PROPOSED DEVIATIONS FROM THE AUTHORISED ALIGNMENT FOR THE 30 KM 132 KV DISTRIBUTION LINE BETWEEN TSHEBELA NEW SUBSTATION AND NHLUVUKO SUBSTATION, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO PROVINCE, SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT

EIA REFERENCE: ***TO BE ASSIGNED***

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Compiled for`

Eskom Distribution Limpopo
PO Box 3499
92 Hans van Rensburg Street
Polokwane, 0700
South Africa

Compiled by

ACER (Africa) Environmental Consultants
PO Box 503
Suites 5 & 6, Golden Penny Centre
26 Hely Hutchinson Road
Mtunzini, 3867
South Africa

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DOCUMENT CONTROL

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Proposed deviations from the authorised alignment for the 30 km 132 kV distribution line between Tshebela new substation and Nhluvuko substation, Capricorn District Municipality, Limpopo Province, South Africa (Rev 0)	N Nadasen	Ntsoaki Ramokgola	Tshifhiwa Matamela
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YOUR COMMENTS PLEASE

Please submit your comments on the draft report by no later than 15 December 2022 to:

Ashleigh Mckenzie
► P O Box 503, Mtunzini, 3867 ► Tel: 035 340 2715 /060 948 5164
► E-mail: EskomNT@acerafrica.co.za

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EXECUTIVE SUMMARY

Introduction

This report is a Basic Assessment Report (BAR) for three proposed deviations to the authorised 132 kV distribution line alignment between the Nhluvuko and Tshebela[1] substations, located to the southeast of Polokwane, in the Capricorn District Municipality (DM), Limpopo Province, South Africa (Figure 1).

An Environmental Authorisation (EA) for this line was issued to Eskom Distribution (Northern Region) in 2012 (EA Reference: 12/12/20/2237). The EA was for construction of the new Tshebela substation and associated 132 kV distribution powerlines situated south of Polokwane in the Capricorn District Municipality of Limpopo Province. This development will provide electrical capacity and address low voltage issues on the lines providing new electrifications for rural customers (6000 connections) in the Mankweng area, Capricorn District Municipality. Construction of the infrastructure commenced during 2017, with the substation now completed and construction of the powerline in progress .

After concluding servitude/landowner negotiations and commencement of construction, the need has arisen to deviate 3 sections of the authorised alignment of the 30 km Kingbird 132 kV line between the Nhluvuko and Tshebela substations.

These deviations trigger listed activities in Listing Notices 1 and 3 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Therefore, the project requires an Environmental Authorisation (EA) from the Department of Forestry, Fisheries and the Environment (DFFE),[2] involving the undertaking of a Basic Assessment. Eskom Distribution Limpopo has appointed ACER (Africa) Environmental Consultants (ACER) as the independent Environmental Impact Assessment Practitioner (EAP) to undertake the application for environmental authorisation.

It must be noted that while this powerline falls within a strategic transmission corridor, the proposed deviations do not qualify for an exclusion from obtaining an EA (as per the Standards adopted in GN 2313 of 27 July 2022). This is an authorised powerline already under construction and furthermore, some features of very high and high sensitivity along the deviations were identified by the DFFE Screening Tool, with certain features having been confirmed high sensitivity by specialists.

ACER will also apply on Eskom's behalf to the Department of Water and Sanitation (DWS) to authorise water uses (as relevant), in accordance with the National Water (Act 36 of 1998).

Purpose of the project

The purpose of the three deviations being applied for, is as follows (Figure 2):

- **Bend 1:** To avoid traversing directly over a sensitive koppie, the alignment has been diverted around the side (base) of the koppie.
- **Bend 2:** This section deviates to make the site accessible for construction (via existing tracks).
- **Bend 3-6:** A change in ownership and land use has required the rerouting of the alignment to remove it out of the property Kleinfontein 172 KS Ptn 1.

1 Also referred to as Tshebela/Rampheri new substation.
2 In consultation with the Limpopo Department of Economic Development, Tourism and Environmental Affairs.

Legal Requirements

There are a host of legal requirements to which Eskom must adhere for this project. A review of the applicable legislation and guidelines is provided in Chapter 2 of this report. The main authorisations/licenses/permits required or potentially required for the proposed deviations are listed below.

#	License/Permit	Authority
1	Environmental Authorisation	DFFE: Integrated Environmental Authorisations
2	Heritage Permit *	South African Heritage Resources Agency
3	Protected Tree Permits*	DFFE: Forestry
4	Protected Plant Permits*	DFFE: Biodiversity
5	Water Use via a General Authorisation	Department of Water and Sanitation
6	Obstacle approval	Civil Aviation Authority

*Only required if the resource is directly impacted

Project location and scope

The project is located within Ward 2 and Ward 3 of the Polokwane Local Municipality. Eskom's authorised powerline (under construction) links the Nhluvuko substation (accessed from the R37) to the new Tshebela substation (accessed via district roads off the R71). The distribution line is a 132 kV Kingbird power cable strung on steel monopoles, roughly 250 m apart and averaging 22 m in height, with a 15.5. m servitude either side of the line and minimum height clearance of 6 m. The project comprises three proposed deviations to sections of this line, as follows:

- **Bend 1** is a minor deviation, approximately 240 m in length (about 30 m longer than the original route) traversing around the northern side, instead of directly over, a small koppie. It is situated about 2km from the eastern end of the powerline, north-west of the new Tshebela substation.

- **Bend 2** is approximately 1.5 km in length (about 100 m shorter than the original alignment) and bends to the south of the original route. It has better access than the original alignment. It is situated about 11 km from the eastern end of the powerline alignment, west of the new Tshebela substation.

- **Bend 3-6** is approximately 5.3 km in length (about 1 km longer than the original alignment). It deviates south and west of the boundary of the game farm on Kleinfontein 172 KS Ptn 1. The deviation is situated towards the western end of the alignment, approx. 7 km east of the Nhluvuko substation.

Relevant GPS co-ordinates (approximate) are provided below. Surveyor General (SG) numbers of affected properties are provided with the Application for Authorisation (Appendix 2).

Further details of project activities may be found in Chapter 5 of this BAR.

GPS Co-ordinates of proposed deviations		
Location	**Latitude (S)**	**Longitude (E)**
Bend 1 (east end)	24°0.503' S	29°43.252'E
Bend 1 midpoint	24°0.469' S	29°43.190'E
Bend 1 (west end)	24°0.503' S	29°43.130'E
Bend 2 (east end)	24°0.499' S	29°38.479'E
Bend 2 midpoint	24°0.739' S	29°38.108'E
Bend 2 (west end)	24°0.857' S	29°37.697'E
Bend 3-6 (east end)	24°2.836' S	29°33.278'E
Bend 3-6 midpoint	24°3.398' S	29°31.903'E
Bend 3-6 (west end)	24°2.962' S	29°30.754'E
Approximate lengths (Bend 1, Bend 2. Bend 3-6)	0.24 km; 1.5 km; 5.3 km	
Width of assessed corridor either side of the line	500 m (aquatic) and 100 m (terrestrial vegetation)	

Project Alternatives
This application is for deviations of an authorised route, for a line that is already under construction. The three deviations can be considered as preferred alternatives to the original alignment.

Technology alternatives do not apply to the deviations, as they will be designed to the same specifications as the current powerline under construction.

The "No Development" alternative does not strictly apply to this project, as the authorised powerline is already under construction. As the powerline is a required to link the newly constructed substation to the existing Nhluvuko substation it is not an option to leave the powerline unfinished. The deviations have been proposed in order to reduce impacts on both the biophysical and social environments. If the deviated sections are not constructed, then Eskom would have to construct the original alignments, which will more negative impacts than the deviations and are not preferred.

Description of the Receiving Environment
A detailed description is provided in Chapter 7. Major features are highlighted below.

Land use/socio-economic characteristics
The broad study area has peri-urban elements (numerous lower income residential villages and settlement) and rural /agricultural elements (extensive communal areas under livestock grazing and dryland maize cropping and adjacent privately owned farms under similar land uses, including game farming).

In this area, people generally earn low incomes and unemployment is high. Services include roads (mainly gravel or unsurfaced), cellular telecommunications and to some extent, piped water and electricity. Administrative institutions include the Molepo Traditional Council, Polokwane Municipality and Capricorn District Municipality.

The broader area is traversed by a number of existing high and medium voltage powerlines. The Polokwane International Airport (which also has an airforce base) is located about 23 km north of the closest proposed deviation. The closest aerodrome is around 14 km from Bend 3-6.

Abiotic characteristics

The area has low annual rainfall (345 mm - 655 mm per year) with dry winters. Mean daily maximum and minimum temperatures range from 33.2 ºC (October) to 0.5 ºC (June). The landscape is fairy hilly with prominent koppies (vegetated rocky outcrops) featuring in the landscape. Flatter areas near Bend 2 have been transformed to land under cultivation. Soils found within the study area are known to be freely drained, structureless soils, often being red or yellow in colour, with low to medium base status. Erosion gullies / dongas occur within the study area.

Agricultural potential

The area falls into Climate Capability Class C7/C8, which has “Severe to Very Severe” limitations for agriculture. The majority of the area affected is under Polokwane Plateau Bushveld, which has a typical carrying capacity of one large livestock unit (LSU, an ox of 450kg) per 8 to 10 ha. This is a poor carrying capacity, but the norm for many thornveld habitats. Flatter parts of the study area have soils which support maize cultivation.

Terrestrial biodiversity

The alignment occurs within a single national vegetation type, namely Polokwane Plateau Bushveld, with a conservation status of “Least Concern”. This is savannah vegetation with a grassland layer and a short open tree layer. Five categories of habitat are encountered along the deviations, viz. natural (Polokwane Plateau) bushveld, a limited area of Mamabolo Mountain Bushveld, secondary vegetation, watercourses (ephemeral rivers and drainage lines) and transformed areas. Bend 3-6 traverses Critical Biodiversity Area 1 (CBA1) and CBA2 areas. No animal or plant species of conservation concern (SCC) were observed in the study area. However one tree species, *Sclerocarya birrea subsp. caffra* (Marula tree), which is protected under the National Forest Act (1988), was observed.

Avifauna

Five avifaunal micro habitats are encountered in the Project Area of Influence (POAI) viz. savanna, ephemeral drainage lines, cultivated lands, mountains and built-up areas. A total of 253 bird species have been recorded within the Nhluvuko-Tshebela 132kV power line PAOI pentads, which include a number of powerline sensitive species, including Cape Vulture, which is an SCC.

Aquatic biodiversity

The proposed deviations fall largely within the Olifants Water Management Area. Only one National Freshwater Ecosystem Priority Area (NFEPA) river is affected (Bend 3-6). No NFEPA wetlands are affected. There are no watercourses within 500 m of Bend 1. However three (3) “A” Channel streams, four (4) Hillslope Seeps and two (2) Depressions were delineated within 500 m of Bend 2 and nine (9) “A” Channel streams and five (5) Hillslope Seeps were delineated within 500 m of Bend 3-6. None of these watercourses or assigned buffer zones (10 m) are directly at risk from project activities. Watercourses within 500 m of the deviations will require a water use authorisation via a General Authorisation (GA) process.

Cultural Heritage

The observed sites of medium or high heritage significance are located in the vicinity of **Bend 2 .** They include two (2) possible grave sites (**NT01** and **NT04**) on the farm Klipspruit 178 KS and two (2) stone cairns known as seatlo (**NT09** and **NT10**), one (1) large archaeological historic site with huts foundations (**NT05** and **NT07**) and an additional archaeological historical site (**NT08**), located further to the north-east of **NT05** on the farm Vaalfontein 179 KS.

Visual landscape

Although theoretically the line could be visible at a distance of 15.2 km, the practical limit of visual effect was determined to be 3 km, due to the colour and character of the powerline structure. The landscape character encountered by the proposed deviations include relatively flat areas under agricultural fields, and relatively undeveloped naturally vegetated undulating and hilly landscapes with prominent koppies. Receptors which will be sensitive to landscape change are likely to be farm workers, users of nearby gravel roads, residents of the nearest settlements and patrons of the game farm adjacent to Bend 3-6.

Pre-application Screening (DFFE Screening Tool)

Numerous specialist studies were required for this project, according to the DFFE Screening Tool Report. Where the EAP was not in agreement with the tool's site sensitivity ratings and need for such studies, a clear motivation for the exclusion of certain specialist studies has been provided.

Assessment methodology

The concept of sustainability was applied as the framework within which environmental aspects arising from or influencing the proposed project (and its alternatives) were considered. Issues and potential impacts were identified by a technical process and a public participation process. Specialist studies were conducted in accordance with the Protocols set out by DFFE. Mitigation measures were identified and are incorporated in an Environmental Management Programme (EMPr). Qualitative assessment conventions were used to assess the significance of each impact both before and after mitigation.

Public Participation Process

The public participation process was designed to comply with the requirements of the 2014 EIA Regulations (as amended) and NEMA and is fully described in Chapter 4 of this report.

Need and Desirability

From an EIA perspective, the need and desirability of any proposed development is a key component of an application for environmental authorisation. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable. Need and Desirability aspects are considered in Chapter 9 of this report, in accordance with DFFE's Need and Desirability Guidelines.

Environmental Issues and Potential Impacts

The information gathered during this Basic Assessment process resulted in the identification of key issues, which have been formulated as nine key questions:

- Will the proposed route deviations result in socio-economic benefits?
- What effects will the proposed route deviations have on the social and socio-economic environment?
- Will the proposed route deviations result in the loss of use of productive agricultural land and associated economic opportunities?
- What effects will the proposed route deviations have on terrestrial biodiversity and natural areas worthy of protection and conservation?
- What effects will the proposed route deviations have on watercourses and aquatic biodiversity?
- What effects will the proposed route deviations have on avifauna species (birds)?
- How will the visual changes to the landscape as a result of the proposed route deviations affect the social and socio-economic environment?
- What effects will the proposed route deviations have on cultural heritage resources, including palaeontological resources?
- What cumulative impacts are anticipated from construction and operation of the proposed route deviations?

Specialist reports and findings

The tables below provide site sensitivity verifications, motivations for exclusion of certain specialist studies required by the DFFE Screening Tool and a summary of main conclusions of specialist studies undertaken.

Site sensitivity verification, motivation for exclusion of certain specialist studies required by DFFE Screening Tool and summary of specialist findings (BEND 1)

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 1
Landscape/ Visual Impact Assessment.	N/A	N/A	Included	Refer to the Visual Impact Assessment (VIA) report in Appendix 5.	Due to the likely relatively low levels of landscape and visual impact and the fact that impacts associated with the proposed deviations are generally lower or similar to those that might be associated with the authorised alignment, there is no reason from a landscape and visual impact perspective why the proposed deviations should not be authorised.
Archaeological and Cultural Heritage Impact Assessment	Low	Low.	Included	Refer to the HIA report in Appendix 5.	It is the specialist's considered opinion that the overall impact of the proposed 132kV overhead line deviations on heritage resources is Low. Provided that the delineated no-go areas are avoided, and the recommended mitigations are applied, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective.
Palaeontology Impact Assessment.	Medium	Insignificant/ Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5.	The Heritage Impact Assessment (HIA) report confirmed that, according to the Palaeo-sensitivity Map available on the South African Heritage Resources Information System database (SAHRIS), the Palaeontological Sensitivity of the Bend 1 area is rated as Insignificant/Zero and no further palaeontological studies are required.
Terrestrial Biodiversity Impact Assessment.	Low	High, Medium and Very Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	It is the specialist's opinion that each of the proposed deviations should receive a favourable outcome for the Environmental Application(s) lodged with the Competent Authority, provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the Project Life-Cycle.
Aquatic Biodiversity Impact Assessment	Low	Insignificant. (No water-courses within 500 m)	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.	Based on the results obtained during this study, it is the specialist's substantiated opinion that the proposed deviations continue, provided that all mitigation and rehabilitation measures prescribed in this report and the site-specific EMPr be strictly implemented and subsequently monitored. (Note that Bend 1 has no water resources within 500m).

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 1
Avian Impact Assessment.	Animal species was indicated as High	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.	The route deviations to the authorised Nhluvuko-Tshebela/Rampheri 132kV power line are not deemed to present significant negative environmental issues or impacts. It is this specialist's opinion that the construction of the 132kV power line within the route deviation areas will result in acceptable levels of impact on the resident avifauna subject to the (recommended) mitigation and management measures.
Hydrology Assessment	N/A	Insignificant. No water-courses on site.	Excluded.	Eskom has undertaken floodline assessments for the powerline under construction.	The aquatic biodiversity study confirmed that there are no watercourses on site.
Socio-economic Assessment	N/A	Medium-Low	Included	Refer to the Socio-economic Impact Assessment report in Appendix 5.	From a social/socio-economic perspective, it is the practitioner's opinion that the proposed project can be authorised by DFFE.

Site sensitivity verification, motivation for exclusion of certain specialist studies required by DFFE Screening Tool and summary of specialist findings (BEND 2)

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 2
Agricultural Impact Assessment	High	Medium-Low	Included (desktop)	Refer to Agricultural Assessment report in Appendix 5.	The impact of Bend 1 on agriculture is of low significance, before and after mitigation. It is the specialist's opinion that the project can be authorised.
Landscape/ Visual Impact Assessment.	N/A	N/A	Included	Refer to the VIA report in Appendix 5.	Due to the likely relatively low levels of landscape and visual impact and the fact that impacts associated with the proposed deviations are generally lower or similar to those that might be associated with the authorised alignment, there is no reason from a landscape and visual impact perspective why the proposed deviations should not be authorised.
Archaeological and Cultural Heritage Impact Assessment	Low	Medium-High as site specific sensitive features (including possible graves) were found along the alignment.	Included	Refer to the HIA report in Appendix 5.	It is the specialist's considered opinion that the overall impact of the proposed 132kV overhead line deviations on heritage resources is Low. Provided that the delineated no-go areas are avoided, and the recommended mitigations are applied, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective.
Palaeontology Impact Assessment.	Medium	Insignificant/ Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5.	The HIA report confirmed that, according to the SAHRIS Palaeo-sensitivity Map, the Palaeontological Sensitivity of the Bend 2 area is rated as Insignificant/Zero and no further palaeontological studies are required.

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 2
Terrestrial Biodiversity Impact Assessment.	Low	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	It is the specialist's opinion that each of the proposed deviations should receive a favourable outcome for the Environmental Application (s) lodged with the Competent Authority, provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the Project Life-Cycle.
Aquatic Biodiversity Impact Assessment	Low	While several watercourses (including wetlands) were identified within 500 m of the deviation route, no watercourses are at risk of being impacted by Bend 2.	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.	Based on the results obtained during this study and presented herein, it is the specialist's substantiated opinion that the proposed deviations continue, provided that all mitigation and rehabilitation measures prescribed in this report and the site-specific EMPr be strictly implemented and subsequently monitored. In accordance with GN509 (DWS: GG 40229, 2016) and the NWA (Act no. 36 of 1998) the proposed deviations at Bend 2 should be subject to Section 21(c) and (i) water use authorisation via a GA process.
Avian Impact Assessment.	Animal species was indicated as Medium	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.	The route deviations to the authorised Nhluvuko-Tshebela/Rampheri 132kV power line are not deemed to present significant negative environmental issues or impacts. It is this specialist's opinion that the construction of the 132kV power line within the route deviation areas will result in acceptable levels of impact on the resident avifauna subject to the (recommended) mitigation and management measures.

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 2
Civil Aviation Assessment.	Very High	Medium	Compliance Statement included. An Obstacle Application is in progress.	Refer to Appendix 9.	While the DFFE Screening Tool has assigned a Theme Sensitivity rating of Very High and High along the entire powerline alignment, after site verification, the EAP has assessed the Civil Aviation theme as Medium Sensitivity. This is due to the nature of the proposed development and its location in relation to other existing powerlines and aerodrome facilities, which suggests that there is low potential for negative impacts on the civil aviation installation, and if there are impacts, there is a high likelihood of mitigation. Any mitigation measures required will be identified by the SACAA and Eskom in response to the outcome of the Obstacle Application process, and implemented by Eskom. Subject to approval by the CAA, the project should be authorised.
RFI Assessment. (Radio Frequency Interference)	Not indicated	Medium	Compliance Statement included.	Refer to the comment in the adjacent column and to Appendix 9.	According to Zhang et al (2019) the protecting distance between radar stations and ultra high voltage power transmission lines is at least 2.2 km. The DFFE Screening Tool does not mention radar facilities, although it does assign a Civil Aviation Theme Sensitivity rating of High, due to Bend 2 being between 15 and 35 km of a major civil aviation aerodrome. No radar towers were observed on site. Given that the proposed line is one of several other lines within similar proximity to existing radar facilities 15-35 km away, it is assumed that if there is an impact, it can be mitigated to acceptable levels. An Obstacle Application is in progress during which the CAA also considers the RFI impact on aviation. Any mitigation measures required will be identified by the CAA. Subject to approval by the CAA, the project should be authorised.

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 2
Geotechnical Assessment	N/A	N/A	Excluded. Eskom will undertake a geotechnical assessment on the actual tower positions once finalised.	Refer to Appendix 9 and comment in adjacent column.	Unlike for substations, where geotechnical studies are undertaken at an early stage of the project, for overhead powerlines, Eskom undertakes a geotechnical assessment only once the tower positions are finalised, after obtaining input from the environmental specialists, Basic Assessment and the Environmental Authorisation. For obvious reasons, it is unfeasible and indeed unnecessary for Eskom to undertake a generalised geotechnical assessment over an extensive corridor associated with an overhead powerline, as Eskom requires exact and accurate information at each specific tower position to pinpoint the exact type of foundations required for each tower. The intervening overhead sections of line have no geotechnical impact.
Plant Species Assessment	Medium	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	While no plant Species of Conservation Concern (SCC) were observed within the study area during fieldwork, SCC have been recorded within the greater area and a pre-construction walkthrough would still be recommended. One protected tree species was observed within the study area, viz *Sclerocarya birrea subsp. caffra* which is protected under the National Forest Act, 1998 (Act No. 84 of 1998).
Animal Species Assessment	Medium	Low (excluding birds, which are separately assessed)	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	According to the records available, the study area was likely to have a moderate faunal diversity. However, only three (3) animal SCC have been recorded within the Quarter Degree Square associated with the study area (QDS 2329CD). These were not observed on site.

Site sensitivity verification, motivation for exclusion of certain specialist studies required by DFFE Screening Tool and summary of specialist findings (BEND 3-6)

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 3-6
Agricultural Impact Assessment	Medium	Low	Included (desktop)	Refer to Agricultural Assessment report in Appendix 5.	The overwhelming extent of the land has a Low Agricultural Theme Sensitivity, equivalent to a Land Capability Class (LCC) of LCC VII and VIII, suitable for livestock and game only. The equivalent ATS Rating is 1 to 4 on scale of 1 to 15. The impact of the project on agriculture is of low significance, without mitigation.
Landscape/ Visual Impact Assessment.	N/A	N/A	Included	Refer to the VIA report in Appendix 5.	Due to the likely relatively low levels of landscape and visual impact and the fact that impacts associated with the proposed deviations are generally lower or similar to those that might be associated with the authorised alignment, there is no reason from a landscape and visual impact perspective why the proposed deviations should not be authorised.
Archaeological and Cultural Heritage Impact Assessment	Low	Low.	Included	Refer to the HIA report in Appendix 5.	It is the specialist's considered opinion that the overall impact of the proposed 132kV overhead line deviations on heritage resources is Low. Provided that the delineated no-go areas are avoided, and the recommended mitigations are applied, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective.
Palaeontology Impact Assessment.	Medium	Low /Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5.	The HIA report confirmed that, according to the SAHRIS Palaeo-sensitivity Map, the Palaeontological Sensitivity along Bend 3-6 is rated mostly as Insignificant/Zero and no further palaeontological studies are required. Only one site within Bend 3-6 study area, was rated as Low significance. No further palaeontological studies are required, however a protocol for incidental palaeontological finds is required for this area.
Terrestrial Biodiversity Impact Assessment.	Very High	High, Medium and Very Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	It is the specialist's opinion that each of the proposed deviations should receive a favourable outcome for the Environmental Application(s) lodged with the Competent Authority, provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the Project Life-Cycle.

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 3-6
Aquatic Biodiversity Impact Assessment	Very High	While several watercourses (including wetlands) were identified within 500 m of the deviation route, no watercourses are at direct risk of being impacted by Bend 3-6.	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.	Based on the results obtained during this study and presented herein, it is the specialist's substantiated opinion that the proposed deviations continue, provided that all mitigation and rehabilitation measures prescribed in this report and the site-specific EMPr be strictly implemented and subsequently monitored. In accordance with GN509 (DWS: GG 40229, 2016) and the NWA (Act no. 36 of 1998) the proposed deviations at Bend 3-6 should be subject to Section 21(c) and (i) water use authorisation via a GA process.
Avian Impact Assessment.	Animal species was indicated as Medium	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.	The route deviations to the authorised Nhluvuko-Tshebela/Rampheri 132kV power line are not deemed to present significant negative environmental issues or impacts. It is this specialist's opinion that the construction of the 132kV power line within the route deviation areas will result in acceptable levels of impact on the resident avifauna subject to the (recommended) mitigation and management measures.
Civil Aviation Assessment.	Very High	Medium	Compliance Statement included. An Obstacle Application is in progress.	Refer to Appendix 9.	While the DFFE Screening Tool has assigned a Theme Sensitivity rating of Very High and High along the entire powerline alignment, after site verification, the EAP has assessed the Civil Aviation theme as Medium Sensitivity. This is due to the nature of the proposed development and its location in relation to other existing powerlines and aerodrome facilities, which suggests that there is low potential for negative impacts on the civil aviation installation, and if there are impacts, there is a high likelihood of mitigation. Any mitigation measures required will be identified by the CAA and Eskom in response to the outcome of the Obstacle Application process, and implemented by Eskom. Subject to approval by the CAA, the project should be authorised.

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 3-6
RFI Assessment. (Radio Frequency Interference)	Medium	Medium	Compliance Statement included. An Obstacle Application is in progress.	Refer to the comment in the adjacent column and to Appendix 9.	According to Zhang et al (2019) the protecting distance between radar stations and ultra high voltage power transmission lines is at least 2.2 km. The DFFE Screening Tool has assigned a Theme Sensitivity rating of Medium as there is a civil aviation radar feature between 15 and 35 km of the Bend 3-6 alignment. No radar facilities were observed along the actual proposed alignment of Bend 3-6. Given that the proposed line is one of several other lines within similar proximity to existing radar facilities 15-35 km away, it is assumed that the if there is an impact, it can be mitigated to acceptable levels. Any mitigation measures required will be identified by the CAA. Subject to approval by the CAA, the project should be authorised.
Geotechnical Assessment	N/A	N/A	Excluded. Eskom will undertake a geotechnical assessment on the final tower positions.	Refer to Appendix 9 and comment in adjacent column.	Unlike for substations, where geotechnical studies are undertaken at an early stage of the project, for overhead powerlines, Eskom undertakes a geotechnical assessment only once the tower positions are finalised, after obtaining input from the environmental specialists, Basic Assessment and the Environmental Authorisation. For obvious reasons, it is unfeasible and indeed unnecessary for Eskom to undertake a generalised geotechnical assessment over an extensive corridor associated with an overhead powerline, as Eskom requires exact and accurate information at each specific tower position to pinpoint the exact type of foundations required for each tower. The intervening overhead sections of line have no geotechnical impact.
Plant Species Assessment	Medium	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	During the field assessment, no plant Species of Conservation Concern (SCC) were observed within the study area. However, SCC have been recorded within the greater area and a pre-construction walkthrough would still be recommended. One protected tree species was observed within the study area, viz *Sclerocarya birrea subsp. caffra* which is protected under the National Forest Act, 1998 (Act No. 84 of 1998).

Specialist Studies required (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment	Specialist and/or EAP findings (main conclusions): BEND 3-6
Animal Species Assessment	Medium	Low (excluding birds, which are separately assessed)	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.	According to the records available, the study area was likely to have a moderate faunal diversity. However, only three (3) animal SCC have been recorded within the Quarter Degree Square associated with the study area (QDS 2329CD). These were not observed during fieldwork.

Environmental impact Statement

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity and their significance (after mitigation, where applicable) is provided below.

For this project, it is particularly important to understand the context of the proposed activity, which consists of three separate and minor route deviations along an approximately 30 km long 132 kV overhead powerline that has already been granted environmental authorisation and is under construction (except for the deviated sections). The deviations have been proposed as better options because they avoid or reduce particular environmental impacts that would occur with the original routing. However, most impacts of the proposed deviations will be similar to those expected from the overall development already underway and the deviations on their own, will not alter the significance of these impacts.

Social and socio-economic impacts

In terms of socio-economic benefits, the line deviations need to be considered as part of the overall development, which is expected to contribute positively to local economic and socio-economic conditions through the provision of electricity connections and better reliability of supply. The project will continue to provide employment and income earning opportunities in the area for the duration of the construction period. Specifically, Bend 3-6 seeks to avoid negative impacting on potential socio-economic opportunities associated with the adjacent game farming property.

In terms of negative impacts, local communities and road users will be subject to various (temporary) nuisance impacts, as well as increased health, safety and security risks due to the presence and activities of construction teams and vehicles in the area. Importantly, no resettlement will be required for the deviations.

With management, the positive economic/socio-economic impacts of the electrical infrastructure at a local and regional level during construction and operation are deemed to be of medium and high significance. With mitigation, the negative impacts are of low significance.

Impacts on aviation

Considering the distance of the deviations from major airports and other aerodromes, as well as the existing powerlines operating in the area, it is likely that impacts on aviation and radar facilities can be successfully mitigated. An obstacle application process is underway with the South Africa Civil Aviation Authority (CAA) and subject to the required permission from the CAA, the risk to civil aviation is anticipated to be low.

Impacts on agriculture

The permanent loss of agricultural land (the majority being of a low land capability and agricultural sensitivity) will be minimal, as the footprint of the towers is only 2 m^2 per tower, averaging 8.7 m^2 per km of deviation. Small areas of maize cultivation are affected by Bend 1 and Bend 2, however Eskom compensates accordingly as part of servitude negotiations. The remaining area under the deviated sections can continue to be grazed and cultivated as before. With mitigation, the loss of agricultural land and the impact of the proposed deviations on the local agricultural economy is assessed to be of low significance.

Impacts on terrestrial biodiversity

The impacts of the deviated sections on terrestrial biodiversity will be limited due to the nature of the development and the nature of the vegetation on site. The permanent loss of vegetation is minimal due to the small footprint of the towers (as explained above) and because indigenous vegetation is left to grow within the servitude, although is kept short and cleared of woody vegetation for a 4-8 m width

immediately below the line. The conservation status of vegetation on site is “least concern” and few to no SCC’s and protected plants/trees were observed along the deviations. No protected areas will be impacted. While Bend 3-6 traverses CBA1 and CBA2 areas, the powerline here has already been authorised and is not expected to negatively impact conservation targets. Due to the limited impact on natural habitat, and the limited occurrence of faunal SCCs in the area, impacts on animals will not be significant. Provided the recommended mitigation measures are implemented, impacts on terrestrial biodiversity are assessed as having a low significance.

Impacts on avifauna
The habitat within which the PAOI is located is low to moderately sensitive from a potential bird impact perspective. In recent years, anthropogenic impacts, mostly in the form of urbanisation, agricultural and pastoral activities have largely transformed the landscape, resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the proposed deviations within the authorised powerline will result in impacts of medium-low significance to birds occurring in the vicinity of the new infrastructure, which can be reduced through the application of mitigation measures to low-negligible levels.

Impacts on watercourses and aquatic biodiversity
It was determined after risk screening that all aspects associated with the proposed deviations, specifically the proposed tower positions, were situated more than 60 m away from the delineated watercourses identified on site. Considering the nature of the proposed deviations (i.e. overhead electricity infrastructure), no watercourses were deemed to be at-risk of being impacted on by the proposed activities. This is subject to implementation of the avoidance, mitigation and rehabilitation measures recommended by the aquatic specialist and as specified in the EMPr. After mitigation/management, impacts on watercourses and aquatic biodiversity were assessed as having a low significance.

Visual impacts
Potential negative visual impacts include rural landscape change (all three deviations) and changes in view. Changes in view will be experienced primarily by local agricultural workers (Bend 1 and Bend 2), residents of Manthowane (Bend 2), local road users (Bend 2 and Bend 3-6) and patrons of an adjacent game farm (Bend 3-6). The significance of all these impacts is assessed as low, with and without mitigation.

Impacts on cultural heritage
The project could potentially result in disturbance or destruction of heritage resources of medium to high heritage sensitivity identified along Bend 2. These include possible graves, archaeological/historical homesteads, a stone kraal, and rock cairns. However, with the implementation of the recommended buffers and management guidelines, the significance of impacts on the tangible cultural heritage resources is assessed as low. The heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. If further resources are uncovered during construction, impacts can be managed to acceptable levels via the chance finds procedure.

Cumulative impacts
Both positive and negative cumulative impacts relating to all the impacts discussed above, are possible. However the contribution of the proposed deviations towards cumulative impacts, in comparison with the rest of the 30 km line under construction and the numerous surrounding powerlines in the area, will be negligible. Overall, the significance of these negative cumulative impacts is assessed to be medium and low.

Environmental Management Programme (EMPr)

An Environmental Management Programme (EMPr) prepared for the original development is currently in use by the construction Contractor on site. However, in order to comply with current legislation, an EMPr has been prepared as part of this assessment (Appendix 6) in accordance with GN 435 and incorporates generic as well as site specific mitigation and management measures. This EMPr will apply to the deviations specifically and cannot be applied retrospectively to components of construction already up and running for the construction contract (e.g. site camp, stockpiles, etc). Compliance monitoring and auditing of the contract will have to accommodate the requirements of both EMPRs once an EA has been issued for the deviations.

Concluding statement and recommendation of the EAP

Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are environmental benefits and no fatal flaws associated with the proposed route deviations along the Nhluvuko-Tshebela 132 kV powerline. The negative impacts resulting from the construction and operation of the proposed route deviations can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE, conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr, and including approval from the CAA.

The co-ordinates (approximate) of the alignments to be authorised are as shown in the table above and as depicted in the figures in this BAR. However, Eskom must be allowed flexibility to fine tune the alignments within the assessed corridor, in case shifts are required, following the findings of the preconstruction specialist walkdowns and final technical design.

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ABBREVIATIONS AND ACRONYMS

ACER	ACER (Africa) Environmental Consultants
AIPS	Alien invasive plant species
BAR	Basic Assessment Report
BID	Background Information Document
BGG	Burial Grounds and Graves
°C	Degrees Centigrade
CA	Competent Authority
CAA	Civil Aviation Authority
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
CR	Critically Endangered
CRR	Comments and Responses Report
DEA	Department of Environmental Affairs
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
ECO	Environmental Control Officer
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
Eskom	Eskom Holdings SOC Limited
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
GA	General Authorisation
GIS	Geographical Information System
GN	Government Notice
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency syndrome
I&APs	Interested and Affected Parties
IAIAsa	International Association of Impact Assessment, South Africa
IEM	Integrated Environmental Management
IBA	Important Bird Area
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
LC	Least Concern
LCC	Land Capability Class
LM	Local Municipality
LSU	Large livestock unit
NDP	National Development Plan
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Areas

NHRA	National Heritage Resources Act
NWA	National Water Act, 1998 (Act 36 of 1998)
PAOI	Project's Area of Influence
PES	Present Ecological State
POPIA	Protection of Personal Information Act (Act no 4 of 2013)
QDS	Quarter Degree Square
REDZ	Renewable Energy Development Zone
RFI	Radio Frequency Interference
SACNASP	South African Council for Scientific Professions
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANDF	South African National Defence Force
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEI	Site Ecological Importance
SMME	Small, Medium and Micro Enterprises
StatsSA	Statistics, South Africa
TOPS	Threatened or Protected Species
VIA	Visual Impact Assessment
VU	Vulnerable
WMA	Water Management Area
ZTV	Zone of Theoretical Visibility

AUTHORS

The author of this draft report is Ms A McKenzie of ACER (Africa) Environmental Consultants (ACER). An internal review was conducted by Mrs N Nadasen (ACER).

