placed at a local public place in the area (Ogies Public Library). The notices and posters afforded I&APs who may be interested in the project with the opportunity to register for the project as well as to submit any issues/queries/concerns and indicate the contact details of any other potential I&APs that should be contacted. The contact person at EIMS and contact details were stated on the posters. Comments/concerns and queries were encouraged to be submitted in either of the following manners:

- Electronically (fax, email);
- Telephonically; and/or
- Written letters (postal).

### 6.5. Availability of Environmental Sensitivity Report

Notification regarding the availability of this Environmental Sensitivity Report (ESR) for public review was given in the following manner to all registered I&APs:

- Registered letters with details on where the scoping report could be obtained and/or reviewed, EIMS contact details as well as the public review comment period;
- Facsimile notifications with information similar to that in the registered letter described above; and/or
- Email notifications with a letter attachment containing the information described above.





The scoping report was made available for public review for a period of at least 30 days from 28 September 2023 to 30 October 2023. Proof of notifications are attached in **Appendix C**. As per the Standard, the Final Environmental Sensitivity Report has also been circulated to registered I&APs for record keeping and information purposes. No comments on this Final ESR will be accepted as per the Standard.

## 6.6. Comments and Responses Report

At the conclusion of the PPP for the project and at the time of compilation of this final report, no objections were raised against the development. All comments that received during the public participation process have been captured and responded to through a Comments and Response Report included in this Final ESR as part of **Appendix C**. All I&APs registered on the Project database were informed of the availability of the Draft ESR which was made available for public review. Although the Final Environmental Sensitivity Report has also been circulated to registered I&APs, no commenting on the report will be accepted at this stage of the registration process as per the Standard. A final Comments and Responses Report (**Appendix C**) has been compiled and is submitted together with this final ESR to MPDARDLEA for decision making.

## 6.7. Review of the Environmental Sensitivity Report by Competent Authorities

The Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MP DARDLEA) as the Competent Authority for the registration process must, within 30 days of receipt of this Final ESR which has been subjected to 30 days of public review, issue a registration certificate or if the information is incomplete, indicate to the proponent that the submission is incomplete and identify the outstanding information. A register of all registrations must be kept by the competent authority.

## 6.8. Appeal Period

After a decision has been reached by MP DARDLEA, Chapter 2 of the National Appeal Regulations 2014 makes provision for any affected person to appeal against the decision also. Within 20 days of being notified of the decision by the competent authority, the appellant must submit the appeal to the appeal administrator. An appeal panel may be appointed at the discretion of the delegated or organ of state to handle the case and it would then submit its recommendations to that organ of state for a final decision on the appeal to be reached. EIMS will communicate the decision of the Provincial Authority and the way appeals should be submitted to the Minister to all I&APs as soon as reasonably possible after the final decision has been received.



## 7. CONCLUSION

This Environmental Sensitivity Report (ESR) was undertaken to ensure that the site that have been identified for development is appropriately located in terms of both technical and environmental requirements. The process was conducted in a manner that allowed for the minimisation of infrastructure, operation, and maintenance costs, as well as social and environmental impacts in line with the Environmental Management and sustainability principles. EIMS undertook the environmental sensitivity assessment process based on information collected desktop review and specialist assessments. This report presented the findings of the ESR for the proposed Zibulo Colliery 132kV Overhead Powerline Project. The purpose of this report was to present the results of the ESR for the proposed development by presenting the following:

- The details and relevant expertise of the EAP and specialists preparing the report;
- The project description and locality;
- The status quo of the environmental conditions of the site;
- Legislative framework governing the site;
- The outcome of the National Web-Based Environmental Screening Tool Report;
- The outcome of specialist's site verification;
- The potential impacts and recommendations; and
- Stakeholder engagement through the public participation process.

