

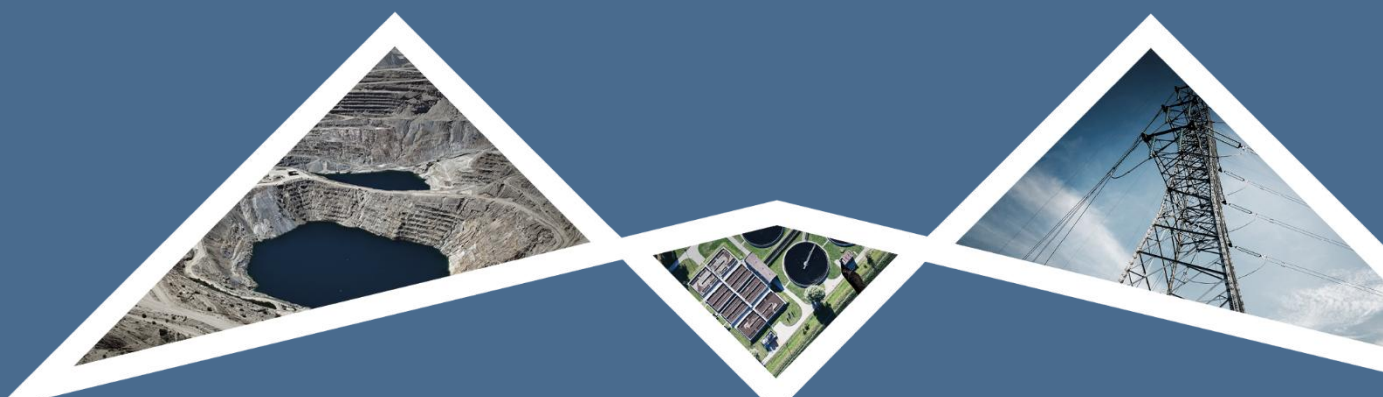


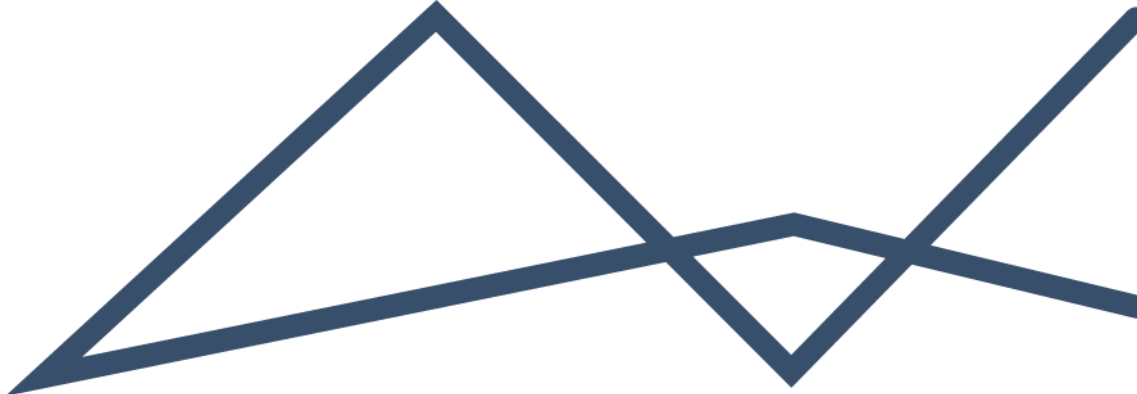
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## Basic Assessment Report

NTCSA ARIES-PAULPUTS-KOKERBOOM 400KV LOOP-IN-LOOP-OUT  
POWERLINE AND SUBSTATION UPGRADE







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## ACRONYMS AND ABBREVIATIONS

ACSR	Aluminium Conductor Steel Reinforced
AIP	Alien Invasive Plants
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CRM	Cultural Resource Management
CSP	Concentrated Solar Plant
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Services (Pty) Ltd
EMPr	Environmental Management Programme
GA	General Authorisation
GN	Government Notice
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilovolt
LCA	Landscape Character Areas
LCT	Large Cutting Tool
LILO	Loop-In-Loop-Out
LSA	Later Stone Age
LUS	Land Use Scheme
MHI	Major Hazardous Installation
MSA	Middle Stone Age
MVA	MegaVolt-Amperes
NDC	Nationally Determined Contributions
NDP	National Development Plan



NEMA	National Environmental Management Act (Act No. 107 of 1998)
NTCSA	National Transmission Company South Africa
PPP	Public Participation Process
PV	Photovoltaic
REDZ	Renewable Energy Development Zone
S&EIA	Scoping and Environmental Impact Assessment
SACAD	South African Conservation Areas Database
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resources System
SAPAD	South African Protected Areas Database
SARAO	South African Radio Astronomy Observatory
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SOC	State Owned Company
SWSA	Strategic Water Source Areas
TBC	The Biodiversity Company
VAC	Visual Absorption Capacity
WMA	Water Management Area
WUL	Water Use License
WULA	Water Use License Application
WWW	World Wide Web



# EXECUTIVE SUMMARY

## 1.1 INTRODUCTION AND OVERVIEW

The National Transmission Company South Africa SOC Ltd (NTCSA) (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of application for:

- Environmental Authorisation (EA) in accordance with the National Environmental Management Act (NEMA- Act 107 of 1998)- Listed activities:
  - Listing Notice 1: Activities 19, 27 and 47
  - Listing Notice 2: Activity 9
  - Listing Notice 3: Activities 4, 12 and 14
- Water Use Licence (WUL) in accordance with the National Water Act (NWA- Act 36 of 1998) - Listed activities:
  - Section 21 (c) and (i)

## 1.2 REGULATORY FRAMEWORK AND PROCESS

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA.

On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project.

Other legislation and standards or guidelines considered in this application includes:

1. National Environmental Management Protected Areas Act (Act No. 57 of 2003 – NEMPAA)
2. National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA)
3. National Water Act (Act No. 36 of 1998)
4. National Heritage Resources Act (Act No. 25 of 1999 – NHRA)
5. National Forestry Act (NFA)
6. The Spatial Planning and Land Use Management Act (Act No. 16 of 2013 – SPLUMA)
7. Occupational Health and Safety Act (Act No. 85 of 1993 - OHSA)
8. National Planning documents including the Integrated Resource Plan (2019)
9. Provincial and Municipal Planning tools
10. International legislation and agreements.

## 1.3 PROJECT OVERVIEW

The proposed project is for construction of a new ~50km long 400kV loop-in loop-out (LILO)(i.e. two parallel lines) powerline as well as an expansion of the existing Paulputs substation. The need for the project is based on the Northern Cape Strengthening for Renewable Generation Integration (IRP, 2025; 2019). To provide future reliability and flexibility in the evacuation of renewable power from Paulputs Substation, an additional 400kV



infeed is proposed via a loop in loop out from the Aries – Kokerboom 400kV line. The project is part of the group of projects identified for the Northern Cape network strengthening requirements in meeting the IRP 2019 renewables generation integration. The installed generation capacity in the Northern Cape already exceeds the peak load in the province. Generation capacity is expected to increase in the province as a result of bulk renewable energy generation capacity allocation due to favourable sun and wind conditions. Therefore, significant network infrastructure is required to enable the integration and evacuation of power from the renewable energy plants anticipated in the province.

The project falls within the promulgated Strategic Transmission Corridors as per the GN R.113 dated 16 February 2018 and therefore will follow a Basic Assessment Process.

The proposed project is located on Farms Blad-Grond South No. 94 Portions 3, 0 (Remaining Extent), 1 (Remaining Extent), 4 (Remaining Extent), 5 (Remaining Extent), Blad-Grond North No. 77 Portion 2 (Remaining Extent), Steyns Puts 178 Portion 1 (Remaining Extent), Lucas Vlei No. 93 Portion 4 (Remaining Extent), 5 (Remaining Extent), Scuit-Klip No. 92 Portions 0 (Remaining Extent), 1 (Remaining Extent), 2 (Remaining Extent), 4, and Konkoonsies No. 91 Portion 1 and 6, in the Khâi-Ma and Kai !Garib Local Municipalities, Northern Cape. The site is approximately 30kms northeast of Pofadder. The key points of the site are proposed powerline route – Start: 28°52'43.12"S; 19°33'53.35"E; Middle: 28°52'47.57"S; 19°33'56.49"E; End: 28°51'42.17"S; 20°0'18.92"E.

## 1.4 RECEIVING ENVIRONMENT

The following is a summary of the receiving environment and baseline environmental attributes.

### 1.4.1 PHYSICAL ENVIRONMENT

The proposed project is located within the semi-arid Northern Cape, a region characterised by extreme summer temperatures, cold winters, and low, variable rainfall, with climate projections indicating further temperature increases toward 2050.

In terms of geology and soils, the project area consists of shallow, weakly developed soils (including Coega, Glenrosa, Mispah and Vaalbos forms) with low agricultural potential, underlain by calcrete and alluvial deposits. The area is hydrologically defined by ephemeral drainage lines, four NFEPA rivers, and a temporary depression wetland, all of which require strict buffer adherence. Topographically, the landscape is gently sloping with scattered hills and inselbergs, forming part of a visually open and largely natural environment.

### 1.4.2 BIOLOGICAL ENVIRONMENT

The biological environment falls within the Bushmanland Arid Grassland vegetation type of the Nama-Karoo biome, supporting a diversity of indigenous flora, including two confirmed Species of Conservation Concern and one nationally protected tree species (*Vachellia erioloba*). Several provincially protected species and one Alien Invasive Plant (*Neltuma velutina*) occur within the footprint. Faunal communities include small to medium mammals, reptiles, and avifauna, with six bird Species of Conservation Concern, notably Ludwig's Bustard, which is highly susceptible to powerline collision. Habitat types include natural and disturbed arid grasslands, sandy grasslands, rocky outcrops, and watercourse-associated habitats, several of which are rated as High to Medium ecological sensitivity. The project area also intersects Critical Biodiversity Areas (CBA 1 & 2) and Ecological Support Areas (ESAs) that maintain regional ecological processes.

### 1.4.3 SOCIAL AND CULTURAL ENVIRONMENT

The social and cultural environment is predominantly rural, with low population density and land uses centred on extensive livestock grazing. Communities fall within the Khâi-Ma and Kai !Garib Local Municipalities, where socio-economic indicators reflect limited economic opportunities and reliance on natural resources. Several heritage features occur within the project area, including Stone Age artefacts, historical structures, and an early 20th-century cemetery. The landscape has a strong sense of place, with minimal built infrastructure apart from the existing Paulputs Substation and regional CSP facilities.



## 1.5 PUBLIC PARTICIPATION

The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner to assist them to:

- During the Environmental Authorisation:
- Verify that their issues have been recorded;
- Comment on the findings of the environmental assessments; and
- Provide relevant local information and knowledge to the environmental assessment.

The PPP is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&APs are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

The PPP commenced on the 30 July 2025 with an initial call to register notification. Notification letters (in English and Afrikaans) were distributed to pre-identified I&APs through either faxes, SMSs, registered mail, and/or emails on the 13 August 2025.

Advertisements (in English and Afrikaans) describing the proposed project and Environmental Impact Assessment (EIA) process were placed in the Gemsbok newspaper with circulation in the vicinity of the study area on 1 August 2025. The Gazette Notice was placed in the Northern Cape Provincial Gazette on 15 August 2025. Thirteen (13) A1 Correx site notices (in English and Afrikaans) were placed at 13 locations around the proposed project study area on 30 July 2025.

Comments on the proposed project were solicited from pre-identified and registered I&APs and key stakeholders. To date, the following comments have been received:

- I&AP registration.
- Transnet Pipeline: Confirmed that their infrastructure is not affected by the proposed project.
- Sentech: granted approval for the project to proceed with construction subject to certain terms and conditions.
- South African Civil Aviation Authority: No objection in terms of the project, however noted that should the project include structures of height, a formal application must be made. A formal application is to be made for this project.

## 1.6 IMPACT ASSESSMENT AND MITIGATION

Together with the input and observations of the EAP, several specialist studies have been commissioned to investigate key issues and impacts. Specialist studies conducted to inform this BA process include:

- Avifauna
- Terrestrial Ecology;
- Wetland and Aquatic Ecology;
- Soils and Agriculture;
- Landscape and Visual;
- Heritage; and
- Palaeontology.



A list of biophysical and social impacts have been identified and assessed during this BA process, as well as the pre-mitigation and post-mitigation environmental risk, and final significance when applying a priority factor is presented below. This list is representative of the preferred alternative identified in the alternative analysis of this report. A summary of identified impacts and significance of the proposed activities assessed in this BA process is present in the table below.



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
A1	Avifauna	Habitat destruction within the footprint	Construction	High -	Medium to high -	High -
A2	Avifauna	Destruction, degradation and fragmentation of surrounding habitats	Construction	High -	Medium to low -	Medium to high -
A3	Avifauna	Displacement/emigration of avifauna community (including SCC)	Construction	High -	Medium to low -	Medium to high -
A4	Avifauna	Direct mortality from persecution or poaching of avifauna species and collection of eggs	Construction	High -	Medium to low -	Medium to low -
A5	Avifauna	Direct mortality from increased vehicle and heavy machinery traffic	Construction	High -	Medium to low -	Medium to low -
A6	Avifauna	Collisions with gridlines if the line is located away from the existing gridline	Operation	High -	Medium to low -	Medium to high -
A7	Avifauna	Collisions with gridlines if the line is located alongside the existing gridline	Operation	High -	Medium to high -	Medium to high -
A8	Avifauna	Electrocution	Operation	High -	Medium to high -	High -
A9	Avifauna	Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs	Operation	High -	Medium to low -	Medium to low -
A10	Avifauna	Direct mortality due to earthworks, vehicle collisions and persecutions	Decommissioning	High -	Medium to low -	Medium to low -
A11	Avifauna	Continued habitat degradation due to Invasive Alien Plant Encroachment and erosion	Decommissioning	High -	Low -	Low -
A12	Avifauna	Collisions	Decommissioning	High -	Medium to low -	Medium to low -
AQ1	Climate and Air Quality	Dust generation from construction activities	Construction	Medium to high -	Medium to low -	Medium to low -
AQ2	Climate and Air Quality	Emissions from diesel/petrol generators	Construction	Medium to low -	Low -	Low -
AQ3	Climate and Air Quality	Dust generation from operational routine maintenance along powerline and at Substation	Operation	Medium to low -	Medium to low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
AQ4	Climate and Air Quality	Supporting of current and encouragement of development of additional renewable energy projects	Operation	High +	High +	High +
AQ5	Climate and Air Quality	Dust generation during the removal and dismantling of infrastructure	Decommissioning	Medium to low -	Medium to low -	Medium to low -
AQ6	Climate and Air Quality	Re-establishment of natural ground cover	Decommissioning	Medium to high +	Medium to high +	Medium to high +
G1	Geology and soils	Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	Medium to low -	Low -	Low -
G2	Geology and soils	Soil compaction, Soil erosion, Land degradation and Soil contamination	Operation	Low -	Low -	Low -
G3	Geology and soils	Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning	Low -	Low -	Low -
G4	Geology and soils	Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials - Powerline	Construction	Medium to high -	Medium to low -	Medium to low -
G5	Geology and soils	Clearing of vegetation leading to soil erosion and loss of topsoil - Powerline	Construction	Medium to high -	Medium to low -	Medium to low -
G6	Geology and soils	Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials - Substation	Construction	Medium to high -	Medium to low -	Medium to low -
G7	Geology and soils	Clearing of vegetation leading to soil erosion and loss of topsoil - Substation	Construction	High -	Medium to low -	Medium to low -
G8	Geology and soils	Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials - Substation	Operation	Medium to high -	Low -	Low -
G9	Geology and soils	Continuous stripping of topsoil, leading to ongoing land degradation, including erosion - Substation	Operation	Medium to high -	Medium to low -	Medium to low -
SW1	Surface water/wetlands	Loss, disturbance and degradation of watercourses	Construction	Medium to high -	Low -	Medium to low -
SW2	Surface water/wetlands	Loss or degradation in ecosystem services	Construction	Medium to high -	Low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
SW3	Surface water/wetlands	Altered hydrological regimes	Construction	Medium to high -	Low -	Medium to low -
SW4	Surface water/wetlands	Increase in erosion of receiving systems	Construction	Medium to high -	Low -	Medium to low -
SW5	Surface water/wetlands	Introduction and spread of alien and invasive vegetation	Construction	Medium to high -	Medium to low -	Medium to low -
SW6	Surface water/wetlands	Increased bare surfaces, flood peaks and potential erosion	Construction	Medium to high -	Medium to low -	Medium to low -
SW7	Surface water/wetlands	Impaired water quality	Construction	Medium to high -	Low -	Medium to low -
SW8	Surface water/wetlands	Decreased flow inputs into watercourses	Construction	Medium to high -	Low -	Medium to low -
SW9	Surface water/wetlands	Increased sediment loads to downstream reaches	Construction	Medium to high -	Medium to low -	Medium to low -
SW10	Surface water/wetlands	Contamination of wetlands	Construction	Medium to high -	Low -	Medium to low -
SW11	Surface water/wetlands	Disturbance and degradation of wetland vegetation	Construction	Medium to high -	Low -	Medium to low -
SW12	Surface water/wetlands	Proliferation of alien and invasive species	Operation	Medium to high -	Low -	Medium to low -
SW13	Surface water/wetlands	Nutrient enrichment of watercourse	Operation	Medium to high -	Low -	Medium to low -
SW14	Surface water/wetlands	Increase in erosion and sedimentation of receiving systems	Operation	Medium to high -	Low -	Medium to low -
SW15	Surface water/wetlands	Degradation of wetland vegetation	Operation	Medium to high -	Low -	Medium to low -
N1	Noise	Noise generation through construction activities	Construction	Medium to low -	Low -	Low -
N2	Noise	Noise generation through maintenance activities	Operation	Medium to low -	Low -	Low -
V1	Visual/Landscape	Change of character of the landscape - Substation	Construction	Medium to low -	Medium to low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
V2	Visual/Landscape	Change of character of the landscape - Powerline	Construction	Medium to high -	Medium to low -	Medium to high -
V3	Visual/Landscape	Change of character of the landscape - Substation	Operation	Medium to low -	Medium to low -	Medium to low -
V4	Visual/Landscape	Change of character of the landscape - Powerline	Operation	Medium to low -	Medium to low -	Medium to high -
V5	Visual/Landscape	Change of landscape character as viewed from the R357 - Substation	Construction	Low -	Low -	Low -
V6	Visual/Landscape	Change of landscape character as viewed from the R357 - Substation	Operation	Low -	Low -	Low -
V7	Visual/Landscape	Change of landscape character as viewed from the R357 - Powerline	Construction	Low -	Low -	Low -
V8	Visual/Landscape	Change of landscape character as viewed from the R357 - Powerline	Operation	Low -	Low -	Low -
V9	Visual/Landscape	Change of landscape character as viewed from the N14 - Substation	Construction	Medium to high -	Medium to low -	Medium to high -
V10	Visual/Landscape	Change of landscape character as viewed from the N14 - Powerline	Construction	Medium to high -	Medium to low -	Medium to high -
V11	Visual/Landscape	Change of landscape character as viewed from the N14	Operation	Medium to high -	Medium to high -	Medium to high -
V12	Visual/Landscape	Change of landscape character as viewed from local homesteads	Construction	Medium to high -	Medium to low -	Medium to high -
V13	Visual/Landscape	Change of landscape character as viewed from local homesteads	Operation	Medium to high -	Medium to high -	High -
V14	Visual/Landscape	Potential light pollution and nuisance for neighbours	Construction	Medium to low -	Low -	Low -
V15	Visual/Landscape	Potential light pollution and nuisance for neighbours	Operation	Medium to low -	Low -	Low -
TE1	Terrestrial Ecology	Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC - Powerline	Construction	High -	Medium to high -	Medium to high -
TE2	Terrestrial Ecology	Introduction of invasive and alien species, especially plants - Powerline	Construction	Medium to high -	Low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
TE3	Terrestrial Ecology	Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community - Powerline	Operation	Medium to high -	Medium to low -	Medium to low -
TE4	Terrestrial Ecology	Continued encroachment by alien and invasive plant species - Powerline	Operation	Medium to high -	Low -	Low -
TE5	Terrestrial Ecology	Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC - Substation	Construction	High -	Medium to high -	Medium to high -
TE6	Terrestrial Ecology	Introduction of invasive and alien species, especially plants - Substation	Construction	Medium to high -	Low -	Low -
TE7	Terrestrial Ecology	Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community - Substation	Operation	Medium to high -	Medium to low -	Medium to low -
TE8	Terrestrial Ecology	Continued encroachment by alien and invasive plant species - Substation	Operation	Medium to high -	Low -	Low -
TE9	Terrestrial Ecology	Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Powerline	Construction	Medium to high -	Medium to low -	Medium to low -
TE10	Terrestrial Ecology	Destruction of non resilient habitats (Rocky Outcrops) - Powerline	Construction	High -	Medium to high -	Medium to high -
TE11	Terrestrial Ecology	Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Powerline	Operation	Medium to high -	Medium to low -	Medium to low -
TE12	Terrestrial Ecology	Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Substation	Construction	High -	Medium to high -	Medium to high -
TE13	Terrestrial Ecology	Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Substation	Operation	Medium to high -	Medium to low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
S1	Social	Disturbance of current landuses and landowner routines due to liaison with applicant and servitude	Planning	Medium to low -	Low -	Low -
S2	Social	Creating of employment opportunities through construction contracts	Construction	Medium to high +	Medium to high +	Medium to high +
S3	Social	Increased and continued human presence due to the need for personnel engaging in construction activities	Construction	Low to medium +	Low to medium +	Medium to low +
S4	Social	Access restriction in certain areas along the powerline and along route to be affected by substation upgrade	Construction	Medium to low -	Low -	Low -
S5	Social	Disturbance of sense of place with the continued presence of overhead powerline and towers	Operation	Medium to high -	Medium to high -	Medium to high -
S6	Social	Potential additional employment opportunities through substation upgrade and powerline maintenance	Operation	Medium to high +	Medium to high +	Medium to high +
S7	Social	Building of relationships between applicant and landowners	Operation	Medium to high +	Medium to high +	Medium to high +
S8	Social	Building of NTCSA's and the province's overall transmission capacity	Operation	High +	High +	High +
C1	Cultural Heritage	Disturbance of identified Stone Age individual finds and scatters	Construction	Low -	Low -	Low -
C2	Cultural Heritage	Destruction or disturbance of identified historical period finds such as glass bottles, cans, and and old metal canisters	Construction	Low -	Low -	Low -
C3	Cultural Heritage	Destruction or disturbance of rubble and middens which may include unidentified historical finds	Construction	Medium to low -	Low -	Low -
C4	Cultural Heritage	Destruction or disturbance of Stone Age knapping sites	Construction	Medium to high -	Low -	Low -
C5	Cultural Heritage	Disturbance of existing structures (ARI001 and ARI002) due to their proximity to the powerline	Construction	Medium to high -	Low -	Low -
C6	Cultural Heritage	Disturbance of the Hill (ARI028) which is part of the landscape's cumulative heritage value	Construction	Medium to high -	Low -	Low -
C7	Cultural Heritage	Disturbance of the Sense of Place	Construction	Medium to high -	Medium to high -	Medium to high -
C8	Cultural Heritage	Destruction or disturbance of undiscovered below-ground heritage features.	Construction	Medium to low -	Low -	Low -
C9	Cultural Heritage	Loss of fossil heritage	Construction	Low -	Low -	Low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
E1	Economy	Additional employment created in the region through the project	Construction	Medium to high +	Medium to high +	Medium to high +
E2	Economy	Increased support of local industries and businesses through additional movement of persons around the project area	Operation	Low to medium +	Low to medium +	Medium to low +
E3	Economy	Expansion of NTCSA's transmission grid in relation to required skilled and unskilled labour for maintenance thereof	Operation	Medium to high +	Medium to high +	Medium to high +
E4	Economy	Encouragement of the development of renewable energy alternatives	Operation	Medium to high +	Medium to high +	Medium to high +



## 1.7 ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the reconnaissance activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the BA project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorised.



## 2 INTRODUCTION

The National Transmission Company South Africa SOC Ltd (NTCSA) (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of application for:

- Environmental Authorisation (EA) in accordance with the National Environmental Management Act (NEMA- Act 107 of 1998)- Listed activities:
  - Listing Notice 1: Activities 19, 27 and 47
  - Listing Notice 2: Activity 9
  - Listing Notice 3: Activities 4, 12 and 14
- Water Use Licence (WUL) in accordance with the National Water Act (NWA- Act 36 of 1998) - Listed activities:
  - Section 21 (c) and (i)

The proposed project is for construction of a new ~50km long 400kV loop-in loop-out (LILLO) (i.e. two parallel lines) powerline as well as an expansion of the existing Paulputs substation. The need for the project is based on the Northern Cape Strengthening for Renewable Generation Integration (IRP, 2019). To provide future reliability and flexibility in the evacuation of renewable power from Paulputs Substation, an additional 400kV infeed is proposed via a loop in loop out from the Aries – Kokerboom 400kV line. The project is part of the group of projects identified for the Northern Cape network strengthening requirements in meeting the IRP 2019 renewables generation integration. The installed generation capacity in the Northern Cape already exceeds the peak load in the province. Generation capacity is expected to increase in the province as a result of bulk renewable energy generation capacity allocation due to favourable sun and wind conditions. Therefore, significant network infrastructure is required to enable the integration and evacuation of power from the renewable energy plants anticipated in the province.

The project falls within the promulgated Strategic Transmission Corridors as per the GN R.113 dated 16 February 2018 and therefore will follow a Basic Assessment Process.

The proposed project is located on Farms Blad-Grond South No. 94 Portions 3, 0 (Remaining Extent), 1 (Remaining Extent), 4 (Remaining Extent), 5 (Remaining Extent), Blad-Grond North No. 77 Portion 2 (Remaining Extent), Steyns Puts 178 Portion 1 (Remaining Extent), Lucas Vlei No. 93 Portion 4 (Remaining Extent), 5 (Remaining Extent), Scuit-Klip No. 92 Portions 0 (Remaining Extent), 1 (Remaining Extent), 2 (Remaining Extent), 4, and Konkoonsies No. 91 Portion 1 and 6, in the Khâi-Ma and Kai !Garib Local Municipalities, Northern Cape. The site is approximately 30kms northeast of Pofadder. The key points of the site are proposed powerline route – Start: 28°52'43.12"S; 19°33'53.35"E; Middle: 28°52'47.57"S; 19°33'56.49"E; End: 28°51'42.17"S; 20°0'18.92"E.

### 2.1 REPORT STRUCTURE

This report has been compiled in accordance with the NEMA EIA Regulations, 2014, as amended. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 1 below.



Table 1: Report structure

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
<b>Appendix 3(1)(a)</b>	Details of – <ol style="list-style-type: none"> <li>i. The Environmental Assessment Practitioner (EAP) who prepared the report; and</li> <li>ii. The expertise of the EAP, including a curriculum vitae;</li> </ol>	2.2
<b>Appendix 3(1)(b)</b>	The location of the activity. Including – <ol style="list-style-type: none"> <li>i. The 21-digit Surveyor General code of each cadastral land parcel;</li> <li>ii. Where available, the physical address and farm name;</li> <li>iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;</li> </ol>	3
<b>Appendix 3(1)(c)</b>	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – <ol style="list-style-type: none"> <li>i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</li> <li>ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken;</li> </ol>	3
<b>Appendix 3(1)(d)</b>	A description of the scope of the proposed activity, including – <ol style="list-style-type: none"> <li>i. All listed and specified activities triggered and being applied for; and</li> <li>ii. A description of the associated structures and infrastructure related to the development;</li> </ol>	4
<b>Appendix 3(1)(e)</b>	A description of the policy and legislative context within which the development is proposed including- <ol style="list-style-type: none"> <li>(1) 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</li> </ol>	5Error! Reference source not found.



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	
<b>Appendix 3(1)(f)</b>	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;	6
<b>Appendix 3(1)(g)</b>	A motivation for the preferred site, activity and technology alternative	7, 4 and 10
<b>Appendix 3(1)(h)</b>	<p>A full description of the process followed to reach the proposed preferred alternative within the site, including: –</p> <ul style="list-style-type: none"> <li>i. Details of the development footprint alternatives considered;</li> <li>ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</li> <li>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;</li> <li>iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts –               <ul style="list-style-type: none"> <li>a. Can be reversed;</li> <li>b. May cause irreplaceable loss or resources; and</li> <li>c. Can be avoided, managed or mitigated;</li> </ul> </li> <li>vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</li> <li>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;</li> <li>viii. The possible mitigation measures that could be applied and level of residual risk;</li> </ul>	7, 8, 8.2 and 10



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	<ul style="list-style-type: none"> <li>ix. The outcome of the site selection matrix;</li> <li>x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and;</li> <li>xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity.</li> </ul>	
<b>Appendix 3(1)(i)</b>	<p>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 –</p> <ul style="list-style-type: none"> <li>i. A description of all environmental issues and risks that were identified during the environmental impact assessment process; and</li> <li>ii. An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</li> </ul>	7, 8, 8.2 and 10
<b>Appendix 3(1)(j)</b>	<p>An assessment of each identified potentially significant impact and risk, including –</p> <ul style="list-style-type: none"> <li>i. Cumulative impacts;</li> <li>ii. The nature, significance and consequences of the impact and risk;</li> <li>iii. The extent and duration of the impact and risk;</li> <li>iv. The probability of the impact and risk occurring;</li> <li>v. The degree to which the impact and risk can be reversed;</li> <li>vi. The degree to which the impact and risk may cause irreplaceable loss of resources; and</li> <li>vii. The degree to which the impact and risk can be mitigated;</li> </ul>	7, 8, 8.2 and 10
<b>Appendix 3(1)(k)</b>	<p>Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;;</p>	11
<b>Appendix 3(1)(l)</b>	<p>An environmental impact statement which contains –</p> <ul style="list-style-type: none"> <li>i. A summary of the key findings of the environmental impact assessment;</li> </ul>	11.3



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	<ul style="list-style-type: none"> <li>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</li> <li>iii. A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</li> </ul>	
<b>Appendix 3(1)(m)</b>	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr;	11.4
<b>Appendix 3(1)(n)</b>	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;	11.4
<b>Appendix 3(1)(o)</b>	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	12
<b>Appendix 3(1)(p)</b>	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;	11.3
<b>Appendix 3(1)(q)</b>	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	N/A
<b>Appendix 3(1)(l)</b>	An undertaking under oath or affirmation by the EAP in relation to – <ul style="list-style-type: none"> <li>iv. The correctness of the information provided in the reports;</li> <li>v. The inclusion of comments and inputs from stakeholders and interested and affected parties;</li> <li>vi. The inclusion of inputs and recommendations from the specialist reports where relevant; and</li> <li>vii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;</li> </ul>	13
<b>Appendix 3(1)(t)</b>	Any specific information that may be required by the competent authority; and	None
<b>Appendix 3(1)(u)</b>	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	None



## 2.2 DETAILS OF THE EAP

EIMS has been appointed by National Transmission Company South Africa (NTCSA) SOC Ltd as the independent Environmental Assessment Practitioner (EAP) to prepare and submit the EA application, Basic Assessment Report, and undertaking a Public Participation Process (PPP). The contact details of the EIMS consultant and EAP who compiled this Report are as follows:

- Name: Lucien James (Consultant and Candidate EAP) and John von Mayer (Registered EAP)
- Tel No: + 27 11 789 7170
- Fax No: +27 86 571 9047
- E-mail address: paulputsילו@eims.co.za

In terms of Regulation 13 of the EIA Regulations, 2014, as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

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

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's. Please refer to the EIMS website ([www.eims.co.za](http://www.eims.co.za)) for further details of expertise and experience.

John von Mayer is a principal consultant at EIMS and has been involved in numerous large projects the past 16 years. He has experience in Project Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Professional Natural Scientist (400336/11) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered Environmental Assessment Practitioners Association of south Africa (EAPASA) Environmental Practitioner (2019/1247).