AFFIRMATION BY THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

PROPOSED DEVIATIONS FROM THE AUTHORISED ALIGNMENT FOR THE 30 KM 132 KV ESKOM DISTRIBUTION LINE BETWEEN TSHEBELA NEW SUBSTATION AND NHLUVUKO SUBSTATION, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO PROVINCE, SOUTH AFRICA

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	ACER (Africa) Environmental Consultants			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)		Percentage Procurement recognition	
EAP name:	Ms Ashleigh McKenzie			
EAP Qualifications:	MSc Environmental Science			
Professional affiliation/registration:	Environmental Assessment Practitioners Association of South Africa (EAPASA) (2019/1337) South African Council for Natural Scientific Professions (SACNASP) in the field of environmental science (Registration No 400026/05).			
Physical address:	Suites 5&6, Golden Penny Centre, 26 Hely Hutchinson Rd, Mtunzini, KZN			
Postal address:	PO Box 503, Mtunzini			
Postal code:	3867	Cell:	0829228986	
Telephone:	0353402715	Fax:		
E-mail:	Ashleigh.mckenzie@acerafrica.co.za			

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended.

2. DECLARATION BY THE EAP

I, _, declare that –

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

Disclosure of Vested Interest (delete whichever is not applicable)

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

Signature of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants

Name of Company:

08-November-2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, ___Ashleigh McKenzie _, swear under oath / affirm that to the best of my knowledge, the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants

Name of Company

08-November-2022

Date

Signature of the Commissioner of Oaths

8/11/22

Date

JACOBUS FREDERICK DU TOIT
EX OFFICIO COMMISSIONER OF OATHS
PRACTICING ATTORNEY R.S.A
FIRST FLOOR, GOLDEN PENNY CENTRE
26 HELY HUTCHINSON STR, MTUNZINI
TEL: (035) 340 1351

ADHERANCE TO REGULATORY REQUIREMENTS

Table i Required content of Basic Assessment Report according to GNR 326 (7 April 2017)

			Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference
1			A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application must include	
	A		Details of	
		i	The EAP who prepared the report and	Section 3.2 and Appendix 1
		ii	The expertise of the EAP, including a curriculum vitae	Appendix 1
	B		The location of the activity, including	Section 1.3; Figure 1 Appendix 4
		i	The 21-digit Surveyor General code of each cadastral land parcel	Application (Appendix 2)
		ii	Where available, the physical address and farm name	Not available
		iii	Where the required information in items (i) and (ii)is not available, the coordinates of the boundary of the property or properties	N/A
	C		A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or if it is	
		i	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken, or	Section 1.3 Appendix 4
		ii	On land where the property has not been defined, the coordinates within which the activity is to be undertaken	Section 1.3
	D		A description of the scope of the proposed activity, including	Section 1.3, Chapter 5
		i	All listed and specified activities triggered and being applied for, and	Section 3.4
		ii	A description of the activities to be undertaken including associated structures and infrastructure	Chapter 5.
	e		A description of the policy and legislative context within which the development is proposed including	Chapter 2
		i	An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report, and	Chapter 2
		ii	How the proposed activity complies with and responds to the legislation and policy context, plans guidelines, tools frameworks and instruments	Chapter 2, Section 3.7, Section 7.2.1
	f		A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Chapter 9
	g		A motivation for the preferred site, activity and technology alternative	Section 1.2, Chapter 6

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
	h		A full description of the process followed to reach the proposed preferred alternative within the site including	N/A
		i	Details of all the alternatives considered	Chapter 6
		ii	Details of the public participation process undertaken in terms of regulation 411 of the Regulations, including copies of the supporting documents and inputs	Chapter4 Appendix 7
		iii	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	Section 4.4. Appendix 8
		iv	The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspect.	Chapter 7 Appendix 5
		v	The impact and risks identified for each alternative, including the nature significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	
		aa	Can be reversed	Chapter 10 Appendix 5
		bb	May cause irreplaceable loss of resources, and	Chapter 10 Appendix 5
		cc	Can be avoided, managed or mitigated	Chapter 10 Appendix 5
		iv	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives,	Chapter 8 Appendix 5
		vii	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Chapter 10 Appendix 5
		viii	The possible mitigation measures that could be applied and level of residual risk	Chapter 10 Appendix 5 Appendix 6
		ix	The outcome of the site selection matrix	N/a
		x	If no alternative locations for the activity were investigated, the motivation for not considering such, and	Chapter 6
		xi	A concluding statement indicating the preferred alternatives, including preferred location of the activity	Section 1.3 Chapter 12
	i		A full description of the process undertaken to identify assess and rank the impacts the activity will impose on the preferred location through the life of the activity including	Chapter 8 Appendix 5
		ii	A description of all environmental issues and risks that were identified during the environmental impact assessment process, and	Chapter 10 Appendix 5
		ii	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation	Chapter 10 Appendix 5
	j		An assessment of each identified potentially significant impact and risk, including	Chapter 10 Appendix 5
		i	Cumulative impacts	Chapter 10

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
		ii	The nature, significance and consequences of the impacts and risk	Chapter 10 Appendix 5
		iii	The extent and duration of the impact and risk	Chapter 10 Appendix 5
		iv	The probability of the impact and risk occurring	Chapter 10 Appendix 5
		v	The degree to which the impact and risk can be reversed	Chapter 10 Appendix 5
		vi	The degree to which the impact and risk may cause irreplaceable loss of resources and	Chapter 10 Appendix 5
		vii	The degree which the impact and risk can be avoided, managed or mitigated	Chapter 10 Appendix 5
	k		Where applicable, a summary of the findings and impact management measures identified in any specialist's report complying with Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in the final report	Chapter 10 Appendix 5 Appendix 6
	l		An environmental impact statement which contains	
		i	A summary of the key findings of the environmental impact assessment	Chapter 11
		ii	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and	Figure 1. Appendix 4. Figures in the specialist reports (Appendix 5)
		iii	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Executive Summary
	m		Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives and the impact management outcomes for the development for the inclusion in the EMPr	Appendix 6 (EMPr)
	n		Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 12
	o		A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 3.9 and in the specialist reports (Appendix 5)
	p		A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Chapter 11 and Chapter 12
	q		Where the proposed activity does not include operational aspects, period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	N/A
	r		An undertaking under oath or affirmation by the EAP in relation to	Page xxxv
		i	The correctness of the information provided in the reports	Page xxxv

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
		ii	The inclusion of comments and inputs from stakeholders and I&APs	Page xxxv
		iii	The inclusion of inputs and recommendations from the specialist reports where relevant, and	Page xxxv
		iv	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and	Page xxxv
	s		Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/a
	t		Any specific information that may be required by the competent authority, and	Section 1.1. contains confirmation in terms of GN 2313 of 27 July 2022
	u		Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/a

Table ii Regulatory requirement for public participation in a Basic Assessment Process according to Chapter 6 of GNR 326 (7 April 2017)

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
41(1)			This regulation only applies in instances where adherence to the provisions of these regulations specifically required.	
2			The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—	
	a		fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—	
		I	the site where the activity to which the application or proposed application relates is or is to be undertaken; and	Appendix 7b
		ii	any alternative site	N/A
	b		giving written notice, in any of the manners provided for in section 47D of the Act to—	
		i	the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken	Section 4.2; Appendix 7
		ii	owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	Section 4.2; Appendix 7
		iii	the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	Section 4.2; Appendix 7
		iv	the municipality which has jurisdiction in the area	Section 4.2; Appendix 7
		v	any organ of state having jurisdiction in respect of any aspect of the activity; and	Section 4.2; Appendix 7
		vi	any other party as required by the competent authority;	Section 4.2;
	c		placing an advertisement in—	
		i	one local newspaper; or	Section 4.2; Appendix 7
		ii	any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	N/a
	d		placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond	Section 4.2; Appendix 7

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
			the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and	
	e		using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—	
		i	illiteracy;	
		ii	disability; or	
		iii	any other disadvantage.	
3			A notice, notice board or advertisement referred to in subregulations (2) must—	
	a		give details of the application or proposed application which is subjected to public participation; and	Appendix 7
	b		state—	
		i	whether basic assessment or S&EIR procedures are being applied to the application;	Appendix 7
		ii	the nature and location of the activity to which the application relates;	Appendix 7
		iii	where further information on the application or proposed application can be obtained; and	Appendix 7
		iv	the manner in which and the person to whom representations in respect of the application or proposed application may be made	Appendix 7
4			A notice board referred to in subregulation (2) must—	Appendix 7
	a		be of a size of at least 60cm by 42cm; and	Appendix 7
	b		display the required information in lettering and in a format as may be determined byte competent authority.	Appendix 7
5			Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that—	Noted.
	a		such process has been preceded by a public participation process which included compliance with subregulations (2)(a), (b), (c) and (d); and	N/a
	b		written notice is given to registered interested and affected parties regarding where the—	N/a
		i	revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);	N/a
		ii	revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or	N/a
		ii	environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d) may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	N/a

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	**Undertaken during the Basic Assessment**
6			When complying with this regulation, the person conducting the public participation process must ensure that—	
	a		information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and	This BAR
	b		participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.	Section 4.2; Appendix 7
7			Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	Noted. The public will be given the opportunity in this public review process, to review submissions to Department of Water and Sanitation for registration of water uses under the relevant General Authorisations.

1. INTRODUCTION

1.1 Background

This report is a Basic Assessment Report (BAR) for three proposed deviations to the authorised 132 kV distribution line alignment between the Nhluvuko and Tshebela[3] substations, located to the southeast of Polokwane, in the Capricorn District Municipality (DM), Limpopo Province, South Africa (Figure 1).

An Environmental Authorisation (EA) was issued by the national Department of Environmental Affairs and Tourism to Eskom Distribution (Northern Region) on 07 May 2012 (EA Reference:12/12/20/2237). This EA was for construction of the new Tshebela substation and associated 132 kV distribution powerlines just south of Polokwane in the Capricorn DM, Limpopo. This development will provide electrical capacity and address low voltage issues on the lines providing new electrifications for rural customers (6000 connections) in the Mankweng area, Capricorn DM. Construction of the infrastructure commenced during 2017, with the substation now completed and construction of the powerline currently underway.

After concluding servitude/landowner negotiations and commencement of construction, the need has arisen to deviate 3 sections of the authorised alignment of the 30 km Kingbird 132 kV line between the Nhluvuko and Tshebela substations.

These deviations trigger listed activities in Listing Notices 1 and 3 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Therefore, the project requires an Environmental Authorisation (EA) from the Department of Forestry, Fisheries and the Environment (DFFE),[4] involving the undertaking of a Basic Assessment. Eskom Distribution Limpopo has appointed ACER (Africa) Environmental Consultants (ACER) as the independent Environmental Impact Assessment Practitioner (EAP) to undertake the application for environmental authorisation.

It must be noted that while this powerline falls within a strategic transmission corridor, the proposed deviations do not qualify for an exclusion from obtaining an EA (as per the Standards adopted in GN 2313 of 27 July 2022). This is an authorised powerline already under construction and furthermore, some features of very high and high sensitivity along the deviations were identified by the DFFE Screening Tool, with certain features having been confirmed high sensitivity by specialists.

ACER will also apply on Eskom's behalf to the Department of Water and Sanitation (DWS) to authorise water uses (as relevant), in accordance with the National Water (Act 36 of 1998).

1.2 Purpose of the project

The purpose of the three deviations being applied for, is as follows (Figure 2):

- **Bend 1:** To avoid traversing directly over a sensitive koppie, the alignment has been diverted around the side (base) of the koppie.
- **Bend 2:** This line deviation is to make the site accessible for construction (via existing tracks).
- **Bend 3-6:** A change in ownership and land use has required the rerouting of the alignment to avoid the property Kleinfontein 172 KS Ptn 1.

3 Also referred to as Tshebela/Rampheri new substation.
4 In consultation with the Limpopo Department of Economic Development, Tourism and Environmental Affairs (DEDTEA)

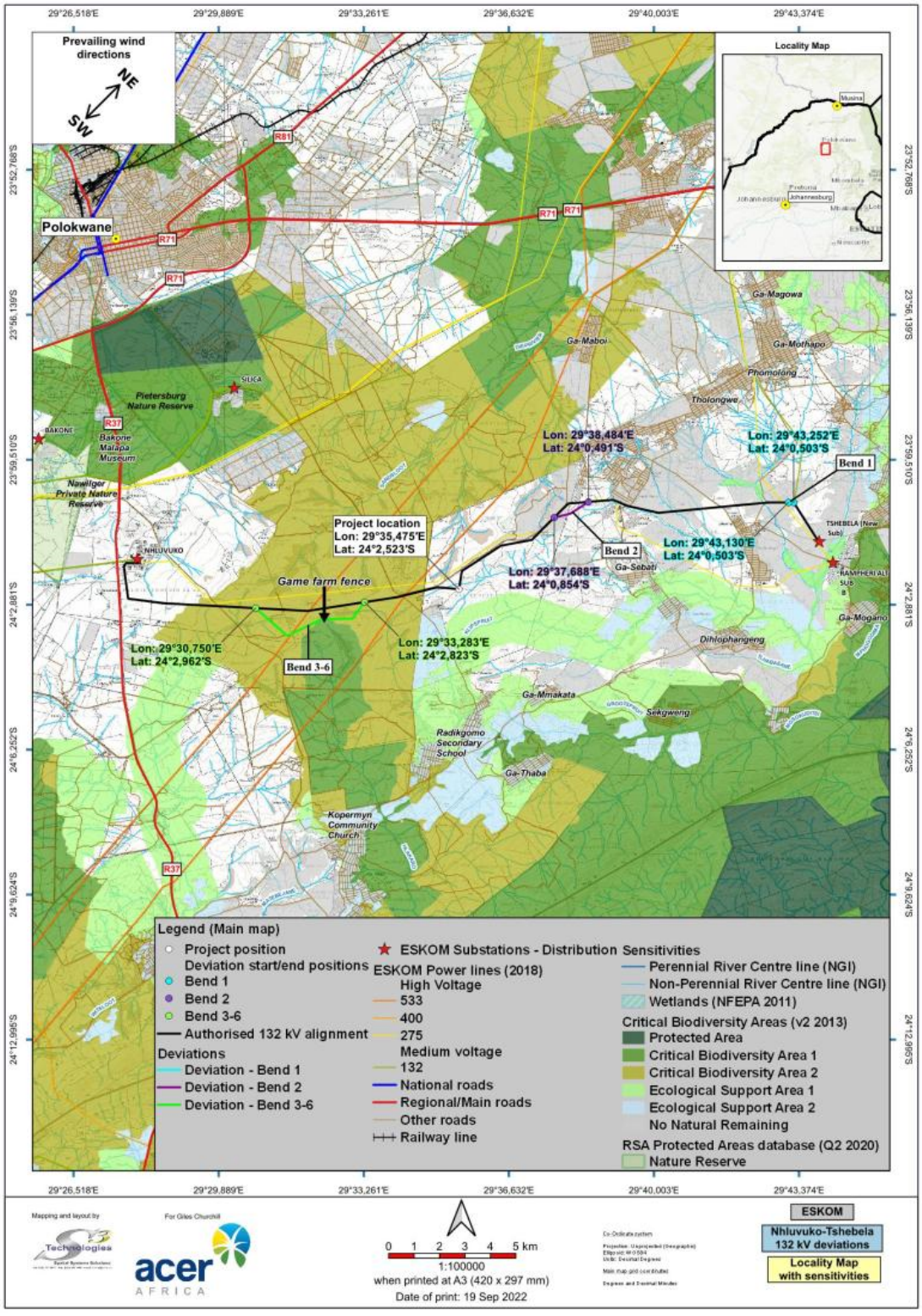


Figure 1 Map of the project study area near Polokwane, Capricorn District Municipality

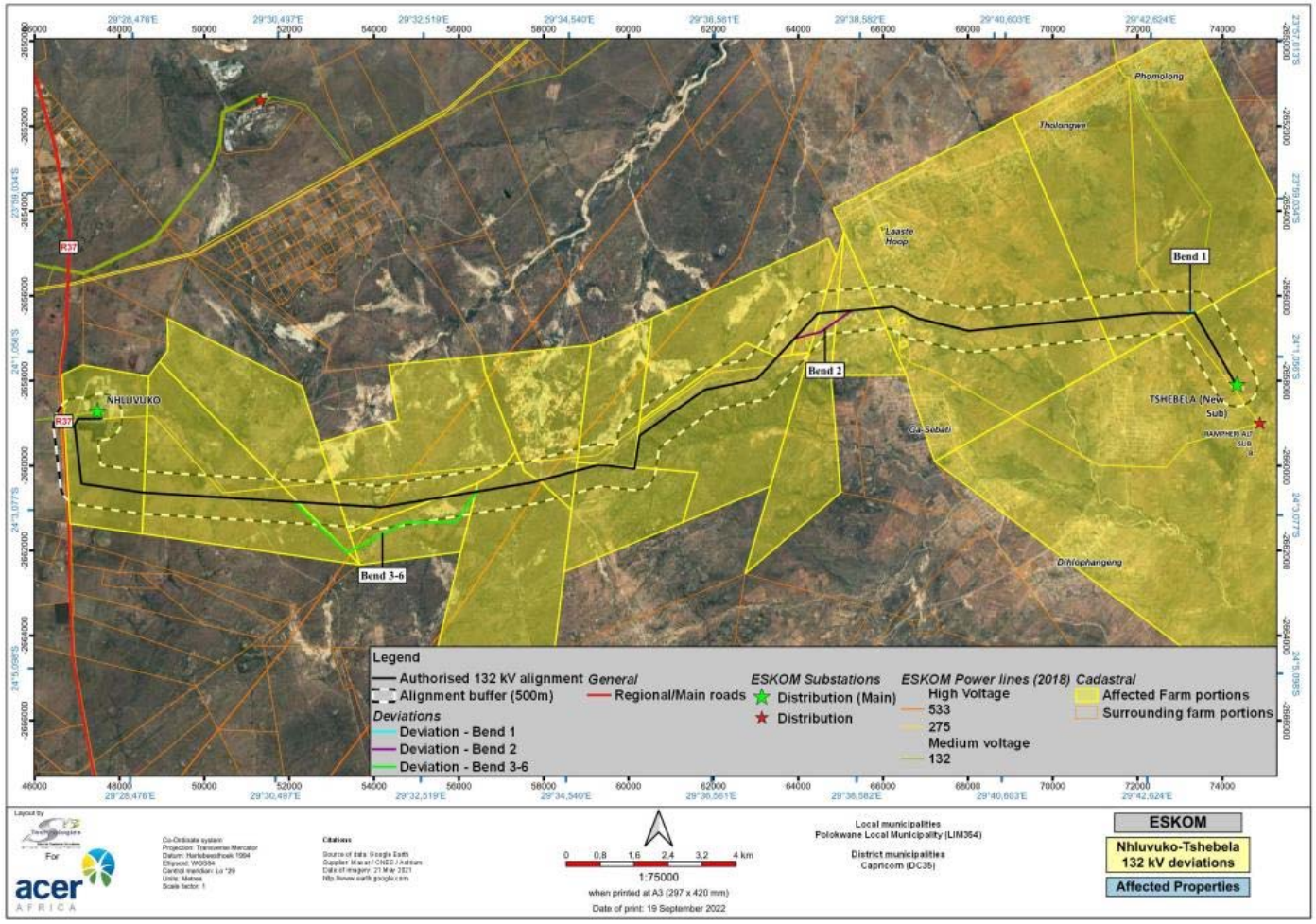


Figure 2 Locations of the three proposed deviations along the alignment of the Nhluvuko-Tshebela/Rhamperi 132 kV distribution line

1.3 Project location and scope

This project comprises 3 proposed deviations to the alignment of an Eskom 132 kV electricity overhead distribution line which, excluding the deviations, has already been authorised and is currently under construction (Figure 2, Plate 1). A detailed project description and description of alternatives are provided in Chapter 5 and Chapter 6, respectively.

1.3.1 Location and dimensions

The project is located within Ward 2 and Ward 3 of the Polokwane Local Municipality (LM) situated in the Capricorn DM, Limpopo province. The authorised 132 kV line links the Nhluvuko substation (accessed from the R37) to the Tshebela substation (accessed via district roads off the R71).

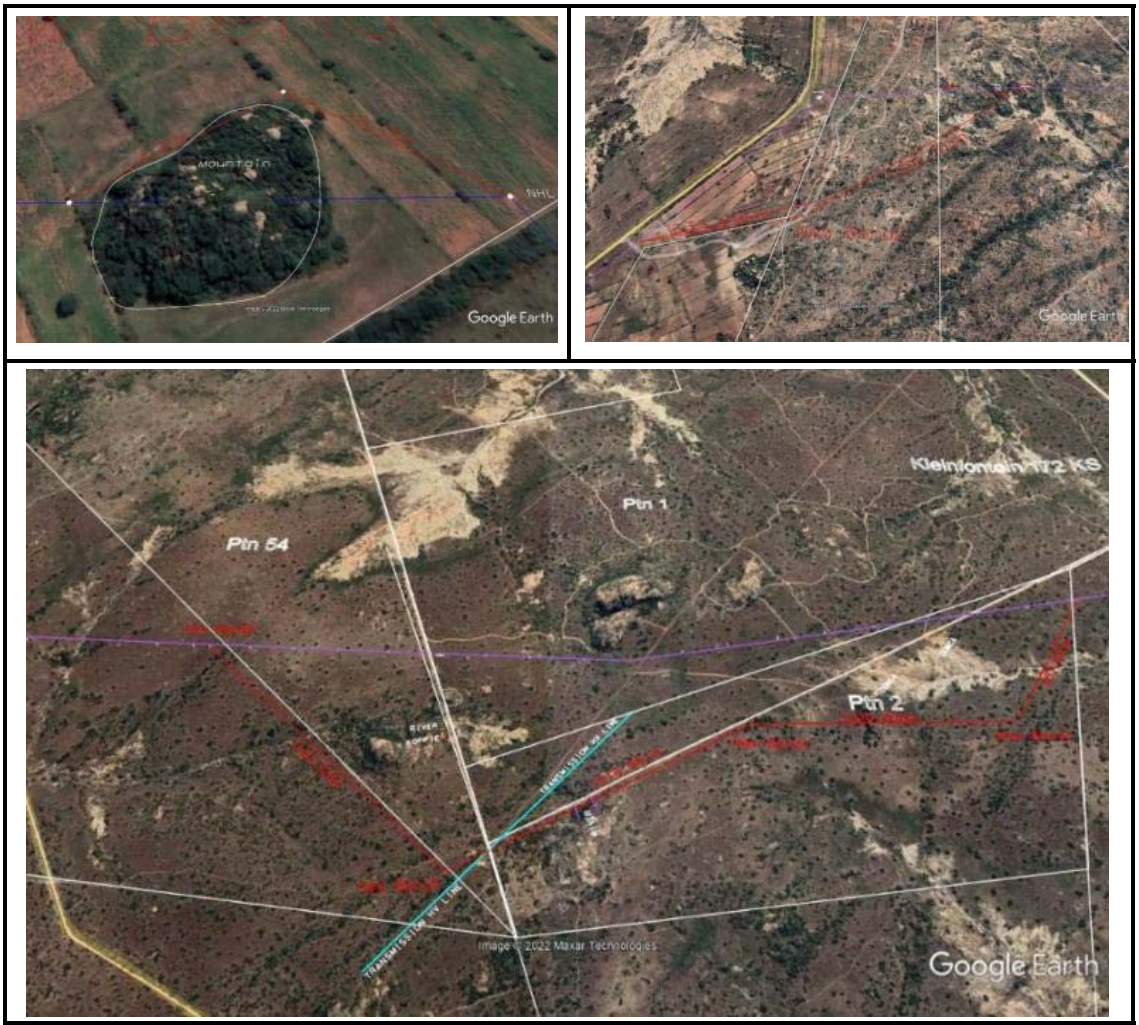


Plate 1 Bend 1 (red line- top LHS); Bend 2 (red line – top RHS) and Bend 3-6 (red line bottom)

As illustrated in Plate 1:

- **Bend 1** is a minor deviation, approximately 240 m in length (about 30 m longer than the original route) traversing around the northern side, instead of directly over, a small koppie. It is situated about 2km from the eastern end of the powerline, north-west of the new Tshebela substation. It crosses agricultural lands cultivated with maize. The closest areas of formal, dense human settlement are 2-3 km distant.

- **Bend 2**: This deviation is approximately 1.5 km in length (about 100 m shorter than the original alignment) and bends to the south of the original route. It has better access than the original alignment, for construction and maintenance. It is situated about 11 km from the western end of the powerline alignment, west of the new Tshebela substation. The deviation crosses open veld and some agricultural lands (subsistence). The closest areas of formal, dense human settlement are located approximately 0.5 – 1 km away.

- **Bend 3-6**: This deviation is approximately 5.3 km in length (about 1 km longer than the original alignment). It deviates southwest of the boundary of the property Kleinfontein 172 KS Ptn 1. The line deviation has bends along it, to avoid an area of serious donga erosion as well as to avoid traversing directly over a koppie. The area crossed by this deviation is open veld, used for grazing of livestock. The deviation is situated towards the western end of the alignment, approx. 7 km east of the Nhluvuko substation. The closest formal settlement is approximately 5 km away.

1.3.2 Global Positioning System (GPS) co-ordinates and affected properties

Relevant GPS co-ordinates (approximate) of the infrastructure are provided in Table 1.

SG numbers of affected properties are provided in the Application for Authorisation (Appendix 2). Cadastral information has been provided in the Application for Authorisation (Appendix 2) and in the supporting map in Appendix 4.

Table 1 GPS co-ordinates of the three proposed deviations to the Nhluvuko-Tshebela 132 kV powerline (approximate)

Location	Latitude (S)	Longitude (E)
Bend 1 (east end)	24°0.503' S	29°43.252'E
Bend 1 midpoint	24°0.469' S	29°43.190'E
Bend 1 (west end)	24°0.503' S	29°43.130'E
Bend 2 (east end)	24°0.499' S	29°38.479'E
Bend 2 midpoint	24°0.739' S	29°38.108'E
Bend 2 (west end)	24°0.857' S	29°37.697'E
Bend 3-6 (east end)	24°2.836' S	29°33.278'E
Bend 3-6 midpoint	24°3.398' S	29°31.903'E
Bend 3-6 (west end)	24°2.962' S	29°30.754'E
Approximate lengths (Bend 1, Bend 2. Bend 3-6)	0.24 km; 1.5 km; 5.3 km	
Width of assessed corridor either side of the line	500 m (aquatic) and 100 m (terrestrial vegetation)	

1.4 Structure of this Basic Assessment Report (BAR)

A BAR must contain the information set out in Appendix 1 of GN No. 326. Table i indicates where in this BAR these various components are covered. This BAR has been structured as follows:

- ❑ Chapter 1 Introduction.
- ❑ Chapter 2 Legislative Framework.
- ❑ Chapter 3 BA process and approach.
- ❑ Chapter 4 Public Participation Process.
- ❑ Chapter 5 Description of the project.
- ❑ Chapter 6 Project alternatives.
- ❑ Chapter 7 Description of the receiving environment.
- ❑ Chapter 8 Assessment methodology.
- ❑ Chapter 9 Integrated description of environmental issues and potential impacts.
- ❑ Chapter 10 Assessment of the significance of potential impacts.
- ❑ Chapter 11 Need and Desirability from an EIA perspective.
- ❑ Chapter 12 Environmental Impact Statement.
- ❑ Chapter 13 Recommendation of the EAP.
- ❑ Chapter 14 Concluding statement and recommendations.
- ❑ Chapter 15 References.

The following documentation is appended to this BAR:

- ❑ Appendix 1: EAP *Curriculum Vitae.*
- ❑ Appendix 2: Application for Authorisation.
- ❑ Appendix 3: DFFE Screening Report .

- ❑ Appendix 4: Supporting Maps.
- ❑ Appendix 5: Specialist reports, *Curriculum Vitae* and Declarations.
- ❑ Appendix 6: Environmental Management Programme.
- ❑ Appendix 7: Public Participation Documentation.
- ❑ Appendix 8: Comments and Responses Report.
- ❑ Appendix 9: Supporting documentation for exclusion of specialist reports recommended by the DFFE Screening Tool

2. LEGISLATIVE FRAMEWORK

There are many legal requirements (national, provincial and local government spheres) to which Eskom must adhere for the construction and operation of the proposed powerline. Key legislation, policies, conventions and guidelines which may be applicable to this project include (but are not necessarily limited to), those provided hereunder.

2.1 National and provincial legislation

2.1.1 Constitution of the Republic of South Africa Act, 1996 (Act 108 of 1996) (as amended)

The Constitution is the supreme law of South Africa, against which all other laws are measured. It sets out a number of fundamental environmental rights.

The Environmental Clause
Section 24 of the Constitution outlines the basic framework for all environmental policy and legislation: It states:

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.

Access to Information
Section 32 of the Constitution provides that everyone has the right of access to any information held by the State or another juristic person, which is required for the exercise or protection of any rights.

Fair Administrative Action
Section 33 of the Constitution provides the right to lawful, reasonable and procedurally fair administrative action.

Enforcement of Rights and Administrative Review
Section 38 of the Constitution guarantees the right to approach a court of law and to seek legal relief in the case where any of the rights that are entrenched in the Bill of Rights are infringed or threatened.

As part of the BA process, the EIA Regulations require that a description of the policy and legislative context within which the development is proposed is reported on in the EIA Report, including an explanation of how the proposed development complies with and responds to such legislation and policy context. This includes an identification of applicable legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments. This section has been prepared to satisfy this requirement.

2.1.2 National Environmental Management Act, 1998 (Act 107 of 1998)

NEMA is South Africa's overarching environmental legislation. It provides the legislative framework for Integrated Environmental Management in South Africa. The Act gives meaning to the right to an environment that is not harmful to health or well-being, entrenched in Section 24 of the Constitution. In addition, NEMA provides for equitable access to natural resources, environmental protection and the formulation of environmental management frameworks. The Act is underpinned by the global concept of sustainable development. Section 2 of NEMA provides a set of principles that apply to the actions of all organs of state that may significantly affect the environment.

The interpretation, administration and application of NEMA are guided by fundamental principles of sustainable development, provided in Chapter 1 of the Act. "Development must be socially, environmentally and economically sustainable" and requires the consideration of all relevant factors, which are guided by eight sub-principles, including:

- The sustainability principle.
- The lifecycle, cradle-to-grave principle.
- The 'polluter pays' principle.
- The precautionary principle.
- The duty of care principle.
- Fair and transparent public consultation.

2.1.3 Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) and other associated Regulations affecting the EIA process.

The 2014 EIA Regulations (as amended April 2017), published in terms of Section 24 of NEMA, regulate environmental management in South Africa. Activities that require authorisation from the CA prior to their commencement are listed currently in Government Notices GNR 327, GNR 325 and GNR 324. The procedures dealing with the EIA Regulations are contained in GN R 326. In terms of Section 24F of NEMA, no activity may commence prior to an Environmental Authorisation being granted by the Department.

The Listed Activities applicable to the proposed project and the Basic Assessment process which is required to apply, in terms of the EIA Regulations, for environmental authorisation for this project, are detailed in Chapter 3.

There are other regulated requirements that affect the environmental authorisation process which include:

- The mandatory Screening via a Screening Tool is regulated in terms of Section 24(5)(h) of NEMA and Regulation 16(1)(b)(v) of the 2014 EIA Regulations.
- Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species) have come into effect. Specialist assessments must be conducted in accordance with these protocols.
- In addition to the above, the EMPr must comply with Appendix 4 of the EIA Regulations, 2014, as amended.

- **Government Notices 113 and 114** of 16 February 2018 which provide that wind and solar PV projects that take place within a Renewable Energy Development Zone (REDZ) and electricity infrastructure that takes place within a Strategic Transmission Corridor only require a Basic Assessment and do not need to undergo the longer and more comprehensive Scoping and Environmental Impact Reporting 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.
- **Government Regulation No 435** of March 2019, published under the National Environmental management Act, 1998 (NEMA) provides for a generic Environmental Management Programme relevant to applications for environmental authorisation for overhead electrical infrastructure that triggers activity 11 or 47 of the EIA Regulations Listing Notice 1 or activity 9 of the EIA Regulations Listing Notice 2.
- **GN 2313** of 27 July 2022 adopts the "Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas" (the Standard). This Standard has been adopted in terms of section 24(10)(a) of NEMA to allow for the exclusion, in terms of section 24(2)(d) of NEMA, of activities which relate to the development and expansion of electricity transmission and distribution infrastructure as identified in Listing Notices 1 and 2 of the Environmental Impact Assessment (EIA) Regulations, promulgated under section 24(5) of NEMA as well as any listed or specified activities necessary for the realisation of such infrastructure which includes substations, as described in the scope of this Standard. When submitting an Application to DFFE for electrical infrastructure falling within strategic transmission corridors, it is necessary to confirm whether the exclusion applies to the project being applied for. This 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.

2.1.4 National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) regulates waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development. In fulfilling the rights contained in Section 24 of the Constitution, the State, through the organs of state responsible for implementing this Act, must put in place uniform measures that seek to reduce the amount of waste that is generated and, where waste is generated, to ensure that waste is re-used, recycled and recovered in an environmentally sound manner before being safely treated and disposed. By implication, the interpretation and

application of the Act must be guided by the national environmental management principles set out in Section 2 of NEMA.

The EMPr contains a number of impact assessment outcomes and actions that include waste management measures to ensure that:

- All reasonable measures must be taken to avoid the generation of waste and where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger human health or the environment or cause a nuisance through noise, odour or visual impacts;
- Prevent any employee or any person from contravening this Act; and prevent the waste from being used for an unauthorised purpose;

The proposed development does not trigger any listed activities (under Categories A and B) of this Act and as such does not require a Waste Management Licence.

2.1.5 National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)

This Act provides for the management and conservation of South Africa's biodiversity, protects species and ecosystems, ensures sustainable use of indigenous biological resources, ensures fair and equitable sharing of benefits arising from the commercial use of these resources, and to establish a South African National Biodiversity Institute. The Act also covers alien and invasive species and genetically modified organisms that pose a threat to biodiversity. As such, it controls and regulates:

- Threatening activities occurring in identified ecosystems.
- Activities which may negatively impact on the survival of identified threatened or protected species.
- Restricted activities involving alien or listed invasive species.
- The Act also provides for regulations and lists regarding Threatened and Protected Species (TOPS).

The following regulations may be of relevance throughout the various phases of the proposed development:

- **GNR 324** of Government Gazette No. 37596 of 2014 provides the Amendment to the Threatened or Protected Species Regulations.
- **GNR 1002** of Government Gazette No. 34809 of 2011, provides a national list of terrestrial ecosystems that are threatened and in need of protection.
- **GNR 151** of Government Gazette No. 29657 of 2007 and GNR 1187 in Government Gazette 30568 of 2007 provides a list of critically endangered (CR), endangered (EN), vulnerable (V) and protected species.
- **GNR 988** of Government Gazette No. 41919 of 2018 provides amendments to the alien and invasive species list as well as the critically endangered, endangered, vulnerable and protected species.
- **GNR 599** of Government Gazette No. 37886 of 2014 and GNR 864 of Government Gazette No. 40166 of 2016 provides a list of invasive and alien plant species.
- **GNR 598** of Government Gazette No. 37885 of 2014 provides the Alien and Invasive Species Regulations. GNR 112 of Government Gazette No. 41445 of 2018 provides the draft alien and invasive species regulations in terms of categories, potential eradication and control techniques and the requirements for the application of permits.

- **GNR 529** of Government Gazette No. 40889 of 2017 provides the most updated amendments to the Regulations on the Convention of International Trade in Endangered Species (CITES) of wild fauna and flora.
- Section 76 of the NEMBA (Act 10 of 2004) provides guidelines for monitoring, control and eradication plans for species listed as invasive in terms of Section 70 of this Act.