This report further highlighted areas within legislation that may require the attention of the applicant and consider the applicable legislative requirements, technical requirements (design, accessibility, operational requirements; etc.), environmental considerations (environmental sensitivity, specialist requirements, land ownership, local site conditions, access constraints, environmental legislative requirements etc.), to ensure that the development will be optimally placed. It is acknowledged that a proactive identification of a location of the proposed development would enhance the viability of the project and inform the scope of the applicable Environmental processes.

One of the aim objectives of this report was to discuss the specialist site verification against the site sensitivities identified by the National Web-Based Environmental Screening Tool Report also known as the DFFE Screening Tool Report. Based on the High and Very High relative environmental sensitivities identified by the DFFE Screening Tool Report, the following specialist studies were conducted:

- Terrestrial Biodiversity Study;
- Wetland Baseline and Impact Assessment Study;
- Heritage Impact Assessment;
- Palaeontology Impact Assessment; and
- Agricultural and Soils Impact Assessment.

As indicated in **Section 2** and **Section 5**, the studies argued against DFFE Screening Tool Report High and Very sensitivities based on their site sensitivity verification assessments. Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the Terrestrial Biodiversity Theme sensitivity, as allocated by the National Environmental Screening Tool. The Project Area is assigned an overall sensitivity of 'Low' - largely due to the high levels of persistent anthropogenic disturbance present and the overall low indigenous flora species diversity which is heavily impacted by the dominance of a wide array of weedy species and pioneers.

Based on the results and conclusions presented in Wetland Baseline and Impact Assessment Report, it is of the specialists' opinion that if all mitigation measures are met with the placement of the pylons and use of existing



roads, it is expected that the proposed activities will pose low risks on the wetlands and thus no fatal flaw was identified for the project. Therefore, the project can be allocated a 'Medium' sensitivity classification.

The soil specialist found that the baseline findings and land capability sensitivity concur with each other, in most areas indicating a "Moderate to Moderate High" land capability sensitivity. The specialist disputes, some areas which were identified with a "High to Very High" sensitivity to a revised classification being "Moderate" sensitivity as these soils are characterized with soils with a restricted potential for cropping activities following the verified soil baseline findings. Overall, the area can be classified as "Medium" following the verified soil baseline findings on site.

A total of four heritage features and resources were identified within the study area by the heritage specialist. These consist of three burial grounds and one locality with a recent historic structure. The burial grounds are rated as having a high heritage significance and will require further mitigation work before the project can continue if these may be impacted upon. It is the opinion of the heritage specialist that the proposed project will not have a direct impact on the identified heritage resources, rated being of low to medium heritage significance as these are highly visible and can be easily avoided by the construction activities associated with the powerline and substation development. Therefore, relative archaeological and cultural sensitivity can be downgraded to 'Medium' sensitivity.

According to the Palaeontological Impact Assessment, the geology of the proposed development site as depicted on the 1: 250 000 East-Rand 2628 (1986) Geological Map (Council for Geosciences, Pretoria) indicates that the study area is underlain by the Vryheid Formation (Ecca Group) with small areas of Jurassic dolerite. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High, while that of Jurassic dolerite is Zero. According to the site investigation and desktop research, fossil heritage of scientific and conservation relevance is rather uncommon in the total development footprint. A Medium Palaeontological value was assigned to the proposed development prior to mitigation and a Low value after mitigation by the specialist.

Although no fatal flawed issues were identified on the basis of the assessments done, consideration and best environmental practices should be given to the scale or extent of the development in relation to the surrounding environmental sensitivities. Based on an assessment of information gathered from desktop studies, site environmental screening and a subsequent review of specialist's studies, it was determined that the site falls within a 'Low to Medium' relative environmental sensitivity. It is the EAP's opinion that the proposed powerline route (Option 2) should be authorised in terms of the registration process. The recommendations presented in **Section 5** of this report, specialist assessments (**Appendix D**) and guidelines indicated in the Generic EMPr (**Appendix E**) should be implemented by the applicant.



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