Dr Lucien James is an Environmental Consultant and Archaeologist with experience in different fields across the Arts, Social Science, Natural Science, and academia in general. He has been employed by EIMS as an environmental consultant since March 2023 working on several projects under various roles. He is registered with EAPASA as a Candidate EAP. Lucien has obtained a BSc (Hons) in Geography, Archaeology and Environmental Studies (Archaeology-focused) and is accredited as a Professional Archaeologist with the Association of South African Professional Archaeologists (ASAPA). He holds a MSc in Geography having done research on phytoremediation and the mining industry. In 2024, he completed his Ph.D. through research with a focus on collaborative River Basin Management in South Africa. He has worked as a Teaching Assistant (TA) and researcher since 2018 and engages in academic work through publications and conferences. He has taught 1st year, 2nd year, 3rd year and Honour's Archaeology and Geography courses. His research has been funded by the National Research Foundation (NRF) and the Water Research Commission (WRC). He is also actively publishing new papers in international academic journals. He has presented his research at a national level through various conferences in South Africa and has participated in other conferences and workshops on Climate Change and Climate Change Adaptation. The Curriculum Vitae of the EAP and Candidate EAP responsible for the compilation of this Report are included in APPENDIX A.



### 3 DESCRIPTION OF THE PROJECT AREA

Table 2 indicates the details of the project area for the proposed project including details on the project location as well as the distance from the proposed project area to the nearest towns.

Table 2: Locality details

<b>Project Area</b>	The proposed project is located on Farms Blad-Grond South No. 94 Portions 3, 0 (Remaining Extent), 1 (Remaining Extent), 4 (Remaining Extent), 5 (Remaining Extent), Blad-Grond North No. 77 Portion 2 (Remaining Extent), Steyns Puts 178 Portion 1 (Remaining Extent), Lucas Vlei No. 93 Portion 4 (Remaining Extent), 5 (Remaining Extent), Scuit-Klip No. 92 Portions 0 (Remaining Extent), 1 (Remaining Extent), 2 (Remaining Extent), 4, and Konkoonsies No. 91 Portion 1 and 6.
<b>Application Area (ha)</b>	The application area includes the upgrade to Paulputs Substation (which will cover ~11,3 ha including the area of the current infrastructure) as well as a powerline servitude ~50km long and 110m wide (~550 ha).
<b>District Municipality</b>	Namakwa and ZF Mgcawu District Municipalities
<b>Local Municipalities</b>	Khâi-Ma Local Municipality and Kai !Garib Local Municipalities
<b>Strategic Infrastructure Corridors (STC) and Renewable Energy Development Zones (REDZ)</b>	The project falls within the Northern Corridor of the STCs. The project does not fall within a REDZ

The locality of the proposed project is shown in

Figure 1.

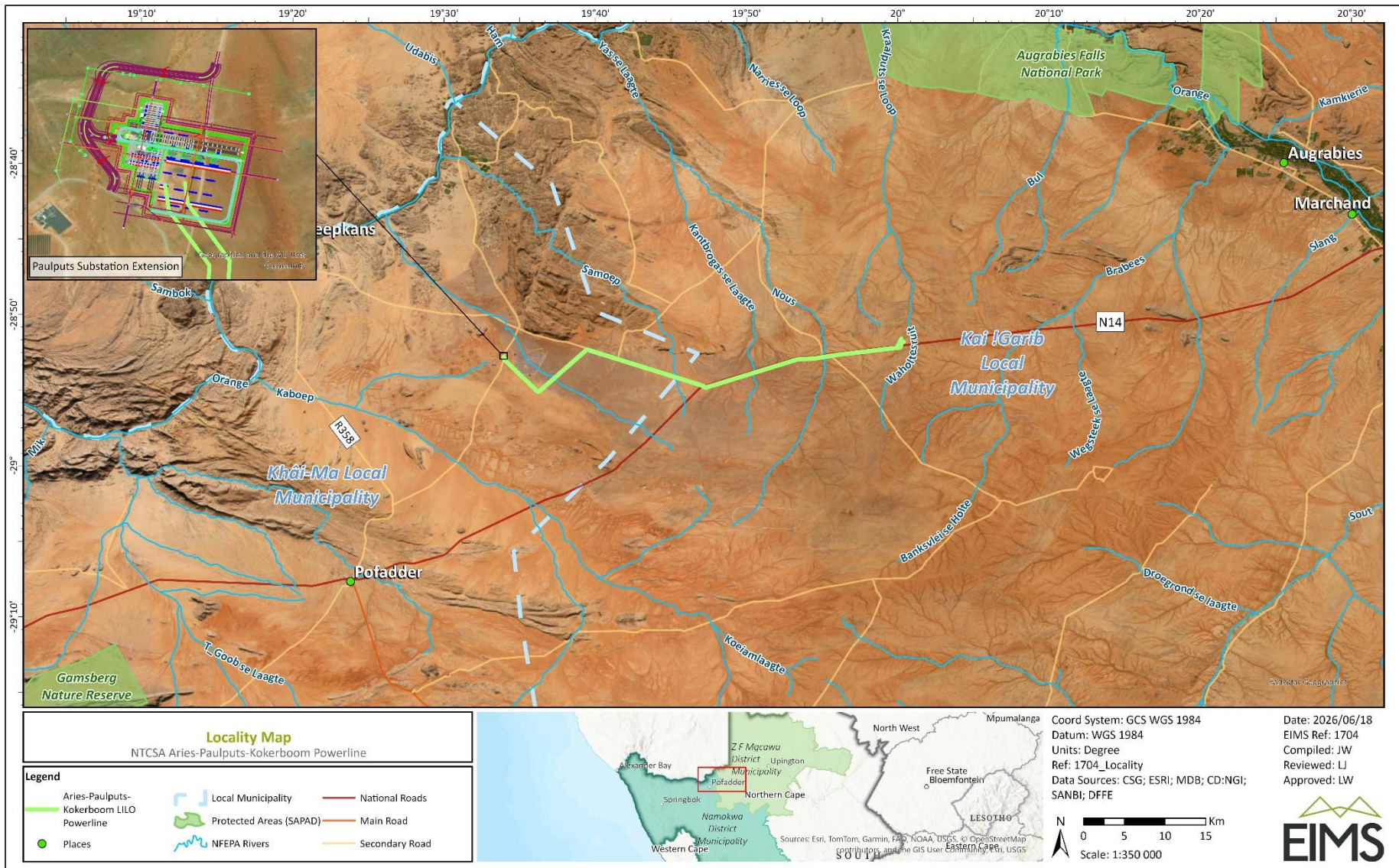


Figure 1: Locality map



## 4 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

### 4.1 PROJECT DESCRIPTION

The project is part of the group of projects identified for the Northern Cape network strengthening requirements in meeting the IRP 2019 renewables generation integration. The installed generation capacity in the Northern Cape already exceeds the peak load in the province. Generation capacity is expected to increase in the province as a result of bulk renewable energy generation capacity allocation due to favourable sun and wind conditions. Therefore, significant network infrastructure is required to enable the integration and evacuation of power from the renewable energy plants anticipated in the province.

To provide future reliability and flexibility in the evacuation of renewable power from Paulputs substation, an additional 400kV infeed is proposed via a loop in loop out from the Aries – Kokerboom 400kV line which is approximately 50 km away. Although there is uncertainty regarding the phasing of IPP integration at the various substations in the province, it is crucial that all project development activities are prioritised and advanced to a stage of execution readiness to ensure timeous integration of the expected renewable generation.

The following is the scope of the project as provided by NTCSA:

Aries – Kokerboom 400 kV loop in loop out – Paulputs Substation (Phase 2)

- Loop in loop out the Aries – Kokerboom 400 kV line into Paulputs (2 x ~50 km individual lines altogether including at least 222 individual towers or pylons);
- Establish/Equip 2 x 400 kV feeder bays at Paulputs Substation;
- Install a 100 MVA busbar reactor at Paulputs Substation.

An overview of the proposed infrastructure in relation to the other transmission powerlines and substations is illustrated in Figure 2.

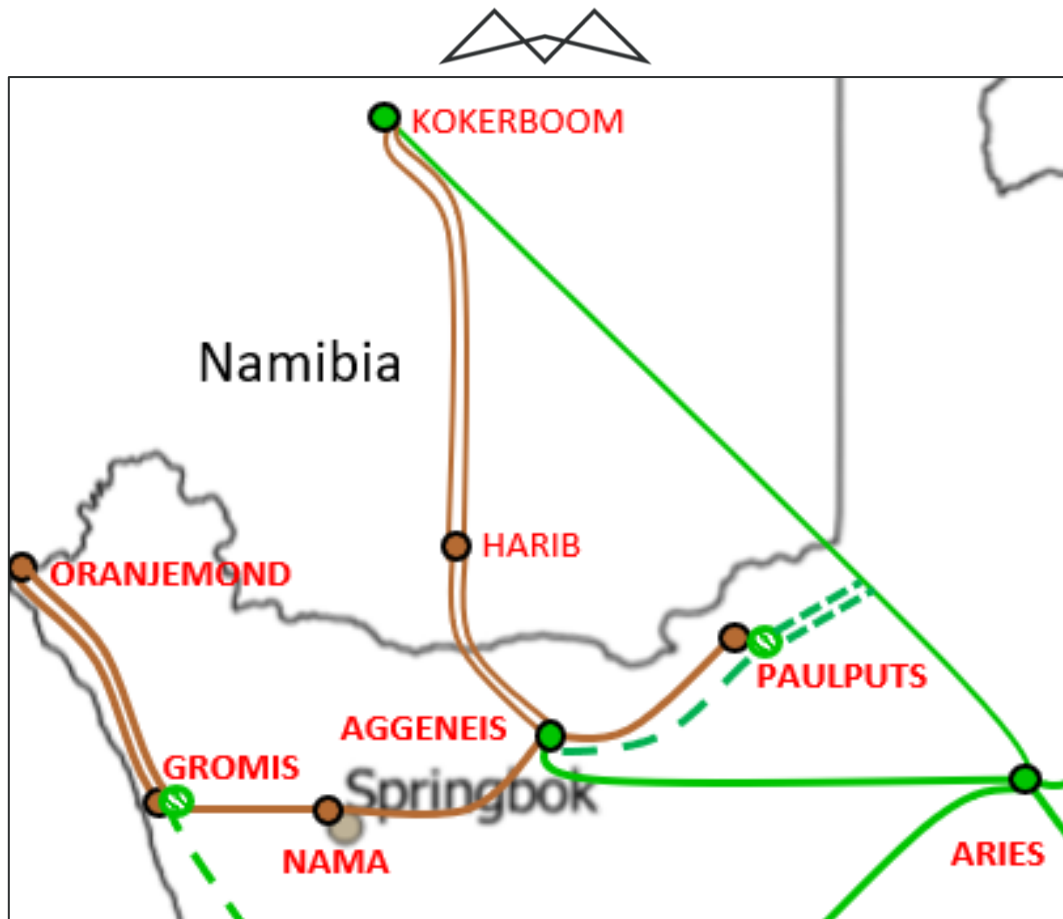


Figure 2: Overview of the proposed infrastructure in relation to other transmission powerlines and substations. The double dotted green line indicates the proposed LILo from Paulputs Substation to the Aries-Kokerboom powerline.

#### 4.1.1 PROJECT OVERVIEW

This section provides an overview of the project’s timelines, components, as well as other details around associated activities and infrastructure, as well as human resources and labour.

#### 4.1.2 PROJECT TIMELINE

The implementation of the proposed Paulputs 400 kV Strengthening Project will follow a phased approach typical of high-voltage transmission infrastructure development. This usually involves a (1) Planning and design phase, (2) Construction phase, (3) Commissioning and Operational phase, and (4) Decommissioning phase.

##### 4.1.2.1 PLANNING AND DESIGN PHASE

The planning and design phase, anticipated to span approximately 6 to 12 months, will involve finalizing the route alignment, securing the necessary permits and licenses including EA, and completing detailed engineering designs for towers, foundations, and conductor specifications. This phase will also include stakeholder engagement and landowner negotiations to ensure compliance and minimise delays.

##### 4.1.2.2 CONSTRUCTION PHASE

The construction phase, expected to take 12 to 18 months, will commence with site preparation and the development of access roads (in this case two-spoor tracks) to facilitate the movement of equipment and materials. This will be followed by foundation works and the erection of transmission towers along the ~50 km route. Once the towers are in place, the stringing of conductors and installation of associated hardware will be undertaken using tension stringing methods to maintain safe clearances and minimise environmental disturbance.



Site preparation will also be involved in the expansion of Paulputs Substation, which will also require the destruction and re-routing of the existing access route which is to be affected. Areas to be affected will be the immediate north and east of Paulputs Substation across an area of approximately 8,5ha.

#### 4.1.2.3 COMMISSIONING AND OPERATIONAL PHASE

The commissioning phase, which will require an estimated 2 to 3 months, will involve rigorous testing of electrical components and safety systems, followed by energisation and integration of the line into the Eskom transmission network. The timeline may be adjusted based on environmental constraints, procurement schedules, and landowner negotiations, but the overall objective is to ensure readiness for renewable energy integration in line with IRP 2019 requirements.

The operational phase of the Paulputs 400 kV Strengthening Project will commence once construction and commissioning activities have been completed and the line is energized. During this phase, the transmission infrastructure will function as part of NTCSA's high-voltage network, facilitating the evacuation of renewable energy from generation facilities in the Northern Cape to the national grid. The primary activities during operation include routine monitoring, inspection, and maintenance of the transmission line and associated substation equipment to ensure reliability, safety, and compliance with technical standards.

Maintenance activities typically involve periodic visual inspections of towers, conductors, and insulators, as well as thermographic surveys to detect potential faults. Where and when necessary, vegetation management will be undertaken along the servitude to maintain statutory clearances and prevent interference with the line. Access paths established within the servitude will be used for maintenance crews and equipment. Operational activities will also include monitoring of electrical performance, managing reactive power through the installed busbar reactor, and ensuring optimal functioning of the 500 MVA transformer and feeder bays at Paulputs Substation.

Environmental considerations during this phase include controlling erosion along access routes, preventing contamination from maintenance activities, and ensuring compliance with the conditions of the EA and EMPr. The operational phase is expected to have a low environmental footprint compared to construction, provided that maintenance is conducted in accordance with the EMPr. This phase will continue for several decades, during which the infrastructure will play a critical role in supporting renewable energy integration and strengthening the regional transmission network.

#### 4.1.2.4 DECOMMISSIONING PHASE

The decommissioning phase of the Paulputs 400kV Strengthening Project will occur at the end of the infrastructure's operational life, which is typically several decades. This phase involves the safe removal and disposal of all project components to restore the site as far as reasonably practicable. Activities will include dismantling transmission towers, removing conductors and insulators, and extracting foundations where feasible. Associated infrastructure such as access roads and laydown areas will either be rehabilitated or repurposed in consultation with landowners and regulatory authorities.

Environmental considerations during decommissioning will focus on minimising disturbance to soils, vegetation, and water resources. Waste materials, including steel from towers and conductors, will be recycled where possible, while hazardous components such as oils from transformers will be handled in accordance with applicable waste management legislation and standards. Rehabilitation measures will include regrading disturbed areas, re-establishing vegetation cover, and implementing erosion control measures to ensure long-term stability of the landscape. The objective of this phase is to leave the site in a condition that is safe, environmentally stable, and aligned with landowner requirements and regulatory obligations.

### 4.1.3 PROJECT COMPONENTS

The proposed development comprises several key components designed to strengthen the Northern Cape transmission network and facilitate renewable energy integration. The primary component is the 400 kV transmission line, approximately 50 km in length, configured as a Loop-In Loop-Out (LILO) from the existing Aries-Kokerboom line into Paulputs Substation. This configuration will provide flexibility and reliability in power evacuation from renewable energy sources.



The line will utilise two main tower types, these are, Guyed V towers, which are lightweight and cost-effective, typically used for straight sections of the route, and cross-roped self-supporting suspension towers, which offer enhanced stability for longer spans and angle or bend points, particularly in areas with challenging terrain. The towers will support high-capacity conductors, such as Aluminium Conductor Steel Reinforced (ACSR), mounted on composite or porcelain insulators designed to withstand mechanical loads and environmental conditions.



Figure 3: A photograph of the two tower types. Guyed V tower to the left, and cross-roped self-supporting suspension tower to the right.

The stringing process will involve pulling conductors through insulator strings using pilot ropes, winches, and tensioners, followed by sagging adjustments to ensure compliance with clearance standards under varying temperature and load conditions. For 400 kV lines, typical span lengths range between 300 and 400 meters, depending on terrain and tower type.

Associated infrastructure will include temporary laydown areas for materials and equipment, access roads or two-spool paths for construction and maintenance, and upgrades at Paulputs Substation. These upgrades will consist of two 400 kV feeder bays, a 100 MVA busbar reactor, and a 500 MVA 400/132 kV transformer with associated bays. Collectively, these components will ensure the project meets its objective of enabling renewable energy integration and improving network stability in the Northern Cape.

#### 4.1.4 ASSOCIATED ACTIVITIES AND INFRASTRUCTURE

This section highlights the associated activities and infrastructure which will be necessary during the construction and operation phases of the project.

##### 4.1.4.1 ADMINISTRATION

The existing Paulputs Substation offices will serve as the local base for coordinating on-site construction planning and activities. While overall project management and strategic decision-making will primarily be handled from NTCSA's headquarters at Megawatt Park in Johannesburg, the Paulputs offices will provide essential support for day-to-day operational oversight, contractor coordination, and logistical arrangements within the project area.



#### 4.1.4.2 **POWER AND ELECTRICITY**

During the construction phase, power supply will primarily rely on portable and temporary solutions to meet the energy demands of on-site activities. For instance, Diesel-powered or petrol-powered generators may be the main source of electricity for equipment, tools, and site offices, ensuring flexibility and mobility across the project footprint. These generators will be strategically positioned to minimise noise and emissions impacts and will be operated in compliance with relevant environmental standards, and the conditions of the EMPr. Where feasible, smaller solar units may be considered for low-demand applications such as lighting and communications to reduce reliance on fossil fuels. Fuel storage and handling will follow strict protocols to prevent contamination and ensure safe operations throughout construction.

#### 4.1.4.3 **ROADS, TRAFFIC AND TRANSPORT**

Access and mobility within the project area will be facilitated through a combination of existing and newly established routes. As part of the powerline servitude, a two-spoor track will be created along the alignment of the proposed 400 kV line. This track will enable the movement of construction equipment during the construction phase and provide long-term access for maintenance vehicles once the line is operational. In addition to this, an existing access road located east of Paulputs Substation will be deviated to the west to accommodate the planned substation expansion and associated infrastructure upgrades. These measures are intended to ensure safe and efficient transport of personnel, materials, and equipment while minimising disruption to surrounding land uses. All road works and deviations will be implemented in consultation with landowners and in compliance with applicable environmental and safety standards.

#### 4.1.4.4 **WASTE MANAGEMENT**

Waste generation during the construction of the powerline and associated infrastructure is expected to be minimal and will primarily consist of general domestic waste from construction camps and crews, as well as packaging materials from equipment and components. No hazardous waste is anticipated beyond small quantities of lubricants or oils associated with machinery maintenance, which will be managed in accordance with the EMPr. Temporary waste storage areas will be established at the Paulputs Substation, and at the temporary construction camps set up along the powerline route and within the servitude, and will be designed to prevent wind dispersal, water contamination, and wildlife access.

#### 4.1.4.5 **WATER**

Water will be required during the construction phase for both potable use and construction-related activities such as concrete mixing. Potable water for temporary construction camps workforce needs, as well as water for construction purposes, will be sourced from municipal supplies and trucked into the project area. No groundwater abstraction will occur, and boreholes will not be needed for this project.

In addition, the project triggers water uses in terms of Section 21(c) and (i) of the National Water Act (Act 36 of 1998), as certain transmission towers will be constructed within regulated areas associated with watercourses. To address these requirements, an application for a Water Use Licence (WUL) will be submitted to the Department of Water and Sanitation (DWS). All water-related activities will be managed in compliance with the conditions of the WUL and relevant legislation to prevent contamination and ensure sustainable water use throughout the construction phase.

#### 4.1.4.6 **SEWAGE AND WASTEWATER**

Sanitation during the construction phase will be managed through the provision of temporary or portable ablution facilities at the on-site construction camps and work areas. These facilities will be serviced regularly by licensed waste management contractors to ensure hygienic conditions and compliance with health and safety standards. Wastewater generated from these ablution facilities will be collected and disposed of at approved municipal treatment facilities, preventing any discharge into the surrounding environment.

Wastewater from construction activities is expected to be minimal and will primarily relate to cleaning of equipment and minor concrete works. Such wastewater will be managed in accordance with the project's Environmental Management Programme (EMPr) to prevent contamination of soil and water resources.



Measures will include designated wash-down areas with containment systems to capture runoff, ensuring that no untreated effluent enters natural watercourses.

#### **4.1.4.7 STORMWATER MANAGEMENT**

Stormwater management during the construction phase will focus on preventing erosion, sedimentation, and contamination of surrounding water resources. Temporary drainage controls such as berms, silt fences, and sediment traps will be installed where necessary to manage runoff from disturbed areas and prevent sediment-laden water from entering natural watercourses. Construction activities will be scheduled, where possible, to avoid periods of heavy rainfall, and exposed soils will be stabilized promptly through compaction or temporary cover. Scheduling will consider the recommendations of all specialists and conditions of the EMPr.

Designated wash-down areas will include containment systems to capture and treat runoff from equipment cleaning, ensuring that no untreated effluent enters the environment. All stormwater management measures will be implemented in accordance with the project's EMPr and relevant legislation, including the National Water Act, to maintain compliance and protect downstream ecosystems.

#### **4.1.4.8 SECURITY**

Security considerations for the project will primarily focus on safeguarding landowner property and ensuring controlled access for construction personnel. While the project area does not present significant security risks, measures will be implemented to prevent unauthorized entry and protect private land. Access to the site will be managed through coordination with landowners and adherence to agreed-upon access protocols. Construction crews will be required to follow strict entry and exit procedures, and all equipment and materials will be secured within designated areas to minimize potential theft or damage. These measures aim to maintain good relations with landowners and ensure a safe and orderly working environment throughout the construction phase.

#### **4.1.4.9 NATURAL RESOURCE USE AND REQUIREMENTS**

The proposed project will not require the extraction or utilisation of natural resources beyond the land required for the establishment of the transmission towers and associated infrastructure. No raw materials will be sourced from the project site, and no groundwater abstraction or use of local natural resources is anticipated. However, the development will result in localized disturbance to soil, natural vegetation, and habitats within the powerline servitude and substation expansion footprint. These impacts have been assessed as part of this Basic Assessment, and mitigation measures have been incorporated into the EMPr to minimize habitat fragmentation, protect sensitive areas, and rehabilitate disturbed land post-construction. The project design and implementation approach aim to ensure that resource use is limited and that ecological integrity is maintained as far as reasonably practicable.

#### **4.1.5 HUMAN RESOURCES AND LABOUR**

The majority of the workforce required for the construction phase of the project will be sourced and managed by the appointed contractor. This will include skilled and semi-skilled personnel responsible for civil works, tower erection, conductor stringing, and associated activities. Employment opportunities will also extend to support services such as logistics, security, and site administration.

During the operational phase, a smaller team will be retained to oversee routine inspections, maintenance of the transmission line, and upkeep of associated infrastructure at Paulputs Substation. These activities will ensure the long-term reliability and safety of the network. All labour practices will comply with relevant labour legislation and occupational health and safety standards, and where possible, local employment will be prioritised to support socio-economic development in the surrounding communities.



## 5 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which relates to the proposed project.

### 5.1 NATIONAL LEGISLATION

#### 5.1.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

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

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

The EIA and associated impact mitigation actions are conducted to fulfil the requirement of the Bill of Rights.

#### 5.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

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

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

NEMA sets out the general objectives of IEM in South Africa, including to (section 23(2)), of which the following two are of relevance for this report:

- Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities. This is to be done with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2 (of NEMA).
- Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them.



### 5.1.2.1 LISTED ACTIVITIES

In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIA's in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the process to be followed when applying for EA for any listed activity.

In terms of these regulations a Basic Assessment process is required for the proposed project. The Table 3 below identifies the listed activities the proposed project triggers and consequently requires authorisation prior to commencement.

Table 3: NEMA listed activities to be authorised

Activity	Activity Description	Proposed Project Activity
<b>GN R 983, Activity 19</b>	<p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>Some of the proposed towers or pylons will be constructed in regulated areas in terms of the NWA. Three earmarked point for tower construction fall within the 500m buffer of a temporary depression wetland. These structures, including all other structures which fall within regulated areas and their buffers will be included in the WULA as additional authorisations needed for this project.</p>
<b>GN R 983, Activity 27</b>	<p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity</p>	<p>Both, the upgrade to Paulputs Substation, and the construction of powerline infrastructure will necessitate the clearance of indigenous vegetation to make way for the footprints of these developments.</p> <p>Altogether, the project will involve ~9,05ha of clearance, of which will include the clearance of indigenous vegetation.</p>
<b>GN R 983, Activity 47</b>	<p>The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</p>	<p>Paulputs Substation will be upgraded to support the additional 400kV capacity needed for the Loop-In-Loop-Out connection. The powerline is also considered part of this expansion relating to the</p>



Activity	Activity Description	Proposed Project Activity
		<p>transmission and distribution of electricity.</p> <p>The footprint of the substation will be increased by ~8,5ha, and the powerline will involve the installation of at least 222 towers or pylons, each with a footprint of no more than 25m<sup>2</sup>. Of these 222 towers, 220 will necessitate site clearing (0,55ha of total area affected). This excludes disturbances introduced by the two-spoor track as well as temporary laydown or construction area.</p>
<p><b>GN R 983, Activity 48</b></p>	<p>The expansion of-</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</p> <p>where such expansion occurs-</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding-</p> <p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 23 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p> <p>[Activity 48 amended by GN 706/2018]</p>	<p>Paulputs Substation will be upgraded to support the additional 400kV capacity needed for the Loop-In-Loop-Out connection. The powerline is also considered part of this expansion relating to the transmission and distribution of electricity.</p> <p>Several components of the upgrade fall within 32m of a watercourse, including the proposed Paulputs substation expansion which will affect previously-diverted watercourses to the northwest and west of the existing footprint of the substation.</p> <p>Certain towers/pylons fall within buffers of watercourses.</p>
<p><b>GN R 984, Activity 9</b></p>	<p>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is-</p>	<p>The proposed project entails construction of a 400kV powerline and is located outside an urban area and removed from the nearest urban centre.</p> <p>The proposed LILO powerline entails two parallel lines which will remain</p>



Activity	Activity Description	Proposed Project Activity
	<p>(a) temporarily required to allow for maintenance of existing infrastructure;</p> <p>(c) within an existing transmission line servitude; and</p> <p>(d) will be removed within 18 months of the commencement of development.</p>	<p>permanent for the foreseen future. A new servitude has been negotiated for the powerline route.</p> <p>While a GN R 984 activity is triggered which would normally necessitate a full EIA process, the proposed powerline falls within a Strategic Transmission Corridor (STC).</p>
<p><b>GN R 985, Activity 4</b></p>	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p>	<p>The upgrade of Paulputs Substation will necessitate the re-routing of a dirt access road. The will be deviated to the west from the east where it runs currently.</p> <p>The proposed road development falls within the Augrabies Falls National Park buffer zones. For this reason, this activity has been included.</p> <p>The re-routed road will be 8m wide, and ~800m long.</p>
<p><b>GN R 985, Activity 12</b></p>	<p>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.</p>	<p>Both, the upgrade to Paulputs Substation, and the construction of powerline infrastructure will necessitate the clearance of indigenous vegetation to make way for the footprints of these developments.</p> <p>Altogether, the project will involve 9,05ha of indigenous vegetation clearance.</p> <p>Some areas along the powerline fall within CBAs and buffer zones (e.g. Augrabies Falls National Park buffer zone). For this reason, this activity has been included.</p>
<p><b>GN R 985, Activity 14</b></p>	<p>The development of-</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs-</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	<p>Several components of the upgrade fall within 32m of a watercourse, including the proposed Paulputs substation expansion which will affected previously-diverted watercourses to the northwest and west of the existing footprint of the substation.</p> <p>Certain towers/pylons fall within buffers of watercourses.</p> <p>Some areas along the powerline fall within CBAs and buffer zones (e.g.</p>



Activity	Activity Description	Proposed Project Activity
		Augrabies Falls National Park buffer zone). For this reason, this activity has been included.

The DFFE have published a number of guidelines and protocols which have been considered in the compilation of this report and include but not limited to:

- Public Participation Guideline in terms of NEMA EIA Regulations (2017).
- Need and desirability Guideline in terms of NEMA (2012).
- National guideline on minimum information requirements for preparing Environmental Impact Assessments for mining act activities that require environmental authorisation (2018).
- 2004 Information Series covering various aspects of the EIA process.
- Procedures for assessment and minimum criteria for specialist studies.

#### 5.1.2.2 SCREENING TOOL

A Screening Tool Report was generated from the DFFE Screening tool as per the requirements of Regulation 16 (1)(b)(v) of the EIA Regulations 2014, as amended, and was included in the Application for EA. The screening Tool provided a list of specialist studies for consideration and inclusion in the process. The Screening Tool identified environmental sensitivities are presented in Table 4.

Table 4: Screening Tool environmental sensitivities.

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

In this regard, as Site Sensitivity Verification Report (SSVR) has been compiled to consider the recommendations of the DFFE Screening Tool Report and to provide a rationale for the selection of specialist studies included in the assessment report. Please refer to Table 5 for a summary of the verification process. Please refer to APPENDIX B for the SSVR.



Table 5: SSVR findings and motivation.

Screening Specialist Required:	Tool Study	Level of Sensitivity:	Suggested Sensitivity:	Required level of Assessment	Motivation
Agriculture Impact Assessment		Medium	Low	None	Agricultural land will be minimally affected by the activities. No agricultural land or active agriculture was observed on site.
Archaeological and Cultural Heritage Impact Assessment		High	High	Full Study	As graves and historical buildings were identified, the sensitivity of the affected area can be confirmed. Additional heritage features may also be affected.
Palaeontology Impact Assessment		Medium	Low	Desktop Study	Minimal bedrock was observed as part of the affected area. However, a desktop assessment is recommended to confirm the sensitivity observed.
Terrestrial Biodiversity Impact Assessment		Very High	Very High	Full Study	Given the occurrence of certain plant species, a full assessment is recommended to assess the impact of the assessment.
Aquatic Biodiversity Impact Assessment		Very High	Medium	Full Study	The watercourses which could be impacted by the project are mainly non-perennial. A wetlands and aquatic assessment is recommended in this regard.
Geotechnical Assessment		High	High	Full Study	This assessment will be undertaken by NTCSA as part of the design for the substation.
Plant Species Assessment		Medium	Medium	Full Study	The impact of the project on plant species will be assessed as part of the terrestrial ecological assessment.
Animal Species Assessment		High	Medium	Full Study	While not many animal species have been noted during the Site Sensitivity Verification assessment, the area may still be sensitive. The impact of the project on animal species will be assessed as part of the terrestrial ecological assessment to be undertaken.
Landscape/Visual Impact Assessment		High	High	Full Study	The project will have an impact on the landscape given that it will involve the construction of pylon tower infrastructure. The overall sense of place of the area is expected to be impacted by



Screening Specialist Required:	Tool Study	Level of Sensitivity:	Suggested Sensitivity:	Required level of Assessment	Motivation
					the construction of the proposed powerline.
Avian Assessment	Impact	High	High	Full Study	This sensitivity was confirmed on spotting a specimen of <i>Aves-Neotis ludwigii</i> (Ludwig's Bastard). A full assessment will be undertaken.
Civil Assessment	Aviation	Low	Low	None	The site is not near any aerodromes or airports. Protocols suggest that no assessment is required if the project falls within an area of Low sensitivity. Therefore, comment will be obtained from ATNS/CAA as part of the EIA process.
RFI Assessment		High	Medium	Compliance Statement	This assessment was flagged by the screening tool, however, the reason for highlighting this was not clear. It is possible that this assessment was recommended given the site's proximity to the Square Kilometre Array. The site does not fall within any of the SKA Karoo Central Astronomy Advantage Areas, and therefore, a Compliance Statement and comment from SARAO as well as Sentech will be requested.