2.1.6 National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)

This Act regulates all aspects of air quality, including prevention of pollution and environmental degradation; providing for national norms and standards regulating air quality monitoring, management and control; and licencing of activities that result in atmospheric emissions and have or may have a significant detrimental effect on the environment.

This project will not require an air emissions licence. However, construction activities may result in the temporary exposure to dust, which will need to be appropriately controlled.

2.1.7 National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended

The National Environmental Management: Protected Areas Act intends to provide for:

- The protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.
- The establishment of a national register of all national, provincial, and local protected areas.
- The management of those areas in accordance with national norms and standards.
- Intergovernmental co-operation and public consultation in matters concerning protected areas.
- The continued existence, governance and functions of South African National Parks; and
- Matters in connection therewith.

For this project, the proposed powerline route does not directly impact on any protected areas.

2.1.8 Limpopo Environmental Management Act 2003, Act 7 of 2003.

This is the relevant statute in Limpopo Province, which aims to manage the removal and destruction of rare and endangered species. Whilst this act is in need of an update, it provides specialists with a basic tool to highlight both protected and specifically protected species which will require permits to relocate.

2.1.9 National Water Act, 1998 (Act 36 of 1998)

The National Water Act, 1998 (Act 36 of 1998) provides the legal framework for the effective and sustainable management of the country's water resources. The DWS is the overall responsible management authority. In line with the international trend of integrated water resource management, the NWA aims to manage rivers, dams, wetlands, surrounding land, groundwater, as well as human activities that influence them, in an integrated way. It provides for the protection, use, development, conservation, management and control of water resources. Section 21 of the NWA identifies 11 consumptive and non-consumptive water uses which must be authorized under a tiered authorization system.

In general, a water use must be licensed unless:

- It is listed in Schedule 1 of the Act.
- Is an existing lawful water use.
- It is permissible under a General Authorisation.
- A responsible authority waives the need for a license.

As development or modifications of watercourses or wetlands are not included in Schedule 1, a licence is required to carry out any activity involving modifications to watercourses or wetlands. For this project, the powerline will potentially affect wetlands within 500 m of the alignment and thus will trigger the following water uses:

- **Section 21(c)** Impeding or diverting the flow of water in a watercourse.
- **Section 21**(i) Altering the bed, banks, course, or characteristics of a watercourse

For this project, as confirmed by the specialist study risk assessment, applications for General Authorisation (GA) of water uses will be required in accordance with DWS General Notice (GN) 509 Government Gazette No. 40229 (2016).

2.1.10 National Forest Act, 1998 (Act 84 of 1998)

In terms of the National Forests Act, 1998 (Act 84 of 1998), trees in natural forests or protected tree species (as listed in Government Gazette Notice 1935 of 25 March 2022) may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold, except under licence granted by DFFE. Each application is evaluated on merit before a decision is taken whether or not to issue a licence (with or without conditions). Such decisions must be in line with national policy and guidelines.

For this project, one tree species in the study area has been identified as protected under the Act. If necessary, licenses will be applied for.

2.1.11 Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)

The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) states that no degradation of natural land is permitted. The Act requires the protection of land against soil erosion and the prevention of water logging and salinisation of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed, as well as protection of vegetation and the combating of weeds and invader plants.

2.1.12 National Heritage Resources Act, 1999 (Act 25 of 1999)

The National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999) aims to promote an integrated system for the identification, assessment and management of the heritage resources of South Africa. Furthermore, it established SAHRA (South African Heritage Resources Agency) to implement the Act.

Section 38 (1) of the NHRA lists development activities that would require authorisation by the responsible heritage resources authority. Activities considered applicable to the proposed project include the following:

(a) The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length.
(c) Any development or other activity which will change the character of a site; and
(i) exceeding 5 000 m² in extent. or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years

The NHRA requires that a person intending to undertake such an activity must notify the relevant national and provincial heritage authorities at the earliest stages of initiating such a development. The relevant heritage authority would then, in turn, notify the person whether a Heritage Impact Assessment Report should be submitted.

As graves have been encountered along the proposed alignment, Section 36 of the Act, which makes provision for the care of burial grounds and graves, will apply to this project.

2.1.13 Civil Aviation Act, 2009 (Act No. 13 of 2009)

The Civil Aviation Act, 2009 (Act No. 13 of 2009) governs civil aviation in South Africa. The Act provides for the establishment of a stand-alone authority mandated with the controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by the South African Civil Aviation Authority (CAA), an agency of the Department of Transport. The CAA achieves the objectives of the Act by complying with the Standard and Recommended Practices of the International Civil Aviation Organisation, while considering the local context when issuing the South African Civil Aviation Regulations. All proposed developments or activities in South Africa that potentially could affect civil aviation must be assessed by CAA in order to ensure civil aviation safety.

For this project, an Obstacle Application will be submitted to the CAA.

2.1.14 Occupational Health and Safety Act, 1993 (No. 85 of 1993)

This Act provides for the health and safety of persons at work and the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.

Eskom and its appointed Contractors/Sub-Contractors will need to adhere to the requirements of this Act as it relates to construction and operation of the proposed powerline.

2.1.15 National Road Traffic Act, 1996 (Act No. 93 of 1996), and National Traffic Regulations, 2000

The National Road Traffic Act, 1996 (Act No. 93 of 1996), and National Traffic Regulations, 2000, provide certain limitations on vehicle dimensions as well as axle and vehicle masses that a vehicle using a public road at any given time must comply with. Certain vehicles and loads cannot be moved on public roads without exceeding the limitations in terms of the dimensions and/or mass as prescribed. Where such a vehicle or load cannot be dismantled, without disproportionate effort, expense, risk, or damage, into units that can travel or be transported legally. Such load is classified as an abnormal load and is permitted to be transported on public roads under an exemption permit issued in terms of Section 81 of the Act.

Eskom (or its appointed contractors) are responsible for procuring permits for abnormal loads of large materials/components that need to be transported to site.

2.2 National, provincial and local policies and plans

Applicable to the context of the proposed project, are the following policies and plans:

- National Development Plan 2030 (NDP).
- Capricorn District Municipality Integrated Development Plan 2020/2021 (IDP)
- Polokwane IDP
- Polokwane Spatial Development Framework, 2010 (SDF).
- The Limpopo Conservation Plan V2 (LCPv2, 2013).
- District and local bye-laws.

2.3 Guidelines

National Guidelines relevant to the project include:

- Department of Environmental Affairs (DEA) Integrated Environmental Management (IEM) Guidelines Series (2010).
- DEA Companion Guideline on the Implementation of the Environmental Impact Assessment Regulations (2014).
- DEA Public Participation Guideline (2017).
- DEA Guideline on Need & Desirability (2017).

Eskom protocols[5] relevant to this project include:

- Environmental Impact Assessment Directive ESKADABE9.
- EIA Procedure for Reticulation and Sub Transmission Lines SCSPCABP7.
- EMP Procedure ESKPVAAZ1.
- Farm Access Protocol.

2.4 Authorisations, permits and licenses

The main authorisations/licenses/permits required or potentially required for the proposed project are summarised in Table 2.

5 Note that Eskom was unable to provide ACER with the latest versions of these protocols.

Table 2 Environmental licenses/permits required (or potentially required) for the proposed deviations

#	License/Permit	Authority
1	Environmental Authorisation	DFFE: Integrated Environmental Authorisations
2	Heritage Permit *	SAHRA
3	Protected Tree Permits*	DFFE: Forestry
4	Protected Plant Permits*	DFFE: Biodiversity
5	Water Use via a General Authorisation	Department of Water and Sanitation
6	Obstacle approval	Civil Aviation Authority

*Only required if the resource is directly impacted

3. BA PROCESS AND APPROACH

3.1 Applicant

The Applicant for this project is Eskom, trading as Eskom Holding SOC LTD. Eskom is a South African electricity public utility. This project is overseen by the office of Limpopo Eskom Distribution under Limlanga cluster, based in Polokwane (92 Hans van Rensburg Street, Polokwane, 0700).

3.2 Qualifications and experience of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants is a well-established company with wide ranging expertise in environmental management and assessment processes. ACER has twice won the International Association of Impact Assessment, South Africa (IAIAsa) National Premium Award for excellence in environmental management and assessment. The qualifications and experience of the ACER team working on this project are listed in Table 3 and *curriculum vitae* are provided in Appendix 1.

Table 3 Qualifications and experience of the Environmental Assessment Practitioner (EAP) Team

Name	Academic Qualification	Relevant Work Experience and registrations
Mrs A McKenzie (Pr. Sci. Nat). Project Manager, EAP, Public Participation and Author.	MSc	More than 21 years' experience in the field of environmental management. Registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2019/1337) and the South African Council for Natural Scientific Professions (SACNASP) in the field of environmental science (Registration No 400026/05).
Mrs N Nadasen (EAPASA and IAIA registered) Senior Environmental consultant and Reviewer	MSocSc	Over 8 years' experience in the field of environmental management. She is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA)- Registered EAP (2020/988) and the International Association for Impact Assessment (IAIA)- Registered Member (5947).

3.3 Details of the specialist team

Details of the specialist team are shown in Table 4.

Table 4 Details and experience of the specialists

Specialist Field	Specialist	Organisation	Registration
Avifauna	Megan Diamond	Feathers Environmental Services	SACNASP Pr.Sci.Nat. 300022/14
Heritage	Nikki Mann	PGS Heritage	Professional Archaeologist with the Association of Southern African Professional Archaeologists.
Riparian/ Wetland	Suheil Hoosen	ENVASS	SACNASP (Pr.Sci.Nat. – 120680)
Social	Lloyd McFarlane	ACER (Africa) Environmental Consultants	Botswana EAP Board (Ref. No. BEAPA/2018/0085)
Vegetation	Wayne Westcott	ENVASS	SACNASP (Pr.Sci.Nat. – 117334)
Visual	Jon Marshall	Environmental Planning and Design	Professional Landscape Architect (SACLAP) Chartered Member of the Landscape Institute (United Kingdom)

3.4 Listed activities triggered by the project

Activities from Listing Notice 1 (GN R.327) and Listing Notice 3 (GN. R. 324) (as amended) are triggered by the project and are detailed in Table 5. Relevant co-ordinates of the proposed linear infrastructure have been provided in Table 1 and the locations in Figure 1 and Figure 2. Since an EA authorises only the listed activities included in the Application for Authorisation (Appendix 2), a precautionary approach is followed when identifying listed activities that could potentially be triggered by the development.

Table 5 Listed activities triggered by the proposed deviations to the authorised Nhluvuko-Tshebela 132 kV powerline alignment

Activity Number and Description (Listing Notice 1 - GN.R 327)		Portion of the proposed project to which the applicable listed activity relates
11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity— outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; …..	A 132 kV distribution line is currently under construction under an existing Environmental Authorisation (EA Reference:12/12/20/2237). Application is being made for three deviations from the authorised route. These three deviations, referred to as Bend 1, Bend 2 and Bend 3-6 respectively, will only be constructed once the amendment to the EA is authorised. The deviations fall outside urban areas and industrial complexes.
12 (ii) (c)	The development of— (i) …. (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) … (b) …… (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —	The proposed deviations of the 132 kV line cross drainage lines/water courses in rural areas. The 132 kV distribution line will be strung on single steel pole structures. Each single steel pole structure will have a footprint of approximately 2 m^2. There will be no hard structures placed in watercourses or within 32 m of watercourses. However, the servitude under the line will be cleared of large shrubs and trees 4-8 m either side of the line. The naturally occurring grasses and low lying vegetation will remain growing under the line.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The EAP has requested confirmation from DFFE as to whether DFFE considers a powerline to be an industrial land use, in order to determine whether this activity will be triggered or not. A response has not been provided to date and therefore, as a precaution, this listed activity will be applied for. With a 15.5. m servitude either side of the line, collectively the three deviations affect approximately 21 ha (although Bend 1 on its own affects less than 1 ha).
Activity Number and Description (Listing Notice 3 - GN.R 324)		Portion of the proposed project to which the applicable listed activity relates
12 (e) (ii) and (iii)	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 e. Limpopo	The proposed deviation Bend 3-6 intersects with CBA1 and CBA2 areas. As such the clearing of more than 300 square meters of vegetation triggers this listed activity.

	i. …… ii. Within critical biodiversity areas identified in bioregional plans; or iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	No information on land zonation in this area is available.

3.5 Basic assessment process and timeframes

The application for environmental authorisation requires a Basic Assessment to be undertaken in accordance with regulations 19 and 20 of GN No. 326 (07 April 2017) as shown in Figure 3. Public participation is to be undertaken in accordance with Chapter 6 of GN No. 326 (refer to Table ii). A detailed description of public participation undertaken for this project is provided in Chapter 4 of this BAR.

Based on the current regulations, the EAP must complete the Basic Assessment within 90 days of acceptance of the Application for Authorisation by DFFE.

It is important to note that timeframes in the EIA Regulations are based on calendar days and the following conditions apply:

- 15 December to 5 January are excluded from the calculation.
- No Public Participation between 15 December and 5 January unless justified by exceptional circumstances.
- Organs of State to comment within 30 days from the date on which it was requested to submit comments.
- For this project, which falls within a Strategic Transmission Corridor, the CA must issue a decision within 57 days.
- Notification of decision by CA within 5 days of date of decision.
- An appeal period of twenty days is allowed for, whereby any person wishing to lodge an appeal against the decision must submit the appeal within 20 (twenty) days from the date of notification of the decision.

3.6 Pre-application consultation

ACER submitted a Request for a Pre-application meeting, along with a proposed Plan for Public Participation, to DFFE on 30 May 2022. A Pre-Application Meeting was held on 29 June 2022. ACER was advised that, as of May 2022, DFFE no longer comments on Plans for Public Participation.

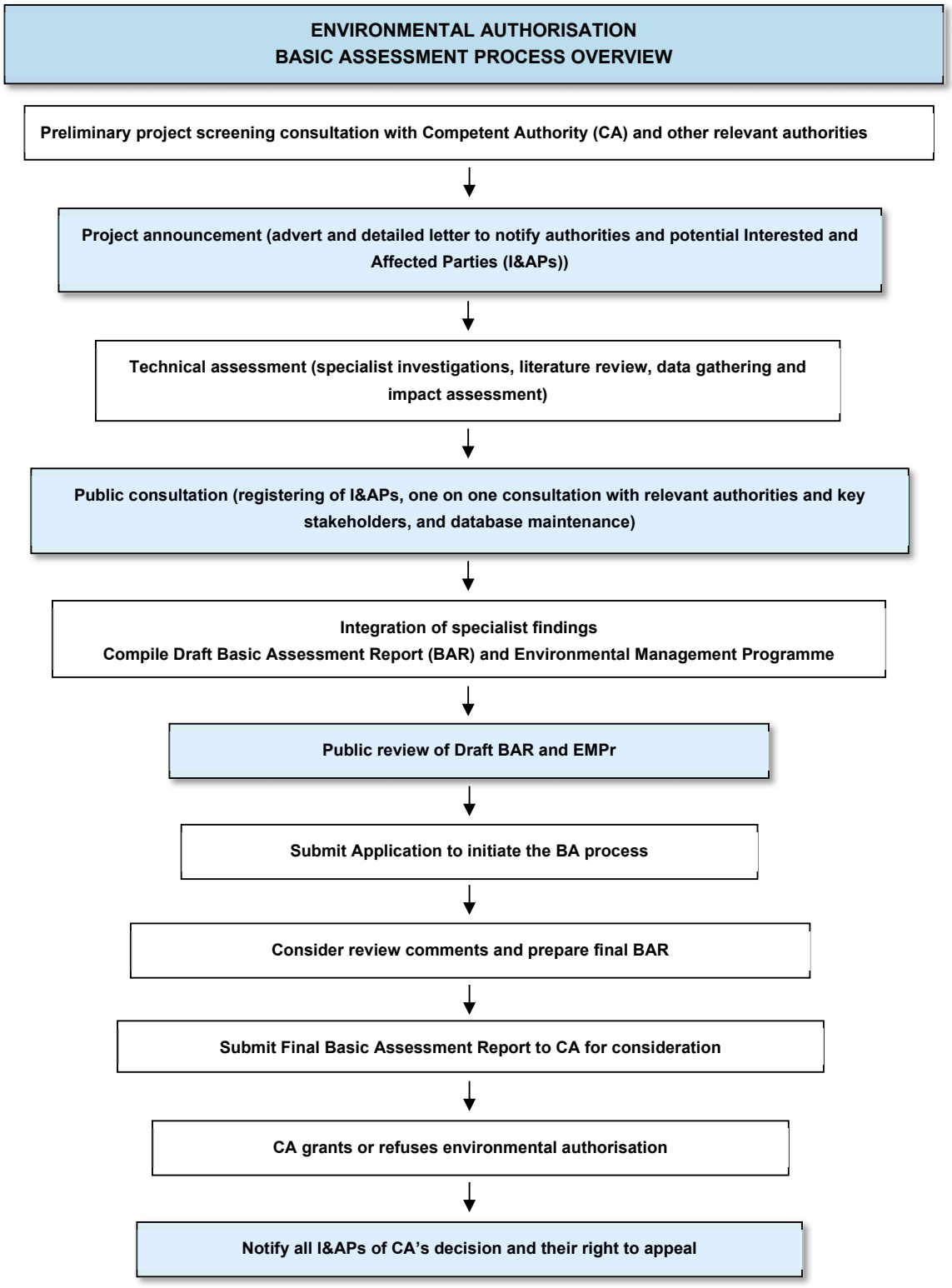


Figure 3 The phases of a Basic Assessment

3.7 Pre-application screening and specialist studies

A mandatory Environmental Screening Report (Appendix 3) was generated for each deviation using the *pro-forma* provided on the national Department of Environmental Affairs' website (https://screening.environment.gov.za/screeningtool/#/pages/welcome). The footprint for Screening was provided as the length of the deviation e with a 500 m buffer on either side (note that the servitude width is 15.5 m either side). The output of the Screening Tool Assessment is outlined below.

3.7.1 Development footprint sensitivities

3.7.1.1 EMF areas, wind and solar developments

The powerline infrastructure comprising Bend 1 falls within 30 km of an approved solar PV development (14/12/16/3/3/2/1049), (20.7 km distant).

The powerline infrastructure comprising Bend 3-6 falls within 30 km of two approved solar PV developments EA References: 12/12/20/2153 and 14/12/16/3/3/2/1049 (15.4 km and 6.8 km distant, respectively).

Bend 1 and Bend 3-6 also fall within the Olifants EMF (borderline).

3.7.1.2 Strategic transmission corridor for bulk electricity

All three deviations are located within a strategic transmission corridor for bulk electricity. Please refer to Appendix 4 (Supporting Maps), for a map showing the location of the proposed project in relation to the strategic transmission corridor.

3.7.1.3 Theme sensitivities

The theme sensitivities identified in the DFFE Screening Tool auto-generated report are shown in Table 6.

Table 6 Theme sensitivities identified in the DFFE Screening Tool auto-generated report

#	Sensitive Feature	BEND 1	BEND 2	BEND 3
1	Within an EMF	Olifants EMF√	x	Olifants EMF√
2	Within 30 km of wind or solar development	√ (20.7 km)	x	√ (15.4 km & 6.8 km)
3	**Theme Sensitivity**			
3.1	Agriculture	High	High	Medium
3.2	Animal species	Medium	Medium	Medium
3.3	Aquatic Biodiversity	Low	Low	Very High
3.4	Archaeological & Cultural Heritage	Low	Low	Low
3.5	Civil Aviation	High	High	High
3.6	Defence	High	High	High
3.7	Palaeontology	Medium	Medium	Medium
3.8	Plant Species	Medium	Medium	Medium
3.9	Terrestrial Biodiversity	Low	Low	Very High

The screening tool recommends various Specialist Assessments (see Table 7) to be undertaken; with a proviso that the footprint sensitivities are identified on site by a suitably qualified person before the specialist assessments identified can be confirmed. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist studies, including the provision of photographic evidence of the site situation. This is dealt with in the following section.

3.7.2 Specialist studies recommended by Screening, confirmation of theme sensitivities and motivation for inclusion/exclusion of recommended specialist studies

Specialist studies recommended by Screening, and a motivation for their inclusion or exclusion from the Basic Assessment, are outlined in Table 7a, 7b and 7c.

Table 7a Recommended specialist studies, site sensitivity verification and motivation for inclusion/exclusion of specialist studies (BEND 1)

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 1)
Landscape/ Visual Impact Assessment.	N/A	N/A	Included	Refer to the VIA report in Appendix 5.
Archaeological and Cultural Heritage Impact Assessment	Low	Low. A walkdown of final alignment and chance finds procedure will be undertaken.	Included	Refer to the HIA report in Appendix 5.
Palaeontology Impact Assessment.	Medium	Insignificant//Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5. The HIA report confirmed that, according to the Palaeo-sensitivity Map available on the South African Heritage Resources Information System database (SAHRIS), the Palaeontological Sensitivity of the Bend 1 area is rated as Insignificant/Zero and no further palaeontological studies are required.
Terrestrial Biodiversity Impact Assessment.	Low	Site Ecological Importance assessment found areas of High, Medium and Very Low sensitivity	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.
Aquatic Biodiversity Impact Assessment	Low	Low. There are no watercourses within 500 m of the alignment.	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.
Avian Impact Assessment.	Animal species was indicated as Medium	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 1)
Hydrology Assessment	N/A	Insignificant. There are no watercourses on site.	Eskom has already undertaken floodline assessments for the powerline alignment.	The aquatic biodiversity study confirmed that there are no watercourses on site.
Socio-economic Assessment	N/A	Medium-Low	Included	Refer to the Socio-economic Impact Assessment report in Appendix 5.

Table 7b Recommended specialist studies, site sensitivity verification and motivation for inclusion/exclusion of specialist studies (BEND 2)

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 2)
Agricultural Impact Assessment	High	Medium-Low. Some subsistence maize cropping is affected on western end.	Included (desktop)	Refer to Agricultural Assessment report in Appendix 5.
Landscape/ Visual Impact Assessment.	N/A	N/A	Included	Refer to the VIA report in Appendix 5.
Archaeological and Cultural Heritage Impact Assessment	Low	Medium-High as site specific sensitive features (including possible graves) were found along the alignment.	Included	Refer to the HIA report in Appendix 5.
Palaeontology Impact Assessment.	Medium	Insignificant/ Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5. The HIA report confirmed that, according to the SAHRIS Palaeo-sensitivity Map, the Palaeontological Sensitivity of the Bend 2 area is rated as Insignificant/Zero and no further palaeontological studies are required.
Terrestrial Biodiversity Impact Assessment.	Low	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 2)
Aquatic Biodiversity Impact Assessment	Low	While several watercourses (including wetlands) were identified within 500 m, no watercourses are at risk of being impacted on by Bend 2.	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.
Avian Impact Assessment.	Animal species was indicated as Medium	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.
Civil Aviation Assessment.	High	Medium	Compliance Statement included. An Obstacle Application is in progress.	While the DFFE Screening Tool has assigned a Theme Sensitivity rating of Very High and High along the entire powerline alignment, after site verification, the EAP has assessed the Civil Aviation theme as Medium Sensitivity. This is due to the nature of the proposed development and its location in relation to other existing powerlines and aerodrome facilities, which suggests that there is low potential for negative impacts on the civil aviation installation, and if there are impacts, there is a high likelihood of mitigation. Any mitigation measures required will be identified by the SACAA and Eskom in response to the outcome of the Obstacle Application process, and implemented by Eskom. Subject to approval by the CAA, the project should be authorised.

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 2)
RFI Assessment. (Radio Frequency Interference)	Not indicated	Medium	Compliance Statement included. An Obstacle Application is in progress.	According to Zhang *et al*. (2019) the protecting distance between radar stations and ultra high voltage power transmission lines is at least 2.2 km. The DFFE Screening Tool does not mention radar facilities, although it does assign a Civil Aviation Theme Sensitivity rating of High, due to Bend 2 being between 15 and 35 km of a major civil aviation aerodrome. No radar towers were observed on site. Given that the proposed line is one of several other lines within similar proximity to existing radar facilities 15-35 km away, it is assumed that if there is an impact, it can be mitigated to acceptable levels. An Obstacle Application is in progress during which the CAA also considers the RFI impact on aviation. Any mitigation measures required will be identified by the CAA. Subject to approval by the CAA, the project should be authorised.
Geotechnical Assessment	N/A	A specialist geotechnical assessment will be undertaken by Eskom on finalisation of the tower positions.	Excluded from this BAR. A specialist geotechnical assessment will be undertaken by Eskom on finalisation of the tower positions.	Unlike for substations, where geotechnical studies are undertaken at an early stage of the project, for overhead powerlines, Eskom undertakes a geotechnical assessment only once the tower positions are finalised, after obtaining input from the environmental specialists, Basic Assessment and the Environmental Authorisation. For obvious reasons, it is unfeasible and contra-indicated for Eskom to undertake a generalised geotechnical assessment over a 1 km wide and 18 km long corridor for an overhead powerline, as Eskom requires exact and accurate information at each specific tower position to pinpoint the exact type of foundations required for each tower. The intervening overhead sections of line have no geotechnical impact.
Plant Species Assessment	Medium	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.
Animal Species Assessment	Medium	Low (excluding birds, which are separately assessed)	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.

Table 7c Recommended specialist studies, site sensitivity verification and motivation for inclusion/exclusion of specialist studies (BEND 3-6)

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 3-6)
Agricultural Impact Assessment	Medium	Low	Included (desktop)	Refer to Agricultural Assessment report in Appendix 5 as well as Section 7.7 of this BAR.
Archaeological and Cultural Heritage Impact Assessment	Low	Low. Remains of structures found with low or no heritage significance.	Included	Refer to the HIA report in Appendix 5.
Palaeontology Impact Assessment.	Medium	Low /Zero	Excluded	Refer to Section 9.3 of the HIA report in Appendix 5. The HIA report confirmed that, according to the SAHRIS Palaeo-sensitivity Map, the Palaeontological Sensitivity along Bend 3-6 is rated mostly as Insignificant/Zero and no further palaeontological studies are required. Only one site within Bend 3-6 study area, was rated as Low significance. No further palaeontological studies are required, however a protocol for incidental palaeontological finds is required for this area.
Terrestrial Biodiversity Impact Assessment.	Very High	Site Ecological Importance assessment found areas of High, Medium and Very Low sensitivity	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.
Aquatic Biodiversity Impact Assessment	Very High	While several watercourses (including wetlands) were identified within 500 m, no watercourses are at risk of being impacted on by Bend 3-6.	Included	Refer to the Aquatic Biodiversity Impact Assessment report in Appendix 5.

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 3-6)
Avian Impact Assessment.	Animal species was indicated as Medium	Low	Included	Refer to the Avifauna Impact Assessment report in Appendix 5.
Civil Aviation Assessment.	High	Medium	Compliance Statement included. An Obstacle Application is in progress.	While the DFFE Screening Tool has assigned a Theme Sensitivity rating of Very High and High along the entire powerline alignment, after site verification, the EAP has assessed the Civil Aviation theme as Medium Sensitivity. This is due to the nature of the proposed development and its location in relation to other existing powerlines and aerodrome facilities, which suggests that there is low potential for negative impacts on the civil aviation installation, and if there are impacts, there is a high likelihood of mitigation. Any mitigation measures required will be identified by the CAA and Eskom in response to the outcome of the Obstacle Application process, and implemented by Eskom. Subject to approval by the CAA, the project should be authorised.
RFI Assessment. (Radio Frequency Interference)	Medium	Medium	Compliance Statement included.	The DFFE Screening Tool has assigned a Theme Sensitivity rating of Medium as there is a civil aviation radar feature between 15 and 35 km of the Bend 3-6 alignment. According to Zhang *et al.* (2019) the protecting distance between radar stations and ultra high voltage power transmission lines is at least 2.2 km. It was verified that there are no radar facilities along the actual proposed alignment of Bend 3-6. An Obstacle Application is in progress during which the CAA also considers the RFI impact on aviation. Any mitigation measures required will be identified by the SACAA. Subject to approval by the CAA, the project should be authorised.

Specialist Studies recommended (DFFE Screening Tool)	Theme sensitivity rating (DFFE)	Site sensitivity verification	Specialist study included/ excluded	Motivation/ comment (BEND 3-6)
Geotechnical Assessment	N/A	A specialist geotechnical assessment will be undertaken by Eskom on finalisation of the tower positions.	Excluded from this BAR. A specialist geotechnical assessment will be undertaken by Eskom on finalisation of the tower positions.	Unlike for substations, where geotechnical studies are undertaken at an early stage of the project, for overhead powerlines, Eskom undertakes a geotechnical assessment only once the tower positions are finalised, after obtaining input from the environmental specialists, Basic Assessment and the Environmental Authorisation. For obvious reasons, it is unfeasible and contra-indicated for Eskom to undertake a generalised geotechnical assessment over a 1 km wide and 18 km long corridor for an overhead powerline, as Eskom requires exact and accurate information at each specific tower position to pinpoint the exact type of foundations required for each tower. The intervening overhead sections of line have no geotechnical impact.
Plant Species Assessment	Medium	Low	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.
Animal Species Assessment	Medium	Low (excluding birds, which are separately assessed)	Included	Refer to the Terrestrial Biodiversity Impact Assessment report in Appendix 5.

3.8 Environmental Management Programme (EMPr)

An Environmental Management Programme (EMPr) prepared for the original development is currently in use by the construction Contractor on site. However, in order to comply with current legislation, an EMPr has been prepared as part of this assessment (Appendix 6) in accordance with GN 435 and incorporates generic as well as site specific mitigation and management measures. This EMPr will apply to the deviations specifically and cannot be applied retrospectively to components of construction already up and running for the construction contract (e.g. site camp, stockpiles, etc). Compliance monitoring and auditing of the contract will have to accommodate the requirements of both EMPRs once an EA has been issued for the deviations.

3.9 Assumptions, limitations and gaps in knowledge

Key assumptions, limitations and/or gaps in knowledge applying to the EAP are listed below. Additional discipline specific ones are listed in the individual specialist reports contained in Appendix 5.

- This BAR has drawn on primary and secondary information from various sources including the client; engineering team; national, provincial and municipal databases; municipal planning documents; specialist studies and input from Interested and Affected Parties. It is assumed that this information from these sources was true and correct at the time of writing this report.
- It is assumed that the project scope and information, including maps, GPS co-ordinates and kml files, provided by the client and the engineering/survey team to the EAP and specialists, are accurate.
- It is assumed that the existing site camp and existing approved access routes will be used when constructing the deviations (should they be authorised). Any new access and maintenance routes that may need to be developed will be outside of all delineated watercourses and associated no-go buffer zones.
- A 4- 8 m corridor will be cleared within the proposed deviations servitude, however no clearing will be conducted within delineated watercourses and their associated no-go buffer zones as the vegetation within these systems was observed to be below the minimum height clearance of approximately 6 m. Individual specimens which grow higher than 6 m during the operational phase will be trimmed with little to no direct impact.

4. PUBLIC PARTICIPATION PROCESS

Public participation can be defined as the identification of issues in the public domain. The objectives of public participation in an environmental assessment are to provide sufficient and accessible information to I&APs, in an objective manner, to assist them to:

- Identify issues of concern and provide suggestions for enhanced benefits and alternatives.
- Contribute local knowledge and experience.
- Verify that their issues have been considered.
- Comment on the findings of the assessment, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

The public participation process was designed to comply with the requirements of the 2014 EIA Regulations (as amended) as referenced in Table (ii). Public participation documentation is provided in Appendix 7.

4.1 Identification and registration of Interested and Affected Parties

Key stakeholders and other I&APs were identified, and their contact details incorporated into a project database (Appendix 7). Due to the nature of the area, reliance was placed on traditional authority structures to assist in dissemination of information and calling meetings for project announcement. Stakeholders included representatives of a variety of sectors, as shown in Table 8.

Table 8 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
Parastatals
Civil Aviation
Property owners and local residents
Non-Governmental Organisations/Community Based Organisations
Conservation/Environmental Groups
Traditional Authorities (Molepo)
Local Communities (Laaste Hoop, Podile, Mathorwane)

In particular, the following commenting authorities were requested to comment, in order to determine relevant environmental sensitivities and /or permit requirements.

- Polokwane LM.
- Capricorn DM.
- Limpopo Department of Economic Development, Environment and Tourism.
- Limpopo Department of Agriculture and Rural Development.
- Department of Forestry, Fisheries and the Environment (Biodiversity and Conservation Directorate).
- Department of Mineral Resources.
- South African Heritage Resources Agency.
- Civil Aviation Authority.
- Department of Defence.
- Molepo Traditional Authority

While consultation has taken place with representatives of different sectors of society, special efforts have been made to obtain the contributions of all people who may be directly affected by the proposed project.

4.2 Project announcement and invitation to participate

Notification of the project and the opportunity for I&APs to participate in the Basic Assessment process[6] was announced as follows:

- Onsite notices (English and Sepedi) were placed at strategic public locations along and/or nearby the proposed alignment, notifying I&APs of the proposed development and BA process (from 14 July 2022).
- Advertisements (English and Sepedi) were placed in the provincial newspaper, Seipone (15 July 2022).
- A letter, inclusive of a Background Information Document (BID) and Comment Sheet, was compiled and emailed to I&APs on the database (12 July 2022).
- Electronic copies of the notification letter, BID and comment sheet were sent to relevant Government departments and commenting authorities (12 July 2022 and additional on 20 July 2022).
- All I&APs who registered following the project announcement, were sent the letter and BID.
- Telephonic and/or email engagement with I&APs was undertaken as and when required.
- Direct correspondence and/or meetings with the local Ward Councillor, relevant Polokwane officials, and commenting authorities.
- Meeting with Molepo Traditional Council 2 August 2022.
- Community meetings held 30 September 2022.
- Where possible, community forums were notified of the BA process, by their representatives.
- Public documents were made available on ACER's website (https://acerafrica.co.za/).

4.3 Obtaining and dealing with comments from I&APs

The following opportunities have been provided to I&APs to contribute comments:

- Completing and returning Registration and Comment Sheets.
- Providing comments telephonically, by email and/or by way of onsite meetings and/or meetings conducted over Zoom (or similar remote technology).
- Verbal comments at community meetings.

4.4 Comments and Responses Report and summary of issues raised

Issues and concerns raised by I&APs have been captured in a Comments and Response Report (CRR) (see Appendix 8). Responses have been provided as applicable. To date, comments received from I&APs and relevant authorities relate to the following topics:

- Stakeholder registration and provision of information and mapping.
- Correspondence between ACER and DFFE on various process issues.
- Uploading of the project case to SAHRIS.
- The need to submit an obstacle application (CAA).
- Appreciation for consultant coming to inform members of the community.

[6] All relevant project documents were loaded onto ACER's website at the applicable time and were available for public review.

- Concerns regarding current authorised alignment already under construction (not the deviations):
  - Concern that a tower has been placed too close to the boundary of a homestead in Tsakane area (24.00819 S; 29.65279" E).
  - Concern that alignment will pass over a fenced off area that is set aside for use as a gravesite/cemetery (24.00782 S; 29.64840" E).

4.5 Circulation of the Draft BAR for public review and comment

Notification of the availability of the Draft BAR and request for comment will be undertaken as follows:

- Notification of registered I&APs via email.
- Uploading of the BAR to ACER's website.
- Lodging of the document at a suitable local venue.
- Notification via telephonic engagement if necessary, where registered I&APs do not have email.
- ACER will also make provision for the possibility of virtual meetings / posting of executive summaries, as reasonable alternative methods of public participation, if requested by I&APs.

4.6 Incorporation of review comments into final BAR and notification of submission to DFFE

- Comments submitted on the draft BAR will be recorded and responded to in the DBAR CRR, and matters raised will be addressed in the Final BAR, where appropriate.
- Registered I&APs will be notified by email, when the Final BAR is submitted to DFFE.
- A copy of the Final BAR will be made available on ACER's website.

4.7 Notification of DFFE's decision

- Registered I&APs will be notified by email once DFFE has made a decision, and notified of their right to appeal the Environmental Authorisation (EA).
- Notification via telephonic engagement if necessary, where registered I&APs do not have email.