### 5.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT

The National Environmental Management Protected Areas Act (Act No. 57 of 2003 – NEMPAA) is intended to “provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes” and creating a “national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity”.

The NEMPAA defines various kinds of protected areas, namely: “special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments; world heritage sites; marine protected areas; specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act 84 of 1998); and mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act 63 of 1970)”.

According to the protected area spatial datasets from SAPAD (2025) and SACAD (2025), the project area and powerlines do not overlap with any Protected Areas. However, the project does fall within the Augrabies Falls National Park Buffer Zone. Although buffer zones are not regulated as protected areas, they serve as zones of influence where any proposed development must be evaluated with special caution. For this reason, specialist studies were of increased importance in the context of this development to best understand the impact of the project.

### 5.1.4 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (NEMBA)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA) provides for the management and conservation of South Africa’s biodiversity within the framework of the NEMA as well as the



protection of species and ecosystems that warrant national protection. Within the framework of this act, various regulations are promulgated which provide specific requirements and management measures relating to protecting threatened ecosystems, threatened or protected species as well as the control of alien and invasive species. A summary of these regulations is presented below.

The National List of Ecosystems that are Threatened and Need of Protection (GN 1002 of 2011) are promulgated under the NEMBA and these Regulations provide for listing of threatened or protected ecosystems in one of the following categories:

- Critically Endangered (CR) ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- Endangered (EN) ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;
- Vulnerable (VU) ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and
- Protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable.

Further regulations published under the NEMBA are the threatened or protected Species Regulations (GN R 152 OF 2007) which aims to:

- (a) further regulate the permit system set out in Chapter 7 of the Biodiversity Act insofar as that system applies to restricted activities involving specimens of listed threatened or protected species;
- (b) provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;
- (c) provide for the regulation of the carrying out of a specific restricted activity, namely hunting;
- (d) provide for the prohibition of specific restricted activities involving specific listed threatened or protected species;
- (e) provide for the protection of wild populations of listed threatened species; and
- (f) provide for the composition and operating procedure of the Scientific Authority.

The Alien and Invasive Species Lists are promulgated under the NEMBA with the aim of protecting the quality and quantity of arable land in South Africa. Loss of arable land should be avoided and declared Weeds and Invaders in South Africa are categorised according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.



In giving effect to the above, the Alien and Invasive Species Regulations (GNR 1020 of 2020) provide for amongst others, the prevention of the spread or allowing the spread of, any specimen of a listed invasive species.

The proposed development triggers considerations under NEMBA due to the presence of Species of Conservation Concern (SCC) and protected species within the project footprint. Two floral SCC were confirmed on site, along with one nationally protected tree species (*Vachellia erioloba*) and several provincially protected species (*Boscia foetida*, *Euphorbia spinea*, *Euphorbia hamata*). Any removal, damage, or relocation of these species will require permits in terms of NEMBA and the Northern Cape Nature Conservation Act.

Additionally, the project area contains one recorded Alien Invasive Plant (AIP) species (*Neltuma velutina*), and compliance with the Alien and Invasive Species Regulations under NEMBA is required. An Alien Invasive Plant Management Programme must be implemented to prevent the spread of invasive species during construction and operation.

### 5.1.5 THE NATIONAL WATER ACT (NWA)

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

- a) meeting the basic human needs of present and future generations;
- b) promoting equitable access to water;
- c) redressing the results of past racial and gender discrimination;
- d) promoting the efficient, sustainable and beneficial use of water in the public interest;
- e) facilitating social and economic development;
- f) providing for growing demand for water use;
- g) protecting aquatic and associated ecosystems and their biological diversity;
- h) reducing and preventing pollution and degradation of water resources;
- i) meeting international obligations;
- j) promoting dam safety;
- k) managing floods and droughts,

and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

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

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

The above water use processes are described in Figure 4.

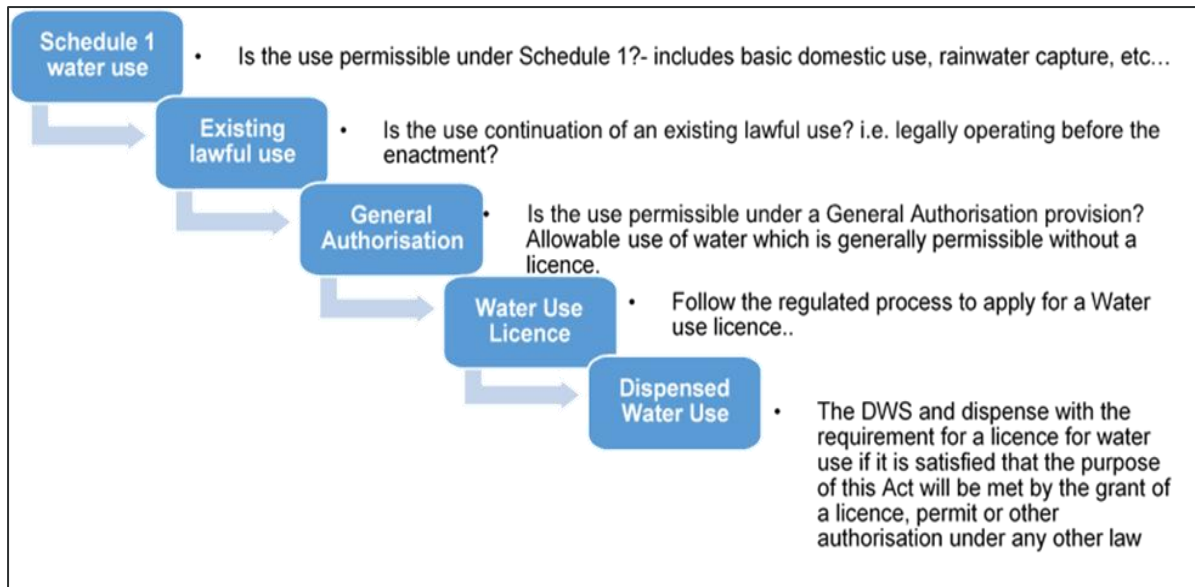


Figure 4: Authorisation processes for new water uses.

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

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

A watercourse is defined in terms of the Act as follows:

- a) a river or spring;
- b) a natural channel in which water flows regularly or intermittently;
- c) a wetland, lake or dam into which, or from which, water flows; and
- d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;

The regulated area of a watercourse for section 21(c) or (i) of the Act water uses, is similarly defined in terms of the Act as follows:



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

As part of this EA process, the relevant water uses will be identified and applied for. The water uses applicable to this project are presented in Table 6 below and shall be discussed and agreed upon with the DWS during the WULA process.

Table 6: Likely NWA Section 21 water uses triggered by this project.

Section water use	21 Description	Applicability
c & i	Impeding or diverting the flow of water in a watercourse and/or altering the bed, banks, course or characteristics of a watercourse.	Several towers or pylons will intersect with regulated areas as per the act. These structures will need to be licensed.

The required water use licencing application will run concurrently with this EIA process and in consultation with the DWS, additional water uses may be identified.

South Africa is divided into nineteen Water Management Areas (WMAs). The delegation of water resource management from central government to catchment level is achieved by establishing Catchment Management Agencies (CMAs) at WMA level. Each CMA progressively develops a Catchment Management Strategy (CMS) for the protection, use, development, conservation, management and control of water resources within its WMA. This is to ensure that on a regional scale, water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The main instrument that guides and governs the activities of a WMA is the CMS which, while conforming to relevant legislation and national strategies, provides detailed arrangements for the protection, use, development, conservation, management and control of the region's water resources.

The project area falls within the Vaal-Orange Water Management Area (WMA), specifically the D81D and D81E quaternary catchments, and is situated in the Nama-Karoo and Orange River Gorge Ecoregions. The Orange River itself is an important transnational water resource as it forms the border between Namibia and South Africa. The WMA also covers the Augrabies Falls National Park, which is a protected area. Several catchments of this area are restricted in terms of water abstraction given the potential for activities to affect Augrabies Falls. While it is not anticipated that this project will affect the Orange River and Augrabies Falls, the current project intersects with the Augrabies Falls National Park Buffer Zone, which has been considered as part of this assessment. As stated in the Augrabies Falls National Park Management Plan (Pg. 57), "the buffer zone serves largely to raise red flags and does not remove the need for carefully considering the exact impact of a proposed development."

### 5.1.6 NATIONAL HERITAGE RESOURCES ACT (NHRA)

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority..." The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, MPRDA and the Development Facilitation Act



(FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The NEMA 23(2)(b) gives effect to the NHRA and states that an integrated environmental management plan should, “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”. A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken into account of in the EIA Regulations under the NEMA relates to the Specialist Report requirements (Appendix 6 of EIA Regulations 2014, as amended) which apply to Heritage Impact Assessments.

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

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Report is compiled.

Several Heritage studies have been undertaken in the area for the CSP facilities nearby, and other infrastructure in the area. Heritage features were identified including Later Stone Age stone tools, and scatters of similar finds at hills around the area. According to the DFFE Screening Tool and data from the SAHRA register of heritage features, the powerline and 1km corridor crosses areas of high sensitivity. A Heritage Impact Assessment was undertaken to verify the sensitivity of the area.

### 5.1.7 THE NATIONAL FORESTS ACT (NFA)

According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that “*no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.*”

Through a site-specific tower-to-tower walkdown, it was ascertained that the project intersects with national protected trees including *Vachellia erioloba* (Camel Thorn). However, none of the proposed towers will affect this tree species based on the current route. At the same time, the presence of the plant is here noted as permits will be needed and applied for should the project impact this tree species in any way.

### 5.1.8 THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT (SPLUMA)

The Spatial Planning and Land Use Management Act (Act 16 of 2013 – SPLUMA) is set to aid effective and efficient planning and land use management, as well as to promote optimal exploitation of minerals and mineral resources. The SPLUMA was developed to legislate for a single, integrated planning system for the entire country. Therefore, the Act provides a framework for a planning system for the country and introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals.



### 5.1.9 OCCUPATIONAL HEALTH AND SAFETY ACT

The Occupational Health and Safety Act (Act 85 of 1993 - OHSA) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; 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; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith. Worker safety will form part of the contractor's safety requirements and be guided by the OHSA. This would entail a full health and safety file including but not limited to pre-mobilization medical assessments, work environment and task specific risk assessments and method statements etc. Therefore safety of all personnel will be guided by overarching South African legislation.

The Major Hazard Installation Regulations (GNR 692 of 30 July 2001) are promulgated under the OHSA and apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.

A "major hazard installation" means an installation-

- a) where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or
- b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident.

This project does not include a MHI, and therefore does not trigger the Major Hazard Installation Regulations.

## 5.2 NATIONAL POLICY AND PLANNING CONTEXT

The project aligns with national imperatives, policy and planning considering the (1) Strategic Transmission Corridors, (2) Integrated Resource Plan (2019), (3) National Development Plan (NDP) 2030, and (4) Second Nationally Determined Contributions under the Paris Agreement (2025).

### 5.2.1 STRATEGIC TRANSMISSION CORRIDORS

On 16 February 2018, Minister Edna Molewa published Government Notice No. 113 in Government Gazette No. 41445, which identified 5 strategic transmission corridors important for the planning of electricity transmission and distribution infrastructure, as well as the procedure to be followed when applying for environmental authorisation for electricity transmission and distribution expansion when occurring in these corridors.

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors.

The project overlaps with the northern corridor, as shown in Figure 5.

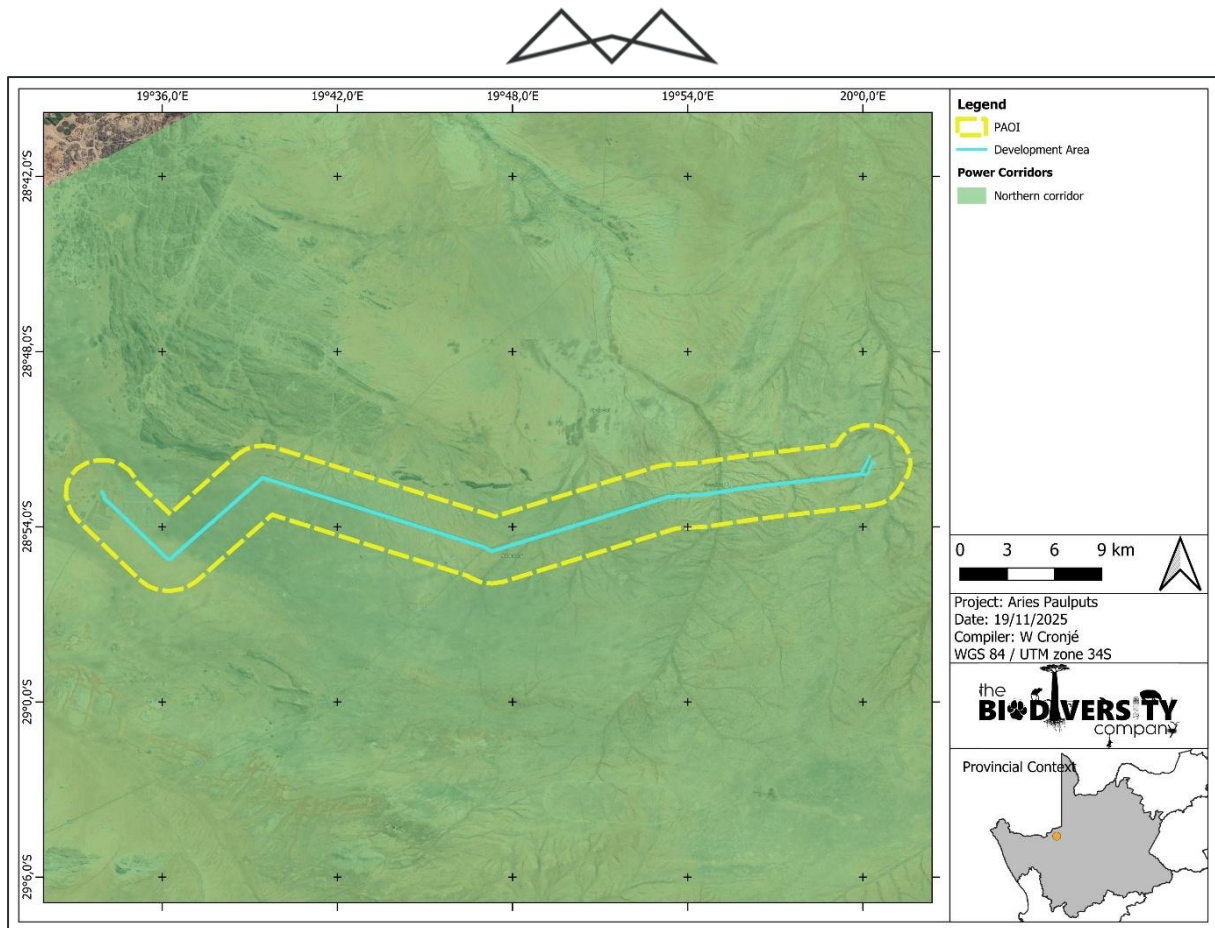


Figure 5: Project in relation to the Northern Corridor of the Strategic Transmission Corridors

## 5.2.2 INTEGRATED RESOURCE PLAN (2025)

The project enables the integration of renewable energy into South Africa’s national grid, which is critical for meeting the country’s decarbonisation targets under the Integrated Resource Plan (IRP, 2019; 2025) and international climate commitments. This transition reduces reliance on fossil fuels, mitigates greenhouse gas emissions, and supports long-term energy security benefits that extend across generations. The IRP emphasizes diversifying South Africa’s energy mix and increasing renewable energy capacity. By facilitating renewable energy projects, the development supports South Africa’s climate commitments under the IRP and international agreements.

## 5.2.3 NATIONAL DEVELOPMENT PLAN 2030

The National Development Plan 2030 emphasises the need for reliable, affordable, and sustainable energy to drive economic growth and social development. By strengthening the transmission network and enabling renewable energy integration, this project directly contributes to improving South Africa’s energy security and reducing reliance on fossil fuels. The NDP calls for a shift toward cleaner energy sources to meet climate commitments and reduce greenhouse gas emissions. This project facilitates renewable energy evacuation from the Northern Cape, supporting decarbonisation and climate resilience goals. The NDP prioritises infrastructure investment as a catalyst for job creation and inclusive growth. The project will create short-term employment during construction and maintenance phases, while enabling long-term economic opportunities through renewable energy expansion.

## 5.2.4 SECOND NATIONALLY DETERMINED CONTRIBUTIONS (NDCs) UNDER THE PARIS AGREEMENT (2025)

In November 2025, South Africa submitted its second NDCs under the Paris Agreement. These NDCs addressed Climate Change concerns, as well as development and planning towards 2050 aligning with international commitments. The NDCs addressed the need for infrastructural improvements to enable better Climate Change



disaster management. This included the need to improve infrastructure such as transmission. A key commitment and associated goal highlighted in the NDCs is reaching Net Zero CO<sub>2</sub> emissions by 2050. This project aligns with this as it encourages the growth of renewable energy projects in the Northern Cape.

### **5.3 PROVINCIAL POLICY AND PLANNING CONTEXT**

Two key planning tools were identified which can be related to provincial development. These include the Northern Cape Biodiversity Spatial Plan, as well as the Northern Cape Provincial Spatial Development Framework which is undergoing a review at present.

#### **5.3.1 NORTHERN CAPE BIODIVERSITY SPATIAL PLAN**

The Northern Cape Biodiversity Spatial Plan (NCBSP) serves as the province's key biodiversity planning tool, providing a systematic framework for identifying Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) that are essential for maintaining ecological processes and conserving priority species and habitats. Its purpose is to guide land-use planning, environmental authorisations, and development decisions so that biodiversity-rich and environmentally sensitive areas are safeguarded while enabling sustainable development. In relation to the current project, the NCBSP informs the assessment by highlighting that the proposed powerline and substation upgrades intersect with CBA 1, CBA 2 and ESA areas, requiring avoidance, micro-siting, and mitigation measures to prevent unnecessary habitat loss and ensure alignment with provincial conservation priorities.

#### **5.3.2 NORTHERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK**

The Northern Cape Provincial Spatial Development Framework (PSDF) is the province's overarching spatial planning instrument, providing a unified vision and strategy to guide sustainable land-use, infrastructure investment, and socio-economic development across the Northern Cape. Developed in 2020, it is currently undergoing a statutory review to ensure full alignment with the Spatial Planning and Land Use Management Act (SPLUMA), which requires provinces to develop and revise PSDFs every five years. This review is mandated under Sections 12 and 15 of SPLUMA, which call for updated spatial strategies that integrate national and provincial policy, support coherent land-use management, and promote spatial transformation. The revision process aims to strengthen policy integration, refine the provincial spatial vision, and ensure that the PSDF remains responsive to environmental constraints, demographic changes, and development pressures.

The proposed Paulputs 400 kV Strengthening Project aligns strongly with the Northern Cape Provincial Spatial Development Framework (PSDF) as it supports the province's strategic emphasis on expanding and modernising critical energy infrastructure. The PSDF identifies the development and reinforcement of high-voltage transmission networks, renewable-energy corridors, and major infrastructure systems as key drivers of economic growth, spatial integration, and long-term sustainability. In particular, the PSDF prioritises Renewable Energy Development Zones (REDZs), Eskom solar corridors, and bulk HV/MV transmission infrastructure as essential for unlocking the province's competitive advantage in solar-based energy generation and improving grid capacity to accommodate Independent Power Producers (IPPs).

### **5.4 MUNICIPAL POLICY AND PLANNING CONTEXT**

Several municipal policy and planning tools were critical to consider in the context of the current project. These mainly included Integrated Development Plans (IDPs) as well as Spatial Development Frameworks (SDFs) of both municipalities.

#### **5.4.1 INTEGRATED DEVELOPMENT PLANS (NAMAKWA AND ZF MGCAWU DISTRICT MUNICIPALITIES)**

The Integrated Development Plans (IDPs) of both the Namakwa District Municipality and the ZF Mgcawu District Municipality serve as their primary strategic planning instruments, guiding development, service delivery, and spatial transformation within their jurisdictions. The Namakwa IDP emphasises sustainable socio-economic development, environmental stewardship, and spatial restructuring, highlighting key priorities such as basic service delivery, renewable energy integration, environmental management, and the protection of Critical



Biodiversity Areas (CBAs). It frames development within a long-term vision of a “sustainable green energy, diverse, integrated socio-economy” and aligns municipal objectives with national and provincial directives.

Similarly, the ZF Mgcawu IDP underscores the need to align district-level planning with provincial and national growth strategies, focusing on strengthening service delivery, enabling local economic development, and promoting resilience in areas such as infrastructure, environmental health, and disaster management. It explicitly supports sustainable regional spatial planning frameworks to guide diversified economic growth.

Together, these IDPs provide essential guidance for ensuring that the proposed transmission infrastructure project aligns with district-level priorities, particularly those related to sustainable land-use, environmental protection, renewable energy expansion, and the enhancement of regional infrastructure networks. As statutory plans, the IDPs ensure coordinated governance, spatial coherence, and the alignment of development initiatives across all spheres of government. The project aligns with these planning documents considering overarching development priorities, strategic objectives, and spatial transformation.

Overall, the project is not only consistent with the intentions of the Namakwa and ZF Mgcawu District IDPs, but directly advances the municipalities’ long-term development vision, particularly related to renewable energy integration, infrastructure upgrading, environmental protection, and rural economic development.

#### 5.4.2 SPATIAL DEVELOPMENT FRAMEWORKS (NAMAKWA AND ZF MGCAWU DISTRICT MUNICIPALITIES)

The Spatial Development Frameworks (SDFs) of both the ZF Mgcawu District Municipality and the Namakwa District Municipality provide the core spatial planning directives that guide land-use management, settlement structuring, and long-term development across the Northern Cape. The ZF Mgcawu SDF emphasises an integrated spatial structure anchored by a hierarchy of nodes and transport corridors, aligning local planning with the National Spatial Development Framework (NSDF) and the Northern Cape Provincial SDF. It prioritises the development and strengthening of regional development anchors such as Upington, the protection of environmental assets through Spatial Planning Categories (SPCs), and the delineation of settlement edges to contain sprawl, ensure efficient infrastructure investment, and safeguard high-value ecological areas. The SDF further identifies strategic agricultural zones, tourism corridors, and areas of high biodiversity significance, especially along the Orange River system, where development must be managed to avoid encroaching on Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).

Similarly, the Namakwa District SDF promotes a spatial vision centred on sustainable land-use, the protection of high-value natural landscapes, and the enhancement of rural-urban linkages. It identifies key settlement types, including regional development anchors, rural service centres, and small settlements, to guide the equitable distribution of services and future investments across the district. The SDF highlights major strategic opportunities, including green energy expansion, agri-processing nodes, and ecologically sensitive landscapes requiring strict protection.

Both SDFs therefore provide critical policy direction to ensure that infrastructure development such as the proposed project is aligned with provincial spatial transformation goals, prioritises environmental protection, strengthens existing settlement structures, and supports long-term sustainability across the Northern Cape’s diverse landscape.

The project aligns with the SDFs of the Namakwa and ZF Mgcawu District Municipality as these SDFs emphasise sustainable land-use planning, protection of ecologically sensitive areas, consolidation of infrastructure within strategic corridors, and long-term spatial restructuring. The project supports these objectives through its placement within a Strategic Transmission Corridor, its minimal land-take relative to the regional landscape, and its avoidance-driven design.

### 5.5 INTERNATIONAL LEGISLATION

Although the project itself does not occur across international borders and does not require any form of international approval, it is influenced by several international conventions that South Africa is party to. These



conventions are already embedded in the national legal framework (e.g., NEMA, NEMBA), and therefore indirectly govern how the project must be planned, assessed, and authorised.

Some examples include:

- Convention on Biological Diversity: South Africa is a signatory to the CBD, which requires the conservation of biological diversity and sustainable use of natural resources.
- United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement: South Africa's climate commitments (e.g., NDCs) inform national energy policy such as the IRP 2025, which explicitly supports renewable energy integration.
- Ramsar Convention on Wetlands: While the project area does not intersect any Ramsar-listed wetlands, South Africa's commitments under the convention inform national protection of wetlands and regulation of activities within watercourses
- World Heritage Convention: The project area does not intersect any declared World Heritage Sites. However, South Africa's obligations under the convention require the protection of Outstanding Universal Value in protected areas such as the Augrabies Falls National Park buffer zone, which the project falls within.

The proposed development does not directly trigger any international approvals, nor does it occur within any formally declared international heritage or Ramsar sites. However, it is indirectly governed by several international conventions to which South Africa is a signatory.

## 6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

The needs and desirability analysis component of the "Guideline on need and desirability in terms of the EIA Regulations (Notice 819 of 2014)" includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.). **Table 7** presents the needs and desirability analysis undertaken.



Table 7: Needs and desirability analysis for the proposed project

Ref No.	Question	Response
<b>1</b>	<b>Securing ecological sustainable development and use of natural resources</b>	
<b>1.1</b>	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	<p>The ecological integrity of the project area was assessed through a combination of desktop analysis, field surveys, and a site-specific walkdown, guided by the National Environmental Management Act (NEMA), EIA Regulations, and relevant biodiversity protocols.</p> <p>The proposed development falls within the Bushmanland Arid Grassland vegetation type, which is classified as Least Concern under the Red List of Ecosystems (2022). However, the area overlaps with Not Protected ecosystems, indicating under-protection and the need for careful management. Further, the project footprint intersects Critical Biodiversity Areas (CBA 1 and CBA 2) and Ecological Support Areas (ESA) as per the Northern Cape Biodiversity Spatial Plan (2024). These areas are essential for maintaining ecological processes and biodiversity targets.</p> <p>The project footprint overlaps with CBAs and ESAs that support ecological connectivity and ecosystem services such as soil stabilization, nutrient cycling, and water regulation. The design incorporated avoidance of high-sensitivity habitats (e.g., rocky outcrops and water resources) and recommended pylon relocations to minimize impacts on SCC and CBAs. The Bushmanland Arid Grassland has a national conservation target of 21%, with limited statutory protection. The project design prioritizes disturbed areas and existing servitudes to reduce additional habitat loss and fragmentation.</p> <p>The project aligns with the Northern Cape Biodiversity Plan (2016) and municipal planning instruments, ensuring compliance with spatial priorities and ecological constraints. The development occurs within a Strategic Transmission Corridor, supporting national energy objectives while applying biodiversity safeguards. The assessment considered South Africa's obligations under the Convention on Biological Diversity (CBD) and IUCN standards for Key Biodiversity Areas (KBAs).</p>
<b>1.2</b>	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	<p>Refer to the baseline ecological information in Section 9, and the impact assessment and mitigation measures in Section 10 of this Report. Efforts have been made to avoid any identified impacts/ disturbance to sensitive environmental constraints.</p> <p>The project will lead to potential habitat loss and fragmentation through the clearing of indigenous vegetation within the 50 km powerline servitude and the ±11.3 ha</p>



Ref No.	Question	Response
		<p>substation expansion footprint will result in localised habitat loss. The project may also affect Species of Conservation Concern (SCCs) as the footprints of the infrastructure proposed intersect with these sensitivities. Two floral SCC and one nationally protected tree species (<i>Vachellia erioloba</i>) were confirmed on site, along with several provincially protected species (<i>Boscia foetida</i>, <i>Euphorbia spinea</i>, <i>Euphorbia hamata</i>). Removal or damage to these species will require permits under NEMBA and provincial legislation.</p> <p>The powerline alignment also crosses habitats used by sensitive species, including Ludwig's Bustard (<i>Neotis ludwigii</i>), which is highly susceptible to collision with overhead lines.</p> <p>Several ephemeral drainage lines and one temporary wetland fall within the regulated area of watercourses. Tower placement and access tracks could alter hydrological patterns and increase erosion risk.</p> <p>However, the project also has potential to enhance biodiversity protection. This would be through the implementation of avoidance measures for high-sensitivity habitats and relocating towers away from CBAs and riparian zones. It will also promote the rehabilitation of disturbed areas post-construction to restore ecological function through some of the mitigation measures proposed. Mitigation measures also promote the control of Alien invasive species during construction and operation phases.</p>
1.3	<p>How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?</p>	<p>The proposed development has the potential to pollute and degrade the biophysical environment primarily during the construction phase.</p> <p>Key risks include dust emissions from site clearing and vehicle movement on unpaved tracks, exhaust emissions from diesel-powered machinery, and localised noise pollution from heavy equipment. Soil disturbance through excavation and vegetation clearance may lead to erosion, sedimentation, and compaction, while accidental spills of fuels or lubricants could contaminate surface water resources.</p> <p>Waste generation will consist mainly of domestic refuse and packaging materials, with small quantities of hazardous waste from equipment maintenance. Visual intrusion during construction and permanent alteration of the landscape will also occur.</p> <p>To avoid these impacts, the project design incorporated route optimisation (achieved by incorporating the site-specific tower-to-tower walkdown as part of the Basic</p>



Ref No.	Question	Response
		<p>Assessment Process) to bypass sensitive habitats, wetlands, and steep slopes, and scheduled vegetation clearance during dry seasons to reduce erosion risk.</p> <p>Where impacts could not be avoided, mitigation measures include the implementation of minor and localised dust suppression through regular watering, installation of stormwater and erosion control structures such as berms and silt fences, bunded fuel storage (where applicable) and spill response protocols, noise management by limiting high-noise activities to daylight hours, and strict waste segregation with disposal at licensed facilities.</p> <p>Positive measures include post-construction rehabilitation of disturbed areas using indigenous vegetation and implementation of an Alien Invasive Plant management programme amongst other measures.</p>
1.4	<p>What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>The proposed development will generate waste primarily during the construction phase, with minimal waste expected during operation. Waste streams will include general domestic waste from construction camps, packaging materials from equipment and components, and small quantities of hazardous waste such as oils, lubricants, and contaminated materials from machinery maintenance.</p> <p>To avoid waste generation, the project design incorporates efficient procurement practices to reduce excess materials and encourages the use of reusable packaging where possible. Where waste could not be avoided, measures to minimise and manage waste include segregation of waste streams at source, implementation of recycling initiatives for paper, plastics, and scrap metal, and re-use of suitable materials. Hazardous waste will be stored in bunded (where applicable).</p> <p>All unavoidable waste will be safely treated and disposed of through licensed waste management contractors at approved facilities, ensuring compliance with the EMPr and relevant legislation.</p>
1.5	<p>How will this project 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 the impacts? What measures were explored to enhance positive impacts?</p>	<p>The proposed development will intersect a landscape with documented heritage sensitivities, including Stone Age artefacts, historical farm structures, and a cemetery older than 60 years. While most identified features, such as isolated lithics and rubble, are of low significance, certain sites, such as the Hellum Farm Complex, windmill infrastructure, and the Bladgrond Farm Cemetery, are protected under the NHRA. To avoid adverse impacts, the design incorporates 30-meter buffers around high-sensitivity sites and excludes the cemetery from the construction footprint. Where avoidance is not possible, mitigation measures include recording features prior to disturbance and implementing a Heritage Chance Find Procedure during</p>



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		<p>construction. These measures, combined with route optimisation, aim to minimise irreversible impacts while preserving the cumulative heritage value of the landscape.</p>
<p><b>1.6</b></p>	<p>How will this project 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 the impacts? What measures were explored to enhance positive impacts?</p>	<p>The proposed development will have a limited impact on non-renewable natural resources, as it does not involve extraction of minerals or fossil fuels. However, construction activities will require materials such as steel for towers, concrete for foundations, and fuel for machinery, which are derived from non-renewable sources. To ensure responsible and equitable use, the project design prioritizes efficient procurement and engineering practices to minimise material wastage and optimise resource use. Consequences of depletion were considered by adopting industry best practices for durability and longevity of infrastructure, reducing the need for frequent replacement.</p> <p>Avoidance measures include route optimisation to limit the number of towers and associated foundations, while minimisation strategies involve recycling scrap metal, reusing packaging, and implementing strict waste segregation. Positive measures include sourcing materials from suppliers with sustainability certifications and promoting recycling during decommissioning to recover steel and other components.</p>
<p><b>1.7</b></p>	<p>How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts 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?</p>	<p>The proposed development will interact with renewable natural resources primarily through the use of land, vegetation, and ecosystem services within the Bushmanland Arid Grassland and associated habitats. These habitats provide critical ecological functions such as primary production, soil stabilisation, nutrient cycling, water regulation, and carbon sequestration.</p> <p>Clearing for pylons and servitude roads may lead to habitat fragmentation, reduced ecological connectivity, and disruption of ecosystem services. If unmanaged, these impacts could exceed acceptable thresholds for carrying capacity and ecological resilience, particularly in high-sensitivity habitats such as rocky outcrops and water resources.</p> <p>To mitigate these adverse impacts, several avoidance and minimisation measure were put in place. Firstly, route optimisation was integral to addressing impacts. The alignment was refined through a site-specific tower-to-tower walkdown to avoid high-sensitivity features and observations. Following the walkdown, micro-siting took place involving the adjustment of pylon positions to avoid sensitivities were possible. Vegetation management, for instance, was considered in depth. Clearing will be limited to essential areas, and topsoil will be stockpiled for rehabilitation. Indigenous species will be used for revegetation to restore ecosystem function.</p>



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		<p>The project design prioritizes the use of existing roads and disturbed areas to minimise new habitat loss. Permits will be obtained for any unavoidable interaction with protected species, and relocation will be considered where feasible.</p>
1.7.1	<p>Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?</p>	<p>The proposed project does not exacerbate dependency on increased resource use for economic growth; rather, it supports a transition toward reduced resource dependency by enabling renewable energy integration into the national grid. The infrastructure is designed to facilitate the evacuation of renewable power in the Northern Cape, which aligns with South Africa’s Integrated Resource Plan (IRP, 2019) and Just Energy Transition objectives. This approach promotes de-materialised growth by shifting reliance away from fossil fuels toward clean energy sources, reducing long-term environmental and resource pressures.</p> <p>While the construction phase requires non-renewable inputs such as steel, concrete, and fuel, these are once-off investments in durable infrastructure with a long operational lifespan.</p>
1.7.2	<p>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?</p>	<p>Yes, the proposed use of natural resources constitutes the best and most justifiable use when considering both intragenerational and intergenerational equity. The project enables the integration of renewable energy into South Africa’s national grid, which is critical for meeting the country’s decarbonisation targets under the Integrated Resource Plan (IRP, 2025) and international climate commitments. This transition reduces reliance on fossil fuels, mitigates greenhouse gas emissions, and supports long-term energy security benefits that extend across generations.</p> <p>The resources used (land, vegetation, and ecosystem services) are applied in a manner that prioritises ecological sustainability - the footprint falls within a Strategic Transmission Corridor, aligning with national spatial planning priorities and minimising the need for new linear infrastructure in undisturbed areas.</p>
1.7.3	<p>Do the proposed location, type and scale of development promote a reduced dependency on resources?</p>	<p>Yes, the proposed location, type, and scale of development promote a reduced dependency on resources. The project is strategically situated within a designated Strategic Transmission Corridor, which minimises the need for new linear infrastructure in undisturbed areas or earmarked as more sensitive and optimises the use of existing servitudes and access routes. This approach reduces land disturbance, avoids unnecessary duplication of infrastructure, and limits resource consumption during construction.</p>



Ref No.	Question	Response
<b>1.8</b>	<b>How were a risk-averse and cautious approach applied in terms of ecological impacts:</b>	
<b>1.8.1</b>	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	While the walkdown provided site-specific information regarding ecological and cultural heritage features, the potential to encounter below-ground features must be accounted for. To address this in terms of a heritage perspective, chance finds with regards to cultural heritage and palaeontology is required to prevent the loss of heritage and palaeontological resources. A chance find protocol was developed by the heritage specialist. Further, a level of on-site training will be incorporated into the construction program to allow for the identification of any additional features which may not have been identified during the walkdown.
<b>1.8.2</b>	What is the level of risk associated with the limits of current knowledge?	The level of risk associated with the limits of current knowledge is considered low since an extensive walkdown survey was incorporated into this assessment. Mitigation measures have been incorporated to reduce the level of risk attributed with limits of current knowledge (refer to Section 10 for the impacts and mitigation measures).
<b>1.8.3</b>	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A risk-averse and cautious approach was applied throughout the project design and assessment process to address uncertainties and minimise ecological risks. Although the level of risk associated with knowledge gaps was considered low due to the comprehensive site-specific walkdown and specialist studies, aligning to the Precautionary Principle (observed through mitigations such as the adoption of a Heritage Chance Find Procedure, for example), micro-siting and route optimisation, as well as the implementation of buffer zones and adaptive management were some measures demonstrating the extent of risk-averse approaches considered and presented.
<b>1.9</b>	<b>How will the ecological impacts resulting from this development impact on people's environmental right in terms following?</b>	
<b>1.9.1</b>	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 were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The project's potential negative impacts include habitat loss, visual intrusion, among other impacts as listed in Section 10. To avoid these, the alignment was optimised through a site-specific tower-to-tower walkdown and micro-siting to steer clear of sensitive habitats, wetlands, and cultural heritage sites. Where avoidance was not possible, measures such as requirements for permitting, noise restrictions and recommendations towards implementing stormwater controls were made. In addition, individual specialists provided input in terms of site-specific mitigations



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		such as bird flight diverter installations and other engineering mechanisms which assist in limiting ecological impacts.
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	The project will deliver several positive impacts, including improved energy security, integration of renewable power into the national grid, and long-term reduction in greenhouse gas emissions. These benefits enhance air quality and support South Africa's climate commitments. To maximise these positive outcomes, the design prioritises the use of Strategic Transmission Corridors to avoid extensive, unconsidered land disturbance, incorporates biodiversity safeguards, and commits to rehabilitating disturbed areas with indigenous vegetation. Additionally, the project promotes socio-economic benefits through job creation during construction and maintenance phases, while enabling sustainable energy access for future generations.
1.10	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 site, opportunity costs, etc.)?	<p>Human wellbeing and livelihoods in the project area are closely tied to ecosystem services provided by the affected environment. Ecosystems support soil stability, water regulation, nutrient cycling, and biodiversity, which underpin grazing activities, cultural heritage, and tourism potential. Local communities rely on these services for livestock farming, access to clean water, and the preservation of cultural landscapes that contribute to sense of place and identity.</p> <p>The proposed development introduces ecological impacts such as vegetation clearance, habitat fragmentation, and potential disturbance to watercourses, which could reduce ecological connectivity and affect ecosystem services. This may lead to opportunity costs for landowners, temporary disruption of grazing areas, and visual changes that influence tourism and cultural values. Heritage sites, including historical farm structures and cemeteries, are also at risk, which could affect cultural continuity and community identity.</p> <p>However, the project also delivers significant socio-economic benefits. By enabling renewable energy integration into the national grid, it supports energy security, climate resilience, and job creation during construction and maintenance phases. These benefits contribute to long-term sustainability and economic development, offsetting short-term ecological trade-offs.</p>
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	In summary, while the project temporarily affects ecosystem services and cultural landscapes, its contribution to renewable energy infrastructure promotes broader socio-economic objectives aligned with national development and climate goals.



Ref No.	Question	Response
1.12	<p>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), resulted in the selection of the “best practicable environmental option” in terms of ecological considerations?</p>	<p>To secure ecological integrity and a healthy biophysical environment, alternatives for both the powerline and the substation upgrade were iteratively identified, screened, and refined using a combination of desktop analysis, field surveys, and a site-specific tower-to-tower walkdown.</p> <p>A 1 km corridor was assessed to locate the least-sensitive alignment. Heritage datasets and the DFFE Screening Tool flagged parts of this corridor as highly sensitive, prompting targeted verification and avoidance buffers around cemeteries and historical structures, and micro-siting of towers to reduce residual risk.</p> <p>Within the corridor, micro-siting was applied at tower level relocating pylons and adjusting spans to avoid ecologically sensitive areas, ephemeral drainage lines, and the temporary wetland. Buffers and stormwater/erosion controls were embedded to maintain hydrological function and connectivity.</p> <p>Visual and amenity considerations were incorporated by avoiding ridgelines and maintaining recommended setbacks from receptors (e.g., N14, Uitkyk hamlet and nearby homesteads), thereby reducing visual exposure and sense of place impacts while staying within the strategic corridor.</p> <p>The alignment was further constrained and optimised inside the Strategic Transmission Corridor - a national planning instrument that concentrates transmission upgrades to minimise new disturbance in undisturbed areas.</p> <p>The substation upgrade was tested against footprint and layout options to contain expansion within or adjacent to existing disturbed areas at Paulputs, limiting new land take.</p> <p>Alternatives that would have pushed development into higher-sensitivity habitats or closer to ephemeral drainage features were scoped out in favour of layouts that reduce habitat fragmentation and maintain connectivity.</p>
1.13	<p>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?</p>	<p>The project adds to the cumulative footprint of energy infrastructure in the region, which already includes CSP facilities, existing transmission lines, and substations. This can lead to incremental habitat fragmentation, visual intrusion, and disturbance of ecological connectivity. The clearing of indigenous vegetation within the ±550 ha servitude and substation expansion footprint, combined with other planned developments, may exacerbate pressures on sensitive species and ecosystem services. Additionally, cumulative impacts on sense of place and cultural landscapes are expected due to the industrialisation of a largely natural setting.</p>



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		<p>However, the project contributes to South Africa’s long-term climate and energy objectives by enabling the integration of renewable energy into the national grid. This reduces reliance on fossil fuels, lowers greenhouse gas emissions, and supports national decarbonisation targets under the IRP (2025) and international commitments.</p>
<b>2</b>	<b>Promoting justifiable economic and social development</b>	
<b>2.1</b>	<b>What is the socio-economic context of the area, based on, amongst other considerations, the following:</b>	
<b>2.1.1</b>	<p>The IDP (and its sector plans’ vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area</p>	<p>The site intersects with two District Municipalities (the Namakwa District Municipality, and the ZF Mgcawu District Municipality).</p> <p>The project area spans Khâi-Ma (Namakwa District) and Kai !Garib (ZF Mgcawu District) in the Northern Cape, both characterised by vast arid landscapes, low population density, and high renewable energy potential. Namakwa has ~148 000 residents, with Khâi-Ma the least populated (~8500), and faces high unemployment (~28%), housing backlogs, and infrastructure deficits. Its economy is dominated by mining, with emerging renewable energy and tourism sectors. ZF Mgcawu, covering ~102,000 km<sup>2</sup>, relies on agriculture along the Orange River, mining, and tourism. Both IDPs prioritise energy security, infrastructure upgrades, spatial transformation, and job creation, aligning strongly with the proposed transmission project’s objectives to enable renewable integration and stimulate socio-economic development.</p>
<b>2.1.2</b>	<p>Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</p>	<p>The respective Spatial Development Frameworks (SDF) of the two District Municipalities were considered.</p> <p>The socio-economic context of the area, when viewed through the lens of the SDFs, reflects a strong emphasis on spatial transformation and integration to address historical fragmentation and inequality. The SDFs seek to overcome the fragmented spatial form of villages by promoting densification and infill development, particularly around central nodes and corridors. This is intended to centralise socio-economic services and reduce travel distances for communities. While promoting development, the SDF emphasizes avoiding encroachment into prime agricultural land and safeguarding biodiversity and ecological support areas.</p> <p>Overall, the desired spatial pattern is one of compact, connected, and integrated settlements, reducing sprawl, improving access to services, and supporting economic opportunities while maintaining environmental sustainability.</p>



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2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	The area is predominantly rural with dispersed settlements and limited urban nodes, creating a fragmented spatial structure. The area is characterised by vast arid landscapes, low population density, and high renewable energy potential.
2.1.4	Municipal Economic Development Strategy (“LED Strategy”).	The IDPs emphasize creating an enabling environment for economic growth through tourism development, agriculture, and agro-processing. Strategies include job creation, skills development, and support for small businesses, particularly in rural areas. The IDPs and SDFs align LED strategies with spatial priorities by targeting Strategic Development Areas (SDAs), upgrading informal settlements, and improving connectivity between rural settlements and urban nodes.
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposed project is expected to deliver positive socio-economic benefits by enabling renewable energy integration into the national grid, which supports energy security and aligns with South Africa’s decarbonisation goals. Further, enabling renewable energy projects and their subsequent integration may lead to the upliftment of economic opportunities in the province. Short-term impacts include job creation during construction and maintenance phases, prioritising local employment to stimulate rural economies. Improved infrastructure and connectivity will enhance access to services and economic opportunities. However, temporary negative impacts may occur, such as land disturbance affecting grazing areas, visual intrusion, and potential cultural heritage sensitivities. Overall, the development complements municipal and provincial objectives for spatial transformation, sustainable growth, and socio-economic upliftment.
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	Yes, the project aligns with the LED strategies of the local municipalities and local socio-economic initiatives. Refer to 2.1.4.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The development addresses the physical, psychological, developmental, cultural, and social needs of communities by improving energy security and enabling renewable integration, which supports long-term socio-economic resilience. Physically, it enhances infrastructure and connectivity, reducing isolation and improving access to services. Developmentally, it creates short-term employment during construction and maintenance phases, prioritising local labour and skills development initiatives. Culturally and socially, the design incorporates heritage safeguards such as buffers around cemeteries and historical sites, and implements a Heritage Chance Find Procedure to protect cultural continuity. Psychologically, the project fosters



Ref No.	Question	Response
		community confidence through transparent public participation and alignment with municipal LED strategies, which aim to reduce poverty and promote inclusive growth.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The development will result in equitable intra- and intergenerational impact distribution by supporting South Africa's transition to renewable energy, which benefits current and future generations through improved energy security and reduced carbon emissions.
2.5	<b>In terms of location, describe how the placement of the proposed development will:</b>	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	The development will not directly create integrated residential and employment opportunities, as it is located in a remote, sparsely populated area dominated by agricultural land and dispersed rural settlements. However, it will generate short-term employment during the construction phase and limited operational jobs, prioritising local labour where possible. While these opportunities will not lead to new residential clusters, they will provide temporary income and skills development for nearby communities. Indirectly, the project supports broader socio-economic objectives by enabling renewable energy integration into the national grid, which promotes long-term energy security and economic growth.
2.5.2	Reduce the need for transport of people and goods.	The project will not have a significant short-term impact on the movement of people and goods. It may present opportunities to expanding renewable energy production in the area, leading to the development of infrastructure to accommodate the movement of people as employment opportunities increase where applicable.
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms of public transport),	The project will have little impact, if any, on public transport or enable non-motorised and pedestrian transport. As the project is located in a remote area, it may encourage the use of public transport by the construction crew to get to site, but this is observed as the limitation of the impact of the project on public transport.
2.5.4	Compliment other uses in the area,	The project compliments the CSP and PV development land uses, as it enables the evacuation and distribution of energy from the area through Paulputs Substation. Further, the greater area has potential in terms of the development of additional renewable energy facilities. This will be complimented by the substation upgrade and the additional transmission line.



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2.5.5	Be in line with the planning for the area.	Refer to 2 of this table which provides more information on how the project aligns with relevant development plans.
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	The project proposes development of vast, remote landscapes which are far from urban areas.
2.5.7	Optimise the use of existing resources and infrastructure,	The project will largely make use of the existing infrastructure of Paulputs Substation, and connect to the existing Aries-Kokerboom powerline.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	The proposed development does not represent an opportunity cost in terms of bulk infrastructure expansion in non-priority areas because it is strategically located within a designated Strategic Transmission Corridor as per national planning instruments. This corridor was established to concentrate transmission upgrades in areas that minimise new disturbance and align with South Africa's Integrated Resource Plan (IRP, 2025) and spatial planning priorities.
2.5.9	Discourage "urban sprawl" and contribute to compaction / densification.	The project will not contribute to urban sprawl as it is proposed for an area which is extensively remote. The closest town to the proposed project is Pofadder, several kms away.
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	While the project will not address historically distorted spatial patterns of settlement, it will build on existing infrastructure for improving energy transmission and advancing energy distribution in rural areas where applicable.
2.5.11	Encourage environmentally sustainable land development practices and processes	The project is situated within a designated Strategic Transmission Corridor, which concentrates infrastructure upgrades in areas already earmarked for energy development. The alignment was refined through a site-specific tower-to-tower walkdown and micro-siting to avoid sensitive habitats, Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and watercourses. By upgrading the Paulputs Substation and connecting to the existing Aries-Kokerboom line, the project optimises the use of existing infrastructure rather than creating redundant corridors, thereby limiting land take and resource consumption.
2.5.12	Take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The project is located near the N14, a national road which connects key urban areas of the region. Further, while the project may be proposed in a remote area, its



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		placement favours minimising impacts by optimising a route which allows for the development of an accessible servitude.
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The project will potentially create opportunities for new renewable energy generation developments. This will ultimately lead to economic upliftment of the region, as well as the Northern Cape Province.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	Refer to Section 9.1.6 which highlights the landscape quality and visual attributes of the baseline environment. Refer to Section 10.3.12 which highlights the impacts the project will have on heritage resources. As a key finding, the project will have an impact on the sense of place of the area as the landscape remains remote, with the addition of a new powerline altering the area traversed. As far as possible, the project avoids heritage sensitivities and implements buffers to ensure heritage features are not severely impacted.
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	Since the only settlements around the area include hamlets and farmsteads, it is not anticipated that the project will have any impact on settlements.
2.6	How was a risk-averse and cautious approach applied in terms of socio-economic impacts:	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to Section 12 for the Assumptions and Limitations related to this project. Some to note here includes the potential for the project to intersect with below-ground heritage features, as an example.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	Refer to Section 10 which highlights the impacts of the project. The project is located far from urban areas or settlements and hence will have little impact on communities.
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	The project falls within a Strategic Transmission Corridor (STC) which minimises impacts of the development on undisturbed areas. Through route optimisation and micro-siting, the project supports an avoidance approach to its development.
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in <b>Section 10</b> of this report.



Ref No.	Question	Response
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The potential impacts have been identified assessed as part of this Basic Assessment Report and mitigation measures have been recommended to prevent negative impacts in this regard. Refer to the identified impacts, their assessment and recommended mitigation measures in <b>Section 10</b> of this report.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to the identified impacts, their assessment and recommended mitigation measures in <b>Section 10</b> of this report.
2.13	What measures were taken to:	
2.13.1	Ensure the participation of all interested and affected parties.	
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	Refer to Section 8 for details regarding the public participation process undertaken for this project. The public participation process will continue as planned for the duration of the Basic Assessment review period.
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	



Ref No.	Question	Response
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	<p>Notification of Interested &amp; Affected Parties have included:</p> <ul style="list-style-type: none"> <li>• Notification Letters via Emails, Faxes and/or Registered Mail where details were available.</li> <li>• SMS notifications.</li> <li>• Publication of Newspaper Advertisements.</li> <li>• Publication of a Gazette Notice (Northern Cape Provincial Gazette).</li> </ul>
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Workers will be educated on a regular basis as to the environmental and safety risks that may occur within their work environment. Furthermore, adequate measures will be undertaken to ensure that the appropriate personal protective equipment is issued to workers based on the areas that they work and the requirements of their job. Their right to refuse work (if considered dangerous) will be included in the education programme.
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1	The number of temporary versus permanent jobs that will be created.	It is anticipated that the use of local labour will be utilised as far as possible. Labourers will mostly be sourced from surrounding towns and areas such as Pofadder and Kakamas. Skilled labour will be sourced from areas further away from the surrounding towns dependent on the contractor.



Ref No.	Question	Response
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	Unskilled labour is expected to be obtained from surrounding towns and areas. Where a mismatch in skill required is encountered, the contractor will source the required skilled labourers from towns and areas further from the site where applicable.
2.16.3	The distance from where labourers will have to travel.	The closest town to the site is Pofadder, approximately 30kms away. This is expected to be the closest point from which labourers will travel. It is expected that labourers will be required to travel far distances given the remote nature of the project.
2.16.4	The location of jobs opportunities versus the location of impacts.	The location of job opportunities is in the same location as the impacts as assessed in this report.
2.16.5	The opportunity costs in terms of job creation.	The opportunity costs in terms of job creation are considered low.
2.17	What measures were taken to ensure:	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Basic Assessment process requires governmental departments to communicate regarding any application. In addition, all relevant Departments and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties. They will continue to be notified and engaged with regarding the project throughout the Basic Assessment process. Should any conflicts of interest between organs of state be identified, these will be resolved through the appropriate channels.
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental attributes that may be impacted by this project have been identified and where relevant, specialist input has been solicited to ensure that a rigorous impact assessment process is undertaken. Where positive impacts on the interests of the public have been identified (e.g. job creation, impact on existing land use, etc.), mitigation measures are put forward to enhance positive impacts and/or reduce negative impacts. Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.



Ref No.	Question	Response
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The project is not expected to generate significant pollution or environmental degradation requiring substantial remediation costs. However, measures have been implemented to ensure accountability for any potential impacts
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to Section 7 for details of the alternatives considered.
2.22	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?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.



## 7 PROJECT ALTERNATIVES

The identification of alternatives is a key aspect of the success of the impact assessment process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess. There are, however, some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. Such constraints include social, financial and environmental issues, which will be discussed as part of the evaluation of the alternatives for this project. Alternatives can typically be identified according to:

- Location alternatives (including design and layout);
- Scheduling alternatives;
- Process alternatives;
- Technology alternatives; and
- Activity alternatives (including the No-Go option).

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. Section 6 provides an overview of the project need and desirability.

In this section the various alternatives considered are described and their advantages and disadvantages are presented where applicable. Furthermore, the feasibility of the considered alternatives, from both a technical as well as environmental perspective, is determined and the result thereof are the alternatives that will be investigated further in the EIA phase, towards the selection of preferred alternatives. Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate and feasible method of development, all of which are discussed below.

Alternatives can further be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or scoping phases of the EIA process. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation and management measures and are not specifically identified as distinct alternatives. This section provides information on the Project's location, process, technology and activity alternatives considered and assessed.

This project includes embedded alternatives which were considered during planning phase. These related to design and layout specifically.

Following on-site assessments and the site-specific tower-to-tower walkdown undertaken, no further need for design or layout alternatives were deemed necessary.

### 7.1 LOCATION ALTERNATIVES

Location alternatives can apply to the entire Project (e.g. the strategic decision to locate the proposed development at a specific geographical location), as well as more specific footprints of individual components of the project.

While no alternatives were considered as part of this assessment, several were embedded into the planning phase.

#### 7.1.1 DEVELOPMENT LOCATION ALTERNATIVES

The selection of development location alternatives in terms of the project was limited to the infrastructure required for the LILO. This included:

- Paulputs Substation
- Selected connection or tee-off point along the Aries-Kokerboom powerline



- The powerline between Paulputs Substation and the connection or tee-off point along the Aries-Kokerboom powerline.

Embedded alternatives in this regard considered the powerline which spanned from the substation to the connection point. Tower positions and the overall powerline alignment was therefore planned considering pre-identified sensitivities and engagement with stakeholders and landowners.

### 7.1.2 DESIGN OR LAYOUT ALTERNATIVES

As previously discussed, embedded alternatives formed a critical part of the design and layout of the planning of this project. Key features of the project which were planned considering embedded alternatives include:

- Extent of the footprint of the substation upgrade;
- Re-routing of the access route which will be affected by the substation upgrade; and
- Final Tower/Pylon positions selected in relation to pre-identified environmental sensitivities.

The extent of the footprint of the Paulputs substation upgrade had to consider nearby features including watercourses and red dunes. The subsequent re-routing of the access route which will be affected by the substation upgrade had to consider the red dune to the east of Paulputs Substation. For this reason, the route was re-routed to the west of the substation. Lastly, final tower/pylon positions selected considered pre-identified features including hills, watercourses, roads, farmsteads, and red dunes. Where needed, tower positions were adjusted to avoid sensitivities identified on-site.

## 7.2 SCHEDULING ALTERNATIVES

Scheduling alternatives are sometimes known as sequencing or phasing alternatives. In this case an activity may comprise a number of components, which can be scheduled in a different order or at different times and as such produce different impacts. No specific scheduling alternatives have been assessed as discrete alternatives, however various mitigation measures contain scheduling requirements to reduce the overall impacts of the development.

## 7.3 PROCESS ALTERNATIVES

Process alternatives imply the investigation of alternative processes or methods to achieve the same goal for the proposed Project. This includes using environmentally friendly designs or materials and re-using scarce resources like water and non-renewable energy sources. Process alternatives will be defined and implemented as incremental alternatives during the assessment and incorporated into the EMPr. No process alternatives were deemed feasible in the context of this project, and therefore, none were considered.

## 7.4 TECHNOLOGY ALTERNATIVES

The selection of the technology alternatives or techniques to be adopted for the construction and operation of the Project are described in this section. Embedded technology alternatives included the use of different pylon structures. As highlighted in Section 4.1.3, guyed V towers would be used to minimise the surface area disturbed by the tower position. Cross-roped Self-supporting Suspension towers would be used at bend points along the powerline.

## 7.5 ACTIVITY ALTERNATIVES

Activity alternatives refer to project alternatives which requires a change in the nature of the proposed activity. No activity alternatives are considered feasible and therefore have not been considered.

## 7.6 NO GO ALTERNATIVE

The “No Go” or “No Action” alternative refers to the alternative of not embarking on the proposed project at all. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is important to note that the No Go alternative is the baseline against which all other alternatives and the



development proposal are assessed. When considering the No Go alternative, the impacts (both positive and negative) associated with any other specific alternative, or the current project proposal would not occur and in effect the impacts of the No Go alternative are therefore inadvertently assessed by assessing the other alternatives. In addition to the direct implications of retaining the status quo, there are certain other indirect impacts, which may occur should the No Go alternative be followed. The 'no-go' alternative provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the 'no-go' alternative it is important to take into account the implications of foregoing the benefits of the proposed project.

Considering a 'no-go' alternative would involve not implementing upgrades to Paulputs Substation, nor constructing the LILO between the substation and the Aries-Kokerboom Powerline. This would have implications on the evacuation of power from renewable energy producers, both present and future. Further, the capacity of Paulputs substation would be limited to current infrastructural capabilities, and this will in turn limit the amount of energy transmission Paulputs Substation will be able to be utilised for. Considering that South Africa is moving towards ensuring the country's energy security, opting for the 'no-go' alternative may have implications on how current challenges are addressed which have become imperative towards the development and sustainability of South Africa.



## 8 STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&APs are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the necessary authorisation required for the project needs to be managed sensitively and according to best practises in order to ensure and promote:

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

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

- Introduce the proposed project and process for the authorisation project;
- Explain the environmental authorisation;
- Determine and record issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&APs and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

The PPP commenced on the 30 July 2025 with an initial call to register notification. Notification letters (in English and Afrikaans) were distributed to pre-identified I&APs through either faxes, SMSs, registered mail, and/or emails on the 13 August 2025. This Public Participation Report (PPR) (APPENDIX C) lists all verbal and written issues raised by I&APs to date.

### 8.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES (I&APs)

An initial I&AP database has been compiled from historic projects in the area, and Windeed searches were conducted to obtain the contact details of the surrounding landowners. The I&APs referred to in the PPR include:

- Pre-identified and registered landowners and surrounding landowners;
- Pre-identified and registered key stakeholders;
- Regulatory authorities;
- Specialist interest groups; and
- All I&APs who responded to the initial notifications and requested to be registered.

Efforts to pre-identify key I&APs involved various avenues such as consultation with the proponent and known landowners within the study area, review of related previously conducted studies, and identification of key



interest groups and authorities within the vicinity of the study area and municipality. Refer to APPENDIX C for the Key Stakeholder/I&AP Database.

### 8.1.1 LIST OF ORGANS OF STATE IDENTIFIED AND NOTIFIED

The following key I&APs, but not limited to, were notified of the proposed project and invited to participate in the public participation process:

- Air Traffic and Navigation Services (ATNS)
- Department of Mineral Resources and Energy: Northern Cape (Kimberley)
- Department of Mineral Resources and Energy: Northern Cape (Springbok)
- Department of Water and Sanitation (DWS) Upper Orange WMA
- Eskom Soc Ltd
- Kai !Garib local municipality
- Khâi-ma Local Municipality
- National Department of Agriculture Land Reform and Rural Development
- National Department of Agriculture, Environmental Affairs, Rural Development and Land reform
- National Department of Co-operative Governance and Traditional Affairs
- National Department of Forestry, Fisheries and the Environment
- National Department of Human Settlements
- National Department of Mineral Resources & Energy (DMRE)
- National Department of Rural Development and Land Affairs
- National Department of Science and Technology
- National Department of Tourism
- National Department of Transport
- National Department of Water and Sanitation (DWS)
- National Energy Regulator of South Africa (NERSA)
- National House of Traditional Leaders
- National Transmission Company South Africa SOC Ltd (NTCSA)
- Northern Cape Department of Health
- Northern Cape Department of Agriculture, Environmental Affairs, Land Reform, and Rural Development
- Northern Cape Provincial Heritage Resource Agency
- Northern Cape Department of Agriculture
- Northern Cape Department of Agriculture, Land Reform and Rural Development
- Northern Cape Department of Co-operative Governance, Human Settlement and Traditional Affairs (NC COGHSTA)
- Northern Cape Department of Economic Development and Tourism (NCDEDAT)
- Northern Cape Department of Environment & Nature Conservation (DENC)
- Northern Cape Department of Roads & Public Works (NC DR&PW)
- Northern Cape Department of Social Development (NCSD)
- Northern Cape Department of Sports, Arts and Culture
- Northern Cape Department of Transport, Safety and Liason
- Northern Cape Department of Water and Sanitation
- Northern Cape Economic Development Agency
- Northern Cape Economic Development, Trade and Investment Promotion Agency (NCEDA)
- Northern Cape Heritage Resources Authority (NCHRA)



- Northern Cape Protech and Agri Revolution (Pty) Ltd
- Northern Cape Tourism Authority
- Northern Cape Wetland Forum
- Petroleum Agency SA
- South African Heritage Resources Agency (SAHRA)
- South African National Parks (SANParks)
- Signal distributor for the South African broadcasting sector (Sentech)
- South African Civil Aviation Authority (SACAA)
- South African Defence Force (SANDF)
- South African National Biodiversity Institute (SANBI)
- South African National Roads Agency Ltd (SANRAL)
- South African Radio Astronomy Observatory (SARAO)
- Transnet Freight Rail
- Transnet Pipelines
- Transnet Properties
- ZF Mgcawu district municipality

### 8.1.2 LIST OF OTHER KEY I&APS IDENTIFIED AND NOTIFIED

- Pre-identified and registered landowners and surrounding landowners.
- Afgri Agri Services
- African Conservation Trust
- African Farmers Association of South Africa
- AfriForum
- Agri Northern Cape
- Agri South Africa
- Birdlife South Africa
- Botanical Society of South Africa
- Centre for Environmental Rights
- Conservation South Africa (CSA)
- Council of Geoscience
- Earth Life Africa
- Endangered Wildlife Trust
- GroundWork SA
- GUBICO
- National Khoisan Council
- Natural Justice
- Augrabies Falls National Park
- Tara Wildlife SA
- The Green Connection
- Wilderness Foundation Africa (WFA)
- World Wide Fund South Africa

## 8.2 INITIAL NOTIFICATION OF KEY I&APS

The PPP commenced on the 30 July 2025 with an initial call to register. Notification during this initial consultation was given in the manner described below.

### 8.2.1 FAXES, REGISTERED MAIL AND EMAILS

Notification letters (in English and Afrikaans) were distributed to pre-identified I&APS through either faxes, SMSs, registered mail, and/or emails on the 13 August 2025.

The notification documents included the following information:

- Authorisations required;



- Sufficient detail of the proposed development to enable I&APs to assess/surmise what impact the development will have on them or the use of their land;
- The purpose of the proposed project;
- Details of the application processes associated with proposed activities;
- Details of the affected properties;
- Details of the South African environmental legislation that must be adhered to;
- Relevant EIMS contact person for the project.