5. DESCRIPTION OF THE PROJECT

5.1 Route and location

The location of the three proposed deviations along the previously authorised route alignment has been described in Section 1.3.1.

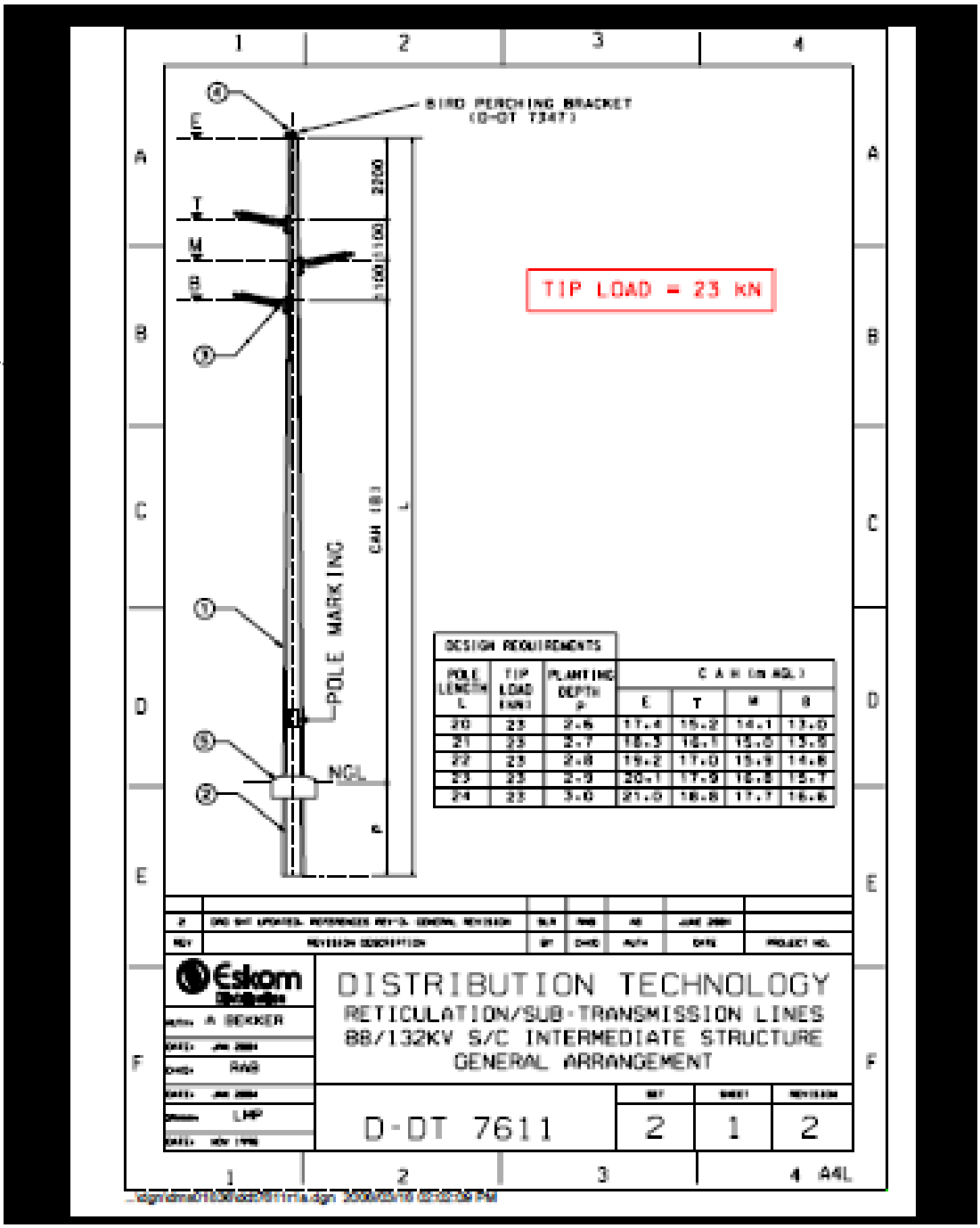
5.2 Technical specifications

Refer to Table 9 for technical specifications.

Table 9 Technical specifications of the 132 kV distribution line

Length	18 km
Voltage and Line	132 kV Kingbird power cable
Tower design	steel monopole (Plate 2, Figure 4)
Tower Height	Can vary from 18 m to 26 m depending on terrain/topography
Required clearance	6m
Tower footprint	Approx. 2 m^2
Distance between towers	Approx. 230 m
Permanent Servitude width	15.5 m on either side of the electrical cable
Vehicle access along servitude	Vegetation clearance is required for a distance of 4-8 m either side of the cable to allow for vehicle access under the line. Vegetation in the wider servitude that does not grow high enough to cause interference with overhead power lines, or cause a fire hazard is not cut or trimmed unless it is growing in the vehicle access area.

Plate 2 Typical 18m high 132kV self-sustaining steel monopole tower



POLE LENGTH L	TIP LOAD (kN)	PLANTING DEPTH P	CAN (in sq.) E	T	M	B
20	23	2.6	17.4	15.2	14.1	13.0
21	23	2.7	18.3	16.1	15.0	13.8
22	23	2.8	19.2	17.0	15.9	14.6
23	23	2.9	20.1	17.9	16.8	15.7
24	23	3.0	21.0	18.8	17.7	16.6

Figure 4 General specifications of steel monopoles for sub-transmisison lines

5.3 Construction activities

5.3.1 Details of the construction process

The construction of a proposed power line will typically entail the process described below.

- *Access negotiations*: negotiations between the landowner (where applicable), contractor and Eskom will be undertaken in order to determine access methods to the tower positions.
- *Establishment of construction camps*: for this project, there is an existing construction camp located next to the newly constructed Tshebela substation.
- *Tower pegging*: Eskom will appoint a surveyor to peg the central line of the power line servitude and to set out the location of the tower footprints. This work will be undertaken in two phases as follows:
  - Marking and pegging of the centre line of the proposed 132 kV power line route.
  - Marking and pegging the position of the tower positions.
- On-*site verification:* the surveyed line and tower positions will be inspected by relevant specialists (for example, avifauna and vegetation specialists) who will undertake their inspections before construction commences. If there is a problem with the alignment or tower site in their professional opinion, the surveyor is recalled to find a suitable alternative.
- *Vegetation clearance:* A 4-8 m wide strip directly under the position of the powerline will be cleared of all vegetation for construction access purposes. Any plants that could interfere with the construction, maintenance or operation of the powerline, will be removed or trimmed in accordance with relevant legislation and the EMPr.
- *Selection of best-suited structures and foundations:* a geotechnical and soil assessment is undertaken at each tower position to establish the type of foundation required according to the soil and rock type at each tower position.
- *Gate installation*: gates are installed where it is necessary to breach existing fence lines.
- *Excavation of foundations*: foundation holes (each approximately 2 m^2 in size) for each tower will be excavated to a depth of between 1.5 m and 2.0 m and filled with concrete once the monopole has been placed in position. During construction, fences will be temporarily erected around holes and working areas as a safety precaution.
- *Foundation of steelwork*: the foundation structures will be positioned into the excavated holes and tied together for support.
- *Concrete filling/foundation pouring*: a “ready-mix” truck, which contains 6 m^3 of concrete will be utilised to pour concrete into the foundation holes. If there are difficulties in gaining access for the truck, concrete will be mixed on site by hand or using mobile “mini mixers”.
- *Delivery of steel to tower site*: the steelwork is usually delivered to the site approximately one month after the foundation has been poured. Where possible, the steel is transported to the site by truck. If access is difficult by truck or sensitive environments prevent ground access, helicopters will be utilised to transport material to site.
- *Assembly team, punch and paint*: the tower is assembled whilst it is lying on the ground. Every nut is screwed into the framework and painted with a non-corrosive paint (“punch and paint”).
- *Erection of towers*: using cranes, the construction team will lift the towers into place. If the cranes cannot access a site, a helicopter is used to lift the tower into position.
- *Stringing, sag and tension*: large equipment is utilised during this activity. Two cable drums, with a winch in-between, are placed approximately 5 km apart. A pilot tractor lays the cable, which is then pulled up to the towers with the use of pulleys. Once the tension has been exacted, the conductor cables are strung, never touching the ground. In

mountainous areas, the pilot cables are flown in by helicopter or shot across valleys, to create the correct tension to pull through the conductors. A small team of people, with survey equipment, conducts the sag and tension process. Tension is then created, the conductors clamped into place at the tower, and the excess cable is cut off.

- *Rehabilitation*: this is a continuous process, conducted throughout the construction phase. Any bladed temporary access roads (considered unlikely) will be ploughed over, contoured and replanted with endemic grasses.

5.3.2 Construction camp and stockpile areas

Construction has already commenced for this contract (excluding the deviations) and thus a construction camp has already been established.

5.3.3 Access roads

Access will be via existing gravel roads and tracks in the area.

5.3.4 Water use

Water sources are already in place for this contract.

5.3.5 Effluent management

The deviations will not result in the generation of any effluent different to the current construction contract. The project is not expected to generate effluent, other than domestic waste. It is likely that ready-mix cement or pre-cast will be used for concrete structures, rather than mixing of cement on site. Chemical toilets will be provided for construction workers. These chemical toilets will be serviced by an appointed service provider and all waste will be disposed at an approved treatment works.

5.3.6 Solid waste management

Waste generated during construction activities will be removed from site and disposed of at an authorised landfill site(s) suited to the category of waste. It is anticipated that small volumes of waste will be generated including unused steel, conductor cables, cement or concrete and general domestic waste. Disposal will be undertaken by the contractor, in separate waste streams (for recycling) where possible and to authorised waste disposal sites.

5.3.7 Storm water management

Stormwater during construction will be managed to ensure that no contaminated water enters the surrounding natural environment.

5.3.8 Emissions

During construction, exhaust emissions will be generated from construction plant and vehicles. No other emissions are envisaged.

5.3.9 Noise

Noise will be generated during construction due to movement of vehicles and plant, excavations and other construction activities. Provided construction activities are confined to daylight hours, noise during construction is not anticipated to cause significant disturbance.

5.4 Job creation and procurement

A contractor and construction team is already in place on site.

5.5 Anticipated construction dates and programme

This contract is already under construction and is expected to be complete by October 2023. However, the deviations will only be constructed once an EA is issued during the course of 2023.

5.6 Operation and maintenance activities

Ongoing maintenance is required for the lifespan of the cable. Line inspections are usually undertaken once or twice per year, via vehicle inspections along the servitude. Defects on the line and towers which could have a detrimental effect on future line operation are identified and corrected as required. Servitude management also includes checking for bird mortalities and installing bird flight diverters or other mitigation as required, controlling soil erosion, periodic clearing and pruning of vegetation, and periodic clearing of the centre line track to ensure vehicle access. This entails Eskom personnel and vehicles gaining access to and traversing private properties.

5.7 Decommissioning activities

Decommissioning is not envisaged in the foreseeable future. Should decommissioning be required, it would need to be undertaken in accordance with applicable environmental legislation at the time.

6. PROJECT ALTERNATIVES

Alternatives are different means of achieving the purpose and need of a proposed development. They include alternative sites, layouts or designs, technologies and the "No Development" alternative. This chapter describes the various alternatives applicable to the proposed project.

6.1 Route and technology alternatives

This application is for an amendment to an authorised route for a line that is already under construction. The three deviations can be considered as preferred alternatives to the original route.

6.2 Technology alternatives

Technology alternatives do not apply to the deviations, which will be designed to the same specifications as the current powerline under construction.

6.3 "No Development" alternative

The "No Development" alternative does not strictly apply to this project, as the authorised powerline is already under construction. As the powerline is a required to link the newly constructed substation to the existing Nhluvuko substation it is not an option to leave the powerline unfinished. The deviations have been proposed in order to reduce impacts on both the biophysical and social environments. If the deviated sections are not constructed, then Eskom would have to construct the original alignments, which will more negative impacts than the deviations and are not preferred.

7. DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section describes characteristics of the receiving environment that may affect or be affected by the three proposed deviations along the Nhluvuko-Tshebela 132 kV overhead distribution line. Where relevant, information has been sourced directly from the specialist reports which are contained in Appendix 5 and listed under Chapter 13 (References). Citations are only provided where information has been obtained from other sources.

Photographs of important elements of the study area can be found in the text below as well as in the specialist reports.

7.1 Project area

The portion of land under assessment in this study falls within the Capricorn DM.

The project will have direct and indirect impacts on the biophysical and socio-economic environment. The limits or boundaries of the study area can be divided into the project's Direct Area of Influence and Indirect Area of Influence.

The Direct Area of Influence, which is the area directly affected by project activities, includes:

- The physical footprint of the towers to be placed between 200-250 m apart, along the deviation alignments (each tower has a footprint of approximately 2m^2).

- The area of clearance and construction underneath the cable within the permanent servitude (31 m).
- The area where vegetation will be permanently kept clear of any large trees or other vegetation that obstructs vehicle access (4-8 m directly under the line).
- Road /track access for construction.
- The construction camp site (which is already in use and being monitored under the EMPr under the existing EA).

A corridor of 500 m either side of the three deviations was investigated for watercourses and up to 100 m for vegetation.

The Indirect Area of Influence includes areas impacted by secondary effects, cumulative effects, and induced effects, which are not confined to areas directly adjacent to the infrastructure or within 500 m either side (for example, economic benefits from job creation).

7.2 Socio-economic characteristics

7.2.1 Planning and development context

The delivery of services such as water, electricity and sanitation are key concerns for many communities in the Capricorn DM. The availability of these basic services to communities has a direct impact on the quality of life of the population. The NDP and SIP laid out by the National Planning Commission identifies electricity provision as a necessity for development. District and local IDP and SDF are in alignment with national goals. This project aligns with national, provincial and local development planning objectives.

7.2.2 Land use

The land in the study area is primarily rural land under traditional authority, with small housing settlements and land under subsistence agriculture (mainly maize) and open veld which is grazed by cattle and goats. The western end of the 132 kV line runs close to the boundaries of larger privately owned farms under game and livestock grazing. The area is characterised by lower population densities and less infrastructure, hence lower access to services such as refuse removal, formal housing and electricity than what is usually provided in an urban area.

7.2.3 Institutional environment and role players

Some of the key project role players identified are listed below:

- Molepo Traditional Council.
- Communities from nearest villages.
- Polokwane LM.
- Capricorn DM.
- Eskom Distribution.
- Larger landowners adjacent to the project.

7.2.4 Population demographics

The Polokwane LM, one of four local municipalities forming the Capricorn DM, covers an area of approximately 3,766 km² with a total population of approximately 797,127 which equates to

a population density of 212 people per km^2. Approximately 60% of the district population resides within the Polokwane LM boundaries. The Polokwane IDP (2021, cited in McFarlane, 2022) indicates that people are moving towards the city in search of more opportunities associated with economic activities within the city. This trend of urbanisation is likely to continue, as opportunities are scarce in rural areas. Within the study area (Ward 2 and Ward 3), 90% of households are reported to reside in formal dwellings,3% in informal dwellings and 6% in traditional dwellings The population is characterised by a high proportion of people under the age of 35, with 65% of the population aged between 0 and 34 years (31% under the age of 15 and 39% between 15 and 34) (StatsSA, 2011, cited in McFarlane, 2022). The high proportion of the population being classified as young is indicative of a 'developing population' characterised by high birth rates and relatively short life expectancy.

7.2.5 Employment

Table 10 indicates the sectors of employment in the Polokwane LM. Unemployment in the Polokwane LM is reported to be 15.6%, well below unemployment levels for the Capricorn DM, reported to be 24.13%. It is highly likely that the recent economic downturns have increased these levels of unemployment as well as increased the dependency ratio. In the immediate project area, a high percentage (54%) of people are classified as not economically active or discouraged work seekers (StatsSA, 2011, cited in McFarlane, 2022).

Table 10 Employment composition by economic sector in the Polokwane Municipality

Sector	Percentage
Agriculture	4
Mining	1
Manufacturing	7
Electricity	1
Construction	9
Trade	27
Transport	5
Finance	13
Community Services	26
Household	7

7.2.6 Household income

South Africa experiences serious challenges in terms of poverty, inequality and unemployment. The majority of households (62%) within the Polokwane LM are reported to be living in the low income category of between R1 and R 76 800 per annum, which can be described as living under conditions of poverty in relation to the World Bank threshold.

7.2.7 Access to services (water, sanitation and electricity)

Services are available, but largely in the urban areas of the Capricorn DM and Polokwane LM. Further away from the City of Polokwane, there are noticeably less services available.

7.2.7.1 Water and sanitation

Access to piped water has decreased in the study area, signalling a deterioration of municipal infrastructure and services. However, this is still higher than the Capricorn DM (69%) and

Limpopo (63%). The ward level data indicate that 60% of households obtain their water from a regional or local service provider. Many households obtain water from a borehole. Regarding sanitation, only 3% of the population has access to flush or chemical toilets, which is far below the provincial and DM sanitation statistics.

7.2.7.2 Electricity

Although many households have access to electricity, there remains a high demand for electrical connections. The reliability and quality of supply also requires improvement. However, it must be noted that many households rely on firewood for cooking and heating due to the increasing cost of electricity.

7.2.8 Civil Aviation facilities

As indicated in the Civil Aviation compliance statement in Appendix 9, the DFFE Screening Tool has assigned ratings of High Sensitivity (due to dangerous and restricted airspace) and Medium Sensitivity due to the distance away from various aerodromes and civil aviation radar.

The proximity of the aerodromes closest to the proposed powerline deviations is as follows:

- Bend 1 is located approximately 31 km southeast of the Polokwane International Airport and the nearest other aerodrome (Microlight) is located approximately 15 km northwest.
- Bend 2 is located approximately 25 km southeast of the Polokwane International Airport and the nearest other aerodrome (Microlight) is located approximately 17 km northwest.
- Bend 3-6 is located approximately 23 km south of the Polokwane International Airport and the nearest other aerodrome (Microlight) is located approximately 13-15 km north.

It has been verified by the EAP during site visits during June 2022, that there are no aviation facilities along the proposed alignments.

An Obstacle Application Form has been submitted to the CAA. In this process, confirmation will be provided by the CAA as to what mitigation will be required (if any) for the proposed line.

7.2.9 Military bases

The South African National Defence Force operates a military base from the Polokwane International Airport. No known defence facilities are located along the proposed deviations. However, the South African Airforce also gives input to the CAA Obstacle Application process so would comment via this process on required mitigation (if any).

7.2.10 Crime and security risks

South Africa has a high crime rate due, inter alia, to high levels of inequality, poverty and unemployment, and a culture of general lawlessness and corruption. Contractors should also be aware of the “construction mafia” operating in South Africa, who have interfered with and delayed many government construction contracts, with serious negative consequences (https://globalinitiative.net/analysis/extortion-construction-mafia-south-africa/). As such, contractors working in the area need to be alert to the risks and take sensible precautions. Crime prevention and law enforcement are the domain of the South African Police Services. However, private security firms play a prominent role in protection of people and property, for

those that can afford to pay for this service. Should construction plant or materials need to be left on site, 24-hour security will likely be required.

7.3 Abiotic characteristics

7.3.1 Climate

The area has a low Mean Annual Rainfall which can fluctuate between 345 mm and 655 mm. Winters are dry and most of the rain falls in the summer months (October, January, February), with the highest rainfall being experienced in November (average of 85mm). Mean daily maximum and minimum temperatures range from 33.2 ºC (October) to 0.5 ºC (June). There are an average of 11 frost days per year.

With the notable peaks in rainfall, flash floods can occur and construction in the summer months is not advised, especially within close proximity to watercourses.

7.3.2 Climate change

The need to plan and adapt, in a multi-disciplinary way, to the challenges of extreme weather events is by now well recognised. For this project, taking into account erosion control and stormwater drainage during flood events, will be of relevance.

7.3.3 Geology, soils and topographic setting

The study area is situated within a hilly landscape, with moderate to steep gradients. Prominent geological features occur adjacent to most of the sites and include dry riverbed, large rocky outcrops and eroded drainage lines. The only section of relative flatness occurs around Bend 2, and has been transformed into agricultural fields, with little to no ecological value.

The geology associated within this landscape include migmatites and gneisses of the Hout River Gneiss and the Turfloop Granite (both of Randian Erathem) are dominant. Some ultramafic and mafic metavolcanics, quartzite and chlorite schist of the Pietersburg Group (Swazian Erathem) are also found.

Soils found within the study area are known to be freely drained, structureless soils, often being red or yellow in colour, with low to medium base status. Erosion gullies / dongas are common sight within the study area and therefore soil erosion management will be important in this area.

7.4 Terrestrial environment

7.4.1 Threatened Ecosystems (national)

The listing of Threatened or Protected ecosystems are categorised into Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected. According to the “Schedule of Threatened Terrestrial Ecosystems in South Africa” (promulgated under NEMBA Government Notice 1002 of 2011) the proposed development does not occur within any threatened ecosystems.

7.4.2 Provincial and municipal conservation planning

7.4.2.1 Environmental Management Framework

All three deviations fall within the Environmental Management Framework (EMF) for the Olifants River.

7.4.2.2 Critical Biodiversity and Ecological Support Areas

The Limpopo Province Map of Critical Biodiversity Areas and Ecological Support Areas (2018) encompasses the updated district municipality data and has the following CBA map categories:

- PA: Protected Area.
- CBA1: Critical Biodiversity Area 1.
- CBA2: Critical Biodiversity Area 2.
- ESA1: Ecological Support Area 1.
- ESA2: Ecological Support Area 2 .
- ONA: Other Natural Area.
- NNR: No Natural Remaining.

As shown in Figure 5, Bend 3-6 is the only deviation that intersects with a CBA1 and CBA2 area. Bend 2 intersects with ONA and NNR, and Bend 1 intersects with NNR.

7.4.3 Protected Areas and Important Bird and Biodiversity Areas (IBAs)

No protected areas are located along the proposed powerline route, however as shown in Figure 6, the following observations are made within the 5km and 10km radius established around the site.

- The Bewaarkloof Nature Reserve is found within 10km of Bend 1
- The Pietersburg Nature Reserve is found within 10km of Bend 3-6.
- The Nawilger Private Nature Reserve is found within 10km of Bend 3-6.
- The Limpopo Central Bushveld is found within 10km of Bend 3-6.

Important Bird and Biodiversity Areas (IBAs), as defined by BirdLife International, constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation. Two IBAs are found within a 10km radius of the proposed deviations, namely the Wolkberg Forest Belt and the Polokwane Nature Reserve (Figure 6).

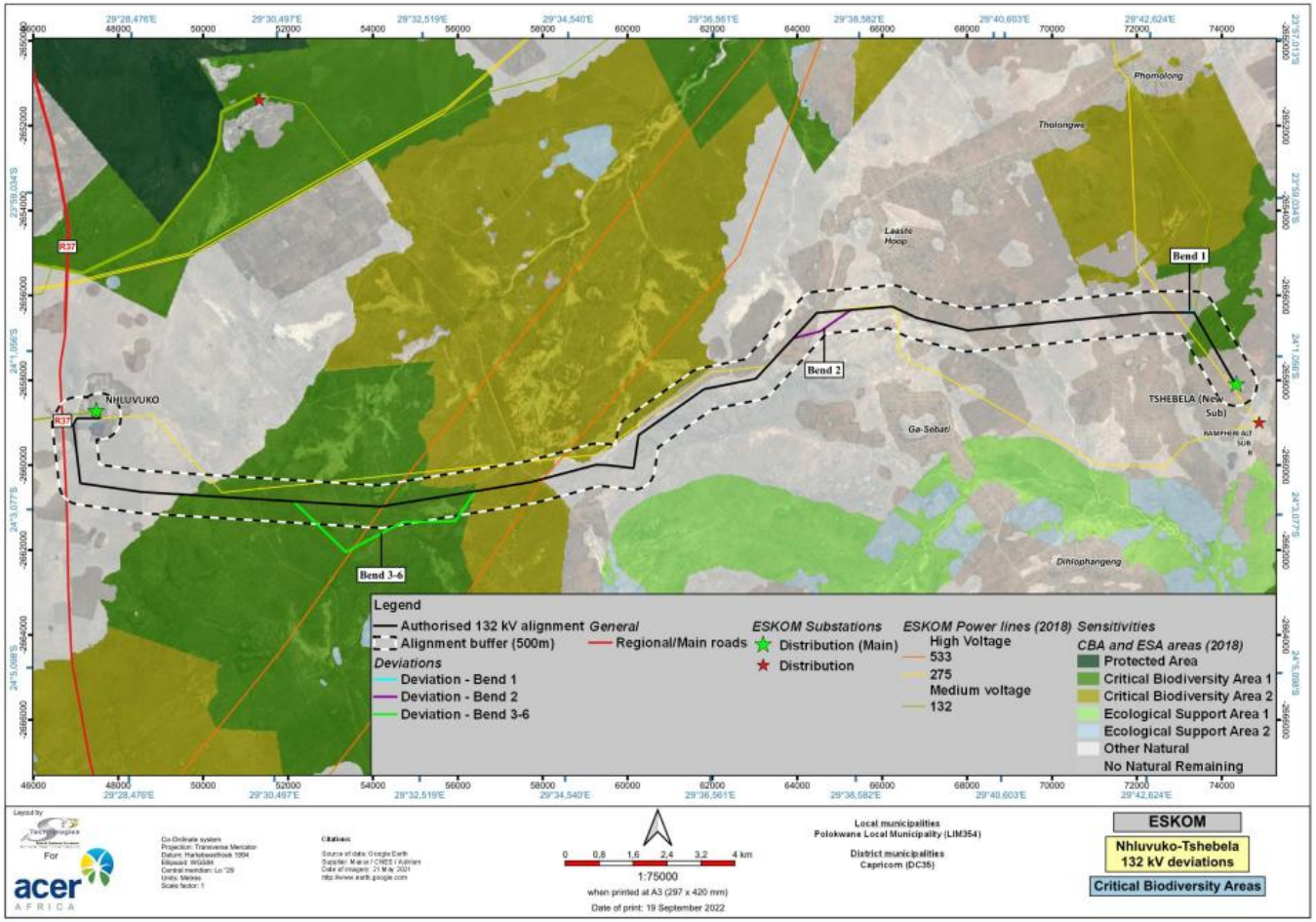


Figure 5 Critical Biodiversity Areas (CBA) occuring in the study area

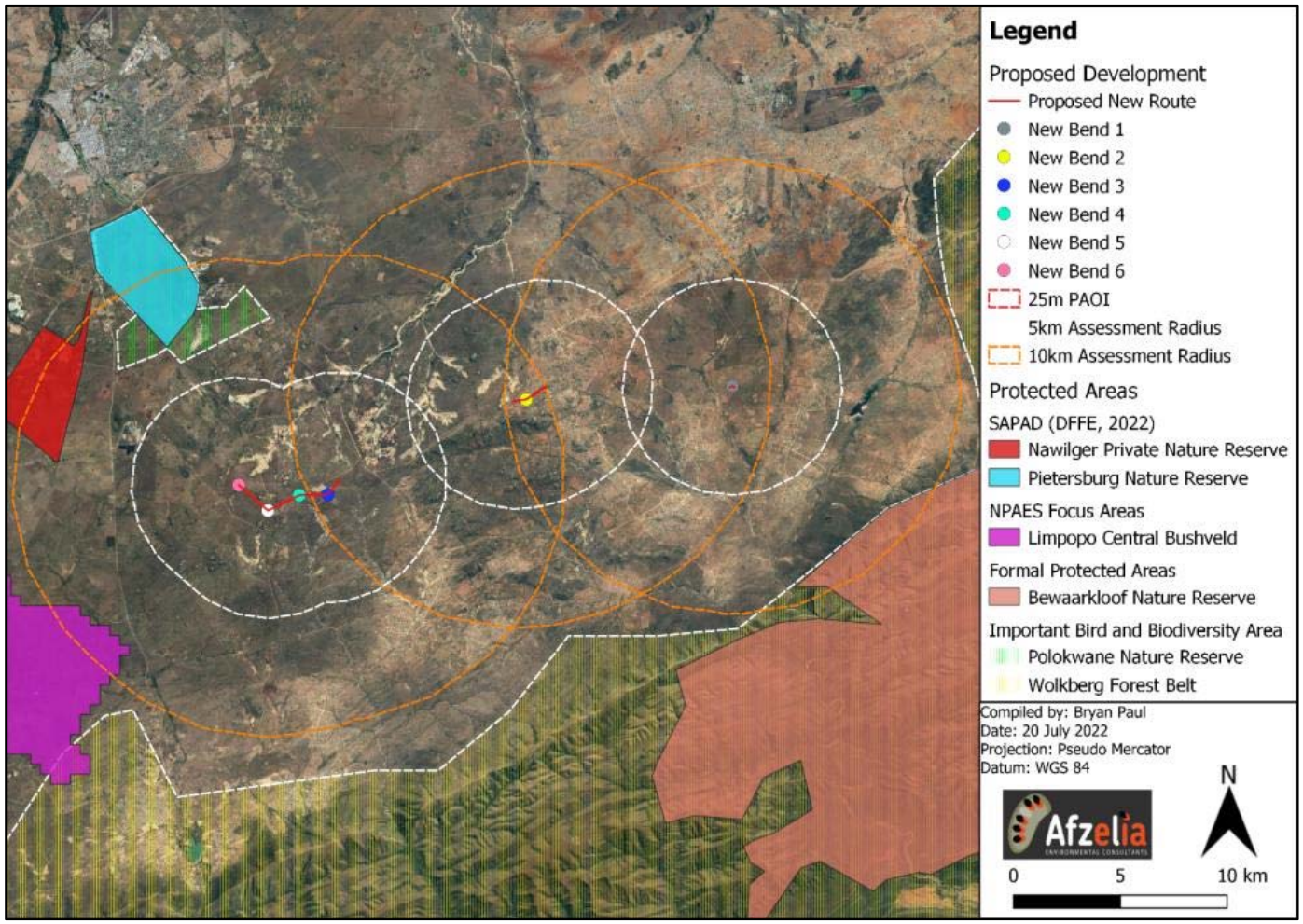


Figure 6 Protected Areas and IBAs closest to the proposed powerline (Afzelia, 2022)

7.4.4 Vegetation types and terrestrial habitat

As shown in Figure 7 , the study area occurs within a single national vegetation type, namely the Polokwane Plateau Bushveld, with a conservation status of “Least Concern”. This vegetation type contains moderately undulating plains with a short open tree layer to grass plains with occasional trees at higher altitudes. Although outside of the study area, the Mamabolo Mountain Bushveld is embedded within this vegetation unit and can often overlap.

The field assessment indicated that the proposed powerline alignment crosses five categories of habitat, as outlined below.

7.4.4.1 Potential watercourses and drainage lines

Potential watercourses and drainage lines (Plate 3) showed signs of either being permanently or temporarily wet at different times of the year (e.g. ephemeral rivers). Watercourses offer increased habitat heterogeneity and will ensure connectivity not only between other micro-habitats present within the study area, but also between outlying areas which may depend on the seasonal availability of water within one or more of these ecosystems. Furthermore, fossorial (burrowing) species are common within the Limpopo climate, and therefore impacts to watercourses and their associated transition areas (river banks and adjacent grasslands) may have a significant impact on these species, without the Contractors knowledge.

Plate 3 Potential watercourses within the study area (Left – dry riverbed located near Bend 2; Right – the Chunies River located between 5 & 6 of Bend 3-6)

7.4.4.2 Secondary Vegetation

Secondary habitat loosely refers to habitat which is not considered primary vegetation, and is often low in species diversity. Examples include secondary grassland habitat found adjacent to roads, and fallow or abandoned cropland which often recruits pioneering or invader species. In this study, secondary vegetation is predominantly linked to fallow cropland (maize fields). Although an unnatural landcover, subsistence cropland can provide suitable habitat for species and is often associated with higher levels of small mammals which can establish burrows and dens in the softer and less rocky substrate. In turn, birds of prey and reptiles will be attracted to these areas to hunt and may be found atop trees or poles waiting to ambush prey.

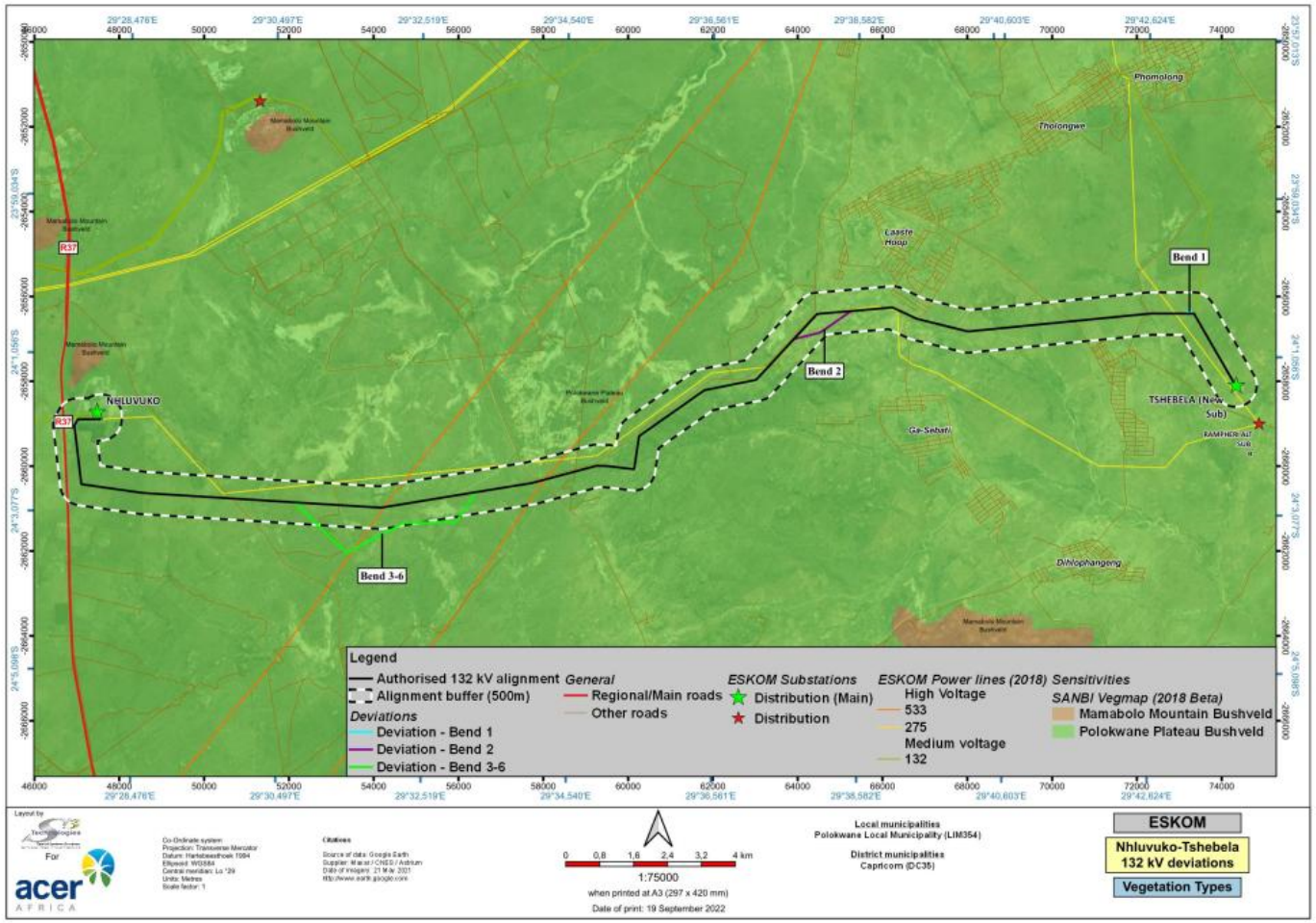


Figure 7 Vegetation Types in the study area

7.4.4.3 Polokwane Plateau Bushveld

A high percentage of the study area (specifically Bend 3-6) was found to consist of both open and closed bushveld habitat, with a well established grass layer and woody layer dominated by *Vachellia sp. (*Plate 4). Species composition varied in areas along the route, but consisted of a medium sized thorny or spiked species like *Vachellia nilotica subsp. kraussiana, Ziziphus mucronata* and dense stands of *Dichrostachys cinerea.* In other clumps, often enclosed within grassland, common tree species included *Combretum molle, Diospyros lycioides subsp. sericea, Cussonia spicata* and *Euclea crispa* subsp. *crispa* amongst other species. Throughout this landcover, the succulent and shrub species level were consistent, with at least three (3) different species of *aloe* being observed. Although just outside of the Project's Area of Influence (PAOI), one *Protea caffra* specimen was observed and may be more frequent closer to the rocky outcrops observed in the landscape situated near Bend 3-6.