### 8.2.2 NEWSPAPER AND GAZETTE ADVERTISEMENTS

Advertisements (in English and Afrikaans) describing the proposed project and Environmental Impact Assessment (EIA) process were placed in the Gemsbok newspaper with circulation in the vicinity of the study area on 1 August 2025. The Gazette Notice was placed in the Northern Cape Provincial Gazette on 15 August 2025. The newspaper and Gazette Notice adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

### 8.2.3 SITE NOTICE PLACEMENT

Thirteen (13) A1 Correx site notices (in English and Afrikaans) were placed at 13 locations around the proposed project study area on 30 July 2025. The on-site notices included the following information:

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

## 8.3 NOTIFICATION OF I&APS OF BAR AVAILABILITY

Notification (in English and Afrikaans) regarding the availability of the Basic Assessment Report (BAR) for public review and comment will be provided to pre-identified and registered I&APs. The notifications will be distributed through either email, registered mail, fax, and/or SMS, where contact details are available.

Contact details will be provided to I&APs should they require assistance accessing the information or require copies of the reports.

A hard copy of the Basic Assessment Report will be placed at the Kakamas Public Library for a period of 30 days.



## 8.4 RECORD OF ISSUES RAISED

Comments on the proposed project were solicited from pre-identified and registered I&APs and key stakeholders. To date, the following comments have been received:

- I&AP registration.
- Transnet Pipeline: Confirmed that their infrastructure is not affected by the proposed project.
- Sentech: granted approval for the project to proceed with construction subject to some terms and conditions.
- South African Civil Aviation Authority: No objection in terms of the project, however noted that should the project include structures of height, a formal application must be made. A formal application is to be made for this project.

All comments and/or queries received to date are included in this report and presented in APPENDIX C. This section will be updated for submission to the competent authority, the Department of Forestry, Fisheries & the Environment (DFFE), following the 30-day public review period of the BA Report.



## 9 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

This section of the BA Report provides a description of the environment that may be affected by the proposed project. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the proposed development have been described. This information has been sourced from existing information available for the area and where relevant specialist assessments.

### 9.1 PHYSICAL ENVIRONMENT

The following section provides an overview of the physical environmental attributes of the project area. This includes descriptions of climatic conditions, geology, groundwater, surface water, topography, and landscape quality and visual status-quo.

#### 9.1.1 CLIMATE AND WEATHER

This section highlights past and future climatic conditions associated with the site. Specifically considered here are seasonality, temperature averages, and precipitation patterns.

##### 9.1.1.1 CURRENT AND HISTORIC CLIMATE

The climate of the Northern Cape is characterised by extreme temperatures, with hot summers and very cold winters. The rainy season usually occurs from late summer through to autumn, with the months of January to April being particularly notable for precipitation. Temperature and precipitation vary significantly across the region, with the eastern and mountainous areas receiving rainfall of about 200-400 mm per annum, while the arid western areas receive less than 100 mm per annum.

The climate in the Northern Cape is mostly semi-arid to arid, characterised by hot and dry summers during the months of November to February and cold winters starting from May to August. The region experiences occasional thunderstorms in the late summer months, and the winter season sees little to no precipitation.

Figure 6 provides an understanding of the general climatic conditions of the area, including an understanding of monthly temperatures and rainfall.

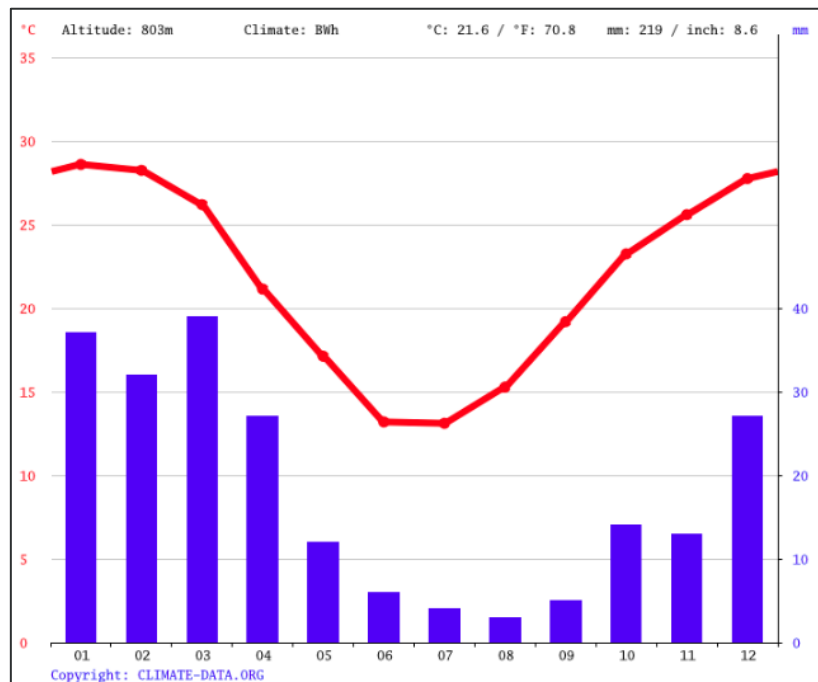


Figure 6: Annual Climatic conditions typical of the Northern Cape (considering data from Upington)(x-axis: 01=January, to 12=December)(after Climate-data.org)



Further to annual climatic conditions, additional climatic data were considered. Meteoblue provides additional information relating to the hottest and coldest recorded days of each month as illustrated in Figure 7. Hottest days are experienced in January, as high as 39°C on average, and coldest days are experienced in July, as cold as -2°C on average.

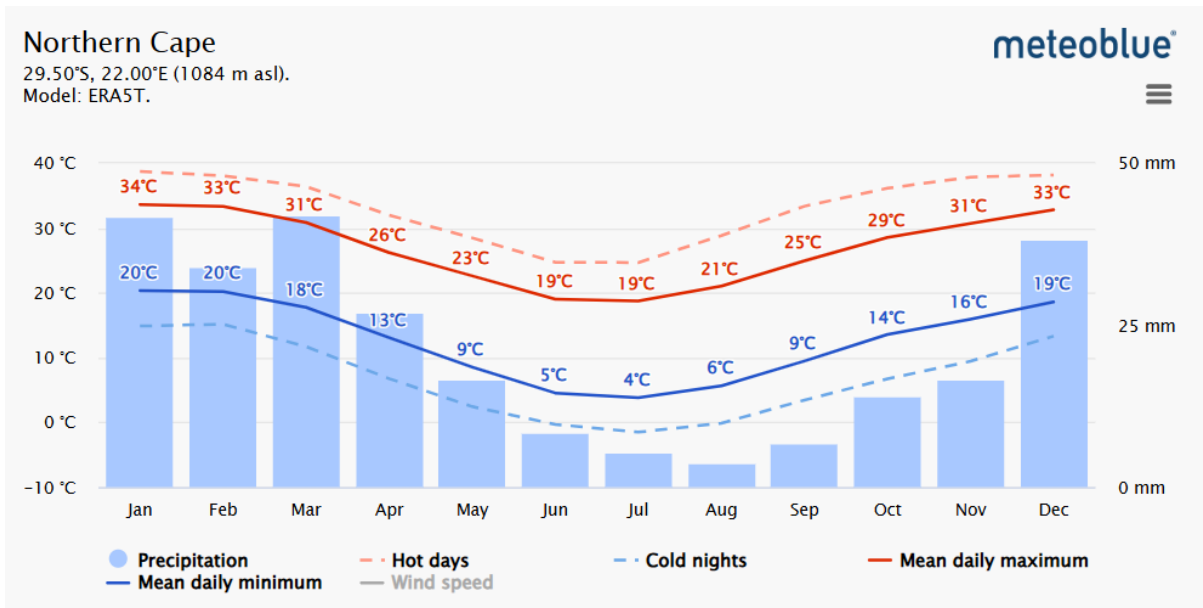


Figure 7: Climatic conditions of the Northern Cape including information on hottest and coldest days experienced (Meteoblue, 2025)

#### 9.1.1.2 PREDICTED FUTURE CLIMATE

The CSIR Greenbook municipal risk profiles (Engelbrecht, 2019) were assessed to understand the predicted future climate of the region and project area. Two main RCPs were considered in this regard, that is, RCP 4.5 and RCP 8.5.

An overall increase in temperature is expected for the region between present and 2050 under both RCPs. Under RCP 4.5, temperatures can be expected to rise to up to 3°C. Under RCP 8.5, this increase is higher at 3.46°C. Figure 8 provides an illustration relating to the intensity of the predicted increase across the region. Higher increases are expected further north of the region and site.

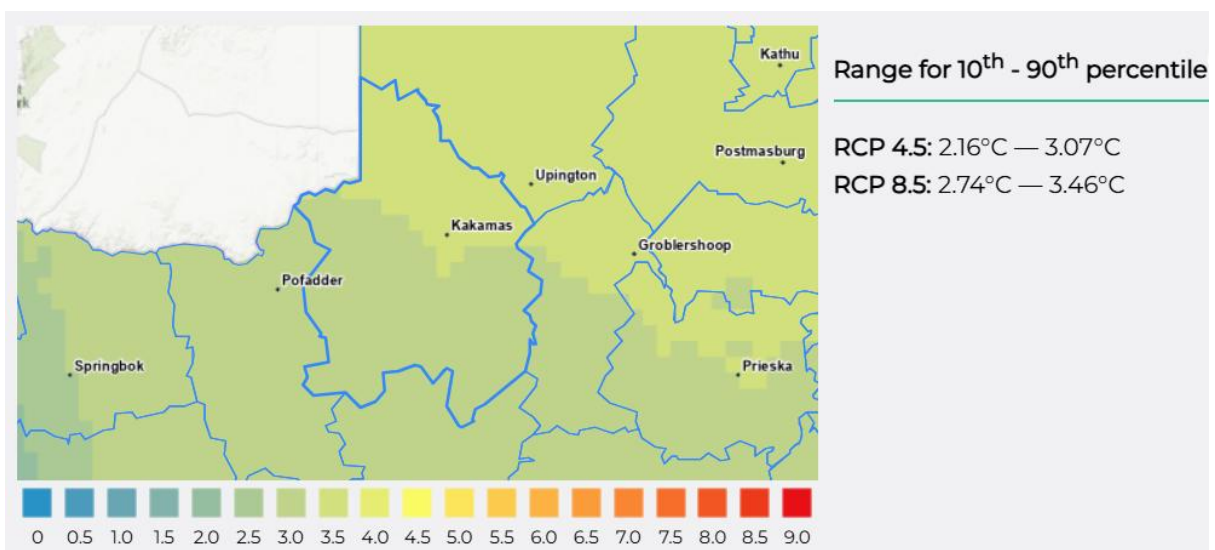


Figure 8: Spatial understanding of the distribution of expected temperature increases (after <https://riskprofiles.greenbook.co.za/>)



Greater variability is expected in terms of annual rainfall predictions. According to the different RCPs studied, more variability in rainfall changes can be expected under RCP 4.5 with a potential decrease in rainfall by at most 48mm, and an increase of 94mm. Under RCP 8.5, less overall rainfall change is predicted, with a potential decrease of up to 38mm, and a potential increase of up to 83mm. In terms of extreme rainfall days, an average of one less or one more extreme rainfall day is expected for the region. Figure 7 provides an illustration relating to the spatial context of changes in rainfall expected across the region.

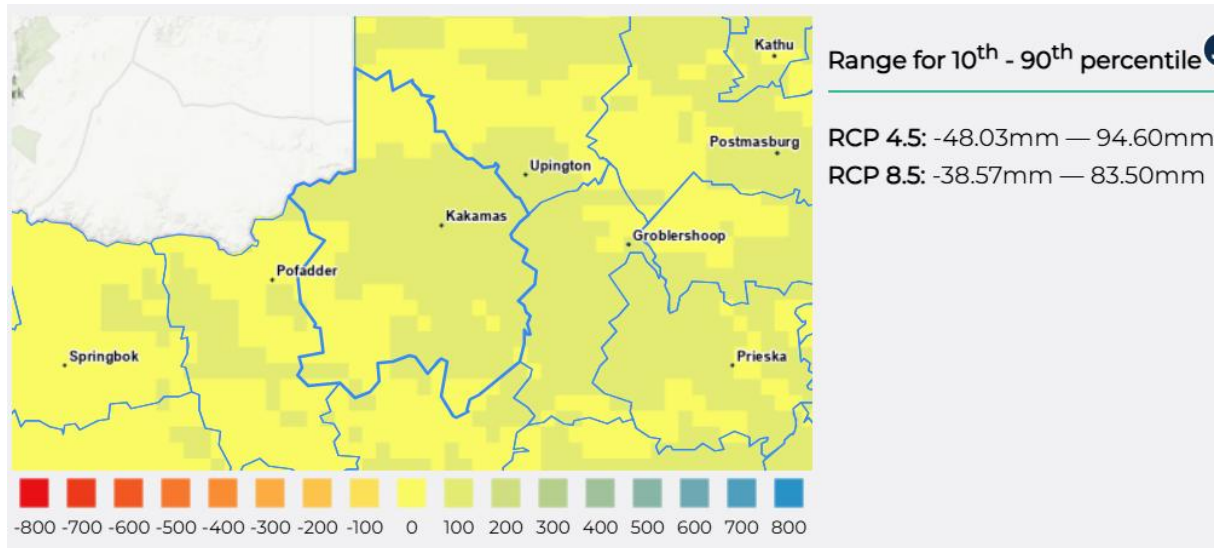


Figure 9: Spatial understanding of the distribution of expected rainfall changes (after <https://riskprofiles.greenbook.co.za/>)

As a key prediction, the number of very hot days in the region is expected to increase more than decrease. Between 26 and 70 very hot days experienced per year is expected across the region under RCP 4.5, and between 40 and 72 very hot days experienced per year is expected under RCP 8.5. The intensity of the increase in very hot days is expected to affect regions to the north, as opposed to near the site, as illustrated in Figure 10.

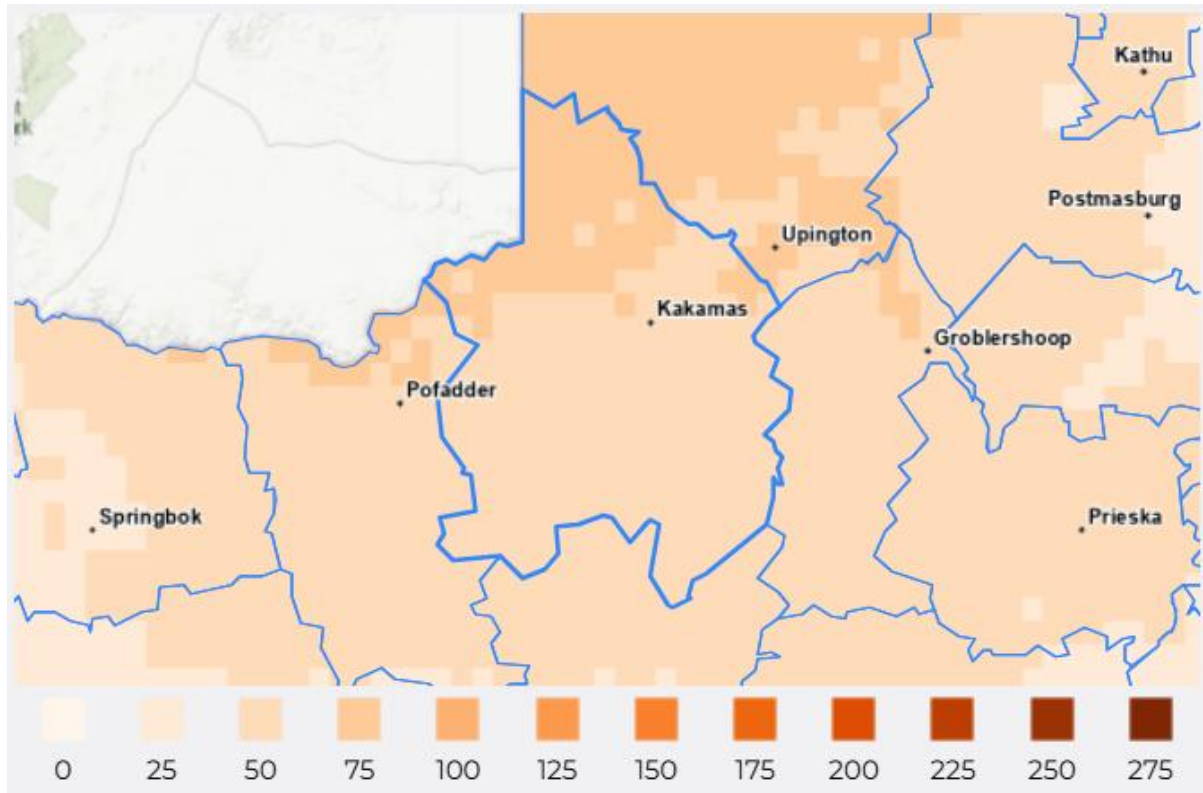


Figure 10: The number of very hot days expected across the region. Number of days indicated in the legend below the map (after <https://riskprofiles.greenbook.co.za/>)

### 9.1.2 GEOLOGY, SOILS, AND LAND CAPABILITY

The proposed Aries-Paulputs-Kokerboom 400 kV Loop-In Loop-Out (LILO) powerline traverses an area underlain by recent Quaternary alluvium and calcrete deposits, with superficial sediments of the Kalahari Group present in the eastern sections. Occasional outcrops of Palaeozoic diamictites (Dwyka Group) and gneisses or metasediments of Mokolian age occur along the route.

As illustrated in Figure 12, the dominant soils along the alignment include:

- Ferralic Arenosols (ARo): Excessively drained sandy soils, typically red, yellow, and greyish in color;
- Chromic Cambisols (CMx): Shallow soils over hard or weathering rock, often associated with Leptosols, Regosols, and Calcisols;
- Lithic Leptosols (Lq): Very shallow soils with minimal development, occurring over hard rock or weathered material.

These soil associations confirm the findings of the specialist soil assessment, which identified shallow, weakly developed profiles dominated by Mispah, Glenrosa, and Coega soil forms, with restrictive horizons such as hard carbonate layers and lithic contacts. Figure... includes photographs of the diagnostic soil forms and soil horizons identified on-site. Additional forms recorded include Grabouw, Witbank, Johannesburg, Dundee, and Vaalbos, the latter exhibiting moderate sensitivity and better drainage characteristics. Overall, the soils are characterized by low water-holding capacity, high susceptibility to erosion, and limited rooting depth, making them unsuitable for intensive cropping.

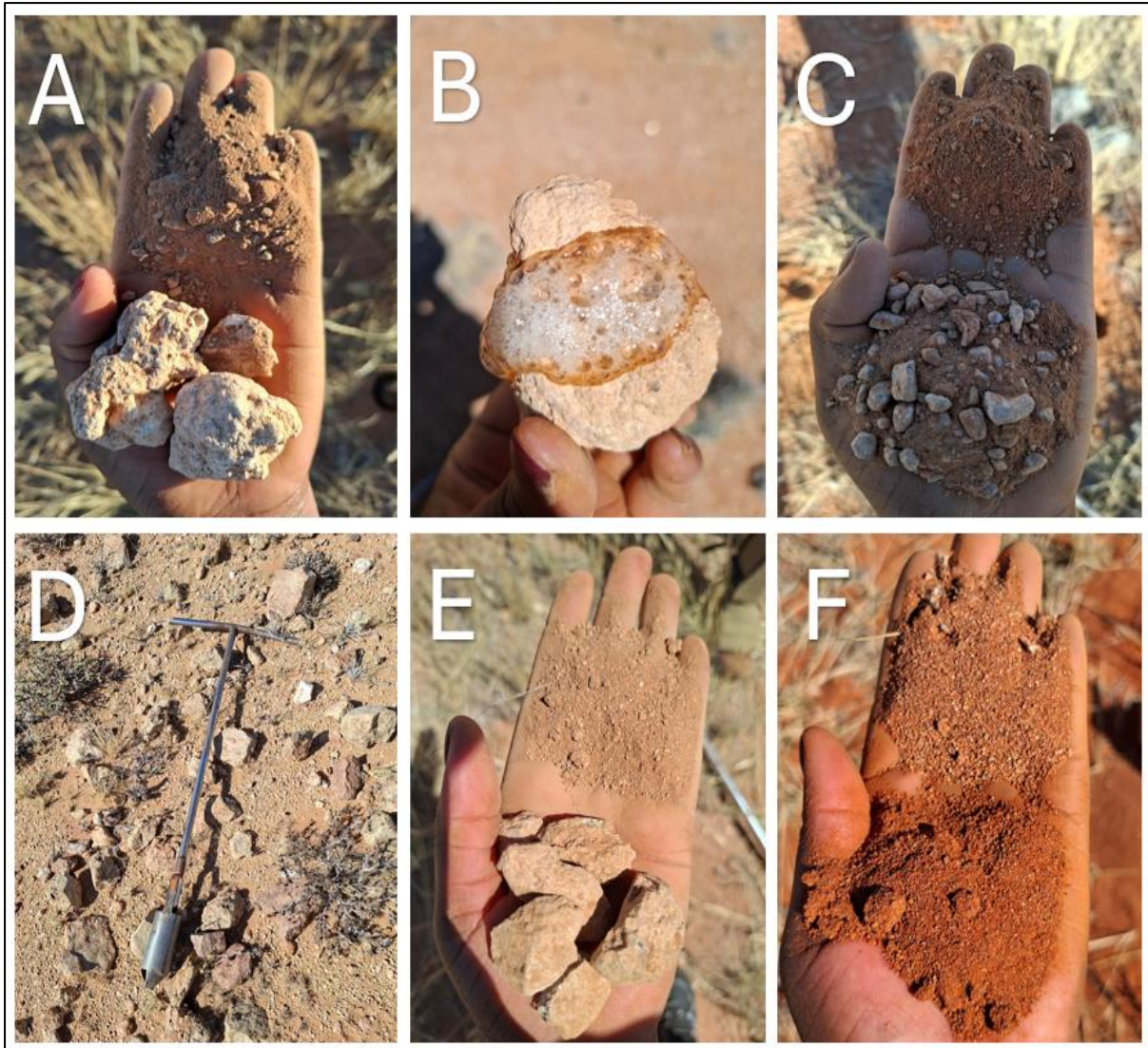


Figure 11: Diagnostic soil forms and soil horizons identified on-site: A-B) Coega soil from( Orthic topsoil horizon/ hard carbonate subsoil horizon); C) Glenrosa (Orthic topsoil horizon/ lithic subsoil horizon); D-E) Mispah soil form (Orthic topsoil horizon/ hard rock); and F) Vaalbos soil form (Orthic topsoil horizon/ red apedal subsoil horizon/ hard rock).

Land capability analysis indicates that the area falls within classes VI-VIII, corresponding to land potential levels L6-L8, which are non-arable and subject to severe limitations due to soil depth, slope, and climatic constraints. Only isolated patches of Vaalbos soils (land potential L6) were observed, but no active crop farming or irrigation infrastructure occurs within the 50 m buffer or the 500 m corridor. Current land use is dominated by natural veld and livestock grazing, which can continue beneath the powerline servitude post-construction. These findings confirm that the project area has low to very low agricultural sensitivity.

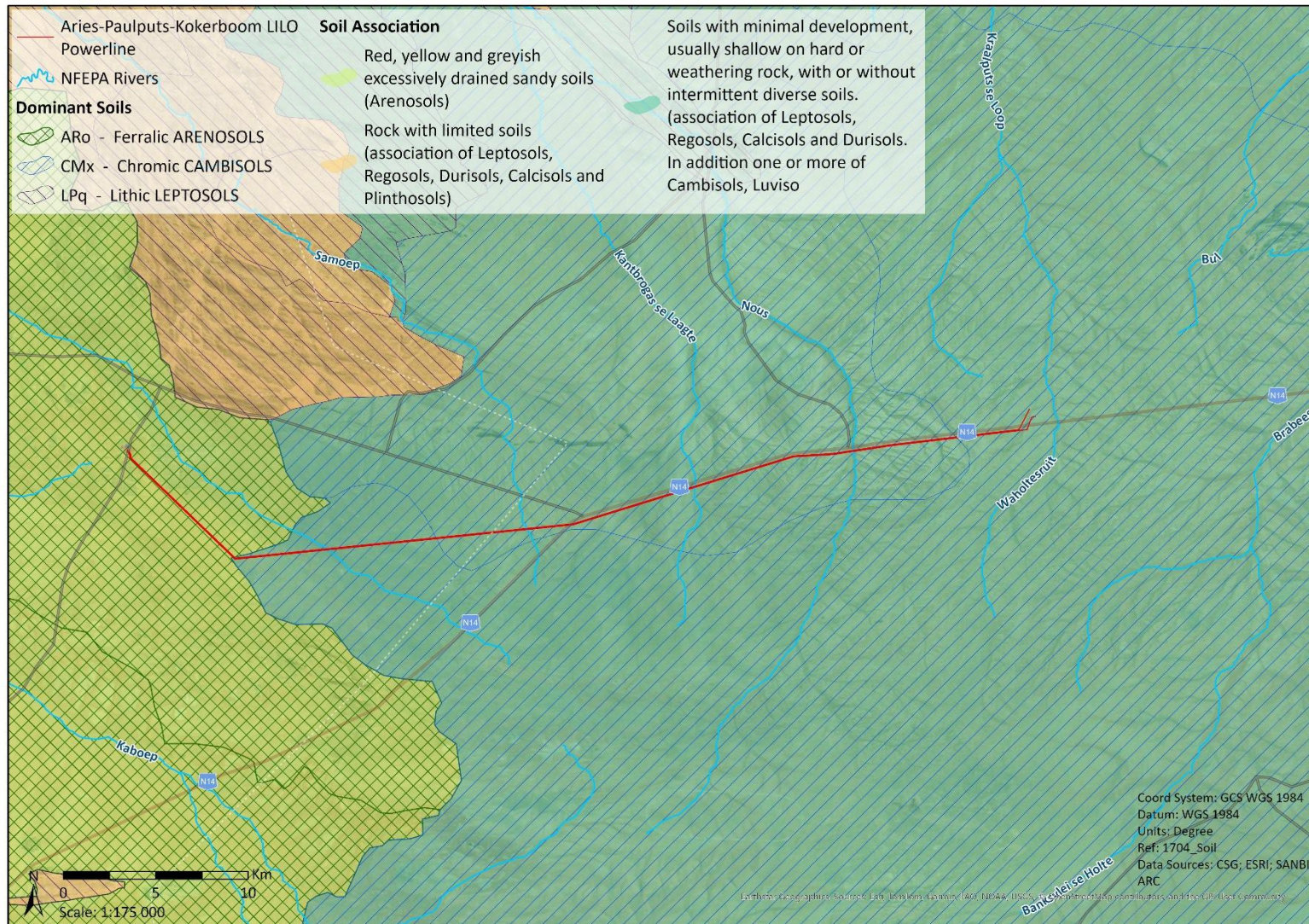


Figure 12: Soil types covering the study area.



### 9.1.3 GROUNDWATER

Groundwater is a crucial, primary water source for both the Namakwa District Municipality and the ZF Mgcawu District Municipality in the Northern Cape province of South Africa. Both districts rely heavily on boreholes for domestic, agricultural, and mining purposes, and engage in monitoring and management efforts to ensure sustainable use. Relating to the project area itself, the site is underlain by geology which would not be favourable for groundwater abstraction, as the soils identified are shallow and excessively drained sandy soils. This is coupled with the climatic constraints described, with limited rainfall experienced across the region.

Strategic Water Source Areas (SWSAs) are areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. The areas supplying  $\geq 50\%$  of South Africa's water supply (which were represented by areas with a mean annual runoff of  $\geq 135$  mm/year) represent national Strategic Water Source Areas (SANBI, 2013). According to Le Maitre *et al.* (2018), "SWSAs are defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important, or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b). They include transboundary Water Source Areas that extend into Lesotho and Swaziland. According to Lötter and Le Maitre, (2021), the 2018 SWSAs data set for surface water was identified based on a generalised 1.7 x 1.7 km resolution Mean Annual Runoff dataset, while the 2021 data set was delineated at a finer resolution of 90 x 90 m. The purpose of the update was to refine the spatial resolution such that SWSAs can be reliably integrated into a range of catchment- and local-level planning, management, and regulatory processes.

According to the SWSAs of South Africa, Lesotho and Swaziland, the site is not located within any SWSAs for surface water or groundwater.

### 9.1.4 SURFACE WATER AND DRAINAGE

The project area falls within the Vaal-Orange Water Management Area (WMA), specifically the D81D and D81E quaternary catchments, and is situated in the Nama-Karoo and Orange River Gorge Ecoregions. Hydrologically, the area is characterised by ephemeral drainage systems typical of semi-arid regions, with surface flows occurring primarily during seasonal rainfall events. The mean annual runoff is low, and no Strategic Water Source Areas coincide with the development area.

Field surveys of the area to be traversed by the powerline and affected by the substation upgrade confirmed the presence of four NFEPA rivers (Nous, Kantbrogas se Laagte, Samoep, and an unnamed tributary), several ephemeral drainage lines, and a single temporary depression wetland. These systems are highly sensitive to disturbance despite their intermittent flow, as they provide critical ecosystem services such as flood attenuation, sediment trapping, and habitat for terrestrial and avifaunal species during wet periods. No permanent impoundments or dams occur within the immediate project footprint, although small farm dams were noted in the broader catchment. Floodlines have not been formally determined, but regulated zones apply: 100 m from the edge of a watercourse and 500 m around wetlands, as per GN 4167 of the National Water Act. Recommended buffer zones include 20 m for NFEPA rivers, 10 m for tributaries and drainage lines, and 30 m for the temporary wetland.

Overall, the surface water environment is considered moderately to highly sensitive, requiring strict adherence to buffer zones, stormwater management, and erosion control measures to maintain ecological integrity and prevent downstream impacts. Figure 13 is a map surface water features intersecting the project area. Figure 14 includes photographs of examples of different watercourses identified during the walkdown.

#### 9.1.4.1 WATER RESOURCES AND BUFFER AREAS

The watercourses were delineated according to DWAF (2005), 5 m contour data, the SAIIE dataset (NBA National Wetland Map, 2018), and the latest Google Earth aerial imagery (2024) as well as a site visit and are presented in Figure 15 along with the required buffer areas. According to the buffer guidelines, the maximum required buffer should be applied to a system (Macfarlane, et al., 2014). Riparian areas have high conservation value and can be considered the most important part of a watershed for a wide range of values and resources. They provide important habitat for a large volume of wildlife and often forage for domestic



animals. The vegetation they contain is an important part of the water balance for the hydrological cycle through evapotranspiration. They are crucial for riverbank stability and in preventing erosion within the channel (Elmore and Beschta, 1987). The implementation of a buffer zone ensures the ecological requirements needed to maintain both the ecosystem functioning and services offered by the watercourses are maintained. Additionally, the watercourses potentially influenced by the project have sensitivity to further disturbance, requiring protection from the project activities. Therefore, they are considered as high priority areas and should be avoided at all costs.

A conservative buffer zone of 20 m was suggested for the NFEPA rivers, a 10 m conservative buffer for the NFEPA river tributaries and drainage areas, and a 30 m conservation buffer zone was assigned for the temporary depression wetland (Figure 15Figure 25). These buffer areas serve as No-go zones for any unauthorised activities. The site development plan should therefore be created accordingly. Ensuring buffers are intact increases the resilience of a watercourse to future disturbances.

#### 9.1.4.2 REGULATED ZONES

In accordance with General Notice (GN) 4167 of 2023 as it relates to the NWA (1998), a regulated area of a watercourse for Section 21 (c) and 21 (i) of the NWA, 1998 means the outer edge of the 1 in 100 year flood or where no flood line has been determined it means 100 m from the edge of a watercourse or a 500 m radius from the delineated boundary (extent) of any wetland or pan. Listed activities in terms of the NEMA (1998), (Act 107 of 1998) EIA Regulations as amended in April 2017 must be taken into consideration if any infrastructure is to be placed within the applicable zone of regulation, which in this case is a 32 m zone of regulation (ZoR). The PAOI includes four NFEPA rivers, NFEPA River tributaries, drainage areas and a temporary depression wetland and therefore the project falls within the NEMA Act 107 and DWS GN 4167 regulated zones. The regulated areas have been applied to the delineations within the project area and are presented in Figures Figure 26Figure 36.

#### 9.1.5 TOPOGRAPHY

The development area falls in an area between 820 and 920 m above sea-level in elevation. The landscape gently slopes towards to the west. The landscape is flat, with some hills occurring around the general area. One hill is traversed by the proposed powerline route. Higher elevation areas are observed to the far north of the site consisting of ridges and hills which contribute to the formation of drainage lines running from north to south across the project area. See Figure 37 for an overview of the topography of the site to be developed and surrounding areas.

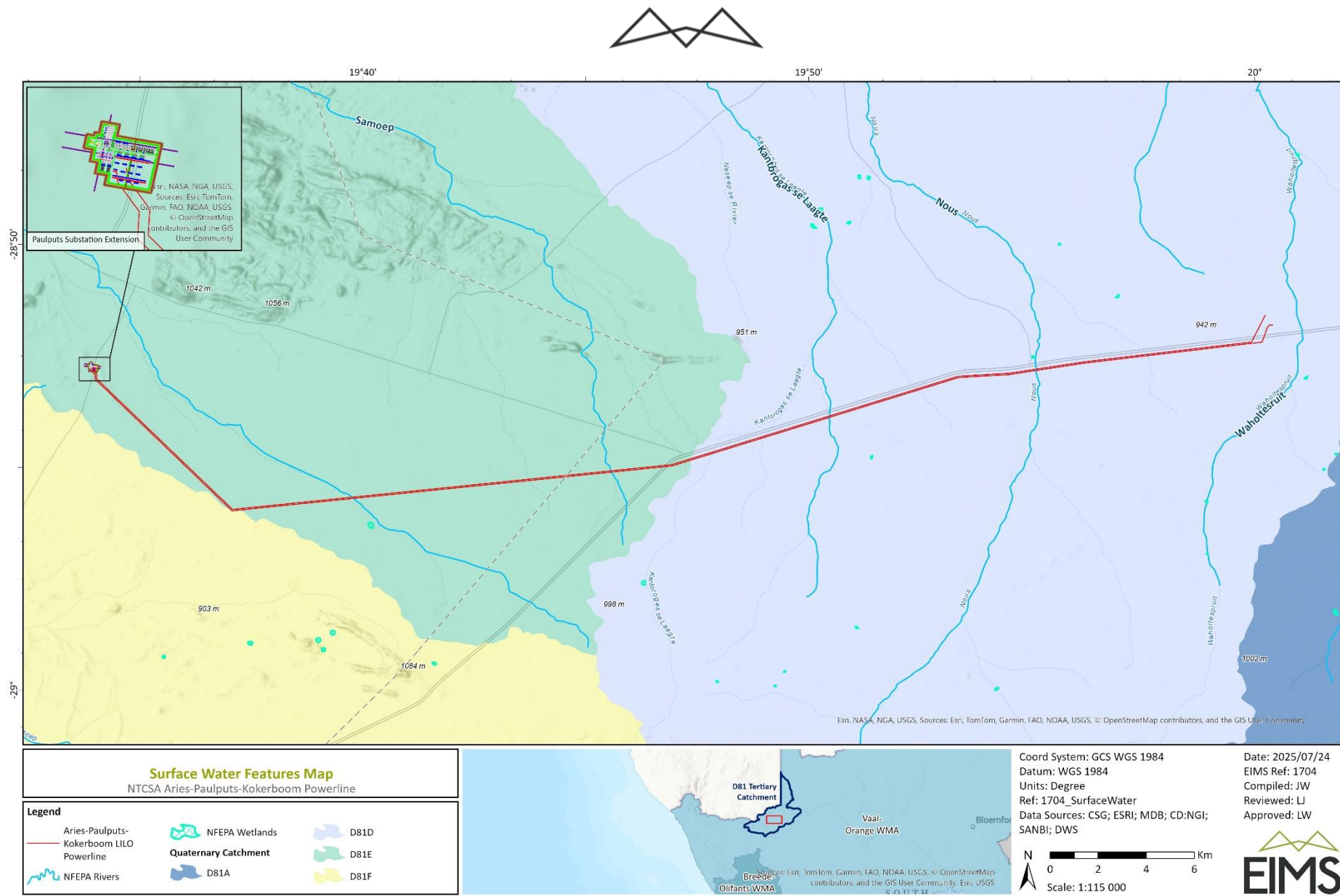


Figure 13: Surface water features map

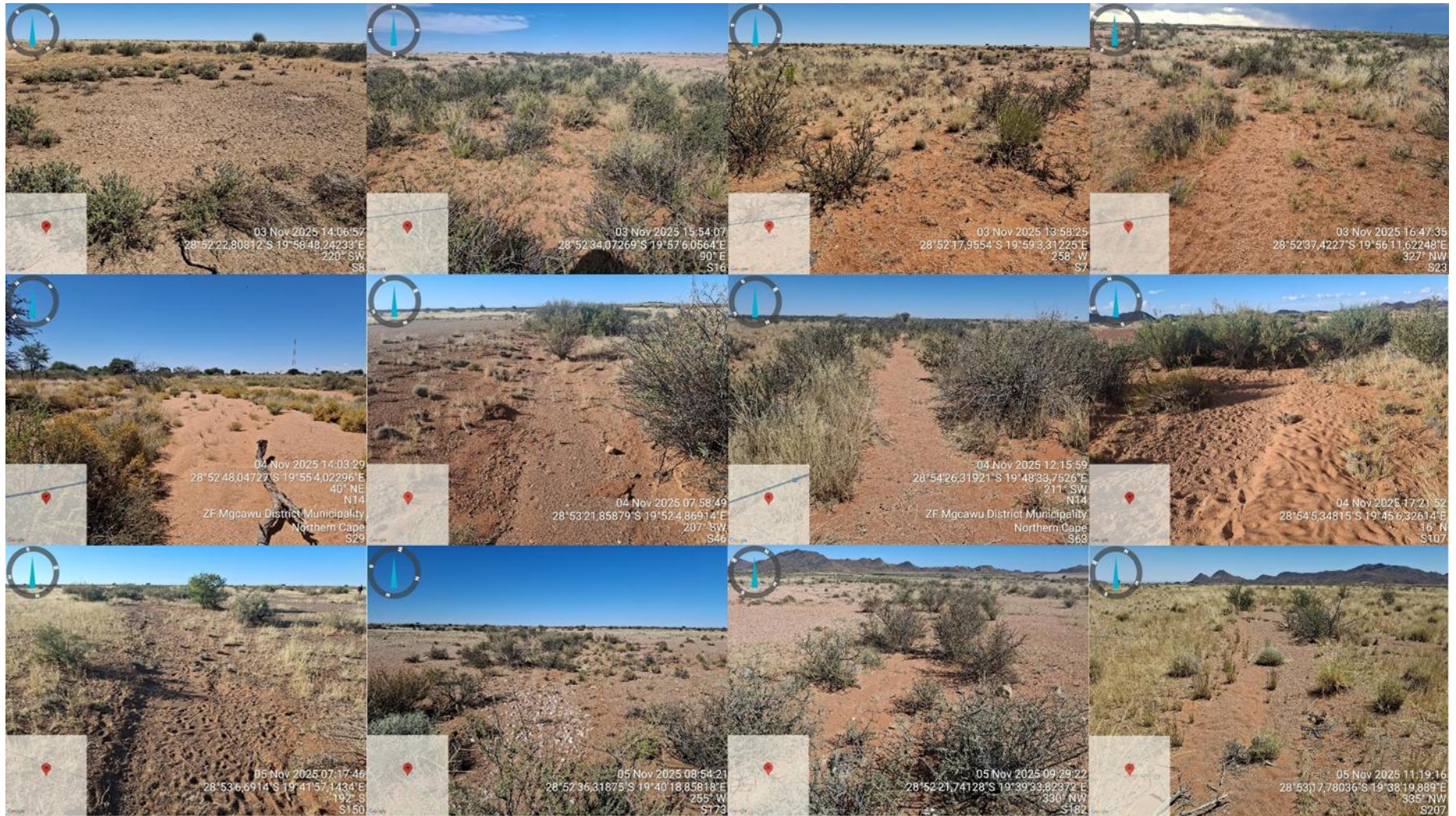


Figure 14: Examples of the different watercourses found during the walkdown

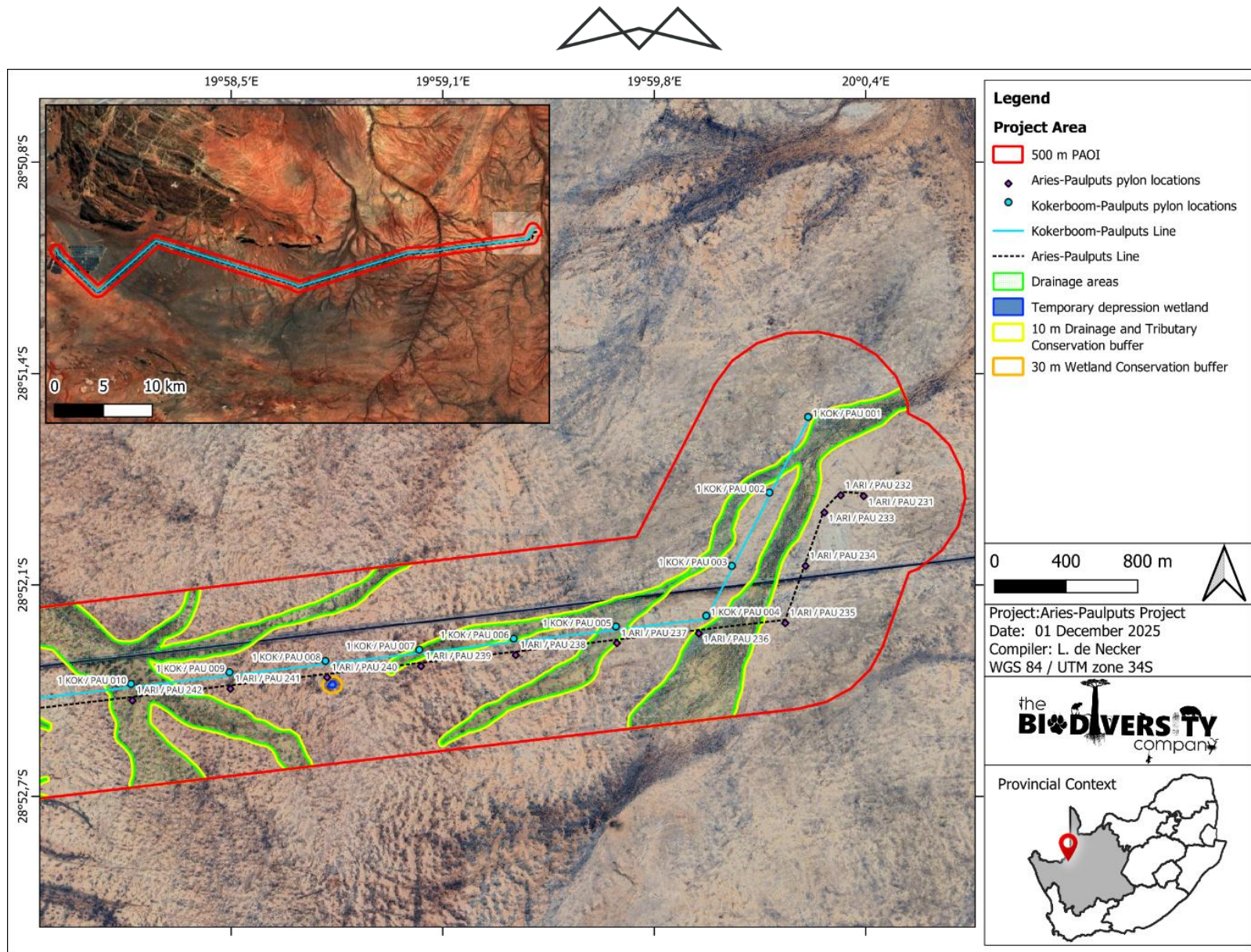


Figure 15: Delineations and buffer areas (Map 1)

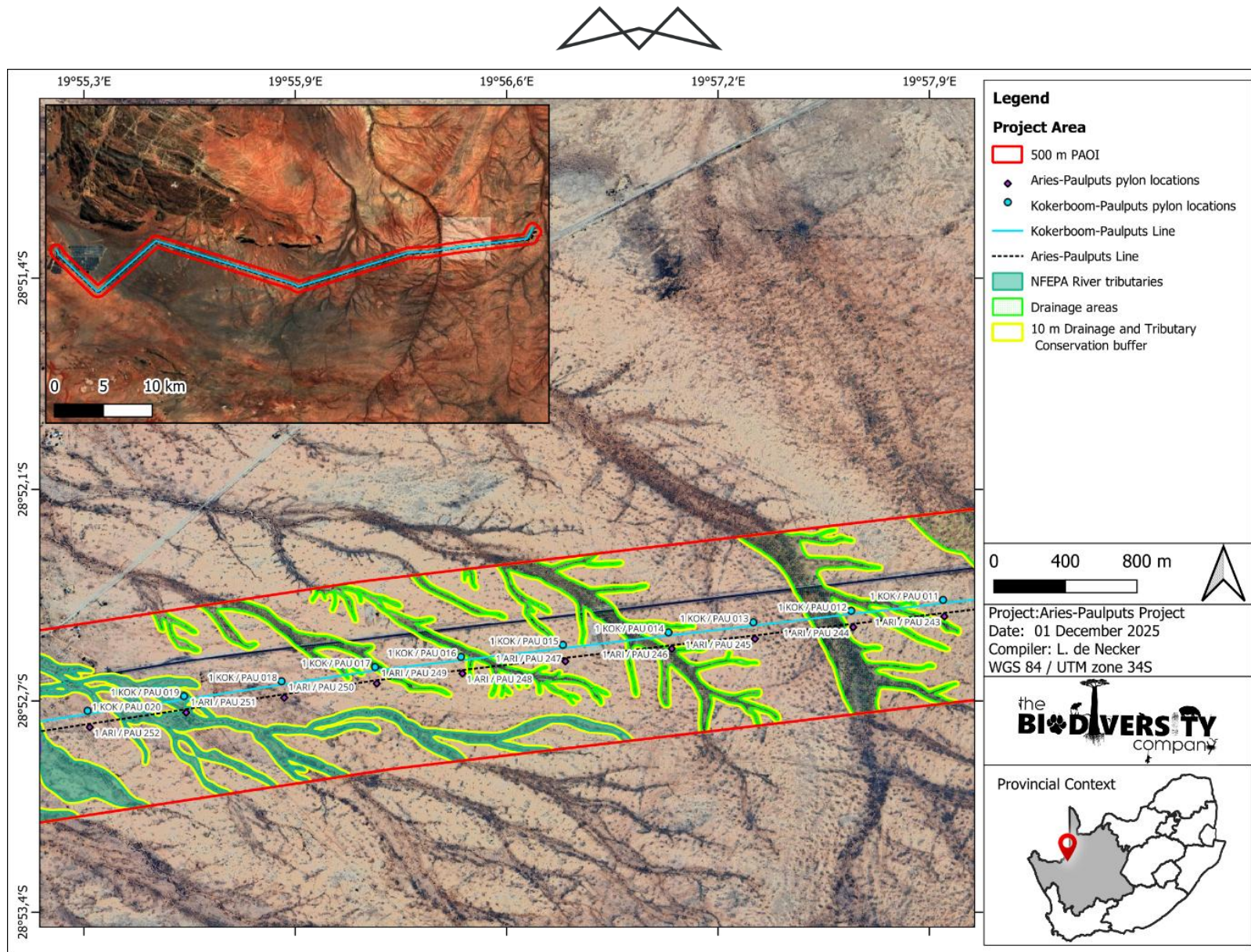


Figure 16: Delineations and buffer areas (Map 2)

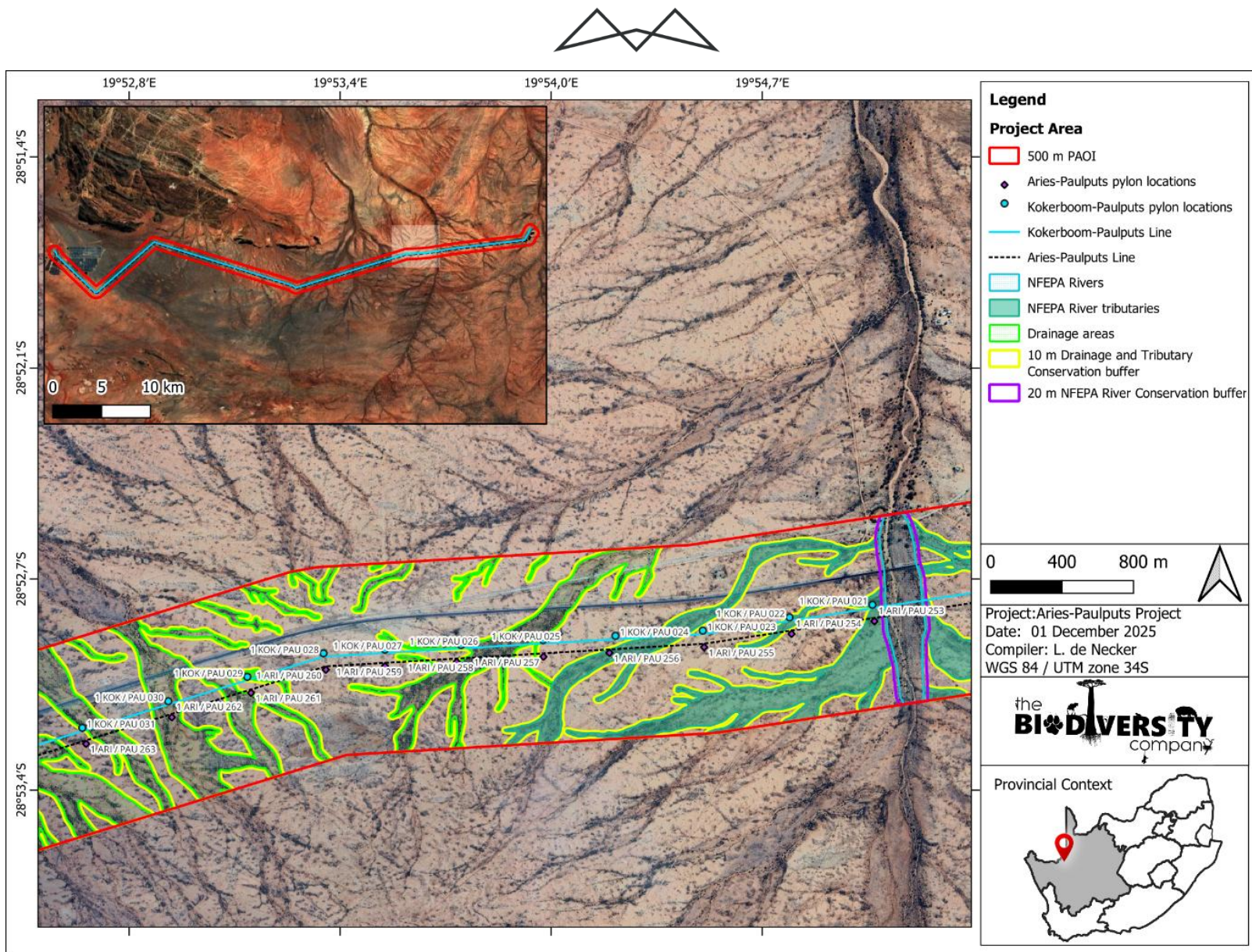


Figure 17: Delineations and buffer areas (Map 3)

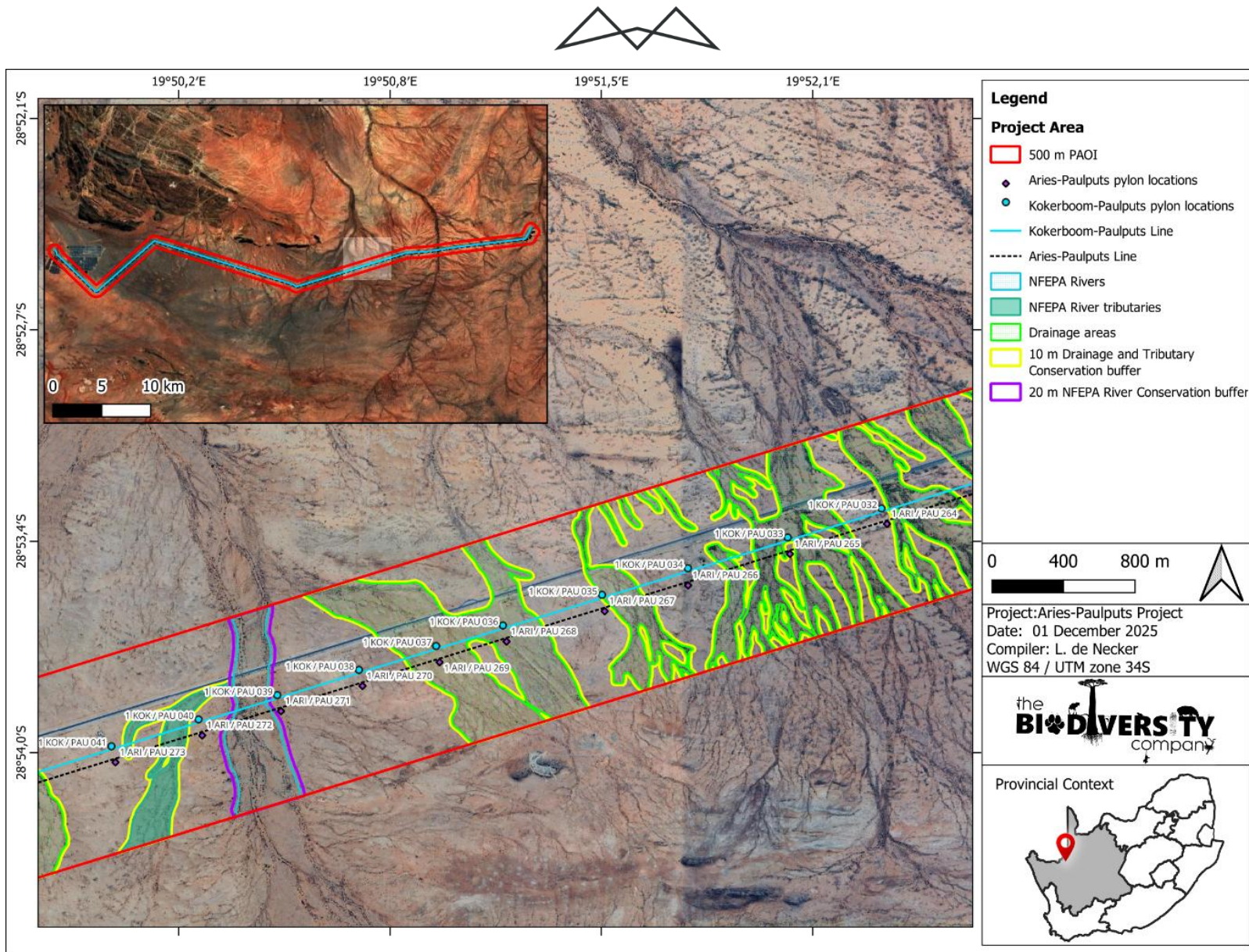


Figure 18: Delineations and buffer areas (Map 4)

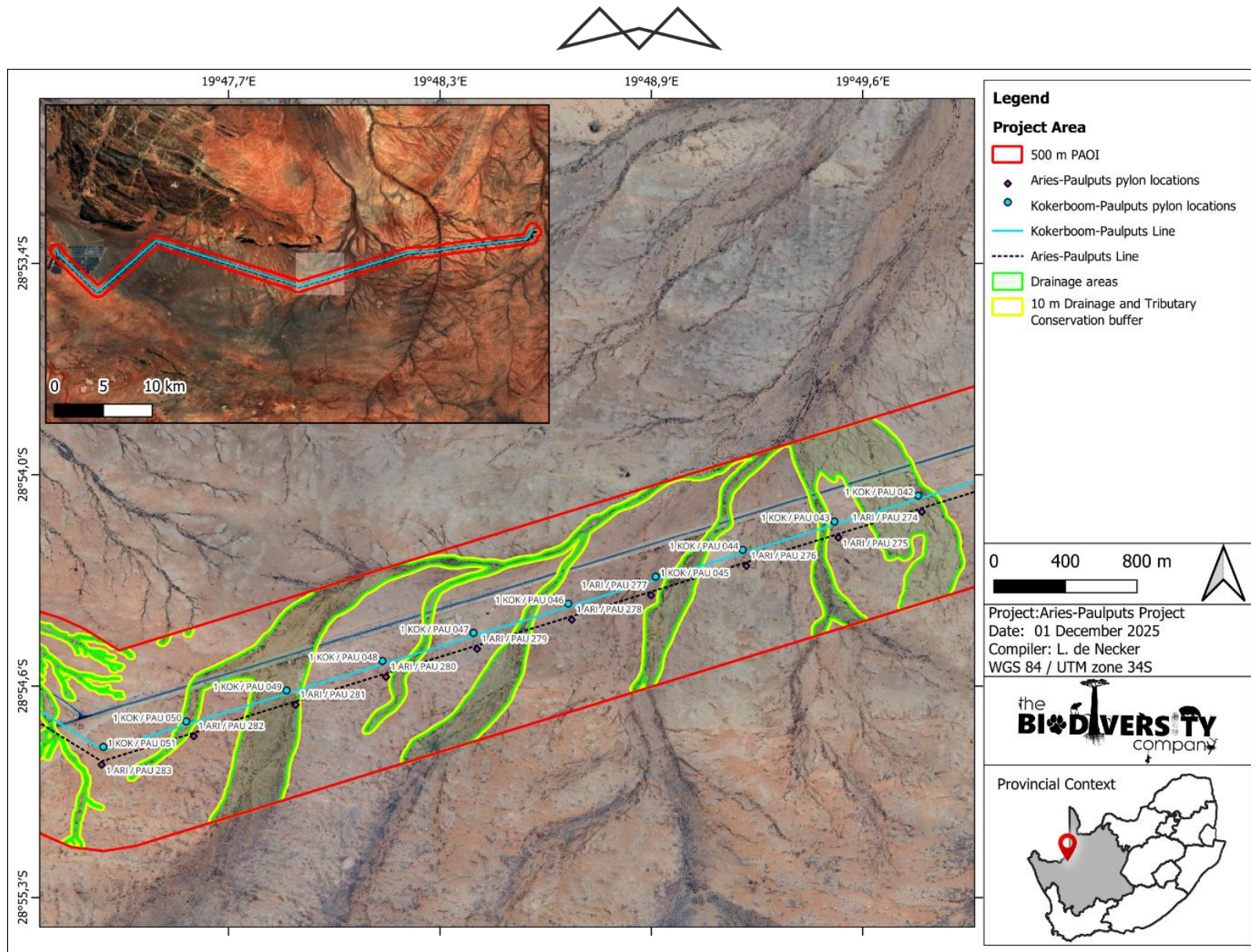


Figure 19: Delineations and buffer areas (Map 5)

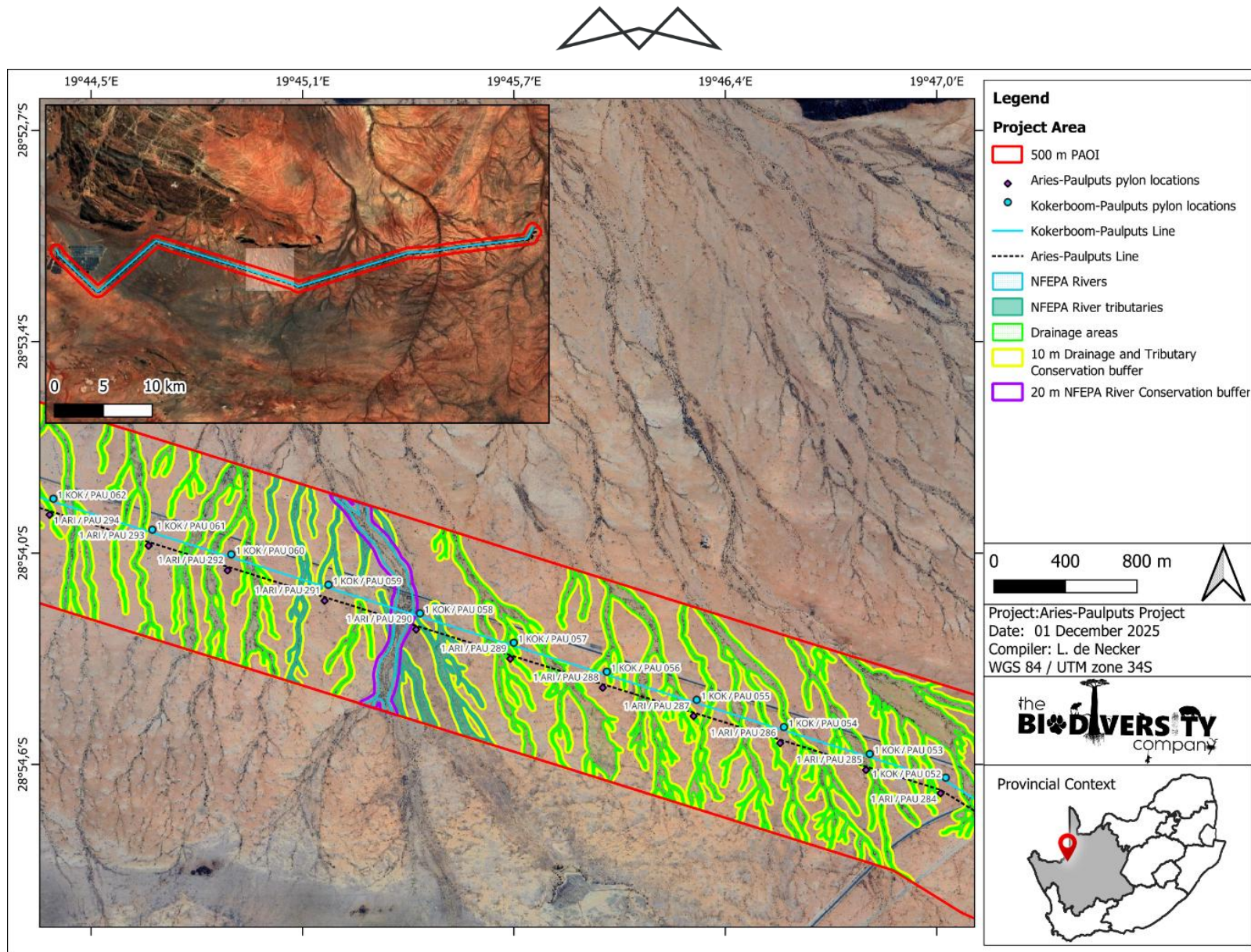


Figure 20: Delineations and buffer areas (Map 6)