Plate 4 Examples of the Polokwane Plateau Bushveld found within the study area.

7.4.4.4 Mamabolo Mountain Bushveld

Sections of habitat near Bend 2 were found to be distinctly different in structure to the surrounding Polokwane Plateau Bushveld and are considered by the specialist to be Mamabolo Mountain Bushveld (also classified as "Least Concern) embedded within the Polokwane Plateau Bushveld. The landscape within this portion of the study area was very rocky, moderate to very steep and contained a number of rocky outcrops, rocky slabs and small hills, which are sparsely vegetated with succulents and shrubs. Each outcrop was associated with a high level of avifaunal activity and would present itself as significant micro-habitats, often containing species that are not present at ground level, being protected from grazing and fire pressures which take place unmanaged within the area (Plate 5).

7.4.4.5 Transformed areas

This landcover category represents areas which contain the least amount of natural habitat, are currently fully transformed and contain no ecological value e.g. tracks and unsurfaced access roads.

Plate 5 Examples of the Mamabolo Mountain Bushveld found within the study area.

7.4.5 Plant Species of Conservation Concern (SCC)

A number of plant SCC, endemic plant species and protected plant species have been recorded within the greater study area. During the field assessment, no plant SCC were observed, however, one (1) protected tree species, *Sclerocarya birrea subsp. caffra* (Marula tree), which is listed under the National Forest Act (NFA, 1998) was observed within the PAOI.

7.4.6 Terrestrial fauna

A total of 4 SCC species have been recorded Quarter Degree Square (QDS) 2429BA,. Of these, only two (2) were reported to be mammal SCC (Table 11). No additional mammal species were identified within the DFFE environmental screening report produced for this application. For full species lists, refer to the Terrestrial Biodiversity Assessment in Appendix 5.

During the field work, limited mammal sightings were made by the specialist. However, spoor from several common mammals species (e.g. jackal, duiker and rock hyrax) were observed within the study area.

Table 11 Red List mammal species likely to occur within Quarter Degree Square 2429BA

Name	Conservation status (IUCN and TOPS)	Likelihood of occurrence
Dasymys robertsii (African Marsh Rat)	NT	High
Panthera pardus (Leopard)	VU	Low-Medium

7.4.7 Herpetofauna

The study area is expected to have a moderate herpetofauna diversity, with approximately 28 (21 reptiles and 7 amphibians) individual species known to occur within the QDS 2429BA. Of the species recorded within this QDS, only one (1) TOPS species was recorded viz. *Kinixys lobatsiana* (Lobatse hinge-back tortoise).

7.4.8 Ecological drivers

In terms of the current ecological process which occur within the study area as a whole, it is important to note that most of the habitat is found along Bend 3-6, being natural bushveld, which forms part of the savanna biome. The habitat found within this region contains both partially open undulating grassland, open bushveld thicket and dense thicket (especially in close proximity to rivers and natural geological fault lines occurring throughout the landscape. The key ecological process to be observed within this type of habitat would include fire, grazing, animal-plant interactions in the form of pollination and seed dispersal through birds and fruit eating mammals such as bats and Vervet monkeys.

7.5 Hydrology and aquatic habitat (freshwater)

7.5.1 Water Management and Catchment Areas

Table 12 indicates the water management and catchment areas into which the three deviations fall.

Table 12 Water management and catchment areas

	BEND 1	BEND 2	BEND 3-6
Water Management Area (WMA)	Olifants WMA	Olifants WMA and Limpopo WMA	Olifants WMA
Sub-WMA	Middle Olifants sub-WMA	Middle Olifants and Sand sub-WMAs	Middle Olifants sub-WMA
Quaternary Catchment Area	B52H	B52H and A71B	B52C and B52F
Sub-Quaternary Reach (SQR)	B52H- 284 (Thlabasane)	B52H- 284 (Thlabasane) A71B-222 (Diep)	B52D-307 (Chunies) B52E- 309 (Olifants)

7.5.2 NFEPA rivers and wetlands

As indicated in Table 13, one (1) National Freshwater Ecosystem Priority Area (NFEPA) river is traversed by Bend 3-6. No other NFEPA rivers or wetlands are affected.

Table 13 National Freshwater National Freshwater Ecosystem Priority Areas (NFEPA) rivers and wetlands

	BEND 1	BEND 2	BEND 3-6
NFEPA Rivers	None	None	Chunies River (PES Class D- largely modified)
NFEPA Wetlands	None	None	None

PES: Present Ecological State

7.5.3 Delineation of watercourses on site and classification of at-risk watercourses

Following a screening of the watercourses on site in relation to the existing access roads and proposed tower positions, it was determined that:

- **Bend 1**: No watercourses were situated within the 500 m investigation area, and thus no watercourses will be at-risk of being impacted on by the proposed deviations (Figure 8).

- **Bend 2**: A total of three (3) "A" Channel (ephemeral) streams, four (4) Hillslope Seep wetlands and two (2) Depression wetlands were delineated within the 500 m investigation area. However, the closest watercourse was situated approximately 60 m away from the closest proposed tower position, and thus no watercourses will be at-risk of being impacted on by the proposed deviation (Figure 9).

- **Bends 3-6**: A total of nine (9) "A" Channel (ephemeral) streams and five (5) Hillslope Seep wetlands were delineated within the 500 m investigation area. However, the closest watercourse was situated approximately 362 m away from the closest proposed tower position, and thus no watercourses will be at-risk of being impacted on by the proposed deviations (Figure 10).

Table 14 presents the abovementioned watercourses delineated within the study area and their associated risk categories. **Based on the risk screening, no watercourses will be at-risk of being impacted on by any of the proposed deviations.** The delineated watercourses were classified in accordance with the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis et al., 2013, cited in ENVASS, 2022) as presented in Table 15.

Table 14 The risk categories of each hydrogeomorphic (HGM) unit

HGM UNIT CODE		RISK RATING
BEND 1		
No watercourses were delineated within the 500 m investigation area applicable to Bend 1, and thus the proposed deviation was determined to pose no risk to the aquatic ecosystems.		
BEND 2		
HGM UNIT CODE	**RATIONALLE**	**RISK CATEGORY**
No watercourses	No watercourses were situated within the direct footprint of the proposed tower positions.	**High Risk**
No watercourses	No watercourses were situated within 15 m of the proposed tower positions.	**Medium Risk**
Rip01, Rip02 and Rip03, Seep01, Seep02, Seep03 and Seep04, Dep01 and Dam01	All watercourses were situated more than 60 m away from the proposed tower positions.	**Low to No Risk**
BENDS 3 - 6		
HGM UNIT CODE	**RATIONALLE**	**RISK CATEGORY**
No watercourses	No watercourses were situated within the direct footprint of the proposed tower positions.	**High Risk**
No watercourses	No watercourses were situated within 15 m of the proposed tower positions.	**Medium Risk**
Rip04, Rip05, Rip06, Rip07, Rip08, Rip09, Rip10, Rip11 and Rip12, Seep05, Seep06, Seep07, Seep08 and Seep09	All watercourses were situated more than 362 m away from the proposed tower positions.	**Low to No Risk**

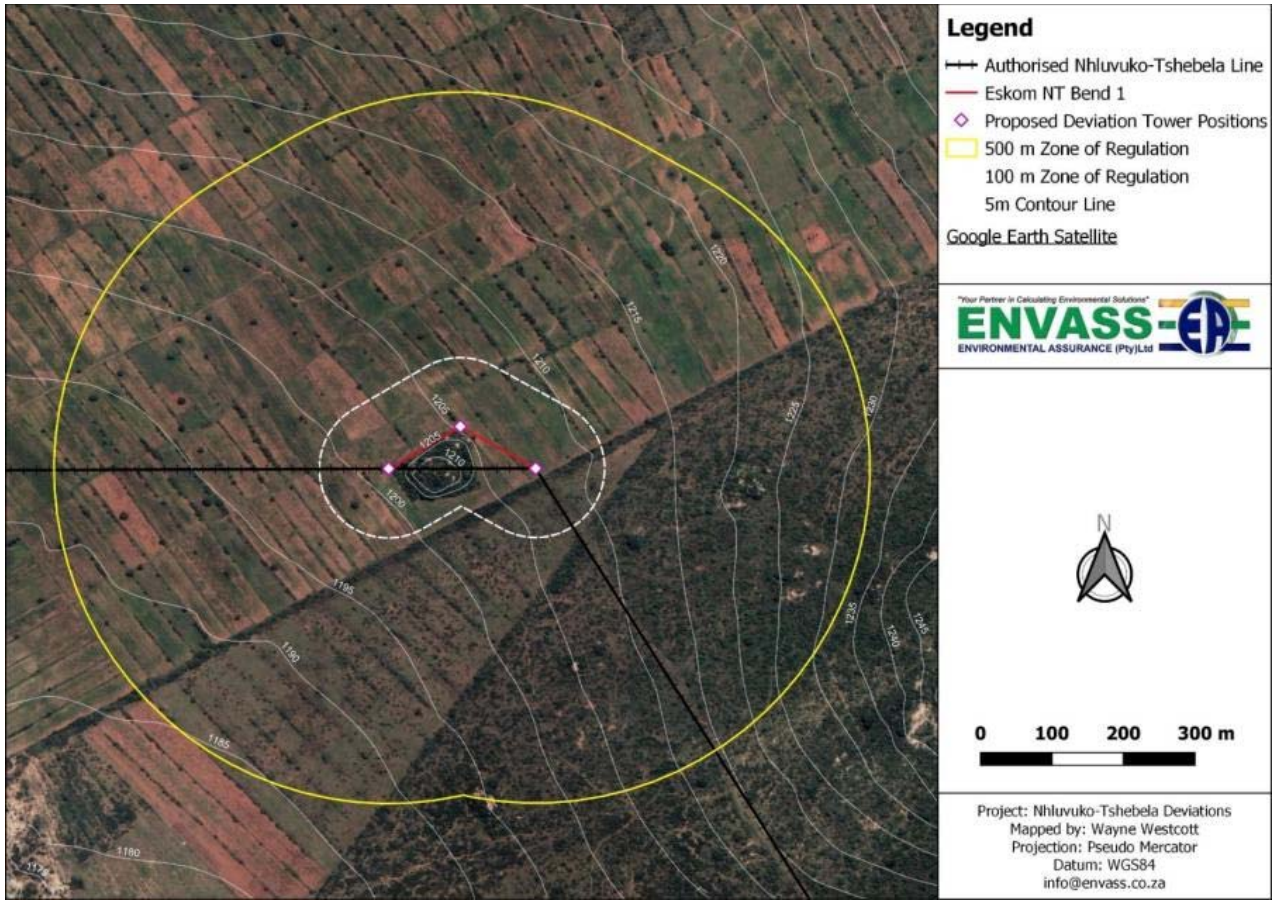


Figure 8 No watercourses are present within the Zone of Regulation (500 m) of Bend 1.

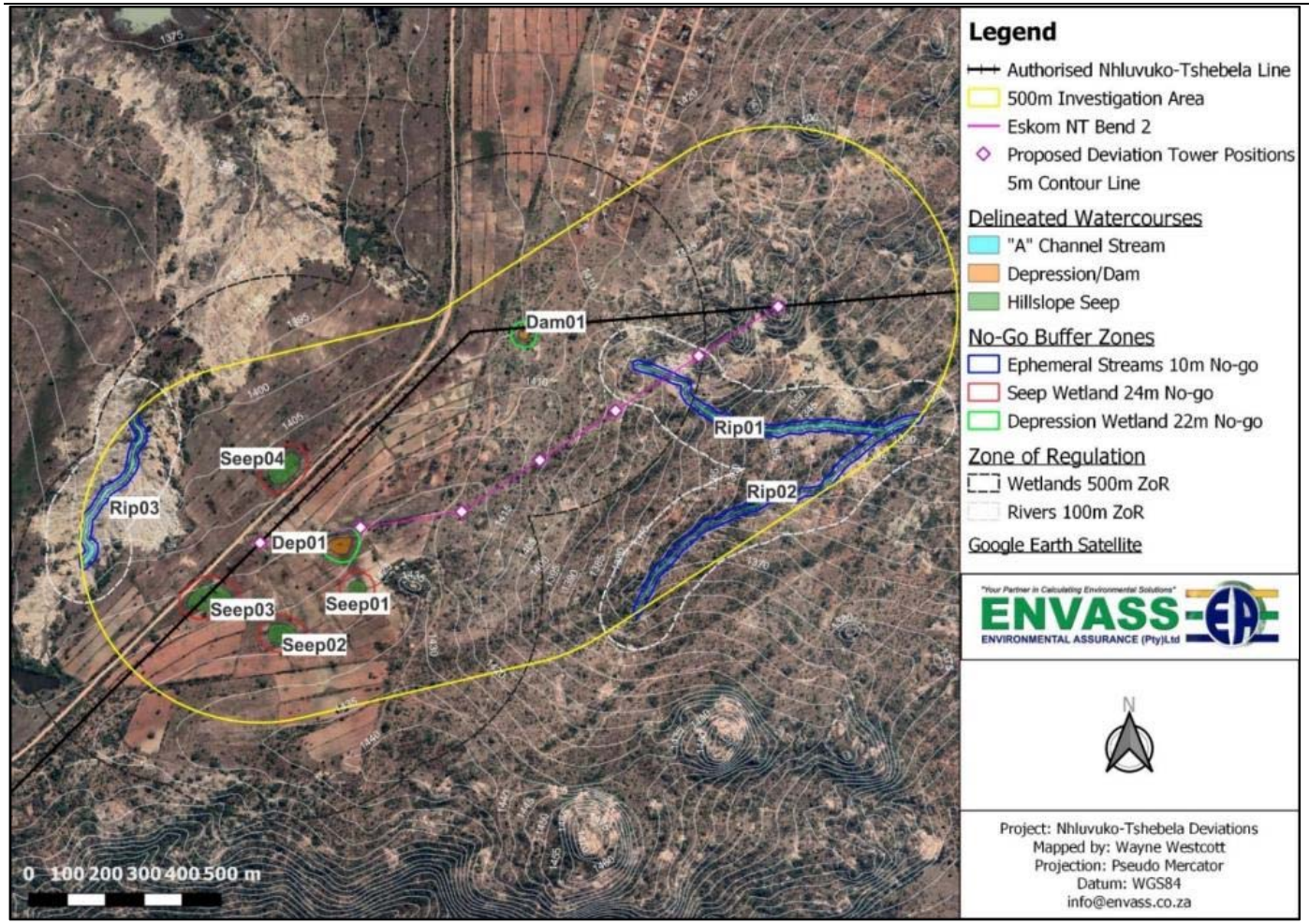


Figure 9 Freshwater habitat within the Zone of Regulation (Bend 2) (KEY: Seep- Hillslope seep wetland, Rip- Riverine system).

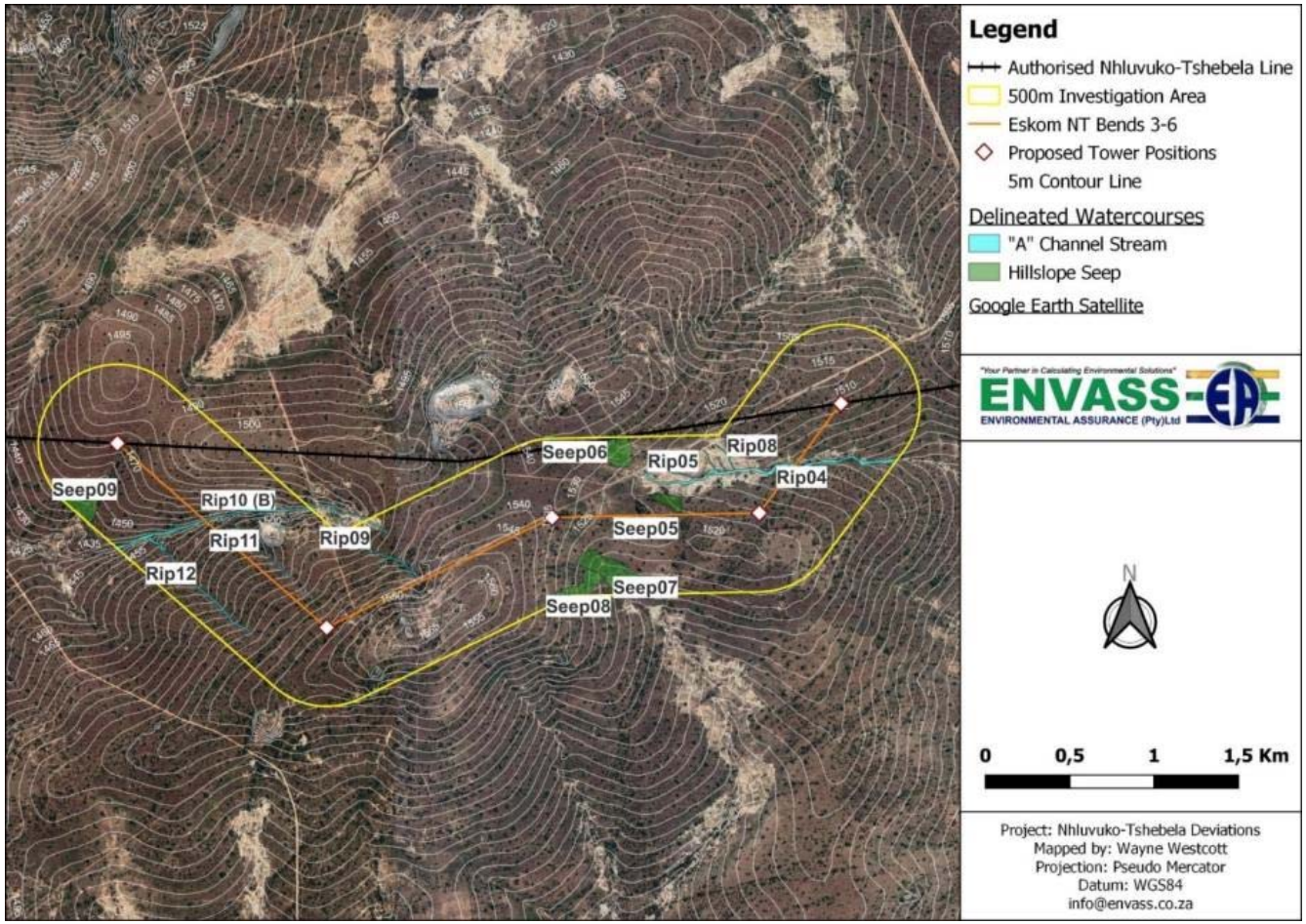


Figure 10 Freshwater habitat within the Zone of Regulation (Bend 3-6) (KEY: Seep- Hillslope seep wetland, Rip- Riverine system).

Table 15 Presentation of the classification of each watercourse to level 5 of Ollis et al. (2013) (cited in ENVASS, 2022).

LABEL	LEVEL 2: REGIONAL SETTING	LEVEL 3: LANDSCAPE UNIT	LEVEL 4: HGM UNIT			LEVEL 5: HYDROLOGICAL REGIME		LEVEL 6
			A- HGM Unit	B- Longitudinal Zonation/Landform/ Outflow Drainage	C- Landform/Inflow Drainage	A- Perenniality/ Inundation	B- Saturation/Non-Perennial Sub-types	Natural vs Artificial
BEND 1								
No watercourses were delineated within the 500 m investigation area associated with Bend 1.								
BEND 2								
Rip01	Central Bushveld (Group 6)	Slope	"A" Channel Stream	Mountain Stream	Active Channel	Non-perennial	Unknown	Natural
Rip02		Slope		Transitional				
Rip03		Valley		Upper Foothill				
Seep01, 02, 03 and 04		Slope	Hillslope Seep	Without channelled outflow	N/A	Never	Seasonally	
Dep01		Slope	Depression	Endorheic	Without channelled inflow	Intermittently	Seasonally	
Dam01		Slope	Depression	Endorheic	Without channelled inflow	Intermittently	Seasonally	Artificial
BENDS 3 - 6								
Rip04	Central Bushveld (Group 6) (CR)	Valley	"A" Channel Stream	Upper Foothill	Active Channel	Non-perennial	Unknown	Natural
Rip05, 06, 07, 08, 09, 11 & 12		Slope		Mountain Stream				
Rip10		Valley		Transitional				
Seep05, 06, 07, 08 & 09		Slope	Hillslope Seep	Without channelled outflow	N/A	Never	Seasonally	

7.5.4 Buffer Zone determination

No-go buffer zones were determined for all delineated watercourses within the study areas to ensure that no adverse impacts occur on these aquatic ecosystems. Table 16 presents the calculated buffer zones that must be applied to the delineated watercourses during the construction and operational phases. These buffer zones are shown in Figure 9 and Figure 10.

Table 16 Calculated no-go buffer zones relevant to the delineated watercourses within the study areas (ENVASS, 2022).

DELINEATED WATERCOURSE	CALCULATED NO-GO BUFFER ZONES	
	CONSTRUCTION PHASE	OPERATIONAL PHASE
BEND 1		
Not applicable as no watercourses were delineated within the 500 m assessment radius applicable to Bend 1		
BEND 2		
"A" Channel Streams	10	10
Hillslope Seep Wetlands	24	10
Depression Wetlands	22	10
BENDS 3 - 6		
"A" Channel Streams	10	10
Hillslope Seep Wetlands	24	10

7.5.5 DWS Risk Assessment Matrix and water use licensing requirements

The Risk Assessment Matrix undertaken by the wetland specialist (refer for more detail to the Aquatic Biodiversity specialist report in Appendix 5). concluded that all aspects associated with the activities are of Low-to-no significance in the post-mitigation state. However, as several tower positions were situated within the Regulatory Area of watercourses (wetlands and non-perennial streams) the proposed deviations Bend 2 and Bends 3 to 6 trigger the need for Section 21(c) and (i) water uses via a General Authorisation (GA) process. This is in line with Appendix D2 of GN509 (DWS, 2016), which states that Eskom may apply for a GA for the "construction of new transmission and distribution powerlines, and minor maintenance of roads, river crossings, towers and substation where the footprint will remain the same".

7.6 Avifauna

The proposed PAOI is rich in birdlife. Assessment of the PAOI revealed five broadly described avifaunal micro habitats i.e. savanna, ephemeral drainage lines, cultivated lands, mountains and built-up areas (examples are shown in Plate 6).

A total of 253 bird species have been recorded within the PAOI pentads. The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur within the route deviation areas. Of the 253 species, ten are regional SCC. Relevant to this development, 48 species are classified as power line sensitive species. Of the power line sensitive species, 33 are likely to occur regularly at the primary and broader areas and immediate surrounding area, with the remaining 15 occurring sporadically. It is important to note that with the exception of Cape Vulture (n=28), SCC have been recorded in very low numbers with less than ten individual birds being recorded over the fourteen-year survey period. This is an accurate reflection of the diversity and abundance of SCC that are likely to be found within the area surrounding the Nhluvuko-Tshebela/Rampheri 132kV power line deviations

given the habitat present and the existing disturbance in the PAOI. No SCC were observed during the field survey.

Plate 6 Examples of avifauna habitat in the study area (savanna woodland- LSH, rocky outcrop and cultivated fields – RHS)

The single winter survey conducted on 21 June 2022 focused effort on the areas through which the three route deviations traverse, and produced a combined list of 36 species. The majority of observations were of passerine species (small perching birds) that are common to this area. Full species lists can be obtained from the Avifauna Specialist Assessment in Appendix 5.

Collisions are the biggest single threat posed by power lines to birds in southern Africa. Most heavily impacted upon are the heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines. From incidental record keeping by the Endangered Wildlife Trust (EWT): Wildlife & Energy Programme, it is possible to give a measure of what species are likely to be impacted upon (see Figure 11). This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for any specific powerline.

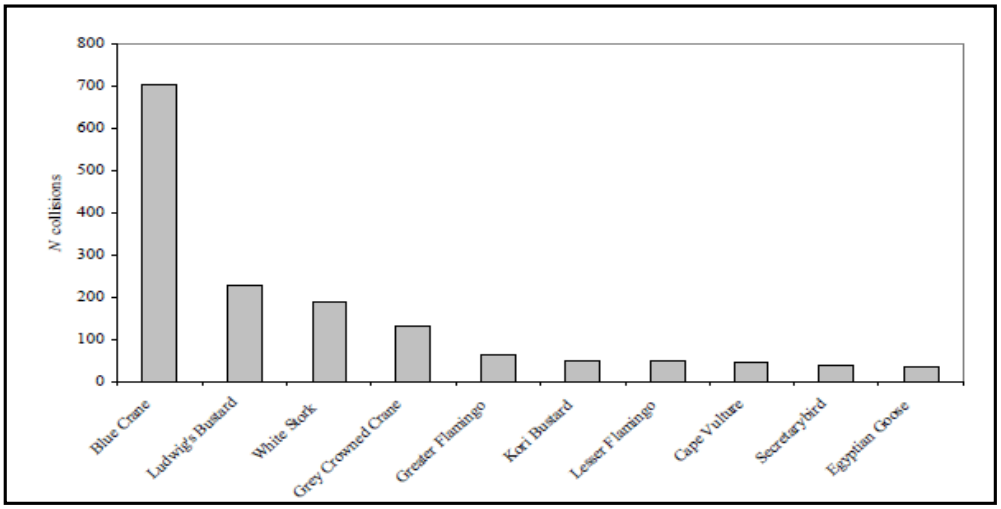


Figure 11 The top ten collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/Endangered Wildlife Trust Strategic Partnership central incident register 1996 - 2007 (Jenkins et al. 2010, cited in Feathers Environmental Services, 2022)

7.7 Land capability and agricultural use

7.7.1 Agricultural land uses

The proposed deviations of the Nhluvuko- Tshebela 132 kV powerline intersect with Polokwane Plateau Bushveld predominantly under livestock grazing, as well as sections of land under subsistence crops (maize).

7.7.2 Climate capability

The area of interest falls into Climate Capability Class C7/C8, which has Severe to Very Severe limitations for agriculture. This climatic data indicates there is insufficient rainfall to grow arable crops without a material element of risk. This classification also indicates that the focus should be on crops that can tolerate rainfall of typically 500mm per annum. Importantly, in this particular ecosystem there is virtually no rainfall at all during the winter months, the 500mm thus being spread over 8 months instead of 12 months.

7.7.3 Carrying capacity

Polokwane Plateau Bushveld has a typical carrying capacity of one large livestock unit (LSU, an ox of 450kg) per 8 to 10 ha. This is a poor carrying capacity but the norm for many thornveld habitats.

7.7.4 Soils and Agricultural theme sensitivity of the area

Approximately 20 km of the 30 km approved powerline route passes over or skirts deep, iron-rich, red soils with >35 % clay content, slope of < 2% and other physical properties that would normally qualify this land as Very High and High Agricultural Theme Sensitivity land with a rating of 12 to 15 on a scale of 1 to 15. These soils (either Hutton Form and Series or Shortlands Form and Series) usually have a low erosion hazard. However, in this area, the soils have an uncharacteristically high level of erosion according to research by the agricultural specialist (Phipson, 2022). Due to the impact of very long dry winters followed by thunderstorms and very hot weather have reduced the elasticity of the soil, thus resulting in an uncharacteristically high level of erosion that would place arable crop production in a high risk category. This reduces the Agricultural Theme Sensitivity from Very High and High to Moderate or Low. This reality is in contrast to impressions that could be gained from aerial photographs and surface observations.

The rest of the route passes over shallow, stony soils of the Mispah and Glenrosa Soil Forms, neither are which can be classified as arable land. These soils come under a Low Agricultural Theme Sensitivity rating, suitable for domestic livestock and wild game only. Bend 3-6 passes over these soils.

It is concluded by the agricultural specialist that is highly likely that the overwhelming extent of the land will have a low Agricultural Theme Sensitivity (ATS). This sensitivity is equivalent to a Land Capability Class of LCC VII and VIII on a scale of I to VIII- suitable for livestock and game only. The equivalence ATS Rating is 1 to 4 on scale of 1 to 15.

7.8 Cultural heritage

7.6.1 Archaeological overview

Archaeological information provided in the Heritage Impact Assessment (HIA) can be summarised as follows:

- ❒ No Early Stone Age (2.5 million to 200 00- years ago) or Middle Stone Age (300 000 to 40 000 years ago) sites are known from the Capricorn district.
- ❒ Later Stone Age (40 000 to historic past (<2000BP)) sites have been identified at an area to the south of Polokwane and at Makabeng.
- ❒ By the beginning of the Later Stone Age, uniquely human traits, such as rock art and purposeful burials with ornaments, became regular practice. Four areas known from the northern part of the country where rock art clusters are found, comprise the Limpopo River Valley, the Makabeng-Blouberg Mountains, the Soutpansberg Mountains and the Waterberg.
- ❒ Only a few Early Iron Age (AD 400-AD 1200) sites have been identified near Polokwane, located either on the southern side of Blouberg or on the northern side of the Makgabeng Plateau.
- ❒ Late Iron Age sites are found in abundance throughout the Limpopo Province. The Late Iron Age settlements are characterised by stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). Copper smelting and iron working sites have been identified between Tzaneen and Polokwane.

7.6.2 Historical overview

Historical aspects relative to the Polokwane area are outlined in the HIA, in chronological sequence from the early 1600's to 2002, reflecting the groups who settled in the area and the tensions and wars that arose between such groups. The town of Pietersburg, named after *Kommandant-Generaal Pieter Jacobus Joubert*, was established around 1883. In February 2002, the city of Pietersburg became one of the first places in South Africa to change its name after the fall of apartheid, and was renamed Polokwane, which in Northern Sotho means "Place of Safety".

7.6.3 On site heritage

Possible heritage sensitive areas around the proposed development area include Cluster of dwellings (farmsteads) and Structures/Buildings. Table 17 rates these structures/areas according to age and thus their level of protection under the NHRA.

Table 17 Tangible heritage sites in the study area

Name	Description	Legislative protection
Architectural Structures/Dwellings	Possibly older than 60 years	NHRA Sect 3 and 34
Archaeological sites	Artefacts and/or structures/sites	NHRA Sect 3 and 35 and Sect 27

Additionally, the evaluation of satellite imagery indicated that certain areas may be sensitive from a heritage perspective. The analysis of the heritage studies conducted in the area has assisted in the development of the following landform type to heritage find matrix (Table 1).

Table 1 Landform type to heritage find matrix

Landform Type	Heritage Type
Crest and foot hill	LSA and MSA scatters, LIA settlements
Crest of small hills	Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery and beads
Watering holes/Pans/Rivers	LSA sites, LIA settlements
Farmsteads	Historical archaeological material
Ridges and drainage lines	LSA sites, LIA settlements
Forested areas	LIA sites

Sites identified during the field survey are listed in Table 19 (Bend 2) and Table 20 (Bend 3-6), with their site co-ordinates and heritage significance. Examples of findings are shown in Plate 7.

Plate 7 Possible grave (NT01-top left), stone kraal (NT06 -top right) and stone walling (NT05-bottom left) along Bend 2; and cairn (NT09-bottom right) along Bend 3-6

Table 19 Heritage resources noted during the field assessment (Bend 2)

Site Nr	Site Co-ordinates		Time Period	Brief Site Description	Grading	Heritage Significance
	X (Lon)	Y (Lat)				
NT01	29.63229	-24.01333	Historical Period	**Possible Graves** located within an overgrown bushy environment. The site was recorded out of caution because the piles of rocks resemble graves.	Grade–3 - A (IIIA)	High
NT02	29.6312	-24.01345	Historical Period/Recent	**Remains of a structure (foundation).**	NCW	No research potential or other cultural significance
NT03	29.62952	-24.01404	Stone Age	**Low Density Surface Scatter of Lithics** (findspot) exposed by erosion. Fine grained quartzite and vein quartz flakes.	NCW	No research potential or other cultural significance
NT04	29.63077	-24.01348	Historical Period	**Possible Graves** located within an overgrown bushy environment. The site was recorded out of caution because the piles of rocks resemble graves.	Grade–3 - A (IIIA)	High
NT05	29.63378	-24.0129	Historical Period	**Archaeological/Historical homestead** located in a flat-lying area. Includes: several hut circle remains. The site is an extended settlement. The large stone circles indicate circular huts with hut rubble present in some of them. The circular hut type and layout indicates that the site is archaeological. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.	Grade–3 - A (IIIA) – Grade 3 – B (IIIB)	Medium - High
NT06	29.63404	-24.01221	Historical Period	A **stone kraal** borders onto natural rock outcrop. No other material cultural observed. It is likely associated with NT05.	Grade–3 - C (IIIC)	Low
NT07	29.63435	-24.01212	Historical Period	**Archaeological/Historical homestead** and a few ceramic pieces. It is likely associated with NT05. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.	Grade–3 - A (IIIA) – Grade 3 – B (IIIB)	Medium - High

Site Nr	Site Co-ordinates		Time Period	Brief Site Description	Grading	Heritage Significance
	X (Lon)	Y (Lat)				
NT08	29.63562	-24.01147	Historical Period/Recent	**Archaeological/Historical homestead** located in a flay-lying area. Includes: three structures (stone walling remains) and a modern midden. Much of the stone walling had been robbed of its stone, which meant that the layout pattern was somewhat obscured. No other material cultural observed. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.	Grade–3 - A (IIIA) – Grade 3 – B (IIIB)	Medium - High
NT09	29.635962	-24.011649	Historical Period/Recent	The structure is potentially a seatlo (isivivane in isizulu) associated with a significant figure or indicating a historical travel route.	Grade–3 - B (IIIB)	Moderate
NT10	29.63661	-24.0113	Historical Period/Recent	The structure is potentially a seatlo (isivivane in isizulu) associated with a significant figure or indicating a historical travel route.	Grade–3 - B (IIIB)	Moderate

Table 20 Heritage resources noted during the field assessment (Bend 3-6)

Site Nr	Site Co-ordinates		Time Period	Brief Site Description	Grading	Heritage Significance
	X (Lon)	Y (Lat)				
NT11	29.526611	-24.059196	Recent	**Remains of a structure (foundation)** is located within an overgrown area.	NCW	No research potential or other cultural significance
NT12	29.53867	-24.05326	Recent	**Remains of a structure** is located within an overgrown area.	NCW	No research potential or other cultural significance

7.7 The visual and aesthetic environment

7.7.1 Limit of visibility

The VIA (Environmental Planning and Design, 2022) determined that while the theoretical distance from which a 132kV power line may be visible is 15.2km, in reality and in the majority of conditions, it is unlikely to be obvious at distances greater than 2-3km due to the colour and character of the powerline. The Limit of Visual Effect was determined by the visual specialist to be 3km.

Plate 8 provides is a view along an existing overhead 132kV power line, similar in scale to the Nhluvuko-Tshebela line under construction. The images indicate the types of impact that might be expected from the proposed project.

Plate 8 A view along the line of a 132kV overhead power line with monopole towers

7.7.1 Receiving Environment and Receptors

The landscape character of the area is largely a product of landform, drainage patterns, nature and density of development, and vegetation patterns.

Visual Receptors are defined as “individuals and / or defined groups of people who have the potential to be affected by the proposal”. The significance of a change in a view for a visual receptor is likely to relate to use.

The landscape character and potential receptors associated with each deviation are described below.

7.7.1.1 Bend 1

The landscape is comprised of relatively flat area that is generally covered by maize cultivation and can be considered a working landscape (Plate 9). The koppie around which the powerline will be deviated is a small natural feature covered with indigenous bushveld that is typical of the regional landscape character. Receptors will comprise local farmers working in the nearby fields.

Plate 9 Photo indicating the landscape character at Bend 1: the koppie is covered with indigenous bushveld and located within a large area of cropping (maize)

7.7.1.2 Bend 2

Bend 2 runs within an undulating landscape under natural Polokwane Plateau Bushveld, which is used for grazing and some areas are used for subsistence cropping (plate 10). There are a number of naturally vegetated koppies in the area as well as small tracks. In the naturally vegetated areas, especially on the eastern end of the alignment, both the currently authorised alignment and the proposed deviation in this area are likely to be highly sensitive to the construction of the overhead powerline. There is a series of koppies behind which Bend 2 will run, which will likely provide screening for people in the nearby settlement.

Possible sensitive receptors include:

- ❒ Local residents of the adjacent Manthowane Rural Settlement area.
- ❒ People using local unsurfaced roads.
- ❒ People using community farmland.

Plate 10 Landscape character near Bend 2: the affected area is undulating, with natural bushveld under communal grazing. Vegetated koppies also occur in the area.
Note, the western portion of the line is under subsistence farming (not shown)

7.7.1.3 Bend 3-6

The area crossed by this deviation is located within an undeveloped elevated valley covered by natural vegetation (Polokwane Plateau Bushveld), also with a number of pronounced koppies both within the valley and on valley ridgelines (Plate 11). There are also extensive areas of erosion. The elevated valley is largely unaffected by development; however, there is a Medium Voltage overhead power line that is visible on the southern-most ridgeline (Plate 12). This ridgeline will also be affected by the proposed deviation and to a lesser extent by the authorised alignment. The existing overhead power line is aligned over the highest sections of the ridgeline and even over the summit of koppies. It should be noted that apart from areas immediately adjacent to the existing power line, whilst it may be physically visible, it is largely not visually obvious. There are a number of unsurfaced roads in the area; however, the closest is approximately 1.2km from the proposed deviation. Due to the natural nature of the affected valley landscape, it is likely to be sensitive to landscape change.

Possible sensitive receptors include:

- ❒ Visitors to the adjacent game farm situated to the north and east of Bend 3-6.
- ❒ People using local unsurfaced roads, which may include visitors to local game parks / farms.

Plate 11 View looking east eastern end of the proposed deviation (Bend 3-6)
Note: The blue and red lines approximately depict the authorized alignment and proposed Bend 3-6, respectively. Bend 3-6 will run parallel to a similar power line as it crosses the ridgeline right of picture. The existing power line is not visually obvious and the proposed deviation is also unlikely to be visually obvious as it crosses the ridgeline.

Plate 12 View looking to the east along the southern ridgeline (Bend 3-6).
Note: The proposed deviation will partly run beside the pictured overhead power line. It will, however not directly cross koppies, as the existing power line does.

8. ASSESSMENT METHODOLOGY

8.1 Concept of sustainability

The framework (Figure 12) within which environmental aspects arising from or influencing the proposed project (and its alternatives) are considered is the concept of sustainability. This considers the inter-related dimensions of the environment, viz. the social, economic and biophysical dimensions, underpinned by a system of sound governance through the legal/statutory requirements of South Africa (particularly NEMA).

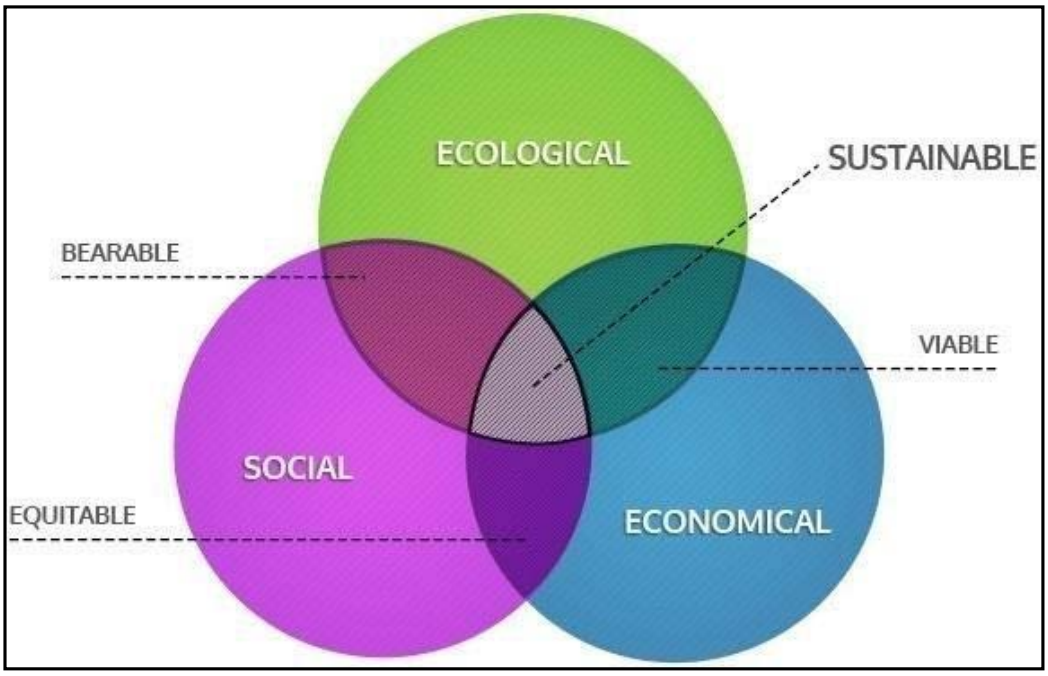


Figure 12 Assessment framework based on the concept of sustainability

All three dimensions of the environment, and the interactions between them (two- and three - dimensional), contribute to achieving sustainability and, therefore, each dimension, individually and its combined interaction with the other two dimensions, needs to be taken into account when assessing a proposed option or project, taking due cognisance that the three dimensions are seldom in perfect balance, with optimised solutions often being dictated by local circumstances, and requiring trade-offs between the dimensions.

In terms of sustainability and the assessment framework, key principles included:

- Development must not irretrievably degrade the natural, built, social, economic and governance resources on which it is based.
- Current actions should not cause irreversible damage to natural and other resources, as this potentially precludes sustainable options.
- Where there is uncertainty about the impact of activities on the environment, caution should be exercised in favour of the environment.
- Land-use and environmental planning need to be integrated.

- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

8.2 Identification and assessment of significance of key issues and impacts

Issues and potential impacts of the project on the environment (and vice versa) were identified by way of field investigations, desktop studies and interaction with I&APs.

Key issues and impacts were addressed by specialist studies and/or further detailed input from the environmental and technical teams. Specialist studies were conducted in accordance with the Protocols for specialist studies set out by DFFE.

Mitigation measures (site specific and general) were identified with inputs from I&APs, the specialists, Eskom personnel and the EAP team. All relevant mitigation measures are included in the EMPr (Appendix 6), noting that many generic mitigations applying to substations and powerlines are already contained in DFFE's Generic EMPr.

Information was collated, evaluated and integrated. Thereafter, the significance of each impact was assessed using the assessment conventions outlined below. The assessment conventions are applied qualitatively by the EAP, based on an understanding of the receiving environment, the proposed project components and activities, and the information gathered from different sources, including specialists and the public.

8.3 Assessment conventions

Taking into account the specialist findings and information from other sources, the EAP assessed all identified impacts (positive and negative), using the following assessment conventions to determine their significance:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

- **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

- **Nature** – the evaluation of the nature of the impact. Most negative impacts will remain negative, however, after mitigation, significance should reduce:
  - **Positive**.
  - **Negative**.

- **Spatial extent** – the size of the area that will be affected by the impact:
  - **Site specific**.

- **Local** (limited to the immediate areas around the site; <2 km from site).
- **Regional** (would include a major portion of an area; within 30 km of site).
- **National** or **International**.

- **Duration** – the timeframe during which the impact will be experienced:
  - **Short-term** (0-3 years or confined to the period of construction).
  - **Medium-term** (3-10 years).
  - **Long-term** (the impact will only cease after the operational life of the activity).
  - **Permanent** (beyond the anticipated lifetime of the project).

- **Intensity** – this provides an order of magnitude of whether or not the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium or high):
  - **Negligible** (inconsequential or no impact).
  - **Low** (small alteration of systems, patterns or processes).
  - **Medium** (noticeable alteration of systems, patterns or processes).
  - **High** (severe alteration of systems, patterns or processes).

- **Frequency** – this provides a description of any repetitive, continuous or time-linked characteristics of the impact:
  - **Once off** (occurring any time during construction).
  - **Intermittent** (occurring from time to time, without specific periodicity).
  - **Periodic** (occurring at more or less regular intervals).
  - **Continuous** (without interruption).

- **Probability** – the likelihood of the impact occurring:
  - **Improbable** (very low likelihood that the impact will occur).
  - **Probable** (distinct possibility that the impact will occur).
  - **Highly probable** (most likely that the impact will occur).
  - **Definite** (the impact will occur).

- **Irreplaceability** – of resource loss caused by impacts:
  - **High** irreplaceability of resources (the project will destroy unique resources that cannot be replaced).
  - **Moderate** irreplaceability of resources (the project will destroy resources, which can be replaced with effort).
  - **Low** irreplaceability of resources (the project will destroy resources, which are easily replaceable).

- **Reversibility** – the degree to which the impact can be reversed/the ability of the impacted environment to return/be returned to its pre-impacted state (in the same or different location):
  - Impacts are **non-reversible** (impact is permanent).
  - **Low** reversibility.
  - **Moderate** reversibility of impacts.
  - **High** reversibility of impacts (impact is highly reversible at end of project life).

- **Significance** – the significance of the impact on components of the affected environment (and, where relevant, with respect to potential legal infringement) is described:
  Please note that this excludes positive impacts on the environment. In these cases, the level of significance should be denoted as Low**, Moderate** or High**.
  - **Low** (the impact will not have a significant influence on the environment and, thus, will not be required to be significantly accommodated in the project design).

- **Medium** (the impact will have an adverse effect or influence on the environment, which will require modification of the project design, the implementation of mitigation measures or both).
- **High** (the impact will have a serious effect on the environment to the extent that, regardless of mitigation measures, it could block the project from proceeding).

- **Confidence** – the degree of confidence in predictions based on available information and specialist knowledge:
  - **Low**.
  - **Medium**.
  - **High**.

9. NEED AND DESIRABILITY

The need and desirability of a proposed development, from an EIA perspective, is a key consideration of an application for environmental authorisation and differs from the Developer's aims and purpose of the development (as described in Section 1.2). The Guideline on Need and Desirability in terms of the EIA Regulations (DEA, 2017) states that *"consistent with national priorities, environmental authorities must support "increased economic growth and promote social inclusion" while ensuring that such growth is "ecologically sustainable"*. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable.

Table 21 and Table 22 are derived directly from the Guideline and contain the *"questions to be engaged with when considering need and desirability"*. Responses pertaining to the proposed project are provided in the Comments column.

Table 21 Need and desirability aspects considered for securing ecological sustainable development and use of natural resources

Ref #	Description	Comment
1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	The findings of the relevant ecological specialist studies indicate that the ecological impacts will be of low significance after mitigation.
1.1	How will the following ecological integrity considerations be taken into account?	
1.1.1	Threatened ecosystems.	No threatened terrestrial ecosystems are impacted.
1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems which require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	There are no watercourses at risk. The findings of the specialist study on watercourses and aquatic biodiversity indicate that impacts of the project will be of low significance after mitigation. Mitigation measures are contained in the EMPr to be implemented as a condition of the Environmental Authorisation.
1.1.3	Critical Biodiversity Areas and Ecological Support Areas.	Bend 3-6 intersects both CBA1 and CBA 2. However, as the line has already been authorised, and the proposed deviation aims to reduce the overall impact associated with authorised route (avoids a game farm), and will allow for the continuation of the existing land uses below the powerline, Bend3-6 should have a negligible impact on the conservation objectives associated with both categories.
1.1.4	Conservation targets.	Refer to point 1.1.3 above.
1.1.5	Ecological drivers of the ecosystem.	The main ecological drivers are fire and vegetation-animal interactions. The proposed development is unlikely to have an impact on these processes.
1.1.6	Environmental Management Frameworks (EMF).	Although the deviations are located within the Olifants EMF, no issues have been identified in this regard.
1.1.7	Spatial Development Frameworks (SDF).	The proposed development is compatible with the SDF for Polokwane.
1.1.8	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, climate change, etc).	There are no RAMSAR sites, and the project activities will not significantly influence climate change.
2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Specialist studies have been undertaken to identify and assess the risks to biological diversity (terrestrial and aquatic) and to recommend mitigation to avoid or minimise negative impacts, and to enhance positive impacts (as relevant).
3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the	Potential pollution is limited to hydrocarbon spills and light industrial and domestic waste during construction. The EMPr contains specifications for the handling of waste and dealing with incidents.

Ref #	Description	Comment
	impacts? What measures were explored to enhance positive impacts?	
4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will be limited to light industrial waste (and general construction and domestic waste. Where possible, waste will be recycled. Waste management specifications are provided in the EMPr.
5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	A specialist cultural heritage impact assessment has been undertaken and recommendations for avoidance and management of potentially affected cultural heritage resources are contained in the EMPr.
6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The proposed deviations do not significantly impact on non-renewable natural resources. However, the production of electricity which will be distributed by the powerline is generated using non-renewable resources and cannot be avoided at this time.
7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	Land use (agriculture and grazing) will continue as before underneath the overhead powerline and thus there will be no significant impact on renewable natural resources and the ecosystem of which they are part.
7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (Sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life).	The provision of electricity to poor rural households may reduce harvesting of wood for energy.
7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and inter-generational equity and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources for this proposed development?).	N/A
7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	The provision of electricity to poor rural households may reduce harvesting of wood for energy.

Ref #	Description	Comment
8	How will a risk-averse and cautious approach be applied in terms of ecological impacts?	The recommendations of the specialist studies are taken into account and site specific recommendations taken across to the EMPr.
8.1	What are the limits of current knowledge (the gaps, uncertainties and assumptions must be clearly stated)?	These are stated in this BAR and in the specialist studies. However, the study area and the type of development are well known.
8.2	What is the level of risk associated with the limits of current knowledge?	Given that the study area is well known, the technology is well known and that the powerline is already under construction, there is negligible risk in terms of a lack of current knowledge.
8.3	Based on the limits of knowledge and the level of risk, how and to what extent will a risk-averse and cautious approach be applied to the development?	Refer to item 8.
9	How will the ecological impacts arising from this development impact on people's environmental rights in terms of the following:	
9.1	Negative impacts, e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc), health impacts, visual impacts, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Open-grazing land and some agricultural fields will be affected. The footprint however is very small and the land use will continue under the powerline deviations once constructed. Eskom pays compensation to the landowner for the use of the servitude under the powerline.
9.2	Positive impacts, e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures will be taken to enhance positive impacts?	N/A
10	Describe the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g., on livelihoods, loss of heritage sites, opportunity costs, etc).	Refer to point 9.1.
11	Based on the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	No significant negative impacts are anticipated.
12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being projected) will result in the selection of the "best practicable environmental option" in terms of ecological considerations.	The route amendments were proposed in order to reduce impacts on terrestrial biodiversity and socio-economic activities (game farming).
13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and existing and other planned developments in the area.	There are approximately 22 existing high voltage powerlines and significantly more distribution and reticulation lines totalling hundreds of kilometres within the 30km radius around the Nhluvuko-Tshebela/Rampheri 132kV power line PAOI. The contribution of the route deviations to cumulative impacts will be negligible. Refer to Section 10.9.

Table 22 Need and desirability aspects considered for promoting justifiable economic and social development

Ref #	Description	Comment
1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
1.1	The Integrated Development Plan (IDP) (and its sector plans' vision, objectives, strategies, indicators, and targets) and any other strategic plans, frameworks or policies applicable to the area.	The proposed development aligns with the IDP. Refer to Section 7.2.1.
1.2	Spatial priorities and desired spatial patterns (e.g., need for the integration of segregated communities, need to upgrade informal settlements, need for densification, etc.).	N/A
1.3	Spatial characteristics (e.g., existing land uses, planned land uses, cultural landscapes, etc.)	The deviations affect open land under extensive grazing and small areas under subsistence cropping.
1.4	Municipal Economic Development Strategy.	Provision of electrical connections will enhance local economic development opportunities.
2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects) and specifically also on the socio-economic objectives of the area?	As above. This is particularly important for the poorer rural communities currently with less access to services. Refer to Section 10.1
2.1	Will the development complement the local socio-economic initiatives (such as local economic development initiatives), or skills development programs?	As above. Refer to Section 10.1
3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	As above. Refer to Section 10.1
4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The powerline as a whole, will assist in addressing inequality of services between urban and rural customers.
5	In terms of location, describe how the placement of the proposed development will:	
5.1	Result in the creation of residential and employment opportunities in proximity to or integrated with each other.	Employment opportunities have already been generated as construction of the powerline is underway. If the proposed deviations extend the construction period, they may extend employment periods. Refer to Section 10.1.
5.2	Reduce the need for transport of people and goods.	N/A
5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g., will the development result in densification and the achievement of thresholds in terms of public transport?).	N/A
5.4	Complement other uses in the area.	N/A
5.5	Be in line with the planning for the area.	The proposed development aligns with the IDP. Refer to Section 7.2.1.
5.6	For urban related development, make use of under-utilised land available within the urban edge.	N/A
5.7	Optimise the use of existing resources and infrastructure.	The deviations form part of infrastructure already under construction (or already completed i.e. the substation component).
5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g., not aligned with the	N/A

Ref #	Description	Comment
	bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement).	
5.9	Discourage urban sprawl and contribute to compaction/densification.	N/A
5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs.	The project will serve previously disadvantaged, poorer, rural areas.
5.11	Encourage environmentally sustainable land development practices and processes.	Electrical connections may reduce wood harvesting in the rural areas.
5.12	Take into account special locational factors that might favour the specific location (e.g., the location of a strategic mineral resource, access to a port, access to rail, etc.).	The deviations form part of infrastructure already under construction (or already completed i.e. the substation component). The locations of the deviations (which are minor) have been specifically proposed to improve on the original routing.
5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e., an area with high economic potential).	N/A
5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area.	The Heritage Impact Assessment has identified sensitive sites and associated mitigation measures. Mitigation measures are contained in the EMPr, as applicable.
5.15	In terms of the nature, scale, and location of the development, promote or act as a catalyst to create a more integrated settlement.	Provision of electricity to these areas is likely to lead to future densification.
6	How will a risk-averse and cautious approach be applied in terms of socio-economic impacts?	A consultation process and a Social Impact Assessment has been undertaken to identify key issues and impacts, and associated mitigation. Mitigation measures are contained in the EMPr, as applicable.
6.1	What are the limits of current knowledge? (The gaps, uncertainties and assumptions must be clearly stated).	The type of development and the receiving environment are both well known. The project (barring the deviations) is already approved and under construction.
6.2	What is the level of risk? (Related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability, and sustainability) associated with the limits of current knowledge).	Risk is low. Refer to point 6.1
6.3	Based on the limits of knowledge and the level of risk, how and to what extent will a risk-averse and cautious approach be applied to the development?	Refer to item 6.
7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following?	
7.1	Negative impacts: e.g., health (HIV/AIDS), safety, social ills, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Anticipated impacts are of low significance. Relevant management of health and safety aspects will be specified in the EMPr.
7.2	Positive impacts. What measures will be taken to enhance positive impacts?	Eskom needs to build the line and maintain it in the most efficient and cost-effective manner possible. Eskom needs to protect its assets from criminals.
8	Considering the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-	Current land use will continue almost unchanged below the powerline. No resettlement is required.

Ref #	Description	Comment
	economic impacts will result in ecological impacts (e.g., over utilisation of natural resources, etc.).	
9	What measures will be taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The deviations are proposed as they are a better environmental option than the original routing.
10	What measures will be taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified allow the "best practicable environmental option" to be selected or is there a need for other alternatives to be considered?	These are minor route deviations to a powerline already under construction. The environmental assessment process and EMPr have as best as possible, attempted to identify social impacts and recommend mitigation.
11	What measures will be taken to pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing, and what special measures will be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The project will provide connections in previously disadvantaged, poorer, rural areas.
12	What measures will be taken to ensure that the responsibility for the environmental health and safety consequences of the development have been addressed throughout the development's life cycle?	Refer to the EMPR (Appendix 6).
13	What measures will be taken to:	
13.1	Ensure the participation of all interested and affected parties.	The regulated public participation process is designed to share information and facilitate public comment. Refer to Chapter 4 and Appendix 7 and Appendix 8.
13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.	The regulated public participation process is designed to share information and facilitate public comment. Refer to Chapter 4 and Appendix 7 and Appendix 8.
13.3	Ensure participation by vulnerable and disadvantaged persons.	Community consultation has been undertaken by way of direct meetings in the study area and ACER staff make themselves available to discuss the project telephonically and respond to queries throughout the duration of the project.
13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	The regulated public participation process is designed to share information and raise awareness. Refer to Chapter 4 and Appendix 7 and Appendix 8.
13.5	Ensure openness and transparency, and access to information in terms of the process.	As above.
13.6	Ensure that the interests, needs and values of all interested and affected parties will be taken into account, and that adequate recognition is given to all forms of knowledge, including traditional and ordinary knowledge.	This is being undertaken throughout the environmental authorisation process as per the regulations. It is the EAP's responsibility to consider all issues raised by all IA&Ps and respond to their concerns in an objective and unbiased manner.
13.7	Ensure that the vital role of women and youth in environmental management and development were	The regulated public participation process is designed to share information and raise

Ref #	Description	Comment
	recognised and their full participation therein is promoted.	awareness amongst all interested and affected parties. No additional efforts were made to engage with women and youth, specifically.
14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g., a mixture of low-, middle-, and high-income housing opportunities) that are consistent with the priority needs of the local area (or that are proportional to the needs of an area).	The electrical infrastructure as a whole targets areas with a backlog of electrical connections.
15	What measures will be taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	The EMPr specifies environmental awareness training to be provided to staff.
16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
16.1	The number of temporary versus permanent jobs that will be created.	The proposed Deviations will likely utilize the current employees already involved in construction.
16.2	Will the labour available in the area be able to take up the job opportunities (i.e., do the required skills match the skills available in the area?).	The use of local labour is encouraged; however the proposed deviations will likely utilize the current employees already involved in construction.
16.3	The distance from where labourers will have to travel.	N/A
16.4	The location of job opportunities versus the location of impacts (i.e., equitable distribution of costs and benefits).	N/A
16.5	The opportunity costs in terms of job creation (e.g., a mine might create 100 jobs but impact on 1,000 agricultural jobs, etc.).	N/A
17	What measures will be taken to ensure:	
17.1	That there is inter-governmental coordination and harmonisation of policies, legislation and actions relating to the environment.	Local, provincial, and national Government departments were requested for comment with the purpose of aligning requirements.
17.2	That actual or potential conflicts of interest between organs of state are resolved through conflict resolution procedures.	N/A
18	What measures will be taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The environmental authorisation process is being undertaken as per the prescribed environmental legislation and associated regulations. Impacts of the deviations will be mitigated to promote the long-term sustainability of the proposed development.
19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Realistic and achievable mitigation measures for the proposed deviations have been identified and incorporated in an EMPr. Eskom is responsible for the long-term maintenance of the servitude.
20	What measures will be taken to ensure that the costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	No significant impacts in this regard are expected. Refer to the EMPr for management of waste.

Ref #	Description	Comment
21	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), will result in the selection of the best practicable environmental option in terms of socio-economic considerations.	The proposed deviations avoid the need for resettlement and seek to minimize impacts on cultivated fields. Bend 3-6 relocates out of a property used as a game farm, thereby promoting socio-economic opportunities as well as conservation of flora and fauna.
22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and other planned developments in the area.	The proposed deviations make a negligible contribution to cumulative impacts. Refer to Section 10.9.

10. DESCRIPTION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS AND ASSESSMENT OF SIGNIFICANCE

The information gathered during this Basic Assessment process resulted in the identification of key issues, which have been formulated as nine key questions:

- Will the proposed route deviations result in socio-economic benefits?
- What effects will the proposed route deviations have on the social and socio-economic environment?
- Will the proposed route deviations result in the loss of use of productive agricultural land and associated economic opportunities?
- What effects will the proposed route deviations have on terrestrial biodiversity and natural areas worthy of protection and conservation?
- What effects will the proposed route deviations have on watercourses and aquatic biodiversity?
- What effects will the proposed route deviations have on avifauna species (birds)?
- How will the visual changes to the landscape as a result of the proposed route deviations affect the social and socio-economic environment?
- What effects will the proposed route deviations have on cultural heritage resources, including palaeontological resources?
- What cumulative impacts are anticipated from construction and operation of the proposed route deviations?

Potentially significant impacts associated with each of the above issues are discussed and assessed in the sections below, incorporating a summary of specialist findings where applicable. For more detail, refer to the relevant specialist reports in Appendix 5.

Where relevant, significance ratings have been assigned to impacts, according to the assessment conventions (Section 8.3), and presented in Impact Assessment tables (Table 23 to Table 31). The tables assess the significance of expected impacts before mitigation, as well as after application of the recommended mitigation measures, as applicable. Mitigation measures from the specialist reports and from other sources, as applicable, have been included in the sections below.

10.1 Will the proposed line deviations have socio-economic benefits?

In terms of socio-economic benefits, the line deviations must be considered as part of the whole current line under construction. According to the assessment, the Nhluvuko-Tshebela 132 kV powerline (with the deviations) will result in positive socio-economic impacts which are of low and medium significance, without management. With management, the significance of these impacts increases to medium and high. Refer to the subsections below and to Table 23.

10.1.1 Boost to local economic development and improvement in socio-economic conditions (during operation)

A lack of electricity, or unreliable and inconsistent electricity, is severely detrimental to socio-economic development. The powerline already under construction will help with the provision of new connections to settlements, which will help to improve many facets of peoples' lives at home and at work. Access to electricity has many direct and indirect impacts as it enables people to implement and maintain, for example, local economic and business activities, community health and education facilities and makes most aspects of daily living easier. The

deviations on their own will not change significance of the impact of the line already under construction, although by avoiding a game farm with tourism potential, Bend 3-6 could be considered to have an additional positive influence in terms of socio-economic conditions.

10.1.2 Increased employment opportunities (construction)

Direct and indirect employment opportunities have been created as a result of the current construction of the powerline. The line deviations on their own are unlikely to have any additional impact in terms of job creation.

10.1.3 Increased opportunities for local business and SMMEs (construction))

Opportunities will have been created for local SMMEs as a result of current construction activities, for provision of goods and services. Such opportunities will have knock-on effects, which will likely lead to secondary impacts, such as increased employment opportunities and more disposable income. The line deviations on their own are unlikely to have any additional impact in this respect.

10.1.4 Mitigation (enhancement) measures

Please note that some of the mitigation measures recommended below, especially with respect to procurement, may not be feasible as construction has been ongoing since 2017.

10.1.4.1 Boost to local economic and socio-economic development (operation)

- ❒ Eskom to efficiently and diligently manage and maintain the infrastructure, in order to optimise on the investment and the socio-economic benefits arising from the electrical connections to communities that this project will enable.
- ❒ Eskom to prevent theft and vandalism of the electrical infrastructure.

10.1.4.2 Increased employment opportunities (construction)

- ❒ Contractor/s to employ local people wherever possible during construction.
- ❒ Where possible, promote labour-intensive construction methods, in order to increase local employment.
- ❒ A monitoring system should be established to ensure that contractors honour the local employment policy.
- ❒ Once construction is completed, local persons employed on a contract/temporary basis during construction should be provided with reference letters that they can submit to gain employment elsewhere. Also, certificates of completion should be provided for in-house (on-the-job) training provided during employment.

10.1.4.3 Increased opportunities for SMMEs (construction)

- ❒ If subcontractors are appointed, the project should give preference to suitable subcontractors/SMEs located in the surrounding communities then in the Polokwane municipal area, and then only to subcontractors located elsewhere in, or outside the province.
- ❒ Procurement practices of construction contractors should be monitored, and they must reinforce the preference to procure locally. Where contracts are awarded to non-local

service providers, contractors must demonstrate that reasonable action was taken to identify a local service provider.

Table 23 Assessment of potential local and regional economic and socio-economic benefits resulting from the proposed 132 kV line (including deviations)

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Boost to socio-economic development (operation)	Unmitigated	Positive	Local	Medium-term	Medium	Periodic	Probable	N/A	Moderate	Medium	High
	Mitigated	Positive	Local and Regional	Long-term	Medium	Continuous	Highly Probable	N/A	Moderate	High	Medium
Increased employment opportunities (construction)	Unmitigated	Positive	Local	Short term	Low	Once off	High	N/A	N/A	Low	High
	Mitigated	Positive	Local	Short term	Medium	Once off	High	N/A	N/A	Medium	High
Increased opportunities for local SMMEs (construction)	Unmitigated	Positive	Local and Regional	Short term	Low	Periodic	High	N/A	N/A	Low	Medium
	Mitigated	Positive	Local and Regional	Medium-to Long - term	Medium	Intermittent	High	N/A	N/A	Medium	Medium

10.2 What effects will the proposed deviations have on the social and socio-economic environment?

In terms of potential negative socio-economic benefits resulting from construction, the line deviations cannot be considered in isolation but rather must be considered as part of the overall development under construction. According to the assessment, negative impacts are expected, which are of medium significance, without management. With management, the significance of these impacts is reduced to low. Refer to the subsections below and to Table 24.

10.2.1 Social impacts arising from demographic change (during construction)

Demographic processes relate to the movement and composition of people in the region. The presence of construction teams and influx of job seekers and other opportunists into the study area, during the course of construction, can result in the following social impacts:

- ❒ Increased spread of disease.
- ❒ Increased criminal activity.
- ❒ Tension/competition between newcomers and local residents/communities.

It is not expected that the proposed route deviations would increase or decrease the intensity or significance of the above impacts, should they already be occurring.

10.2.2 Social impacts resulting from changes in geographical and/or environmental processes (during construction)

Geographical and/or environmental processes are processes that relate to the environment where people reside. The powerline under construction will cause slight changes in the environment, which can result in social impacts which are listed below.

During construction:

- ❒ Increased dust and noise.
- ❒ Reduced safety in and around the construction sites (due to construction vehicles and activities).
- ❒ Increased fire hazard.
- ❒ Site specific social sensitivities:
    - o Disturbances to subsistence farming activities.
    - o Increased risks to livestock from vehicles and excavations.
    - o Negative effect on Sense of Place and aesthetics, for local residents- caused by different elements such as noise, movement of strangers, poor housekeeping at construction sites, possible littering and dumping.
- ❒ Unintended damages to local infrastructure (roads, fences, etc).

During operation and maintenance:

- ❒ Possible damage to local infrastructure (roads, fences, etc.) during maintenance activities.
- ❒ Disturbances to subsistence farming during maintenance.
- ❒ Increased risks to livestock due to disturbance, or gates being left open, during maintenance activities.

Bend 3-6, by deviating away from the adjacent game farm, will avoid risks to valuable game species with which the game farm is stocked. In general however, although locations may shift slightly, it is unlikely that the proposed route deviations would increase or decrease the intensity or significance of the impacts listed above, should they already be occurring.

10.2.3 Socio-economic impacts arising from economic change

Economic processes are processes that affect the economic activity in a given area. Potential economic losses that may occur as a result of the proposed powerline include:

During construction:

- ❒ Unintended damage to private property such as farm roads, gates, fences and other farm infrastructure.
- ❒ Loss of livestock or game due to vehicle collisions or gates left open.
- ❒ Possible theft of peoples property.

During operation:

- ❒ Unintended damage to property during maintenance activities.
- ❒ Loss of livestock or game due to vehicle collisions or gates left open during maintenance activities.

In general, it is unlikely that the proposed route deviations on their own would increase or decrease the intensity or significance of the impacts, should they already be occurring. However, Bend 3-6, by deviating outside of the adjacent game farm, may reduce risks of economic losses to the game farming enterprise.

10.2.4 Impacts on Civil Aviation

According to the DFFE Screening Report, the powerline is in a high risk area for civil aviation due to its proximity to aerodromes. The Polokwane International Airport is situated > 22 km away from the closest deviation and the nearest microlight aerodrome is approximately 13 km distant (refer to Appendix 9). When considering that there are approximately 22 existing high voltage powerlines and significantly more distribution and reticulation lines totalling hundreds of kilometres within a 30km radius around the Nhluvuko-Tshebela 132kV power line PAOI, it is very likely that suitable mitigation is possible. An Obstacle Application Form has been submitted to the CAA to allow for evaluation of the line and identification of any required mitigation.

Subject to the required permission from the CAA, the risk to civil aviation is assessed as low.

10.2.5 Impacts on defence facilities

The South African National Defence Force operates a military base from the Polokwane International Airport, more than 22 km away from the closest deviation (refer to Appendix 9). Due to the distance away, this is unlikely to be negatively impacted by the project. No known defence facilities lie along the alignment and no comment on the proposed line has been received from the SANDF.

Subject to the required permission from the CAA, the risk to defence facilities is assessed as low .

10.2.6 Mitigation measures

10.2.6.1 Spread of disease (preconstruction, construction)

- ❑ Staff showing symptoms of highly infectious or notifiable diseases should stay at home or disclose their symptoms and maintain social distance accordingly.
- ❑ All construction staff should go through an HIV and AIDS education awareness course prior to the project commencing.
- ❑ Education material regarding general hygiene, HIV and AIDS and sexually transmitted diseases, including Monkey Pox, should be easily available.
- ❑ The Contractor should ensure condoms are easily available at the construction camp.
- ❑ Only construction workers should be allowed within the accommodation areas/units.

10.2.6.2 *Increased criminal activity (preconstruction, construction)*

- ❑ All Eskom employees and subcontractors should be easily identifiable by wearing uniforms and/or identification cards that should be exhibited in a visible place on their body.
- ❑ Contractor's and subcontractors' vehicles should be identifiable.
- ❑ Implement strict site camp management and keep non-staff away from contractor's staff accommodation (where ever it is located).
- ❑ Instant dismissal and prosecution of any staff caught in criminal activities of any kind.
- ❑ Inform local crime protection and law enforcement agencies of the possibilities of increased criminal activity in the area.
- ❑ Affected landowners should be consulted well in advance prior to anyone entering their land.
- ❑ Security personnel should be employed on the construction sites as required.
- ❑ Access to farms where construction is taking place should be controlled.
- ❑ All affected landowners should be consulted and, if deemed necessary, additional security staff placed at access points to the land. The cost of this should be carried by Eskom.

10.2.6.3Tension/competition between newcomers and local residents (pre-construction, construction)

- ❑ The recruitment process should give preference to job seekers from the local study area where possible and practical.
- ❑ Ensure that the intention of giving preferential employment to locals is clearly communicated, so as to discourage an influx of job-seekers from other areas.
- ❑ Involve local community structures (e.g. ward councillors and/or ward committees) to assist in communicating the intention to give preference to local labour, and also to assist in identifying the local labour resources.

10.2.6.4 Increased dust and noise (construction)

- ❒ Rehabilitate areas of exposed soils as soon as possible.
- ❒ Implement dust suppression measures (e.g. spraying with water tankers), on site as well as on access roads.
- ❒ Ensure all soil stockpiles exposed to wind are wet or covered.
- ❒ Strict speed limits should be applied on any gravel roads so as to reduce dust levels.
- ❒ Ensure noise levels remain within prescribed levels set by the local noise standards.
- ❒ Avoid undertaking construction activities after daylight hours.

10.2.6.5 Safety risks in construction areas and access routes (construction)

- ❒ Where applicable, the site camp and stockpiles should be fenced off.
- ❒ Strict speed restrictions must be applied and enforced on local and farm roads.
- ❒ All vehicles on site and transporting materials to site must be in a roadworthy condition.
- ❒ Road and warning signs should be placed in suitable areas, in particular, high danger zones.