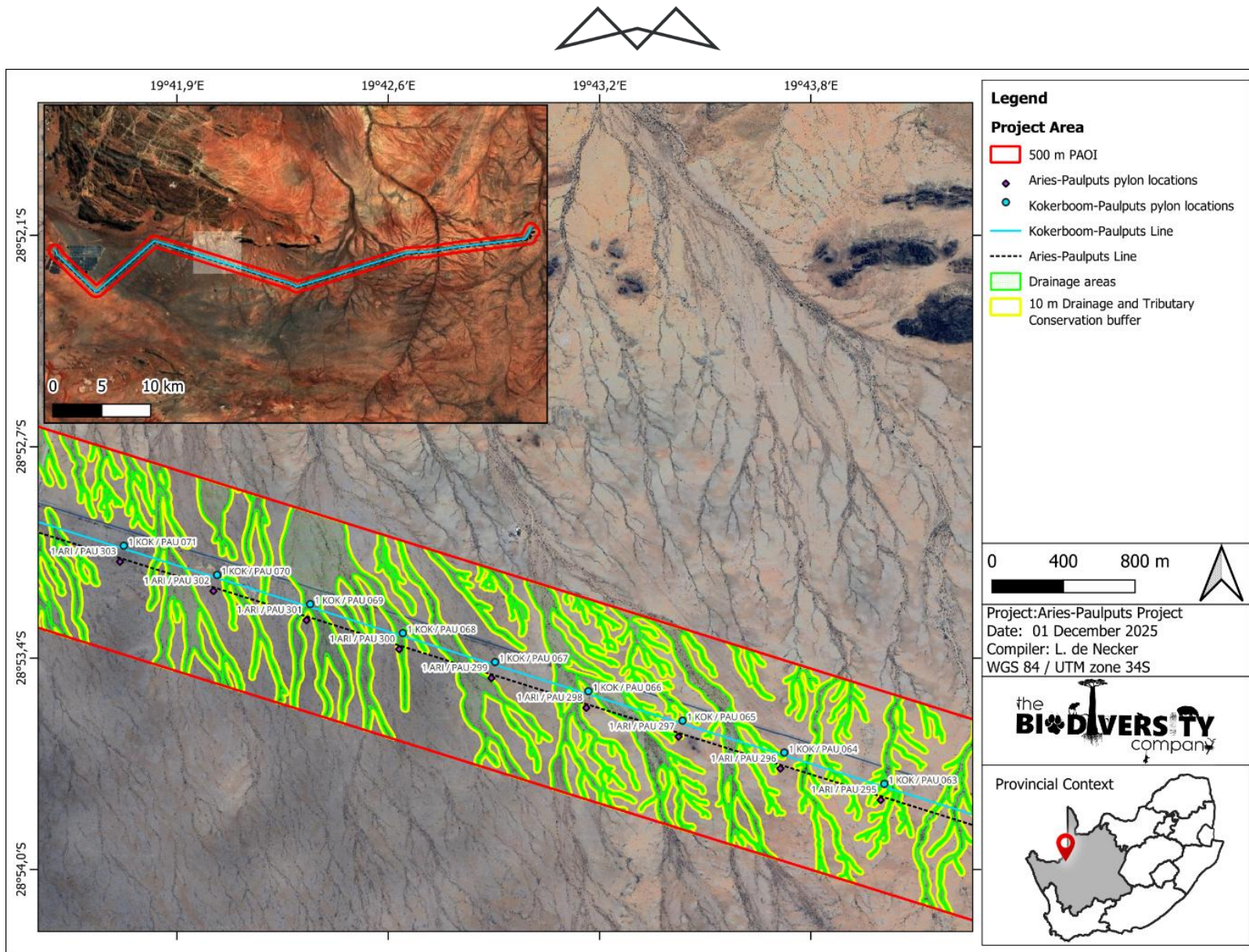


Figure 21: Delineations and buffer areas (Map 7)

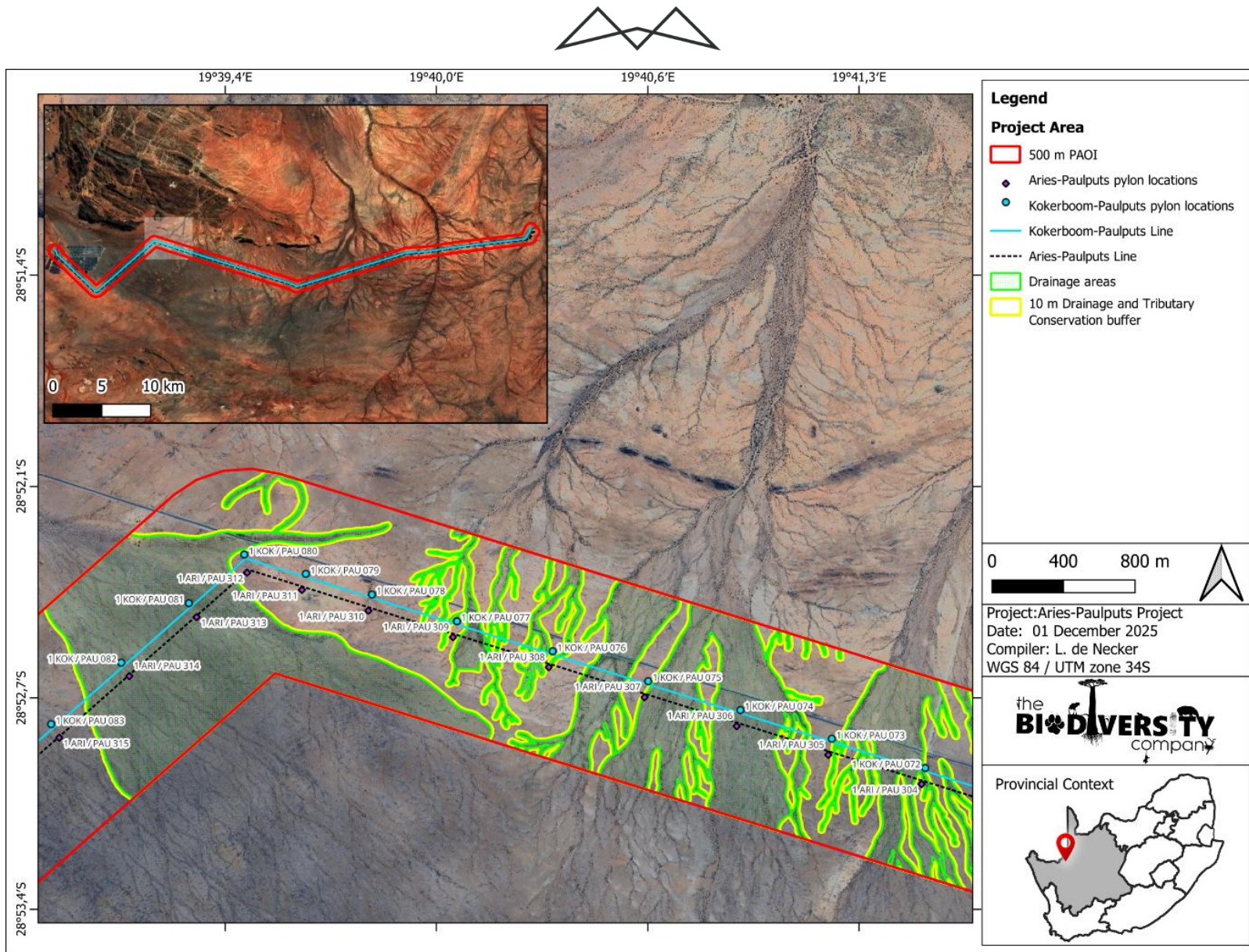


Figure 22: Delineations and buffer areas (Map 8)

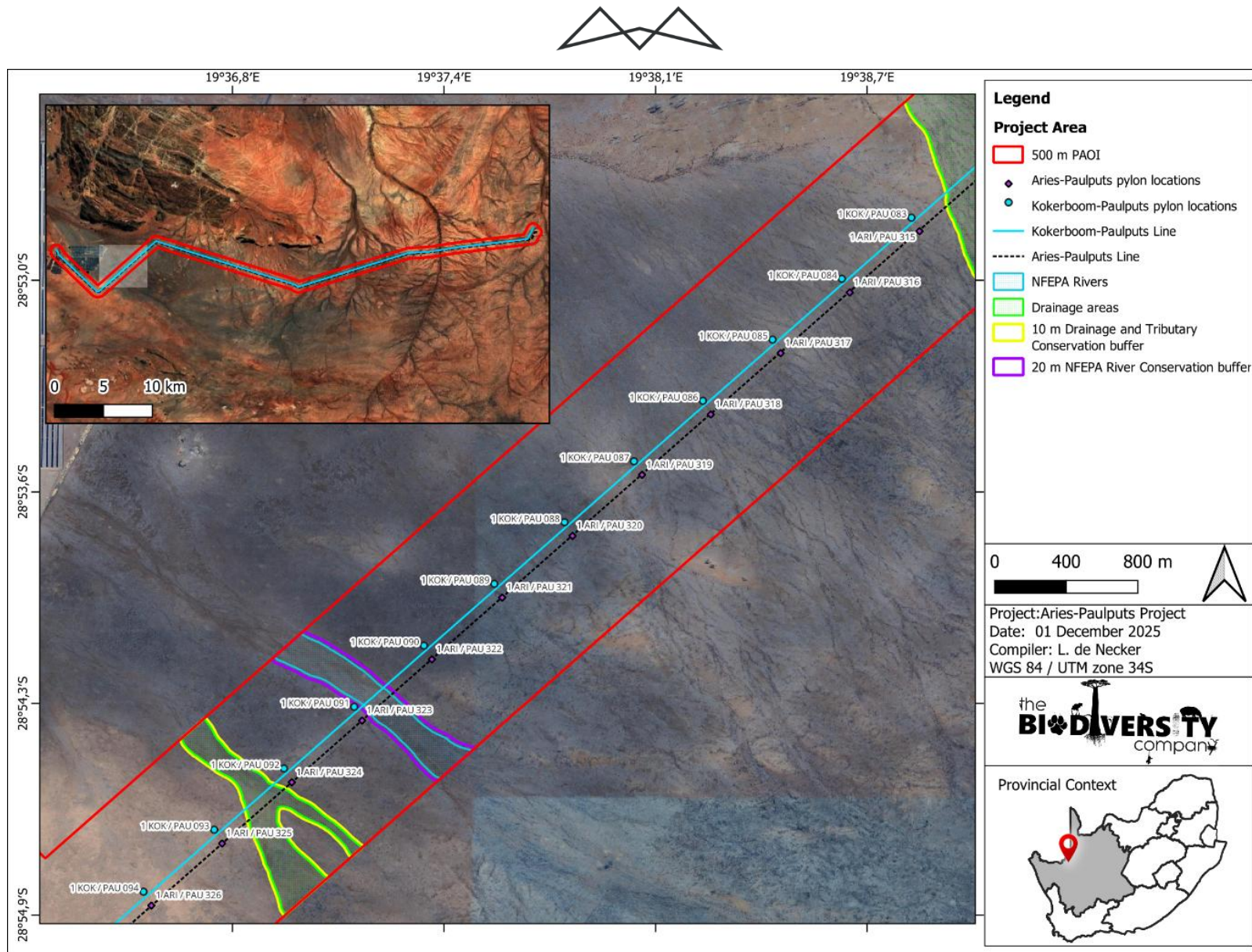


Figure 23: Delineations and buffer areas (Map 9)

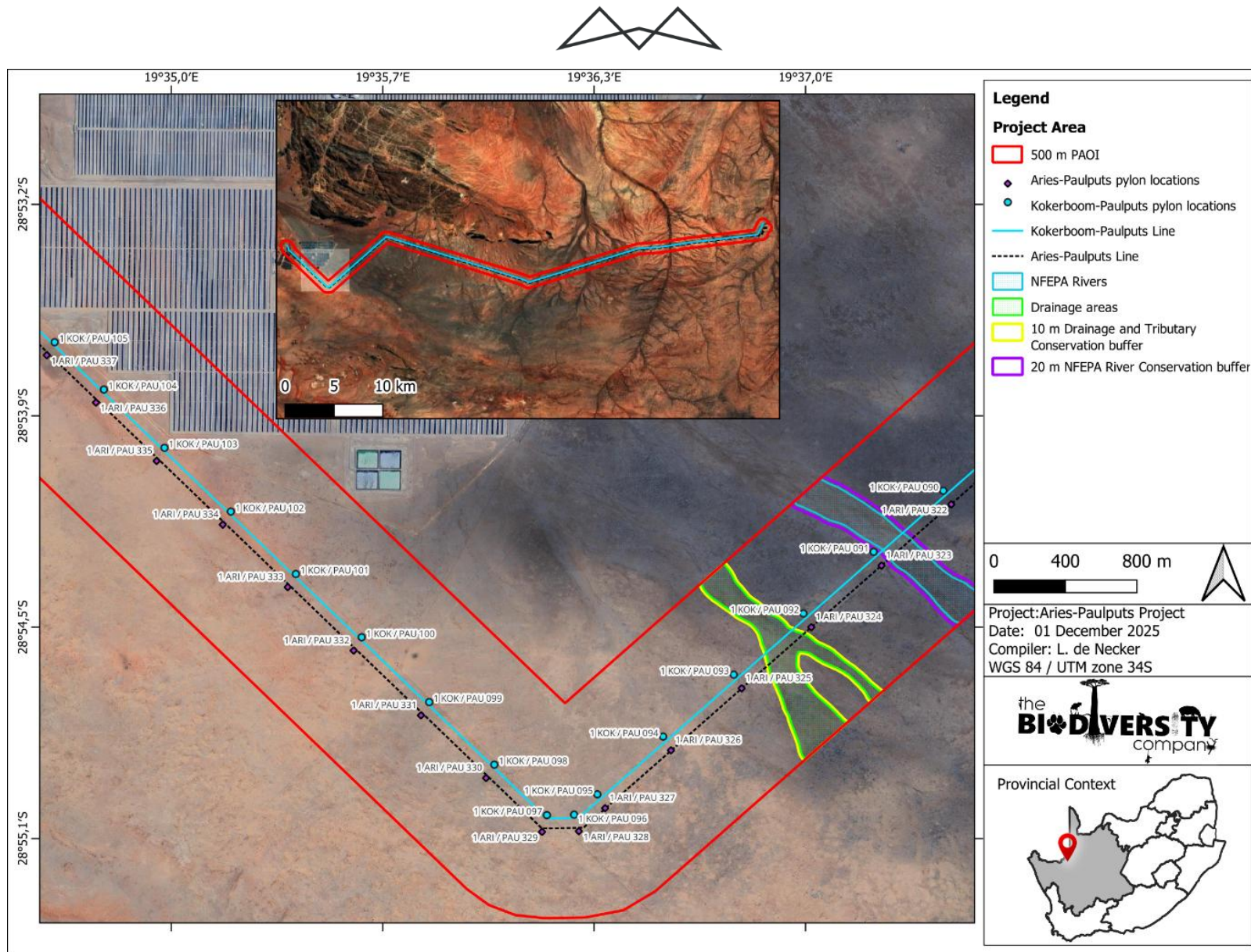


Figure 24: Delineations and buffer areas (Map 10)

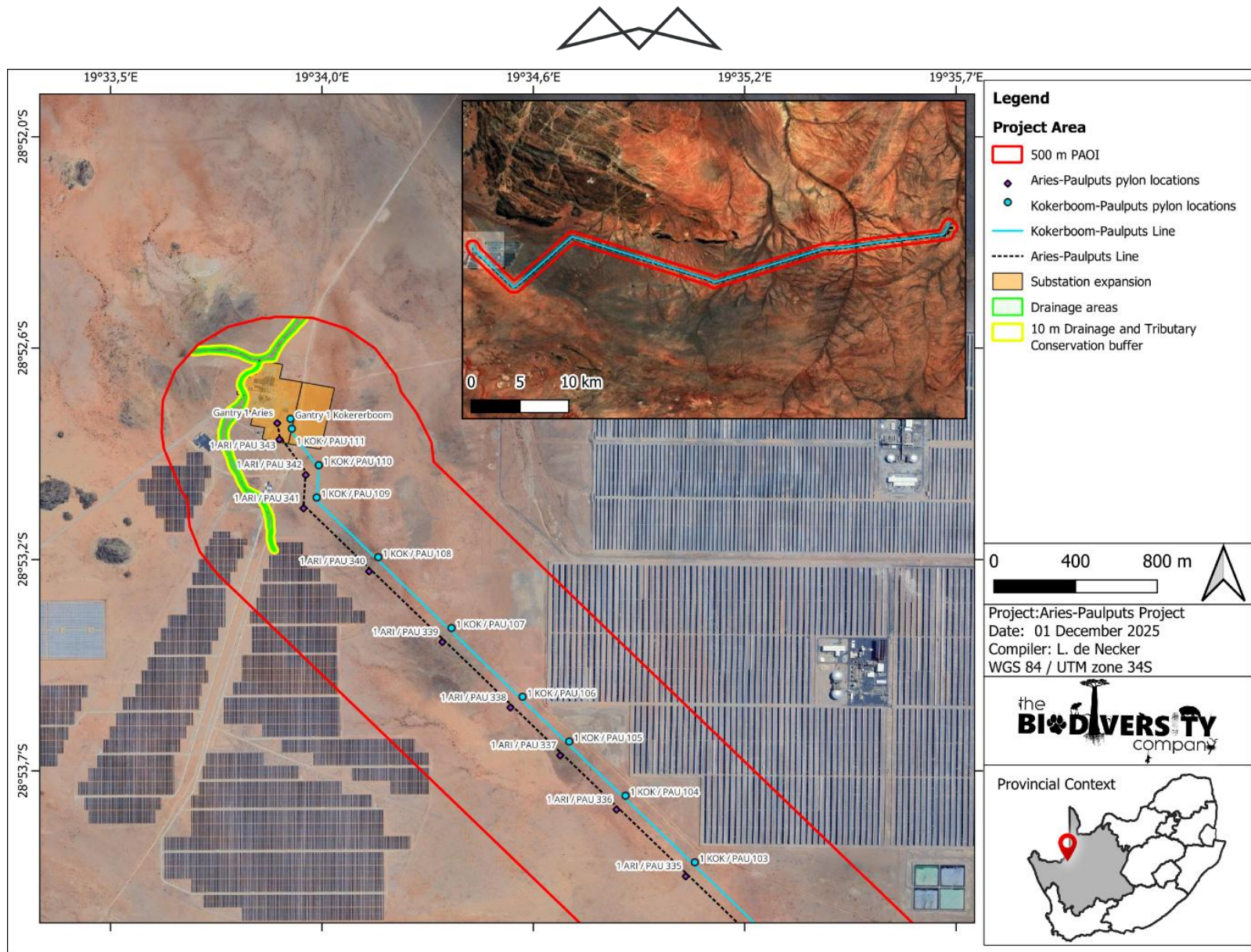


Figure 25: Delineations and buffer areas (Map 11)

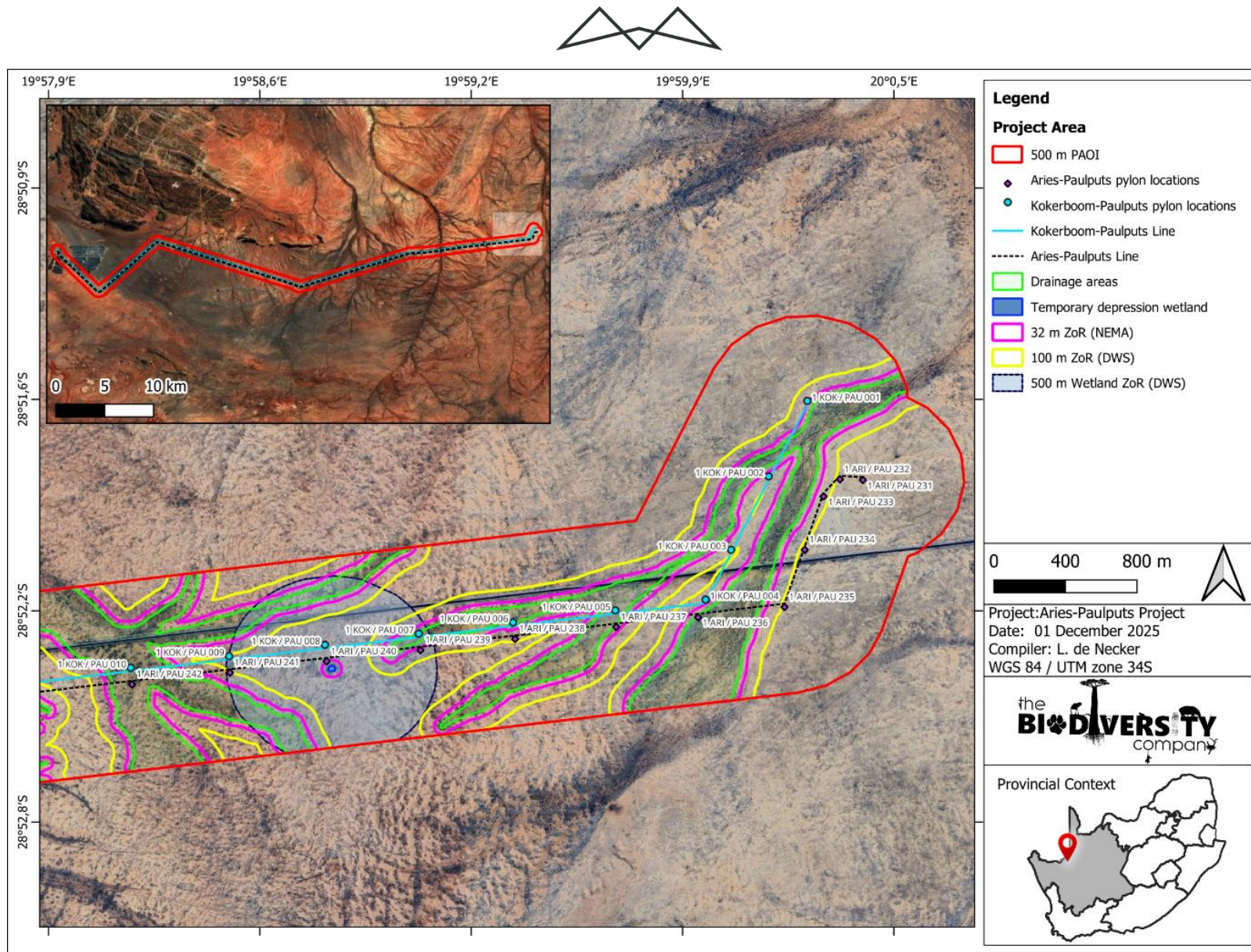


Figure 26: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 1)

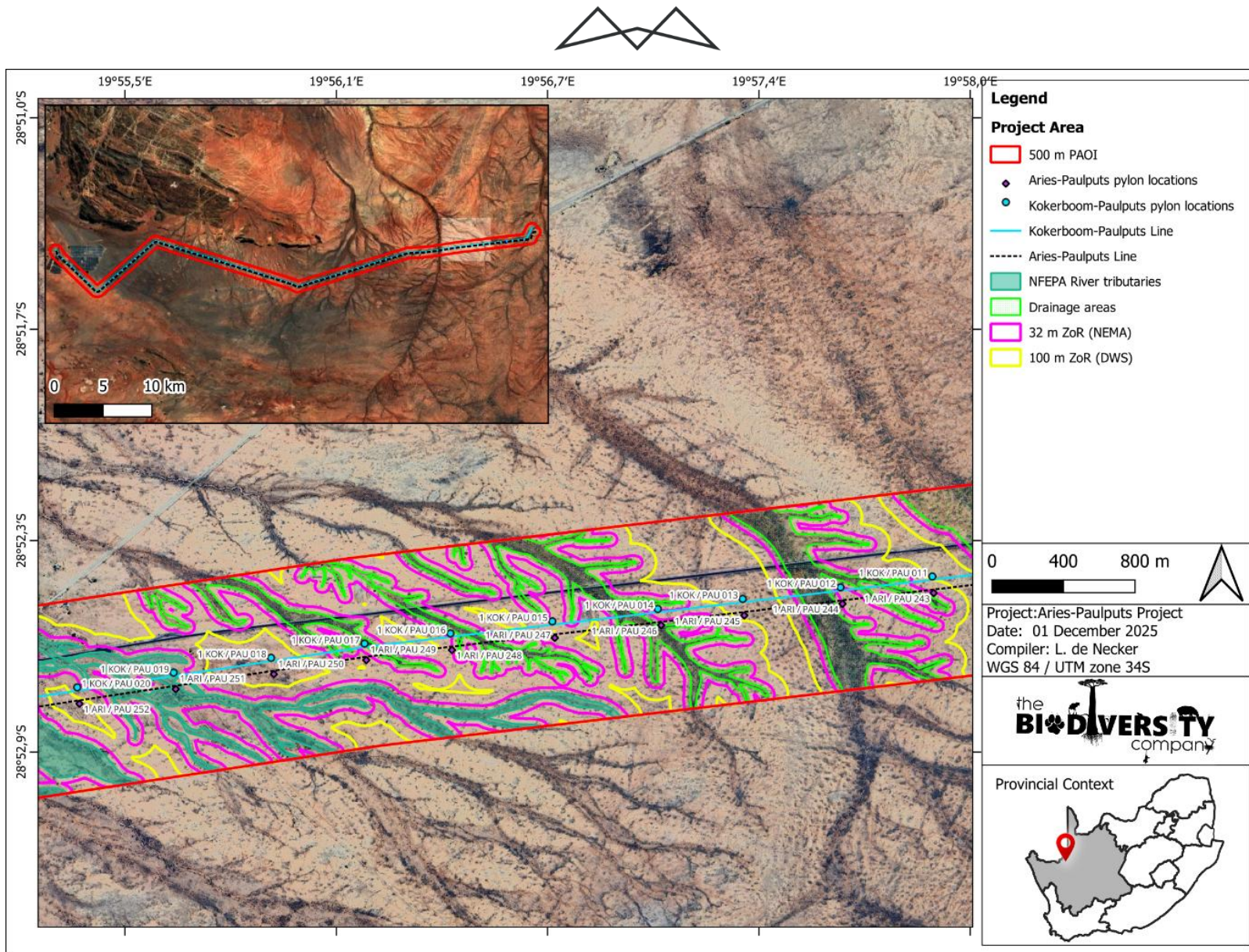


Figure 27: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 2)

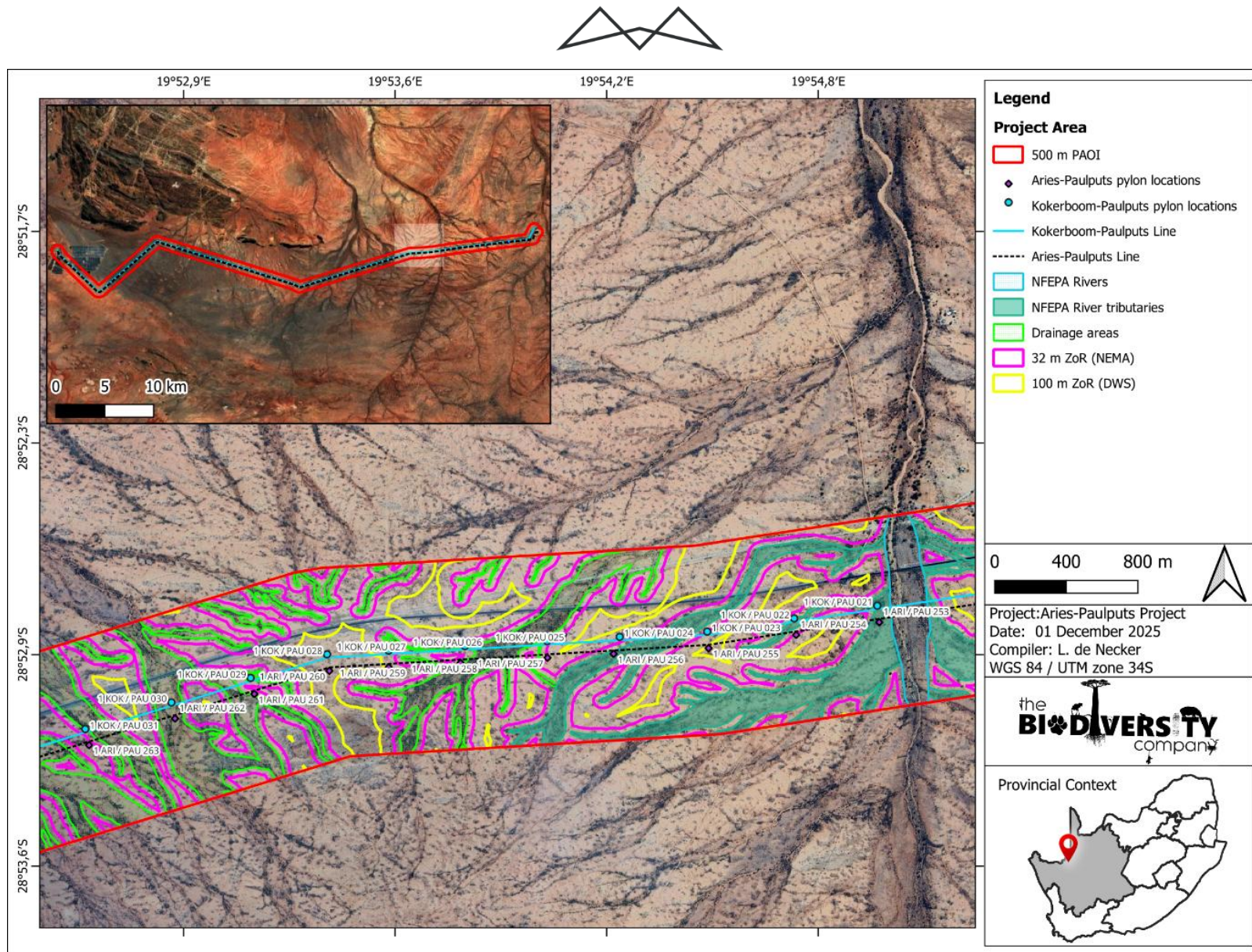


Figure 28: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 3)

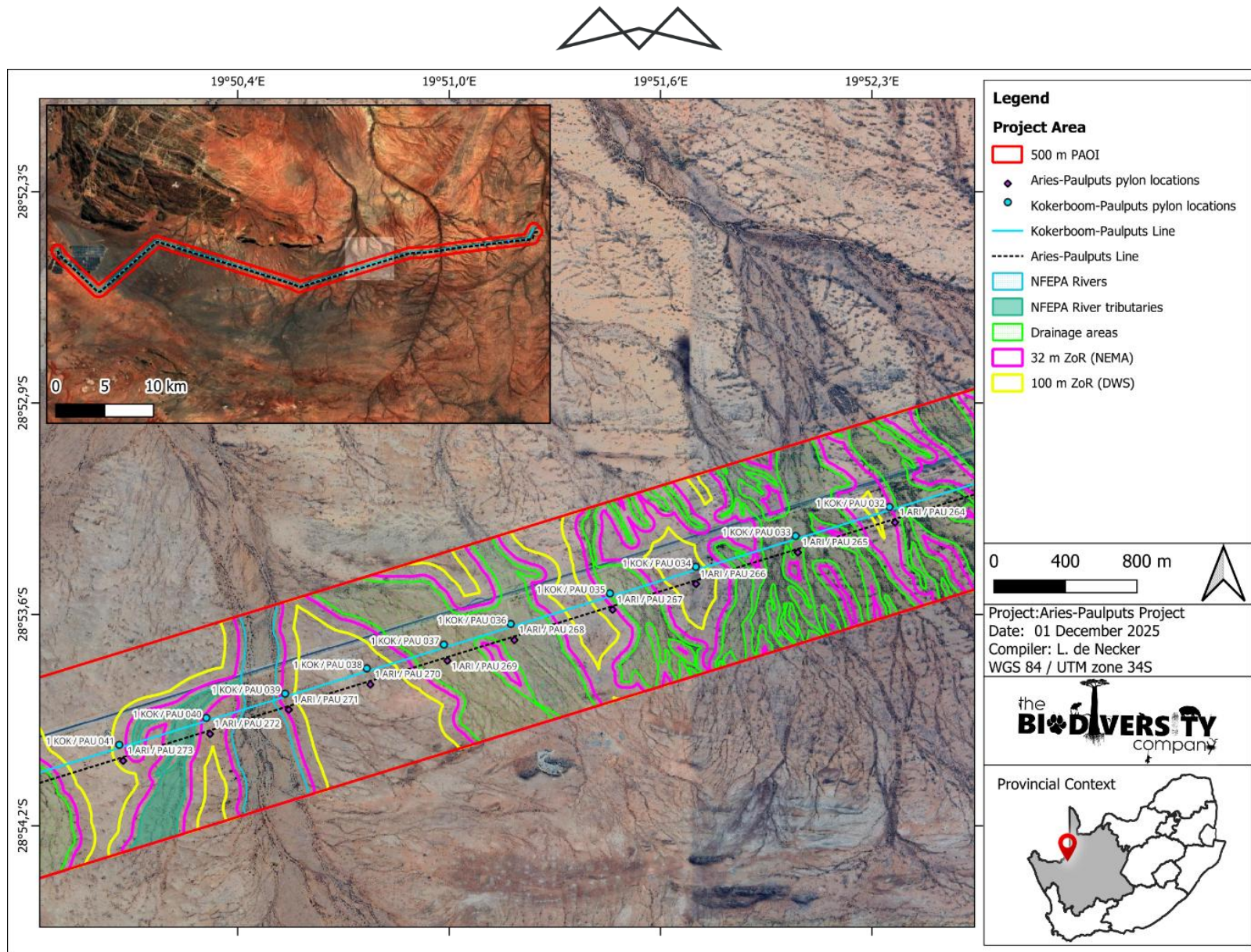


Figure 29: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 4)