10.2.6.6 Increased fire hazard (construction and maintenance)

- ❒ No open fires are to be allowed on site.
- ❒ Firefighting equipment must be available on all construction sites and in all construction vehicles.
- ❒ The Contractor must liaise with property owners on existing protocols used in the prevention and management of fire on properties, and brief all Contractors staff accordingly.
- ❒ A form of fire insurance may be required. This is the responsibility of the Contractor.

10.2.6.7 Unintended damage to property (construction and maintenance)

- ❒ Contractors must adhere to Eskom's Farm Access Protocol.
- ❒ Contractor to establish protocols and/or communication channels with all affected parties to reduce the risk of damage occurring.
- ❒ The Contractor(s) must maintain close liaison with farm managers during the construction period.
- ❒ Ensure a photo record is kept of all areas where private property will be affected.
- ❒ Ensure that any unintended damages to private property are repaired immediately.
- ❒ Ensure that all farm gates are left as found when working between construction areas.
- ❒ In the event of security being compromised because of unintended damages to control measures, arrangements should be made to ensure suitable security is provided until repairs have been made.
- ❒ In the event that damages are caused to private property of any kind and if there is sufficient evidence to suggest this is a result of project activities, compensation should be paid to the owner.

10.2.6.8 Impacts on site specific social sensitivities (construction, operation)

- ❒ Ensure communication protocols are established to manage liaison between Eskom, local communities and the contractor regarding construction activities and measures to ensure disruption and risks to farming activities and property are prevented and/or minimised.
- ❒ Appropriate mitigation measures are to be implemented to ameliorate the biophysical, visual and cultural heritage related impacts, as stipulated in the specialist reports undertaken as part of the BA for the proposed project.
- ❒ Measures to address the impact of the project on the area's sense of place include ensuring a neat appearance of the site, during construction and operation.

10.2.6.9 Risks to Civil Aviation and Defence (preconstruction, construction and operation)

- ❒ Authorisation for the powerline routing must be obtained from the Civil Aviation Authority (CAA) and their recommended markings and mitigation applied as required from an aviation perspective.
- ❒ Mitigation measures required by the CAA must be implemented by Eskom.

Table 24 Assessment of potential impacts of the proposed deviations on the social and socio-economic environment

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Increased spread of disease	Unmitigated	Negative	Regional	Short term	Medium	Once off	Definite	N/A	Moderate	Medium	High
	Mitigated	Negative	Regional	Short term	Low	Once off	Highly Probable	N/A	High	Low	Medium
Increased criminal activity	Unmitigated	Negative	Local	Short term	Medium	Periodic	Highly Probable	N/A	High	Medium	High
	Mitigated	Negative	Local	Short term	Low	Intermittent	Probable	N/A	High	Low	High
Conflict/competition between newcomers and incumbent population	Unmitigated	Negative	Local	Short term	Medium	Periodic	Highly Probable	N/A	High	Medium	High
	Mitigated	Negative	Local	Short term	Low	Intermittent	Probable	N/A	High	Low	High
Increased dust & noise	Unmitigated	Negative	Local	Short term	Low	Intermittent	Highly probable	N/A	High	Medium	High
	Mitigated	Negative	Local	Short term	Low	Once off	Probable	N/A	High	Low	High
Reduced safety in construction and access areas	Unmitigated	Negative	Local	Short term	High	Periodic	Highly probable	N/A	High	Medium	High
	Mitigated	Negative	Local	Short term	Medium	Periodic	Probable	N/A	High	Low	Medium
Increased fire hazard	Unmitigated	Negative	Local	Short term	Medium	Continuous	Highly probable	Moderate	High	Medium	Medium
	Mitigated	Negative	Local	Short term	Low	Periodic	Probable	Moderate	High	Low	Medium
Impacts on site specific social sensitivities	Unmitigated	Negative	Local	Long-term	High	Intermittent	Probable	Low	Low	Medium	Medium
	Mitigated	Negative	Local	Medium-term	High	Once off	Improbable	Low	Low	Low	Low
Unintended damages to property	Unmitigated	Negative	Local	Long-term	High	Intermittent	Probable	Low	Low	Medium	Medium
	Mitigated	Negative	Local	Short term	High	Once off	Improbable	Low	Low	Low	Low
Risks to Civil Aviation and Defence	Unmitigated	Negative	Local	Long-term	Medium	Periodic	Probable	Low	Moderate	Medium	Medium
	Mitigated	Negative	Local	Long-term	Low	Intermittent	Improbable	Low	Low	Low	Low

10.3 Will the proposed deviations result in the loss of use of productive agricultural land and associated economic opportunities?

During construction of the proposed deviations, there will be disturbance of land used for grazing as well as disturbance of fields used for subsistence maize crops. Accessing the site with construction vehicles and machinery has the potential to compact soils and damage crops. There is potential for grazing, crops and water resources to be damaged if herbicides used for AIPS control in the servitude are not properly used. These impacts can, however, be mitigated.

The permanent loss of agricultural land (generally of a low land capability and agricultural sensitivity) will be minimal, as the footprint of the towers is only 2 m^2 per tower, averaging 8.7 m^2 per km of deviation. Also, during operation, grazing and maize cropping can continue as before within the powerline servitude[7].

The construction and maintenance of the powerline will not negatively impact water resources (and thus agricultural production) if the towers and access roads stay outside of the demarcated watercourses and buffers (refer to Section 10.5).

In light of the above, with mitigation, the loss of agricultural land and the impact of the proposed deviations on the local agricultural economy is assessed to be of low significance. Refer to the subsections below and to Table 25.

10.3.1 Mitigation measures

Farmers (via community representatives if necessary for communal lands) must be kept notified of construction schedules, times and activities which affect their lands.

- ❑ Construction staff are to use existing approved tracks already in use for the current line under construction, and may not drive vehicles across agricultural fields except where specifically to access the tower construction areas.
- ❑ Agricultural lands are to be avoided by all construction staff except where absolutely necessary to achieve the establishment of the powerline deviations.
- ❑ Construction in cultivated fields should, if possible, be conducted after harvest.
- ❑ The contractor is to abide by the specifications in the EMPr that aim to protect soil, water, plant and animal resources.
- ❑ During maintenance, existing approved tracks only must be used.
- ❑ Use of herbicides to control AIPS must be controlled so that no harm is done to crops, grazing and water resources.

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7 As the powerline is already under construction, it should be noted that Eskom has reportedly already compensated affected farmers for the use of the servitude and any associated loss of land/crops.

Table 25 Assessment of potential loss of productive agricultural land and associated economic opportunities, due to the proposed powerline route deviations

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Negative impact on productive agricultural land	Unmitigated	Negative	Local	Short to Long-term	Low	N/A	Probable	Low	Medium	Medium	High
	Mitigated	Negative	Local	Short to Long-term	Negligible	N/A	Improbable	Low	High	Low	High
Negative impact on the agricultural economy	Unmitigated	Negative	Regional	Long-term	Negligible	N/A	Improbable	N/A	N/A	Low	High
	Mitigated	Negative	Regional	Long-term	Negligible	N/A	Improbable	N/A	N/A	Low	High

10.4 What effects will the proposed deviations have on terrestrial biodiversity and natural areas worthy of protection and conservation?

According to the assessment, the potential negative impacts of the construction and operation of the deviations on terrestrial biodiversity are of medium significance, without management. With management, the significance of these impacts is reduced to low. Refer to the subsections below and to Table 26.

Importantly it should be noted that Bend 1 and Bend 2, in particular, will reduce the impacts discussed below, when compared with the original routes. Bend 1, by deviating to the side (instead of going directly over) of the koppie and skirting the edge of a cultivated field, will reduce impacts on the natural habitat provided by the vegetated koppie. Bend 2, which can be accessed via existing tracks instead of requiring new tracks, will also reduce impacts on natural habitat.

10.4.1 Loss of vegetation communities

The nature of the development, although linear, will not result in the permanent loss of vegetation communities throughout, and only within the immediate vicinity of the powerline towers (approximately $2m^2$). With application of mitigation measures and good rehabilitation practises, impacts on natural vegetation communities will be of low significance.

10.4.2 Loss of Plant Species of Conservation Concern (SCC)

The risk of loss of SCC and protected species is low, as none or few were observed along the alignment. However, as plant SCC, endemic plant species and protected plant species (including the protected tree *Sclerocarya birrea subsp. Caffra*) have been recorded within the greater study area, care must be taken to check for their presence when implementing site clearing. If removal of any of these species cannot be avoided, the requisite permits must be applied for.

10.4.3 Loss of faunal Species of Conservation Concern (SCC)

During the field assessment, no observations were made of any Faunal SCC (excluding bird species), although, according to the desktop assessment, there are three faunal SCC that may occur within the study area:

- ***Dasymys robertsii* (African Marsh Rat)**:Due to the availability of suitable habitat found at most of the deviations, there is a strong likelihood that the Contractor will observe this species along wetlands and in grasslands adjacent to watercourses or riparian habitat. It was concluded however, that if the tower structures are established more than 30m way from the edge of any wetland / riparian habitat, the risk of permanently impacting this species would be eliminated and rather deferred to temporary impacts associated with construction activities, such as noise, vibrations and the clearing of terrestrial vegetation.
- ***Panthera pardus* (Leopard):**Due to this species ability to inhabit a wide variety of habitat, and the presence of mountainous habitat, the occurrence of this species within the study area is possible and will depend upon the availability of food resources at the time. Leopards are known to continue to inhabit areas within close proximity to construction sites and even small towns with moderately high levels of disturbance. The

threat to this species is negligible and may be managed by avoiding suitable mountainous habitat, and dense cover associated with riparian areas.

- ***Kinixys lobatsiana* (Lobatse hinge-back tortoise):** This species inhabits areas which are found within the study area, and although no evidence (such as shells usually found within grasslands after recent fire activity) was recorded which could confirm the presence of this species, chance finds are still possible. Tortoises in general will avoid the construction sites, but may be impacted by the excavation of holes or trenches along the route, which specimens (like a pitfall) may fall into and become trapped. Furthermore, tortoises may also be actively searched for as a source of food for site staff. This must be prevented, and discouraged.

With adequate rehabilitation and other mitigation, the impact of construction and operation on the above-mentioned species is considered to be low, and it is expected that post construction, they will reinhabit the area and continue to benefit from the same ecological resources offered prior to the implementation of the proposed project.

10.4.4 Fragmentation, loss of ecosystem function and edge effects

As the study area contains habitat associated with high levels of connectivity (rivers and bushveld), poorly managed construction activities within the study area may result in the fragmentation of habitat that would lead to decreased connectively and ecosystem function. This could negatively affect the CBAs traversed by Bend 3-6. The following risks were identified:

- Loss of seed dispersal.
- Loss of pollination and / or pollinators (e.g. through the application pesticides).
- Reduction in gene pool diversity, and limitations in breeding opportunities.
- Reduced access to water resources (especially during late winter).
- Cessation of ecological drivers and processes (e.g. fire or grazing).

The application of mitigation techniques, such as establishing set-backs from watercourses and rocky outcrops (or other important habitat), encouraging the continuation of ecological processes such as fire regimes, and limiting the use of herbicides / pesticides, amongst other mitigation measures, will reduce these impacts.

10.4.5 Invasion of Alien Plant Species

Construction activities and establishment of laydown areas and site camps can result in the influx of seeds from outlying disturbed areas and disturbance of existing seedbanks of AIPS, forcing their proliferation within the study area. As the study area is currently not heavily invaded by alien vegetation, the introduction of AIPs to the area could have a significant influence on existing fauna and flora species and the ecological processes that may be linked to each species. The resultant impact may be the loss of key plant and /or faunal species within the study area. However, this impact can be managed with implementation of a management plan to control alien invasive plants.

10.4.6 Impacts on EMFs, CBAs and protected areas

While the proposed deviations fall within the Olifants River EMF, from a terrestrial perspective, no significant issues were identified. As the proposed deviations are not associated with any

substations (generation) and will not significantly influence connectivity within the catchment, the catchment was not considered further from a terrestrial perspective.

While Bend 3-6 intersects both CBA1 and CBA 2 areas, the line has already been authorised, and the proposed deviation aims to reduce the overall impact associated with authorised route (avoids a game farm), and will allow for the continuation of the existing land uses below the powerline. Therefore, it is expected that Bend 3-6 will have a negligible impact on the conservation objectives associated with both categories.

The proposed deviations fall within10 km of the boundary of various nature reserves in the area, but will have no significant impact on any of these areas.

10.4.7 Mitigation measures

10.4.6.1 Loss of vegetation communities (preconstruction, construction and operation)

- The construction and operational footprint of the development must not extend past the assessment area (approximately 100m).
- All access to the proposed development must be limited to existing access roads and servitude. No *ad hoc* roadways should be permitted, without first being authorised by the ECO.
- All highly sensitivity habitat (e.g. wetlands and koppies) must be signposted and designated as “no-go” areas”, unless for construction purposes. The climbing of mountains for site seeing, or social activities must be prohibited.
- A Rehabilitation Plan, which includes control of AIPS must be compiled prior to construction, and implemented to ensure that all rehabilitation and operational management regimes are well coordinated and budgeted for.

10.4.6.2 Loss of Plant Species of Conservation Concern (SCC) (pre-construction and construction)

- A pre-construction walkthrough must be completed by the suitably qualified professional (e.g. Eskom EO and Surveyor) to determine the frequency and exact location of protected species and/ or SCC at the time of construction.
- No plant species (SCC or common) must be harvested or removed from site without approval from the ECO or Applicant in writing.
- If any protected plant species are found along any of the proposed deviations, permits must be applied for and received before construction commences on site (if applicable).
- If it is found that TOPS species are located within the footprint, but cannot be translocated, a species offset ratio must be agreed upon within the issued permit for each TOPS species destroyed.

10.4.6.3 Loss of Faunal Species of Conservation Concern (SCC) (design, pre-construction, construction and operation)

- No powerline towers must be constructed within 30m of a watercourse.
- Laydown areas should not be established within 100m of a watercourse.
- Contractor must conduct a brief faunal sweep prior to the clearance of vegetation and excavation activities at each new tower location.
- Walking and/ or driving vehicles within river beds, or wetlands must not be permitted unless critical for construction.
- The killing of any fauna must not be tolerated.

- Environmental awareness training must be conducted by the ECO before any new staff commence with work activities on site. The awareness training must include teaching staff how to identify the following species which may be encountered during construction and are prone to being affected by construction activities:
  - *Kinixys lobatsiana* (Lobatse hinge-back tortoise).
  - *Dasymys robertsii* (African Marsh Rat).

	
Dasymys spp (African Marsh Rat) (photo sourced from Google)	*Kinixys lobatsiana* (Lobatse hinge-back tortoise (photo sourced from Google)

- Excavations should be cordoned off and kept open for the minimum period as practically possible.
- Construction should not take place during the evening.
- Any lighting must not point outwards toward any natural habitat and should be focused downwards or towards the development.

10.4.6.4 Fragmentation, loss of ecosystem function and edge effects

- The development footprint must be kept as small as possible and all non-operational areas are to be rehabilitated to a suitable condition.
- No additional access roads may be established unless authorised by the ECO and Engineer.
- Rehabilitated sections of the route should be cordoned off from grazers and/ or livestock to prevent overgrazing of newly sprouted shoots and trampling of rehabilitated areas.
- Connectivity within rivers and wetlands must be maintained throughout the construction phase. Construction activities must not restrict faunal movement within these ecosystems, nor prevent fauna from access to critical resources nearby, such as drinking water or grasslands.

10.4.6.5 Invasion of Alien Plant Species (construction and operation)

- An AIPS Control Plan must form part of the rehabilitation plan developed for the project. This plan must be developed to include both construction and operational phase requirements.
- No dumping of cleared alien vegetation must be allowed on site. All cleared material must be appropriately disposed of at a registered landfill.
- Alien invasive plant control regimes must be executed in accordance with Eskom's servitude maintenance plan.

10.4.6.6 Recommendations for conditions of authorisation

The following mitigations are recommended by the specialist ecologist specifically for inclusion as conditions of the EA. They have been included in the EMPr (Appendix 6), the implementation of which will be a condition of the EA.

- An ECO must be appointed during both the pre-construction and construction phase to ensure that the conditions of the EA are sufficiently complied with.
- The appointed Contractor responsible for constructing the proposed project must be legally responsible for complying with the approved EMPr and EA.
- The Contractor must include environmental topics within toolbox talks at least once a month and should be made aware of any protected plant species (if applicable) located nearby, the presence of nearby sensitive habitats (such as wetlands, river and mountainous habitat) and the possibility of faunal species being found within development footprint.
- All natural habitat found outside the development footprint must remain untouched, and listed as a no-go area, unless for management and maintenance purposes (e.g. IAPS control).
- A plant search and rescue process must be completed before any construction activities takes place on site. The location of each plant, and translocated specimen should be monitored for impacts caused by trampling and overgrazing by stock animals. Management measures should evolve with the findings of these monitoring activities.
- No construction activities should take place during the evening, and construction should take place between 07h00 and 17h00 to avoid periods where fauna are most active.
- All lighting must be focused inward and not towards sensitive habitat.
- If any wetland systems are directly impacted upon by tower structures, a frog and reptile survey must be completed by an ecologist, during an appropriate season for this region.
- Where possible, towers should avoid being placed within CBA1 and CBA2 areas. Where this is not possible, important ecological features such as rivers, wetland and mountainous habitat must be avoided, or a route alternative considered by the Applicant.
- All cleared areas must be adequately rehabilitated immediately after construction has been completed, and not only at the end of construction. Rehabilitation activities must be season appropriate and make use of plant species already associated with the vegetation type occurring within the development footprint.
- A speed limit of 20 kilometres per hour (km/hr) is recommended within 100m of any rivers, wetland or mountainous habitat.
- Any faunal SCC mortalities (regardless of the nature of the incident) must be reported to the DFFE and ECO to be investigated.
- No laydown areas and/ or site camp must be established within 100m of a river, wetland or mountainous area.
- A faunal sweep must be conducted by the Contractor and ECO prior to the clearing of vegetation for both the line, and associated towers. If any significant findings are recorded, the CA must be informed and an appropriately qualified faunal specialist must assess the area and advise on “Species Specific “ mitigation techniques and the appropriate actions to be implemented prior to continuation of construction.

Table 26 Assessment of the potential impacts of the proposed deviations on terrestrial biodiversity

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Loss of Vegetation Communities	Unmitigated	Negative	Site Specific	Long Term	Medium	Once off	Definite	Moderate	Low	Medium	High
	Mitigated	Negative	Site Specific	Medium Term	Low	Once off	Definite	Moderate	High	Low	Medium
Loss of plant SCC as a result of clearing activities.	Unmitigated	Negative	Local	Permanent	Medium	Once off	Probable	Low	Medium	Medium	Medium
	Mitigated	Negative	Site Specific	Short Term	Low	Once off	Probable	Low	High	Low	High
Loss of faunal SCC as a result of clearing, excavation and maintenance activities.	Unmitigated	Negative	Local	Medium-term	Medium	Intermittent	Probable	Moderate	Medium	Medium	Medium
	Mitigated	Negative	Local	Medium-term	Low	Once off	Probable	Low	Medium	Low	Medium
Fragmentation, loss of ecosystem function and edge effects associated with the establishment of the three deviations.	Unmitigated	Negative	Local	Long-term	Medium	Periodic	Probable	Moderate	Low	Medium	Medium
	Mitigated	Negative	Site Specific	Long-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
Introduction and proliferation of alien plant species as a result of construction and operational activities.	Unmitigated	Negative	Local	Long-term	High	Periodic	Highly probable	Moderate	Low	Medium	High
	Mitigated	Negative	Site Specific	Medium	Low	Intermittent	Probable	Low	Medium	Low	High
Impacts on EMFs, CBAs and protected areas	Unmitigated	Negative	Regional	Long-term	Low	Once off	Probable	Low	High	Low	Medium
	Mitigated	Negative	Regional	Long-term	Negligible	Once off	Improbable	Low	High	Low	Medium

10.5 What effects will the proposed deviations have on watercourses and aquatic biodiversity?

According to the assessment, the potential negative impacts of the line deviations on water courses and aquatic biodiversity are of low significance, both before and after management/mitigation. Refer to the subsections below and to Table 27.

10.5.1 Indirect disturbance of aquatic habitat and reduction of ecological connectivity (construction)

Although no watercourses were determined to be at-risk of being directly impacted on by the proposed deviations, there is a risk of indirect disturbance to the aquatic environment as a result of the movement of construction vehicles and the clearance of the servitude within the terrestrial environment. In addition, the reduction of ecological connectivity from terrestrial to aquatic habitat will probably occur, which can indirectly reduce biodiversity and ecosystem functionality of watercourses in the area. Furthermore, in a catchment that is susceptible to erosion, construction within this area will further present an opportunity for erosion to occur if not managed appropriately. With mitigation, this impact is of low significance.

10.5.2 Indirect alteration of water quality (construction)

Water quality in watercourses may be negatively impacted due to increased sedimentation and/or contamination with hydrocarbons and concrete residue, resulting from construction activities. With mitigation, this impact is of low significance.

10.5.3 Direct alteration to the catchment and hydrological flow (construction)

The hardened surfaces created by construction will reduce the area of vegetation and infiltration surface, as well as alter the current hydrological flow regime within the catchment area. This could lead to erosion features developing downslope of the structures, which are situated on moderately steep hillocks, if adequate flow management systems are not integrated into the overall design of the proposed development**.**

10.5.4 Indirect alteration to ecosystem service provisions (construction)

The indirect disturbance of freshwater ecosystems as a result of construction activities and associated infrastructure may alter the ability of the freshwater ecosystems to provide valuable regulating and supporting, as well as cultural and provisioning, benefits to the surrounding anthropogenic and natural environments.

10.5.5 Improvement of aquatic habitat and ecological structure (rehabilitation)

Subsequent to the end of the construction phase, the disturbed areas around the proposed deviation footprints will be rehabilitated to pre-construction (or better) condition. This may result in an improvement of the condition of the downstream watercourses, if all mitigation measures presented in the EMPr are strictly implemented and subsequently monitored.

10.5.6 Indirect alteration of water quality (operation)

Maintenance activities will involve movement of construction vehicles on existing maintenance tracks, which could create excess dust that may enter the delineated watercourses and influence the water quality during rainfall events. In addition to this, hydrocarbons and construction equipment will be brought onto site, increasing the risk of contamination of the delineated watercourses should accidental spills occur within the upslope terrestrial environment.

10.5.7 Indirect alteration to ecosystem service provisions (operation)

Indirect disturbance of watercourses may result in AIPS encroaching into the disturbance footprint during the operational phase of the proposed development. This will reduce the biodiversity within the catchment area and alter the current water balance within the systems. The aforementioned will reduce the ability of the watercourses to provide ESS to the natural and anthropogenic environments.

10.5.8 Mitigation measures

10.5.8.1 Pre-construction Phase

- Site Layout
  - Existing roads must be utilised as far as possible. No new roads should be cleared/constructed through watercourses and their associated no-go buffer zones. In the case where existing access roads traverse watercourses, adequate stormwater infrastructure that can accommodate a 1:20 year flood event should be installed, guided by a suitably qualified engineer or hydrologist, and the area surrounding the direct footprint landscaped to near-natural topography, tilled and revegetated with indigenous grass species for soil stability. Gravel tracks are the preferred road type as this will reduce the direct impact and potential for contamination to occur.
  - Locate site camps, laydown areas, stockpile areas, construction material, equipment storage areas, vehicle parking areas, bunded vehicle servicing areas and re-fuelling areas in designated areas outside of the prescribed buffer zones and watercourses. These areas should preferably be located on level ground in a previously disturbed area of vegetation approved by the Environmental Officer (EO) or Environmental Control Officer (ECO). Cut and fill must be avoided where possible during the set-up of the construction site camp.
  - Fuel, chemicals and other hazardous substances should preferably be stored offsite, or outside of the watercourses and associated buffer zones. These substances must be stored in suitable secure weather-proof containers with impermeable and bunded floors to limit pilferage, spillage into the environment, flooding or storm damage.
  - Design a stormwater management plan which details how stormwater runoff from cleared and compacted surfaces will be controlled. This should include mitre drains and other stormwater infrastructure on all access and maintenance roads. Clearly defined clean and dirty systems must be developed and maintained around the site camp.

- Restrict the movement of construction vehicles and personnel to designated access roads. The indiscriminate movement of construction vehicles and personnel through watercourses must be strictly prohibited.

10.5.8.2 Construction

- ❑ Disturbance of aquatic habitat due to the edge effect
  - Clearly demarcate no go areas with orange hazard tape, fencing or similar prior to the commencement of development activities, and strictly prohibit the movement of construction vehicles and personnel outside of the demarcated areas. Watercourses and associated buffer areas that are located outside of the demarcated construction footprint must be designated as no-go areas. In addition to this, monopole positions must remain outside of the delineated watercourses and their associated buffer zones.
  - Vegetation clearing within the servitude should be limited to those species greater than 6 m in height, unless essential for access purposes. Low shrubs and grass coverage should remain to provide soil stability and groundcover within a catchment area that is susceptible to erosion. No clearing of vegetation should occur within the delineated watercourses and their associated no-go buffer zones, unless essential for maintenance of existing access purposes.
  - All existing access roads must be utilised as far as possible during the construction phase to reduce the disturbance to the receiving environment. Areas where the proposed new line will cross watercourses and associated buffer, should utilise existing access roads and not create new access roads, where possible.
  - Demarcation of the construction footprint must be signed off by an EO or ECO. Demarcations onsite should not be removed until the proposed deviation activities are complete.
  - The position of the monopoles must remain outside of the watercourses and associated buffer zones.
  - A map of all sensitive and no-go areas, including watercourses and buffer zones, must be included in the induction material to be presented to all site personnel by the EO or ECO.
  - Strictly avoid any damage to natural vegetation cover or soils within surrounding watercourses and their associated buffer zones during construction activities. An EO or ECO must inspect the construction footprint on a weekly basis and must take immediate action to address unforeseen disturbances to surrounding aquatic habitat. Any disturbed / compacted areas falling outside of the demarcated development footprint must be immediately rehabilitated to the satisfaction of the EO or ECO.
  - Prohibit the dumping or temporary storage of gravel / building materials / spoil material / within watercourses and their associated buffer areas. Building material must be stored at the designated storage area located outside of the no-go areas and spoil material must be appropriately disposed of at a registered waste disposal facility.
  - Immediately clear and remove any gravel or sediment that may have been accidentally deposited into the watercourses and their associated buffer areas during the construction activities (by hand).
  - The control of AIPS must be guided by an AIPS control management plan to ensure compliance with the NEMBA (Act no. 10 of 2004). This act states that all landowners must control listed AIPs on their property according to the NEMBA: Alien and Invasive Regulations (2014) and associated Alien Species List (2020).
  - Alien and Invasive species control:

- The construction footprint, site camps, laydown areas, stockpile area and any additional bare areas must be checked by a suitably qualified professional. AIPS must be removed on a weekly basis.
- AIPS removal is to take place manually, by hand as far as possible. The use of herbicides should be avoided. Should the use of herbicides be required, only herbicides which have been certified safe for use in aquatic environments by an independent testing authority may be considered (e.g.: Fusilade and Glyphosate). The EO or ECO must be consulted in this regard.
- Care must be taken in order to avoid the disturbance of indigenous species during the removal of AIPS.
- Dispose of removed AIPS material at a registered waste disposal site or burn on a bunded surface where no stormwater runoff is expected.
- Remove vegetation before seed is set and released.
- Cover removed AIPS material properly when transported, to prevent it and seeds from being blown from vehicles.

- Once construction has been completed, all material utilised for the demarcation of the construction footprint as well as all construction waste, rubble, and equipment must be removed from the construction footprint and disposed of at a registered landfill facility.

- Erosion and sedimentation of aquatic habitat
  - Construction activities adjacent to any watercourse must take place within the dry season, where possible (i.e. April to mid-September) to reduce the risk of erosion and sedimentation of the watercourses during construction.
  - Design a Stormwater Management Plan prior to the commencement of construction related activities, which details how stormwater runoff from the construction footprint (specifically roads) will be controlled in order to prevent the erosion and sedimentation of watercourses.
  - Construct silt fences / traps in areas prone to erosion, to retain sediment-laden runoff:
    - Place silt fences / traps strategically on the periphery of the construction footprint area, the site camp, cleared areas, storage areas, soil stockpile areas and laydown areas.
    - Silt fences/traps must be installed downslope of all of the at-risk watercourse to reduce the risk of sediment entering the downstream systems. The EO or ECO must be consulted on the number and location of silt fences, and silt fences must not result in any unnecessary disturbance to wetland, riparian or instream habitat.
    - All sediment trapping devices should be checked weekly by the appointed contractor / EO / ECO and cleared as needed.
    - Ensure silt fences / traps are adequately maintained.
  - Stormwater, sediment and erosion control measures must be installed before construction activities are initiated.
  - Care must be taken to prevent additional disturbance to watercourses during the implementation of stormwater, sediment trapping and erosion control measures.
  - Excess dust observed in the vicinity of the proposed development must be noted and the appropriate dust suppression techniques implemented to ensure no excess sediment input into the surrounding watercourses.
  - Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles.

- The contractor / EO / ECO must check the watercourses and buffer areas for erosion damage and sedimentation weekly and directly after every heavy rainfall event. Should erosion or sedimentation be noted, immediate corrective measures must be undertaken. Care must be taken to prevent additional disturbance to the watercourses during the implementation of these measures.

- Contamination of aquatic habitat
  - A method statement must be developed indicating how the contractor will minimise the passage of contaminants such as fuel and gravel into the watercourses. This method statement must be included with the environmental applications for approval.
  - Inspect all storage facilities and vehicles daily for the early detection of mechanical deterioration or leaks.
  - The placement of drip trays must be conducted under vehicles that are stationary on site.
  - Mixing and transferring of chemicals or hazardous substances must take place on drip trays, shutter boards or other impermeable surfaces within bunded areas and should only be mixed or transferred by suitably trained personnel.
  - Drip trays must be utilised at all fuel dispensing areas.
  - Vehicles and machinery should be cleaned at the site camp and not on site.
  - Dispose of used oils, wash water from cement and other pollutants at an appropriate licensed waste facility.
  - All construction material brought onto site must be non-reactive to prevent contamination.
  - Clean up any spillages immediately with the use of a chemical spill kit and dispose of contaminated material at an appropriately registered facility.
  - The digging of pit latrines is not allowed under any circumstances.
  - None of the open areas or the surrounding environment may be used as ablution facilities.
  - Provide portable toilets where work is being undertaken (1 toilet per 10 workers). These toilets must be located within an area designated by the EO / ECO outside of the watercourses and their associated buffer areas and must be located on level ground. Portable toilets must be regularly serviced and maintained.
  - Provide an adequate number of bins on site and encourage construction personnel to dispose of their waste responsibly. Responsible waste management must form part of the induction process for all site personnel.
  - Waste generated by construction personnel must be removed from the project footprint and disposed of at a registered waste disposal facility on a weekly basis.

10.5.8.3 Rehabilitation

- The rehabilitation of the site camp should be guided by the EMPr.
- All construction waste materials must be removed from site and disposed of at an appropriate waste disposal facility, and temporary structures (e.g. offices, workshops, storage containers, ablution facilities) must be dismantled and removed. This will need to be checked by the EO / ECO and the responsible contractors.
- Any temporary access roads (legal or illegal) which were created must be decommissioned and rehabilitated (ripped and revegetated) to reinstate the natural vegetation, increase the surface roughness and resultantly increase infiltration (e.g. tillage and revegetation) post-construction. It must be noted that rehabilitation specialist should provide guidance with revegetation process.
- The control of AIPS must be guided by a AIPS control plan to ensure compliance with the NEMBA (Act no. 10 of 2004). This act states that all landowners must control listed

AIPS on their property according to the NEMBA: Alien and Invasive Regulations (2014) and associated Alien Species List (2020).

- ❑ Slopes that have been altered due to construction must be reshaped to replicate the original condition and contours and revegetated. All disturbed slopes must be landscaped to no more than a ratio of 1 (vertical): 3 (horizontal) to reduce surface flow velocity and thus erosion potential downslope.
- ❑ Any bare and unstable slopes must be stabilised with a biodegradable cover such as Geojute which must be secured to the steep slope with wooden (biodegradable) pegs. This will reduce soil erosion potential.
- ❑ Remove any gravel or sediment that may have been accidentally deposited into the watercourses and their associated buffer areas (by hand).
- ❑ Any disturbed / compacted outside the development footprint that were caused during the pre-construction and construction phases of this project, must be rehabilitated (ripped and revegetated) to the satisfaction of the EO / ECO as per the relevant EMPr to be composed.
- ❑ Erosion features that have developed as a result of construction-related disturbances are required to be stabilised. This may also include the need to deactivate any erosion head cuts/rills/gullies that may have developed by either compacted soil infill, rock plugs, gabions or any other suitable measures.

10.5.8.4 Operation

- ❑ Domestic waste must be cleared from the access roads, including watercourses therein, on a monthly basis to reduce the contamination potential within the study areas.
- ❑ The control of AIPS must be guided by a AIPS control plan to ensure compliance with the NEMBA (Act no. 10 of 2004). This act states that all landowners must control listed AIPS\s on their property according to the NEMBA: Alien and Invasive Regulations (2014) and associated Alien Species List (2020). A contractor must be appointed by Eskom to control all AIPS within the proposed development sites. The clearing should take place in a phased manner, starting within the initial clearing and then follow-up and lastly maintenance clearing. The clearing processes typically take 3 years with annual updates of the site-specific AIPS control plan.

Table 27 Assessment of the potential impacts of the proposed deviations on watercourses and aquatic biodiversity

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Indirect loss of aquatic habitat and ecological connectivity (construction)	Unmitigated	Negative	Local	Short-term	Low	Once off	Probable	Low	High	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Medium
Indirect alteration of water quality (construction)	Unmitigated	Negative	Site specific	Short-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Medium
Direct alteration to the catchment and hydrological flow (construction)	Unmitigated	Negative	Local	Short-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Medium
Indirect alteration to ecosystem service provisions (construction)	Unmitigated	Negative	Site specific	Short-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Low
Improvement of aquatic habitat and ecological structure (rehabilitation)	Unmitigated	Positive	Local	Short-term	Low	Once off	Probable	Moderate	Low	Low	Medium
	Mitigated	Positive	Local	Medium-term	Negligible	Intermittent	Improbable	Low	High	Low	Low

Indirect alteration of water quality (operation)	Unmitigated	Negative	Local	Short-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Medium
Indirect alteration to ecosystem service provisions (operation)	Unmitigated	Negative	Local	Short-term	Low	Once off	Probable	Moderate	Medium	Low	Medium
	Mitigated	Neutral	Site specific	Short-term	Negligible	Negligible	Improbable	Low	High	Low	Medium

10.6 What impacts will the proposed deviations have on avifauna species (birds) and *vice-versa*?

According to the assessment, the potential negative impacts of the construction and operation of the proposed deviations on avifauna are of low and medium significance, without management. With management/mitigation, the significance of these impacts is reduced to low. Refer to the subsections below and to Table 28.

10.6.1 Displacement as a result of habitat loss or transformation (preconstruction and construction)

During preconstruction and construction, clearance of vegetation (habitat) (4m to 8m on either side of the power line) will reduce the amount of habitat available to birds for foraging, roosting and breeding. The effect of the vegetation clearing is always more marked in woodland areas, where construction necessitates the removal of woody plants, and especially large trees. Given the low report rates for the majority of the SCC, the loss of habitat may potentially be more significant for the more common power line sensitive species and passerine species with small home ranges, as entire territories could be removed during construction activities. While these species have the potential to be displaced by the construction of the power line deviations, identical habitat features prominently in the surrounding areas, providing alternate foraging, roosting and breeding areas for the species observed.

10.6.2 Displacement as a result of disturbance (construction)

Excavation and construction activities are a source of significant disturbance, particularly as a result of the machinery and construction personnel that are present on site for the duration of the construction of the authorised power line. For most bird species, construction activities are likely to be a cause of temporary disturbance impacting on foraging, and roosting behaviours but in more extreme cases, construction may impact on the breeding success of certain species particularly if the disturbance happens during a critical part of the breeding cycle, resulting in temporary breeding failure or permanent nest abandonment. The deviation areas are already subjected to a degree of disturbance in the form of settlement, agricultural and pastoral activities, in addition to vehicle and pedestrian traffic. Construction activities within the proposed route deviations are likely to result in the temporary displacement as opposed to permanent displacement of species from the area.

10.6.3 Direct mortality as a result of construction activities

Bird mortality as a result of construction activities is improbable because birds are incredibly mobile and able to move out of harm's way. If mortality does occur, it is likely to be confined to a localised area and restricted to immobile species e.g. nestlings. No terrestrial bird species (ground) nest locations were observed during the site survey.

10.6.4 Mortality due to collisions with the 132kV power line conductors (operation)

Collisions are the biggest single threat posed by power lines to birds in southern Africa. Most heavily impacted upon are the heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines. Relevant to this development, collisions are unlikely to occur within the route deviation areas,

given the habitat type and the significant levels of disturbance present in the area. Because it has been moved to the base of the koppie instead of traversing over the top, Bend 1 should pose less collision risk than the original route. The collision impact for the remainder of the power line alignment remains moderate as per the avifaunal impact assessment conducted previously for the authorised line.

10.6.5 Mortality due to electrocutions on the 132kV power line infrastructure (operation)

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components. Electrocution risk is strongly influenced by the power line voltage and design of the tower/pole structure and mainly affects larger, perching species that are capable of spanning the spaces between energized components. The clearance distances between the live components and/or live and earthed components of the 132kV tower structure should be sufficient to reduce the risk of electrocutions for most raptor species. However, given the large number of Cape Vulture recorded in the broader area and the presence of high numbers of cattle, should a carcass be available to the birds, they might attempt to roost on the poles. The best possible mitigation is the construction of the power line using an Eskom approved bird friendly pole/tower design (DT 7641/7649) in accordance with the Distribution Technical Bulletin relating to bird friendly structures (APPENDIX 4). Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.

10.6.6 Impact on the quality of electrical supply (operation)

Both bird streamers and bird pollution occur as a result of birds perching and defecating on the pole tops and often directly above live conductors, causing electrical faults on power lines. This impact will be more marked on those towers within close proximity to the towers that will be constructed on the Ibis piggery property. The more faults that occur on a line, the poorer the quality of electrical supply to the end users. The construction of the power line using the steel monopole structure will minimise this impact, in that limited perching space on the structure is available to the vultures and storks that will readily utilise the power line towers to roost on. Site specific mitigation (e.g. anti-perching devices) can be applied reactively , should this impact occur post construction.

Bird nests may also cause faults through nest material, protruding into the air gap between live components on the power line infrastructure. Crows in particular often incorporate wire and other conductive material into their nests. When nests cause flashovers, the nesting material may catch fire. This in turn can lead to equipment damage or a general veld fire. Apart from the cost of replacing damaged equipment, the resultant veld fire can lead to claims for damages from landowners. Power line poles in turn provide nesting substrate for certain bird species, some of which might benefit through the increased availability of nesting substrates on the power line infrastructure. Site specific mitigation (i.e. bird guards) can be applied reactively should this impact occur.

10.6.7 Displacement as a result of disturbance (decommissioning)

The PAOI is already subjected to a degree of disturbance associated with settlement, agricultural and pastoral activities. While the decommissioning of the Nhluvuko-Tshebela/Rampheri 132kV power line in this area will undoubtedly displace some species, the

bird species likely to occupy this area, and the fact that similar habitat is available within the broader PAOI, displacement as a result of disturbance is unlikely to be permanent and of national significance.

10.6.8 Mitigation measures

10.6.8.1 Pre-construction and Construction

- Displacement as a result of habitat loss
  - Avoid removal of sensitive vegetation types. The recommendations of the botanical study must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
  - Construction activity should be restricted to the immediate footprint of the infrastructure.
  - All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
  - All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.
  - Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.

- Displacement as a result of disturbance
  - Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
  - Measures to control noise should be applied according to current best practice in the industry.

- Mortality as a result of electrocutions on the 132kV power line infrastructure
  - The 132kV power line must be constructed using a bird friendly structure (i.e. (DT 7641/7649).
  - Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.

- Mortality as a result of collision with the overhead conductors and/or earth wires of the 132kV power line
  - Conduct a pre-construction inspection (avifaunal walk-through) of the final power line alignment, prior to construction, to identify any species that may be breeding on the site or within the immediate surrounds and to ensure that any impacts likely to affect breeding species (if any) are adequately managed and to identify the exact sections of power line requiring collision mitigation. As a minimum these sections of power line will include rivers, drainage lines, dams and cultivated lands. Relevant to this report, bird flight diverters must be fitted to the sections of power line that border the cultivated lands within the Bend 1 and Bend 2 deviations.
  - Power line marking in the form of bird flight diverters must be installed on the full span length on the earthwires, according to the applicable Eskom Engineering Instruction (Eskom Unique Identifier 240 – 93563150: The utilisation of Bird Flight Diverters on Eskom Overhead Lines). Light and dark colour devices must be alternated so as to provide contrast against both dark and light backgrounds

respectively. These devices must be installed as soon as the conductors are strung.

10.6.8.2 Operation

- Mortality as a result of electrocutions on the 132kV power line infrastructure
  - Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine line patrols of the Nhluvuko-Tshebela/Rampheri 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership.
  - Insulating material (if applied) to be maintained during the operational life span of the Nhluvuko-Tshebela/Rampheri 132kV power line.

- Mortality as a result of collision with the overhead conductors and/or earth wires of the 132kV power line
  - Eskom line and servitude managers are requested to report all bird collisions encountered during routine line patrols of the Nhluvuko-Tshebela/Rampheri 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership.
  - Bird flight diverters to be maintained on sections of power line during the operational life span of the Nhluvuko-Tshebela/Rampheri 132kV power line.

- Nest building on the 132kV power line infrastructure
  - If on-going impacts are recorded once the Nhluvuko-Tshebela/Rampheri 132kV power line is operational, it is recommended that these impacts be assessed by Eskom-Endangered Wildlife Trust Strategic Partnership and site-specific mitigation be applied reactively.
  - While it is not illegal to remove an unoccupied nest that is posing a quality of supply risk, the removal of nests that contain eggs or chicks will require a permit to do so. Nest management strategies to be identified and implemented reactively, if required.

Table 28 Assessment of the potential impacts of the proposed deviations on avifauna species and *vice-versa*

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Displacement of Red List species as a result of habitat loss (construction)	Unmitigated	Negative	Site Specific	Short Term	Medium	Once Off	Highly Probable	Moderate	Low	Low	High
	Mitigated	Negative	Site Specific	Short Term	Low	Once Off	Probable	Low	High	Low	High
Displacement of Red List species as a result of disturbance (construction)	Unmitigated	Negative	Local	Short Term	Medium	Intermittent	Highly probable	Moderate	Medium	Medium	High
	Mitigated	Negative	Site Specific	Short Term	Low	Intermittent	Probable	Low	High	Low	High
Mortality: electrocution on the 132kV power line infrastructure (operation)	Unmitigated	Negative	Regional	Long Term	High	Periodic	Highly probable	High	Low	Medium	High
	Mitigated	Negative	Local	Short Term	Low	Once Off	Improbable	Low	High	Low	High
Mortality: collision with the 132kV power line infrastructure (operation)	Unmitigated	Negative	Regional	Long Term	Medium	Periodic	Highly probable	High	Low	Medium	High
	Mitigated	Negative	Local	Medium Term	Low	Once Off	Improbable	Low	High	Low	High
Displacement of Red List species as a result of habitat loss (decommissioning)	Unmitigated	Negative	Local	Short Term	Medium	Once Off	Highly Probable	Moderate	Medium	Medium	High
	Mitigated	Negative	Site Specific	Short Term	Low	Once Off	Probable	Low	High	Low	High

10.7 How will the visual changes to the landscape as a result of the proposed deviations affect the social and socio-economic environment?

The significance of the visual impacts as a result of the proposed deviations are assessed as low, both before and after mitigation. Refer to the subsections below and to Table 29a, 29b and 29c.

10.7.1 Bend 1

The small koppie around which Bend 1 deviates is the only natural landscape feature in the immediate vicinity. While the Zone of Theoretical Visibility (ZTV) for the authorized section will not be significantly different from Bend 1, it is likely to be marginally more visible. Bend 1 will have less of an impact than the original authorised route, as it traverses the base of the koppie which is a less sensitive landscape, will require less vegetation clearance and elevation will be relatively lower.

Visual receptors likely to be the most sensitive to Bend 1 will be farmers working the maize fields.

The visual impacts of Bend 1 were identified as :

- Possible Landscape Impact.
- Possible visual impacts for agricultural workers.

Both of the above were assessed as being of low significance both before and after mitigation.

10.7.2 Bend 2

The eastern section of the proposed deviation is located within an area of natural Polokwane Bushveld and close to a series of minor koppies. This section of the line will, therefore, be highly sensitive (both the authorised alignment and proposed deviation). It is unlikely that the ZTV for the authorized section of alignment will be significantly different from the proposed deviation. However, as the authorized alignment passes closer to the area of rural settlement and a section of the proposed deviation passes on the opposite side over the series of small koppies, it is likely that the proposed deviation will be less obvious from the settlement area than the authorized alignment.

It is not anticipated that there will be visual impacts which negatively affect socio-economic or economic activities. Visual receptors (residents of the adjacent Manthowane Rural Settlement, users of local roads and workers in the agricultural fields) are unlikely to be highly sensitive to landscape change.

The visual impacts of Bend 2 were identified as :

- Possible Landscape Impact.
- Possible visual impacts for residents of Manthowane.
- Possible visual impacts for travelers on the adjacent unsurfaced road.
- Possible visual impacts for agricultural workers.

All of the above were assessed as being of low significance both before and after mitigation.

10.7.3 Bend 3-6

Due to the natural nature of the affected valley landscape it is likely to be sensitive to landscape change. The ZTV analysis indicates that both the authorized alignment and Bend 3-6 are likely to be visible over a similar area. In terms of landscape impacts, the proposed deviation and the authorized alignment will both partly run along a major ridgeline. Bend 3-6 will run along the ridgeline for a slightly longer distance than the authorized alignment. In both these situations, possible viewpoints are relatively distant from the affected section of ridgeline and because of this, neither the authorized nor the proposed deviation will be highly visually obvious.

Bend 3-6, being longer than the authorised alignment, will affect a bigger section of the valley. However, Bend 3-6 will have much less of an impact on the game farm than the original alignment and therefore less risk of any socio-economic/economic impact. Bend 3-6 is aligned away from the property and given the existing vegetation / tree cover and the landform, it is unlikely that the proposed deviation will be highly visually obvious from this property.

Because both the authorized and Bend 3-6 alignments are located at some distance from roads (closest approximately 1.2km), they are likely to have a similar level of visual impact from adjacent unsurfaced roads.

In light of the above, the VIA concluded that Bend 3-6 will be likely to have a marginally greater Landscape Impact but a significantly lower visual impact for sensitive receptors.

The visual impacts of Bend 3-6 were identified as :

- Possible Landscape Impact.
- Possible visual impacts for travelers on the adjacent unsurfaced road.
- Possible visual impacts for visitors to the game farm located on the adjacent property.

All of the above were assessed as being of low significance both before and after mitigation.

10.7.4 Mitigation measures

Mitigation measures should include:

- Minimise the loss of functional agricultural land (limit impacts to areas used for circulation/access).
- Minimising disturbance during construction.
- Undertaking landscape rehabilitation of disturbed areas following construction.
- Removing all infrastructure on decommissioning.

Whilst these mitigation measures are good practice and will make a difference immediately adjacent to the proposed deviations, due to the height of structures, they are unlikely to have a significant effect in reduction of levels of impact.

Table 29a Assessment of potential visual impacts on the social and socio-economic environment, as a result of Bend 1

LANDSCAPE IMPACT (BEND 1)											
Impact	**Mitigated /Managed**	**Nature**	**Spatial Extent**	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability**	**Reversibility**	**Significance**	**Confidence**
Rural Landscape Change	Unmitigated	Neutral	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
	Mitigated	Neutral	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY AGRICULTURAL WORKERS											
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Low	Continuous	Probable	Low	High	Low	High
	Mitigated	Neutral	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High

Table 29b Assessment of potential visual impacts on the social and socio-economic environment, as a result of Bend 2

LANDSCAPE IMPACT (BEND 2)											
Impact	**Mitigated /Managed**	**Nature**	**Spatial Extent**	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability**	**Reversibility**	**Significance**	**Confidence**
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Low	Continuous	Probable	Low	High	Low	High
	Mitigated	Negative	Local	Long-term	Low	Continuous	Probable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY RESIDENTS OF MANTHOWANE											
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
	Mitigated	Negative	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY PEOPLE TRAVELLING ON THE ADJACENT UNSURFACED ROAD											
Impact	**Mitigated /Managed**	**Nature**	**Spatial Extent**	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability**	**Reversibility**	**Significance**	**Confidence**
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
	Mitigated	Negative	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY AGRICULTURAL WORKERS											
Rural Landscape Change	Unmitigated	Neutral	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
	Mitigated	Neutral	Local	Long-term	Neutral	Continuous	Improbable	Low	High	Low	High

Table 29c Assessment of potential visual impacts on the social and socio-economic environment, as a result of Bend 3-6

LANDSCAPE IMPACT (BEND 3-6)											
Impact	**Mitigated /Managed**	**Nature**	**Spatial Extent**	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability**	**Reversibility**	**Significance**	**Confidence**
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
	Mitigated	Negative	Local	Long-term	Negligible	Continuous	Probable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY VISITORS ON ADJACENT GAME FARM											
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
	Mitigated	Neutral	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
CHANGE OF VIEW EXPERIENCED BY PEOPLE TRAVELLING ON THE ADJACENT UNSURFACED ROADS											
Impact	**Mitigated /Managed**	**Nature**	**Spatial Extent**	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability**	**Reversibility**	**Significance**	**Confidence**
Rural Landscape Change	Unmitigated	Negative	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High
	Mitigated	Negative	Local	Long-term	Negligible	Continuous	Improbable	Low	High	Low	High

10.8 What effects will the proposed deviations have on cultural heritage resources, including palaeontological resources?

The following must be noted in relation to the impact of heritage resources for this project:

- Heritage sites assessed to have a low heritage significance are not included in the impact tables as they will not require mitigation.
- The observed sites of medium or high heritage significance are located in the vicinity of **Bend 2**.
- The heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the size of the study area and the subterranean nature of some heritage sites. The impact assessment conducted for heritage sites assumes the possibility of finding heritage resources during the project life and has been conducted as such.
- An archaeological walk down of the final approved layout will be required before construction commences.

The significance of impacts on heritage resources as a result of the proposed deviations is assessed as medium, without mitigation. With mitigation, the significance is reduced to low. Refer to the subsections below and to Table 30.

10.8.1 Disturbance, damage or destruction to archaeological historical homesteads, including possible graves along BEND 2 (NT05, NT06, NT07 and NT08)

Construction activities may potentially result in the disturbance, damage or destruction of four homestead sites along or near **Bend 2**, as described below.

Site	Longitude	Latitude	Description
NT05	29.63378	-24.0129	**Archaeological/Historical homestead** located in a flat-lying area. Includes: several hut circle remains. The site is an extended settlement. The large stone circles indicate circular huts with hut rubble present in some of them. The circular hut type and layout indicates that the site is archaeological. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.
NT06	29.63404	-24.01221	A **stone kraal** borders onto natural rock outcrop. No other material cultural observed. It is likely associated with NT05.
NT07	29.63435	-24.01212	**Archaeological/Historical homestead** and a few ceramic pieces. It is likely associated with NT05. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.
NT08	29.63562	-24.01147	**Archaeological/Historical homestead** located in a flay-lying area. Includes: three structures (stone walling remains) and a modern midden. Much of the stone walling had been robbed of its stone, which meant that the layout pattern was somewhat obscured. No other material cultural observed. The possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.

Three of these sites (**NT05, NT 07 AND NT08**) are rated as having medium - high heritage significance and had a heritage grading of IIIA and IIIB. **NT06** has a low heritage significance and a heritage grading of IIIC. Without mitigation, the significance of this impact is assessed as medium. However, with mitigation, the significance of this impact is assessed as low.

10.8.2 Disturbance, damage or destruction to cultural structure (NT09 and NT 10 along BEND 2)

Construction activities may potentially result in the disturbance, damage or destruction of two cultural structures at sites NT09 and NT10 along or near **Bend 2**, as described below.

Site	Longitude	Latitude	Description
NT09	29.635962	-24.011649	The structure is potentially a seatlo (isivivane in isizulu) associated with a significant figure or indicating a historical travel route.
NT10	29.63661	-24.0113	The structure is potentially a seatlo (isivivane in isizulu) associated with a significant figure or indicating a historical travel route

These two structures are rated as having moderate heritage significance (Grade IIIB). Without mitigation, the significance of this impact is assessed as medium. However, with mitigation, the significance of this impact is assessed as low.

10.8.3 Impact on palaeontology

The Palaeontological Sensitivity of the majority of the proposed development area is rated as Insignificant/Zero. Only one area within the Bend 3-6 study area, was rated as Low significance.

In accordance with specialist recommendations, no further assessment of impacts on palaeontological resources is required. However a protocol for incidental palaeontological finds is required for the Bend 3-6 area. This protocol should include the termination of all construction work if any palaeontological finds are discovered, and that SAHRA and a palaeontologist should be alerted to determine the way forward.

10.8.4 Chance finds

It is possible that cultural material will be exposed during pre-construction and construction activities, and may be recoverable, keeping in mind delays can be costly during construction and as such must be minimised. Powerline foundation holes do offer a window into the past and it thus may be possible to rescue some of the data and materials. With implementation of a chance find procedure, it will be possible to implement a suitable mitigation strategy on a case by case basis.

10.8.5 Mitigation measures

- **Chance find procedure** must be implemented to deal with possible heritage finds during work on site:
  - An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified.

- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the Heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/archaeologist.

❑ **General project area**: (*preconstruction and construction*)

- An archaeological walk down of the final approved layout will be required before construction commences.
- Implement chance find procedures in cases where possible heritage finds are uncovered.

❑ **Possible graves (NT01, and NT04)** (*preconstruction*)

- Until such time that the presence of a grave at the site has been tested, the stone concentrations must be viewed as containing a grave.
- The possible graves should be demarcated with a **50-meter buffer** and should be avoided and left *in situ*.

If the graves cannot be avoided:

- A Grave Management Plan should be developed for the graves, which also need to be approved by SAHRA BGG.
- If the site cannot be avoided and the site is going to be impacted, then an application to SAHRA will be required for a test excavation and/or Ground Penetrating Radar (GPR) permit to determine if the site contains graves.
- If human remains are discovered, a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA Burial Grounds and Graves (BGG), under the NHRA and National Health Act regulations.
- If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required.

❑ **Archaeological/Historical homesteads with possible grave sites (NT05, NT07, NT08)**

Archaeological site mitigation

- Demarcate extent of the area with a 30-meter buffer and leave in situ.
- If it is not possible to avoid the site, archaeological mitigation with a subsequent destruction permit will be required.
- Mitigation will include:
- Application for a section 35 NHRA excavation permit
- Documentation of the layout of the site.
- Investigation through archaeological excavations, to determine the extent of the site as well as retrieving cultural material to determine cultural affinity and temporal position of the site.
- Upon completion of the excavations and report, an application for a destruction permit can be lodged with the SAHRA by the client.

Human remains investigation

- Mitigation measures would include applying to SAHRA for the test excavation and/or GPR permit to determine if the site contains graves.
- If human remains are discovered, a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG, under the NHRA and National Health Act regulations.
- When graves are discovered/uncovered, the site should be demarcated with a 50-meter no-go-buffer-zone and the grave should be avoided.
- If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required.

❑ **Remains of Structures** (**NT02**, **NT06, NT12**)

- No mitigation is required. The documentation of the site in the HIA report is sufficient and the site can be destroyed without a permit but with the approval of this report.

❑ **Remains of structures** (**NT11**)

- No mitigation is required.

❑ **Low-density surface scatter/findspot** (**NT03**)

- No mitigation is required.

❑ **Stone cairns at NT09 and NT10**

- Demarcation with a 30-meter buffer and conservation in situ
- **If not possible** – consultation with local communities into the significance of the cairns and the possible cultural ceremonies for destruction of the cairns must be done.
- Upon completion of the consultation and report and application for a destruction permit can be lodged with the SAHRA by the client.
- Upon receiving the destruction permit, the implementation of the identified and agreed upon ceremonies can be done to facilitate the destruction of the site.

❑ **Timeframes**

- It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. Guidelines for lead times on permitting are provided below.

Lead times for permitting and mobilisation

ACTION	RESPONSIBILITY	TIMEFRAME
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 months
Documentation, excavation, and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

Table 30 Potential impacts of the proposed deviations on cultural heritage resources, including palaeontological resources

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Disturbance, Damage, or destruction to archaeological historical homesteads (incl. possible graves) (**NT05, NT07**, **NT06** and **NT08**).	Unmitigated	Regional	Permanent	Medium	Once-off	High	Probable	High	Non-reversible	Medium	High
	Mitigated	Local	Permanent	Low	Once-off	High	Improbable	High	Non-reversible	Low	High
Disturbance, Damage, or destruction to cultural structure (**NT09** and **NT10**).	Unmitigated	Negative	Regional	Permanent	Medium	Once-off	Probable	High	Non-reversible	Medium	High
	Mitigated	Negative	Local	Permanent	Low	Once-off	Improbable	High	Non-reversible	Low	High
Palaeontological resources	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

10.9 What cumulative impacts are anticipated from construction and operation of the proposed route deviations?

A cumulative impact is an incremental impact upon the environment that results from the impact of a proposed action when added to past, existing, and reasonably foreseeable future actions which can be both positive and negative in nature.

Of relevance to cumulative impacts for this study is that there are approximately 22 existing high voltage powerlines and significantly more distribution and reticulation lines totalling hundreds of kilometres within the 30km radius around the Nhluvuko-Tshebela 132kV power line PAOI. The Nhluvuko-Tshebela 132kV power line will increase the total number of existing and planned high voltage lines by a small percentage. Construction is already underway and cumulative impacts will be associated with the types of impacts discussed above (Sections 10.2-10.8).

Apart from increasing the timeframe for the project (due to delays resulting from the environmental authorisation process for the deviations) and therefore extending the period of some of the construction impacts, the contribution of the route deviations to cumulative impacts will be negligible and are deemed of low significance[8]. Refer to Table 31. There are no mitigation measures proposed other than those already recommended in this report for the deviations.

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8 Indeed, the proposed deviations are being applied for because they are improvements over the original routing, particularly with respect to terrestrial biodiversity and certain socio-economic impacts.

Table 31 Assessment of potential cumulative impacts of the proposed deviations

Impact	Mitigated /Managed	Nature	Spatial Extent	Duration	Intensity	Frequency	Probability	Irreplaceability	Reversibility	Significance	Confidence
Cumulative positive socio-economic impacts	Unmitigated	Positive	Regional	Long-term	Low	Continuous	Probable	N/A	N/A	Low	Medium
	Mitigated	Positive	Regional	Long-term	Low	Continuous	Probable	N/A	N/A	Low	Medium
Cumulative negative socio-economic impacts	Unmitigated	Negative	Local	Short term	Low	Intermittent	Probable	N/A	N/A	Low	Medium
	Mitigated	Negative	Local	Short term	Low	Intermittent	Probable	N/A	N/A	Low	Medium
Cumulative impacts on terrestrial biodiversity	Unmitigated	Negative	Local	Long-term	Low	Continuous	Probable	Moderate	High	Low	Medium
	Mitigated	Negative	Local	Medium - term	Low	Continuous	Probable	Low	High	Low	Medium
Cumulative impacts on watercourses and aquatic biodiversity	Unmitigated	Negative	Local	Short-term	Low	Once off	Probable	Moderate	Moderate	Low	Medium
	Mitigated	Negative	Site specific	Medium - term	Negligible	Negligible	Improbable	Low	High	Low	Medium
Cumulative impacts on avifauna	Unmitigated	Positive	Local	Medium-term	Negligible	Once off	Probable	Moderate	Low	Low	Medium
	Mitigated	Positive	Local	Medium-term	Negligible	Intermittent	Improbable	Low	High	Low	Medium
Cumulative visual impacts	Unmitigated	Negative	Local	Long-term	Low	Continuous	Probable	Low	Moderate	Low	Medium
	Mitigated	Negative	Local	Long-term	Low	Continuous	Probable	Low	Moderate	Low	Medium
Cumulative impacts on cultural heritage	Unmitigated	Negative	Regional	Permanent	Moderate	Once off	Improbable	High	Non-reversible	Low	Medium
	Mitigated	Negative	Regional	Permanent	Moderate	Once off	Improbable	High	Non-reversible	Low	Medium

11. ENVIRONMENTAL IMPACT STATEMENT

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity and their significance (after mitigation, where applicable) is provided below.

For this project, it is particularly important to understand the context of the proposed activity, which consists of three separate and minor route deviations along an approximately 30 km long 132 kV overhead powerline that has already been granted environmental authorisation and is under construction (except for the deviated sections). The deviations have been proposed as better options because they avoid or reduce particular environmental impacts that would occur with the original routing. However, most impacts of the proposed deviations will be similar to those expected from the overall development already underway and the deviations on their own, will not alter the significance of these impacts.

Social and socio-economic impacts
In terms of socio-economic benefits, the line deviations need to be considered as part of the overall development, which is expected to contribute positively to local economic and socio-economic conditions through the provision of electricity connections and better reliability of supply. The project will continue to provide employment and income earning opportunities in the area for the duration of the construction period. Specifically, Bend 3-6 seeks to avoid negative impacting on potential socio-economic opportunities associated with the adjacent game farming property.

In terms of negative impacts, local communities and road users will be subject to various (temporary) nuisance impacts, as well as increased health, safety and security risks due to the presence and activities of construction teams and vehicles in the area. Importantly, no resettlement will be required for the deviations.

With management, the positive economic/socio-economic impacts of the electrical infrastructure at a local and regional level during construction and operation are deemed to be of medium and high significance. With mitigation, the negative impacts are of low significance.

Impacts on aviation
Considering the distance of the deviations from major airports and other aerodromes, as well as the existing powerlines operating in the area, it is likely that impacts on aviation and radar facilities can be successfully mitigated. An obstacle application process is underway with the South Africa Civil Aviation Authority (CAA) and subject to the required permission from the CAA, the risk to civil aviation is anticipated to be low.

Impacts on agriculture
The permanent loss of agricultural land (the majority being of a low land capability and agricultural sensitivity) will be minimal, as the footprint of the towers is only 2 m^2 per tower, averaging 8.7 m^2 per km of deviation. Small areas of maize cultivation are affected by Bend 1 and Bend 2, however Eskom compensates accordingly as part of servitude negotiations. The remaining area under the deviated sections can continue to be grazed and cultivated as before. With mitigation, the loss of agricultural land and the impact of the proposed deviations on the local agricultural economy is assessed to be of low significance.

Impacts on terrestrial biodiversity

The impacts of the deviated sections on terrestrial biodiversity will be limited due to the nature of the development and the nature of the vegetation on site. The permanent loss of vegetation is minimal due to the small footprint of the towers (as explained above) and because indigenous vegetation is left to grow within the servitude, although is kept short and cleared of woody vegetation for a 4-8 m width immediately below the line. The conservation status of vegetation on site is “least concern” and few to no SCC’s and protected plants/trees were observed along the deviations. No protected areas will be impacted. While Bend 3-6 traverses CBA1 and CBA2 areas, the powerline here has already been authorised and is not expected to negatively impact conservation targets. Due to the limited impact on natural habitat, and the limited occurrence of faunal SCCs in the area, impacts on animals will not be significant. Provided the recommended mitigation measures are implemented, impacts on terrestrial biodiversity are assessed as having a low significance.

Impacts on avifauna

The habitat within which the PAOI is located is low to moderately sensitive from a potential bird impact perspective. In recent years, anthropogenic impacts, mostly in the form of urbanisation, agricultural and pastoral activities have largely transformed the landscape, resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the proposed deviations within the authorised powerline will result in impacts of medium-low significance to birds occurring in the vicinity of the new infrastructure, which can be reduced through the application of mitigation measures to low-negligible levels.

Impacts on watercourses and aquatic biodiversity

It was determined after risk screening that all aspects associated with the proposed deviations, specifically the proposed tower positions, were situated more than 60 m away from the delineated watercourses identified on site. Considering the nature of the proposed deviations (i.e. overhead electricity infrastructure), no watercourses were deemed to be at-risk of being impacted on by the proposed activities. This is subject to implementation of the avoidance, mitigation and rehabilitation measures recommended by the aquatic specialist and as specified in the EMPr. After mitigation/management, impacts on watercourses and aquatic biodiversity were assessed as having a low significance.

Visual impacts

Potential negative visual impacts include rural landscape change (all three deviations) and changes in view. Changes in view will be experienced primarily by local agricultural workers (Bend 1 and Bend 2), residents of Manthowane (Bend 2), local road users (Bend 2 and Bend 3-6) and patrons of an adjacent game farm (Bend 3-6). The significance of all these impacts is assessed as low, with and without mitigation.

Impacts on cultural heritage

The project could potentially result in disturbance or destruction of heritage resources of medium to high heritage sensitivity identified along Bend 2. These include possible graves, archaeological/historical homesteads, a stone kraal, and rock cairns. However, with the implementation of the recommended buffers and management guidelines, the significance of impacts on the tangible cultural heritage resources is assessed as low. The heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. If further resources are uncovered during construction, impacts can be managed to acceptable levels via the chance finds procedure.

Cumulative impacts

Both positive and negative cumulative impacts relating to all the impacts discussed above, are possible. However the contribution of the proposed deviations towards cumulative impacts, in comparison with the rest of the 30 km line under construction and the numerous surrounding powerlines in the area, will be negligible. Overall, the significance of these negative cumulative impacts is assessed to be medium and low.

12. CONCLUDING STATEMENT AND RECOMMENDATION OF THE EAP

Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are environmental benefits and no fatal flaws associated with the proposed route deviations along the Nhluvuko-Tshebela 132 kV powerline. The negative impacts resulting from the construction and operation of the proposed route deviations can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE, conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr, and including approval from the CAA.

The co-ordinates (approximate) of the alignments to be authorised are as shown in the table below and as depicted in the figures in this BAR. However, Eskom must be allowed flexibility to fine tune the alignments within the assessed corridor, in case shifts are required, following the findings of the pre-construction specialist walkdowns and final technical design.

Location	Latitude (S)	Longitude (E)
Bend 1 (east end)	24°0.503’ S	29°43.252’E
Bend 1 midpoint	24°0.469’ S	29°43.190’E
Bend 1 (west end)	24°0.503’ S	29°43.130’E
Bend 2 (east end)	24°0.499’ S	29°38.479’E
Bend 2 midpoint	24°0.739’ S	29°38.108’E
Bend 2 (west end)	24°0.857’ S	29°37.697’E
Bend 3-6 (east end)	24°2.836’ S	29°33.278’E
Bend 3-6 midpoint	24°3.398’ S	29°31.903’E
Bend 3-6 (west end)	24°2.962’ S	29°30.754’E
Approximate lengths (Bend 1, Bend 2. Bend 3-6)	0.24 km; 1.5 km; 5.3 km	
Width of assessed corridor either side of the line	500 m (aquatic) and 100 m (terrestrial vegetation)	

13. REFERENCES

Websites accessed

https://screening.environment.gov.za/screeningtool/#/pages/welcome (Accessed May 2022).

https://globalinitiative.net/analysis/extortion-construction-mafia-south-africa/ (Accessed September 2022).

Publications and Reports

Gibb Engineering (2012). Basic Environmental Assessment for the construction of 132kV distribution lines from Melkhout to Patensie, Cacadu District

Afzelia Environmental Consultants, 2022. Proposed deviations to the existing Eskom Nhluvuko-Tshebela 132 kV distribution powerline located within the Capricorn District, Limpopo, South Africa. Terrestrial Biodiversity Impact Assessment Report prepared for ENVASS, prepared for ACER (Africa) Environmental Consultants.

ENVASS, 2022. Aquatic Biodiversity Impact Assessment of the existing Eskom Nhluvuko-Tshebela powerline situated within the Polokwane Local Municipality of the Limpopo Province, South Africa. Prepared for ACER (Africa) Environmental Consultants.

Environmental Planning and Design, 2022. Three proposed deviations from the authorised alignment of the 132kv Overhead Powerline between Nhluvuko and Tshebela near Polokwane in the Limpopo Province. Landscape & Visual Impact Assessment. Prepared for ACER (Africa) Environmental Consultants.

Feathers Environmental Services, 2022. Nhluvuko-Tshebela/Rampheri 132 kV Power Line Project (Route Deviations). Avifaunal Impact Assessment Report. Prepared for ACER (Africa) Environmental Consultants.

McFarlane, L. 2022. Proposed deviations to the authorised alignment for the 30 km 312 kV distribution line between Tshebela/Rampheri new substation and Nhluvuko substation Capricorn District Municipality, Limpopo Province, South Africa. Social and Socio-Economic Impact Assessment. Prepared for ACER (Africa) Environmental Consultants.

Mzansi Agriculture, 2022. A Basic Desktop Agricultural Impact Assessment for the Construction of 3 Deviations along the already approved Eskom Nhluvuko-Tshebela 132 kV Distribution Powerline, in Polokwane Local Municipality, Capricorn District Municipality, Limpopo Province. In extent approximately 8 km. Prepared for ACER (Africa) Environmental Consultants.

PGS, 2022. Heritage Assessment Report, for the Basic Assessment process, for proposed deviations to the Eskom Nhluvuko-Tshebela 132kv Distribution Powerline, Polokwane Local Municipality, Limpopo Province. Prepared for ACER (Africa) Environmental Consultants.

Zhang, J., Yang, J., Tang, B., Hao, H and Zheyuan, G. (2019). Protecting Distance between Radar Stations and UHV Power Transmission Lines. The Open Electrical & Electronic Engineering Journal ISSN: 1874-1290 – Volume 13.

APPENDIX 1: EAP *CURRICULUM VITAE*

APPENDIX 2: APPLICATION FOR AUTHORISATION

APPENDIX 3: DFFE SCREENING TOOL REPORT

APPENDIX 4: SUPPORTING MAPS

APPENDIX 5: SPECIALIST REPORTS, *CURRICULUM VITAE* AND DECLARATIONS

- ❑ Agricultural Impact Assessment, CV and Declaration
- ❑ Aquatic Biodiversity and Wetlands Impact Assessment (including CV) and Declaration
- ❑ Avifauna Impact Assessment (including CV) and Declaration
- ❑ Heritage Impact Assessment (including CV) and Declaration
- ❑ Social /Socio Economic Impact Assessment, CV and Declaration
- ❑ Terrestrial Biodiversity/fauna/flora, CV and Declaration
- ❑ Visual Impact Assessment (including CV) and Declaration

APPENDIX 6: ENVIRONMENTAL MANAGEMENT PROGRAMME.

- ❑ DFFE Generic EMPr
- ❑ EMPR Part B Section 2 (Project Details and Sensitivity map)
- ❑ EMPR Part C (Site Specific Specifications)

APPENDIX 7: PUBLIC PARTICIPATION DOCUMENTS

Project announcement

- ❑ Media adverts
- ❑ On site notice
- ❑ Letter and Background Information Document (BID)
- ❑ Database
- ❑ Proof of emails sent
- ❑ Stakeholder correspondence
- ❑ Meeting records

APPENDIX 8: COMMENTS AND RESPONSE REPORT

APPENDIX 9: SUPPORTING DOCUMENTATION FOR EXCLUSION OF SPECIALIST REPORTS RECOMMENDED BY THE DFFE SCREENING TOOL

- ❑ Compliance Statement Civil Aviation and RFI Themes
- ❑ Letter regarding Geotechnical study