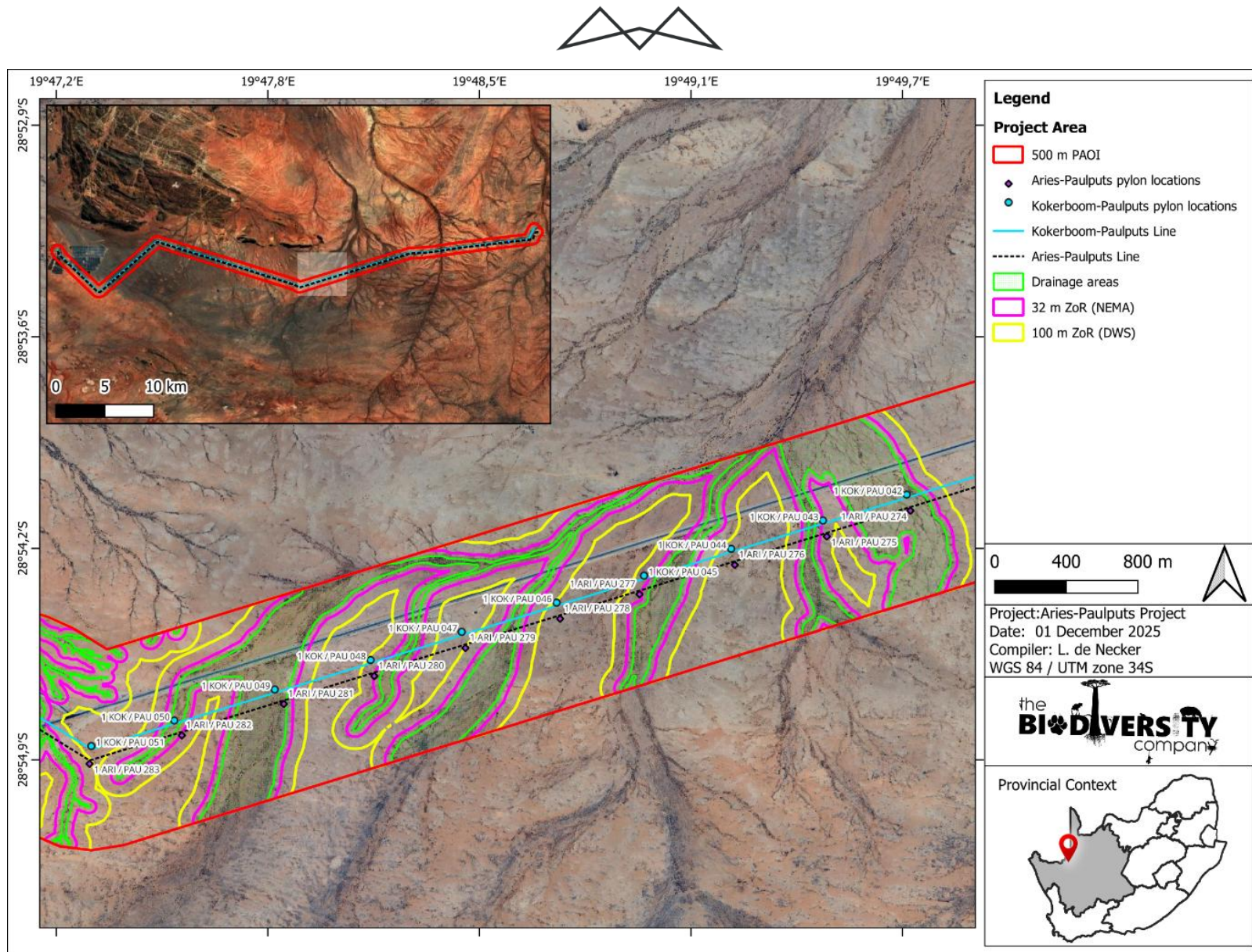


Figure 30: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 5)

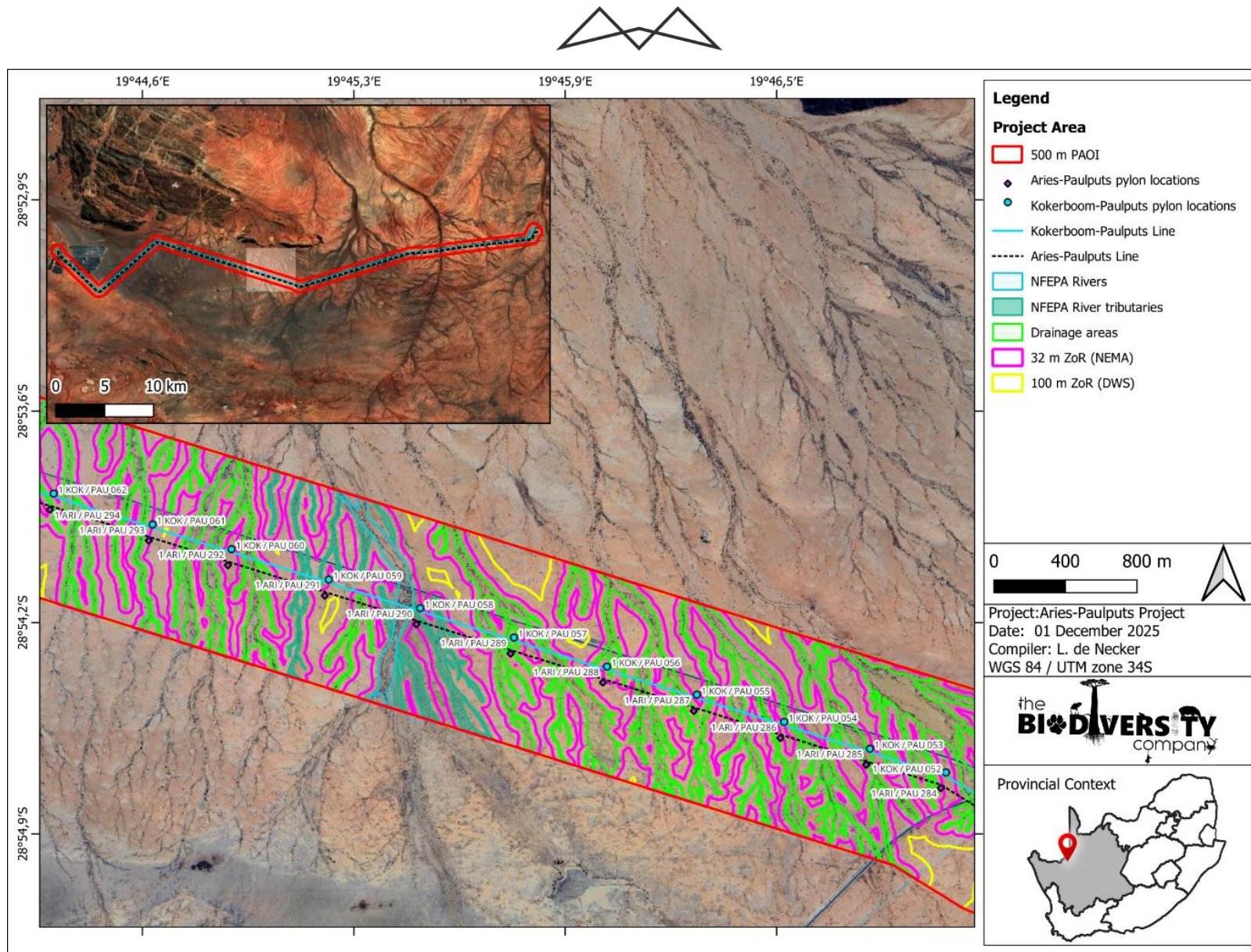


Figure 31: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 6)

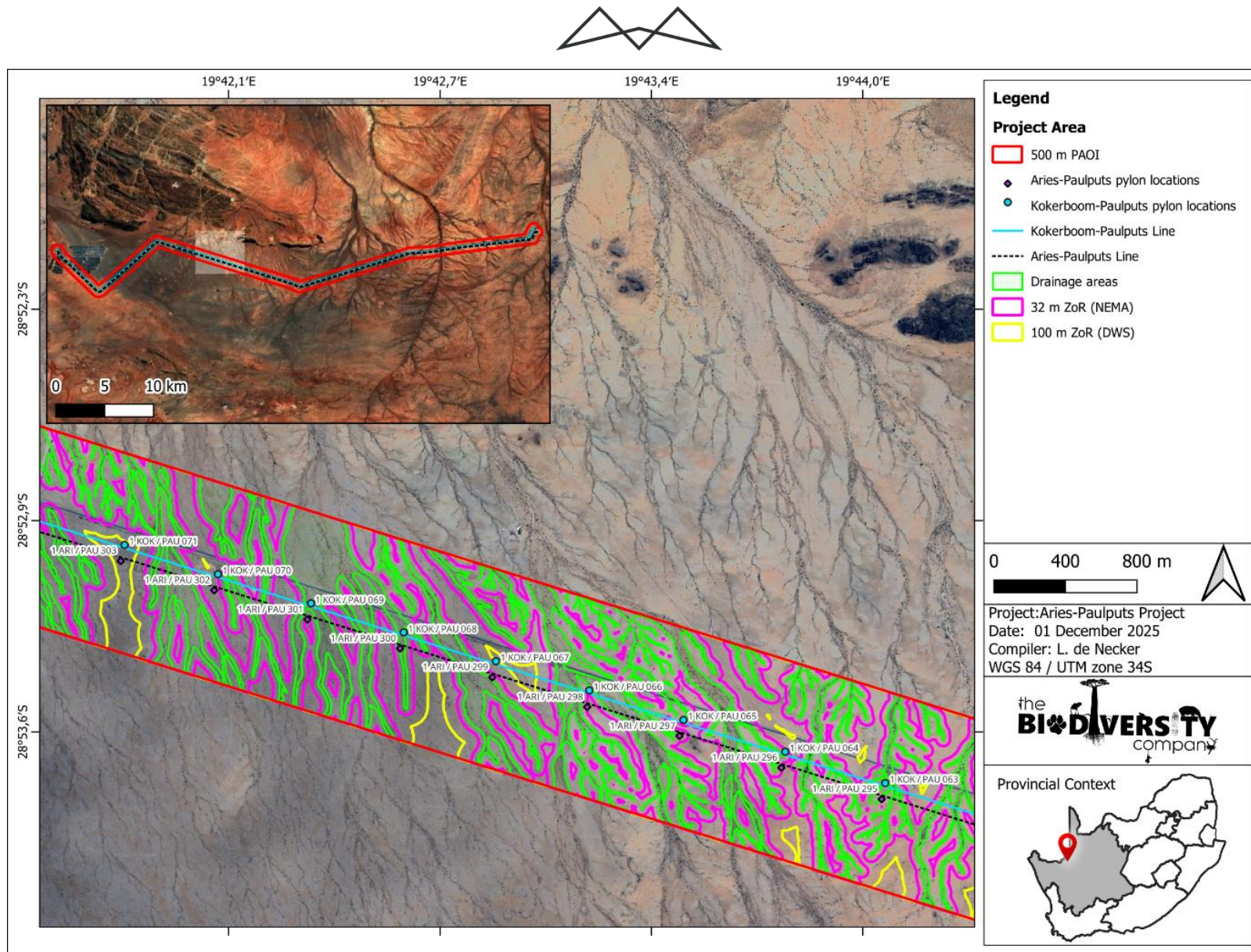


Figure 32: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 7)

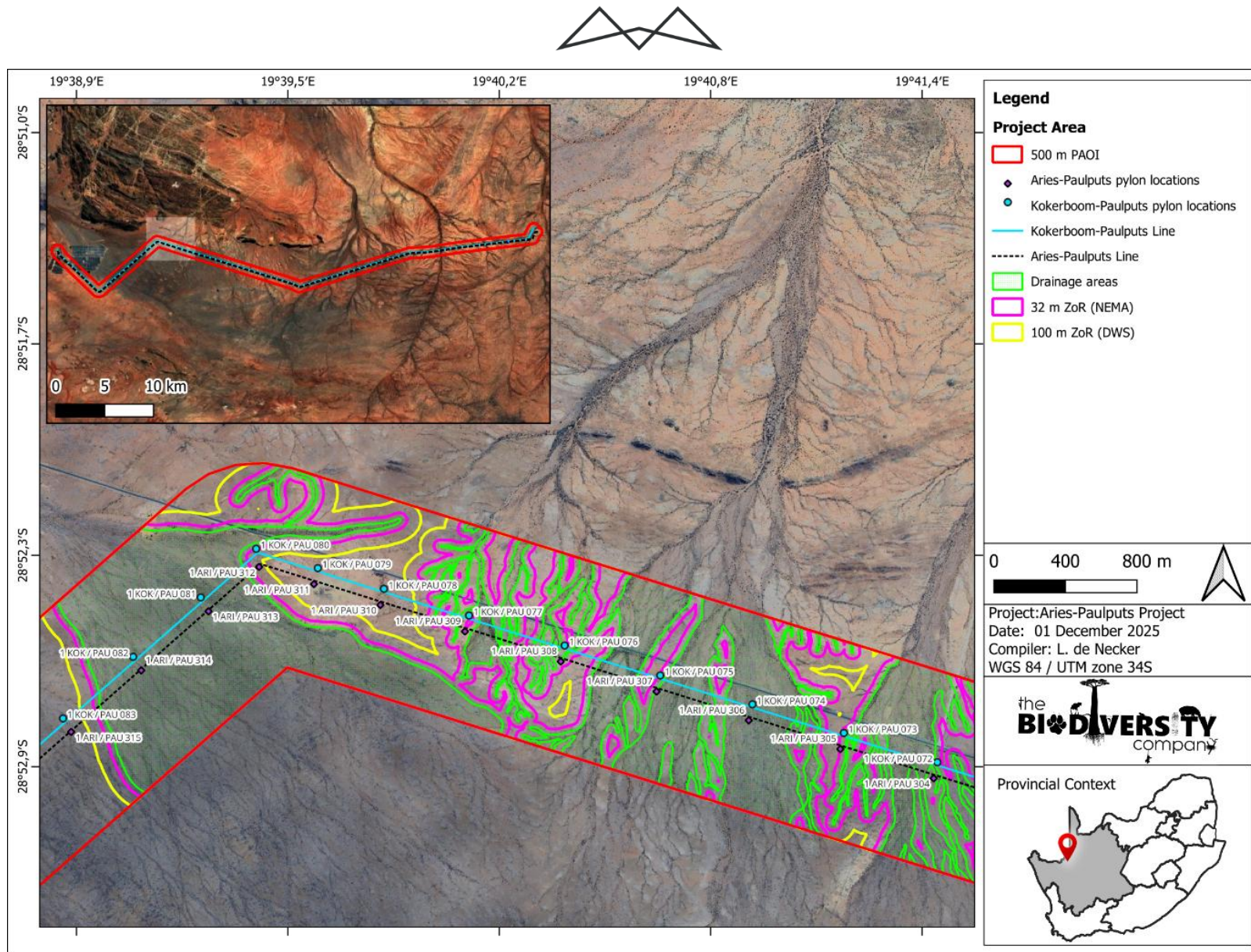


Figure 33: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 8)

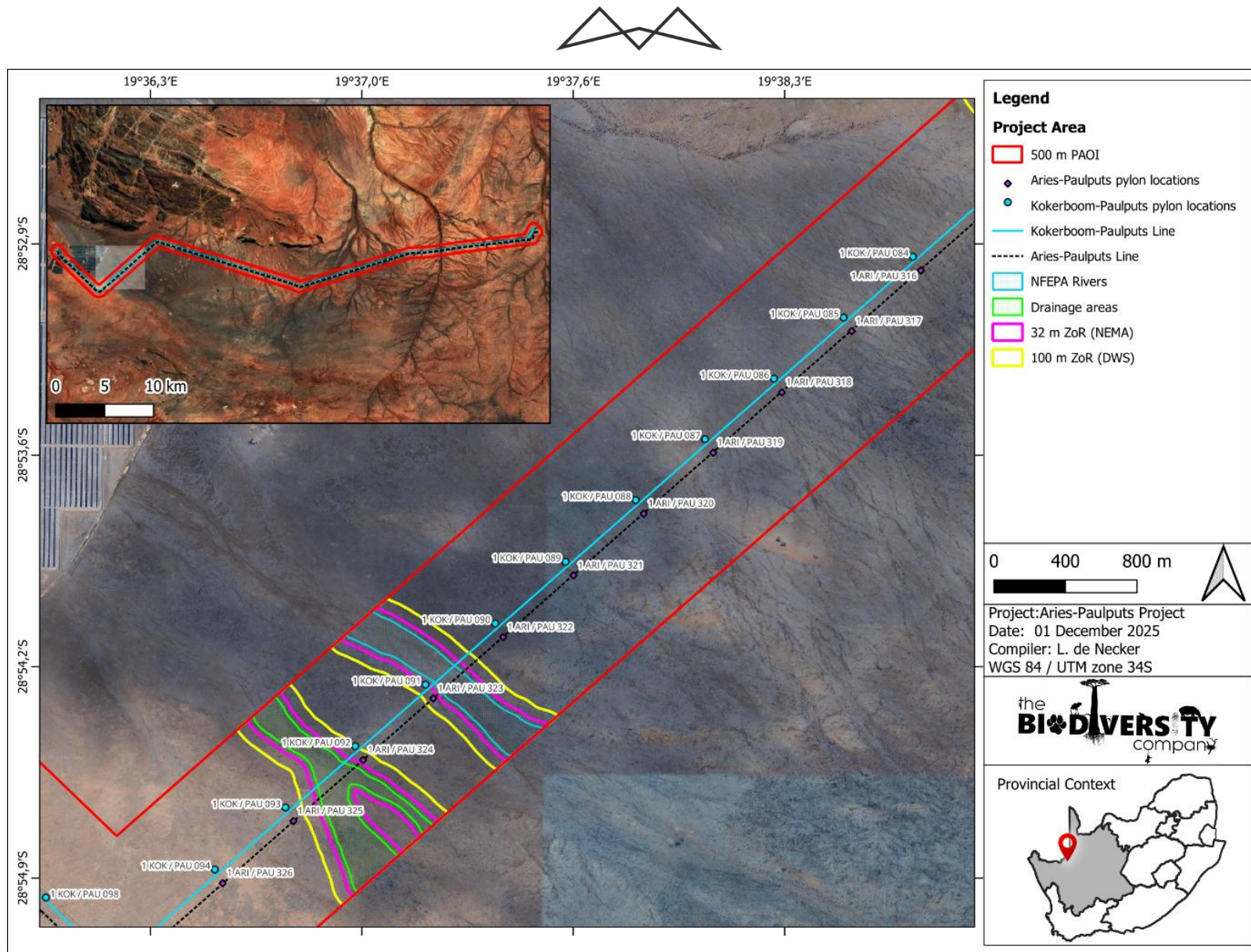


Figure 34: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 9)

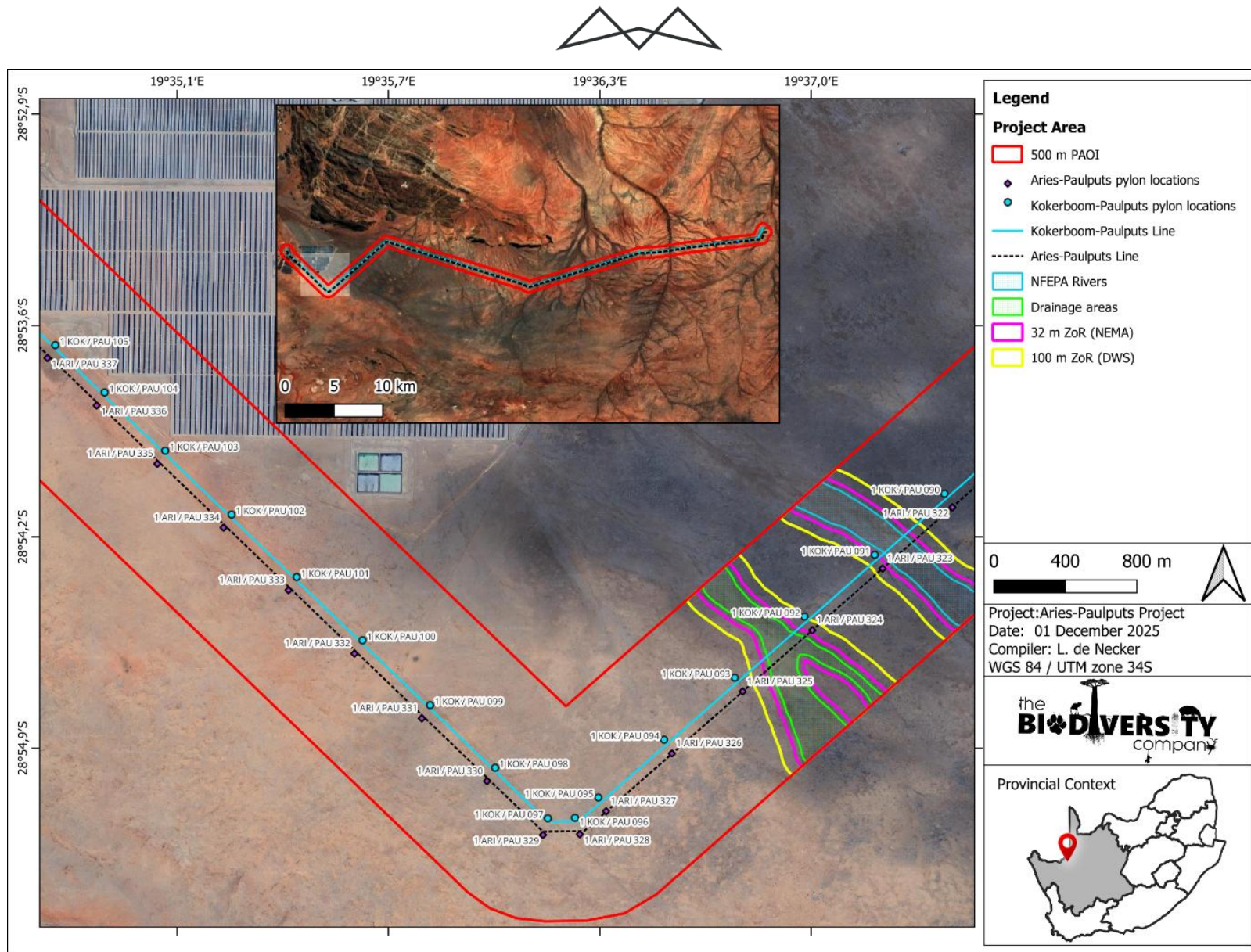


Figure 35: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 10)

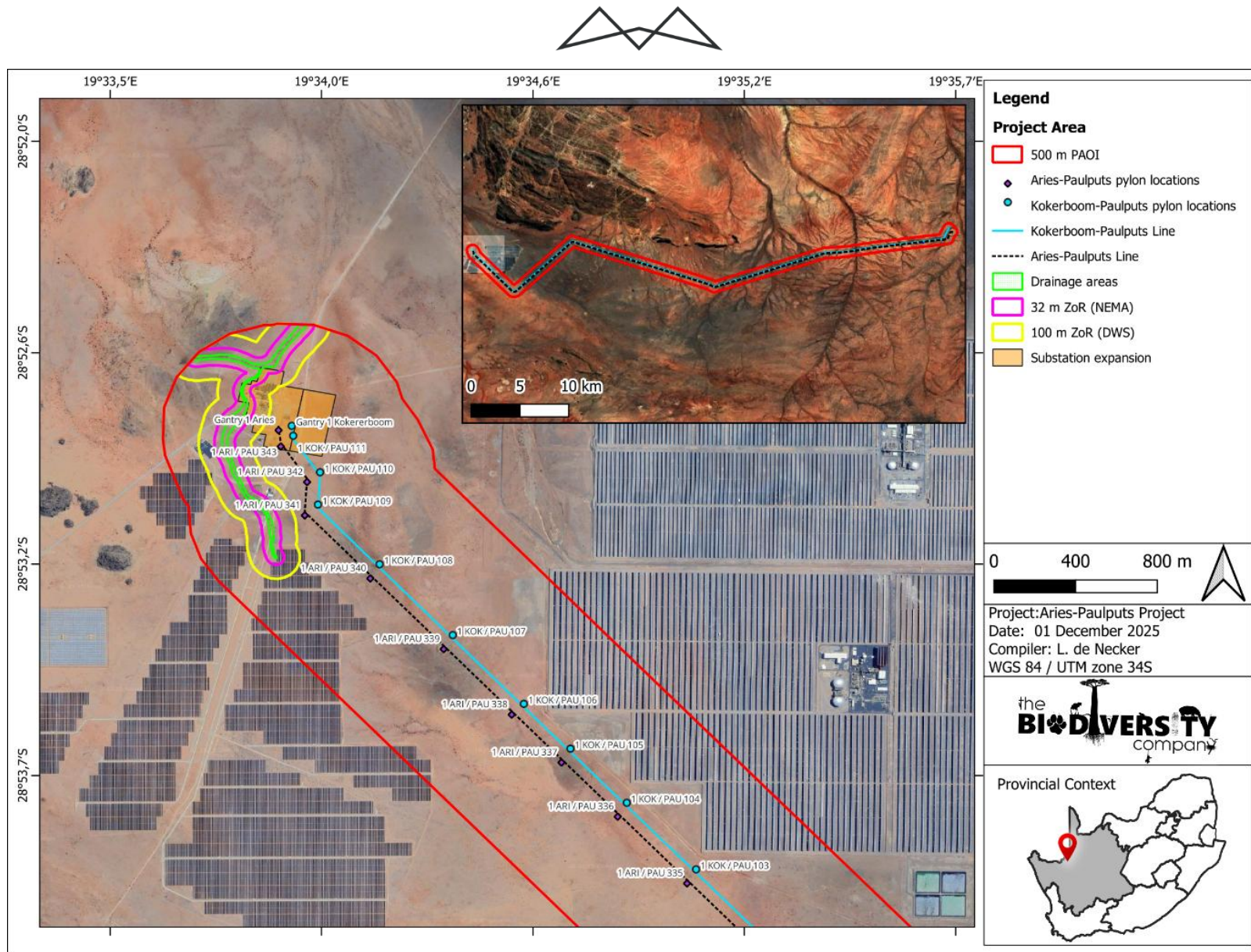
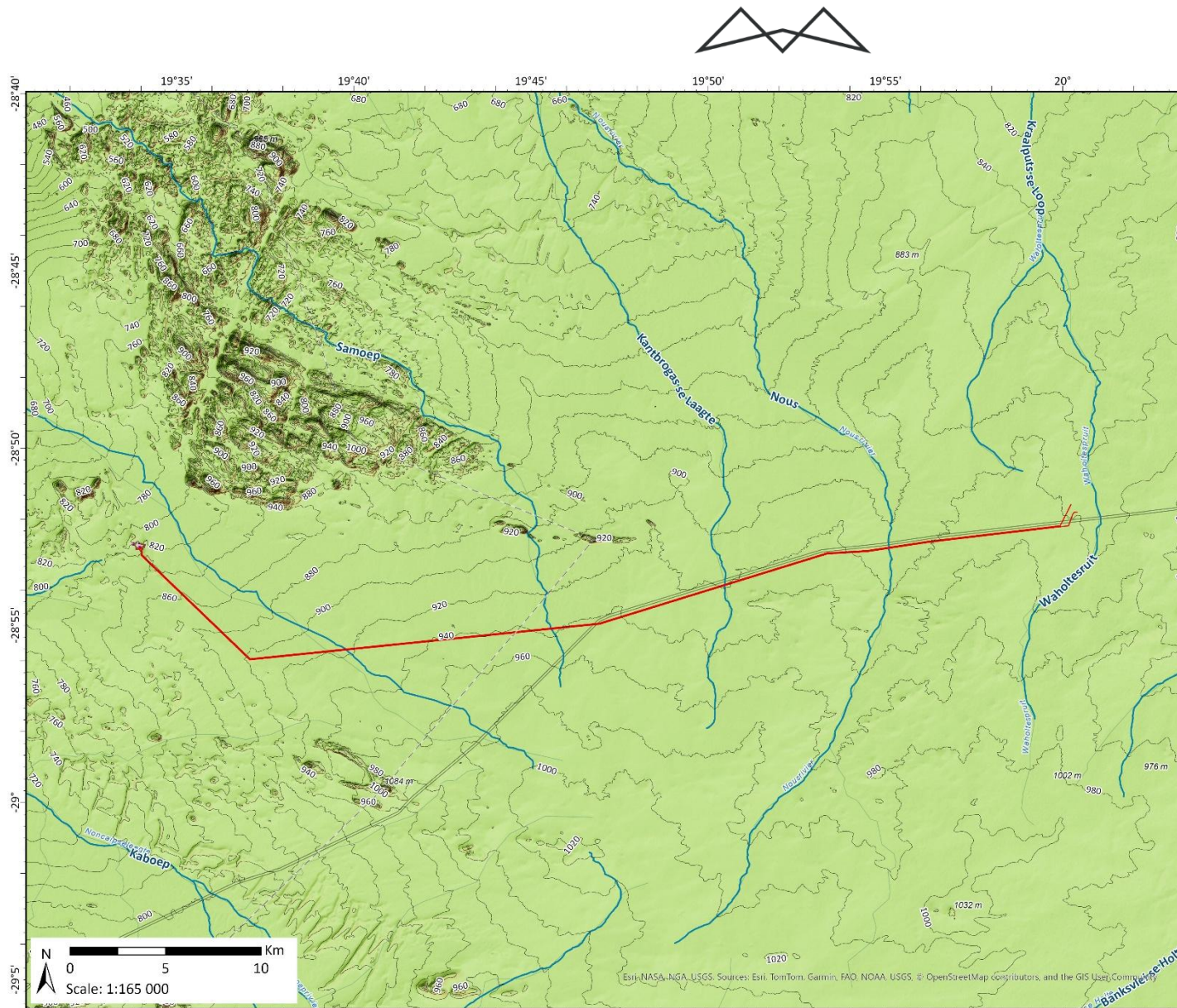


Figure 36: Riparian areas and Zones of Regulation (ZoR) within the project area (Map 11)



**Topography Map**  
NTCSA Aries-Paulputs-Kokerboom Powerline

- Legend**
- Aries-Paulputs-Kokerboom LIL0 Powerline
  - ~ NFEPA Rivers
  - ~ Contours (20m)



Coord System: GCS WGS 1984  
 Datum: WGS 1984  
 Units: Degree  
 Ref: 1704\_Topography  
 Data Sources:  
 CSG; ESRI; MDB; CD:NGI; SANBI

Date: 2026/01/05  
 EIMS Ref: 1704  
 Compiled: JW  
 Reviewed: LJ  
 Approved: LW



Figure 37: Topography Map of the site and surrounding areas



### 9.1.6 LANDSCAPE QUALITY AND VISUAL

The proposed Paulputs 400 kV Strengthening Project is located within a semi-arid landscape dominated by broad valley plains interspersed with inselbergs and ridgelines, draining westward toward the Orange River. The landscape is largely natural in character, with sparse shrubland and bare ground interspersed with occasional homesteads and low-intensity grazing areas. Vegetation is typically low and provides minimal screening, although isolated quiver trees (*Aloe dichotoma*) occur in the region and are considered a symbolic feature of the Northern Cape. No formally protected landscapes occur within the study area; however, the site falls within the Riemvasmaak Community Conservancy, which is significant for its cultural heritage and tourism potential.

#### 9.1.6.1 LANDSCAPE CHARACTER AREAS (LCA)

Landscape character is defined as “a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another”.

The proposed site is located within the floor of a broad valley system that generally falls from the east to the west towards the Orange River. Beside the Orange River there is a near continuous range of rocky hills. The landscape surrounding the site is arid, comprising relatively flat drainage plains with inselbergs or rocky outliers rising above the plains in the wider landscape.

Whilst the general area surrounding the proposed site appears relatively natural, with the exception of roads and scattered homesteads, there are a number of industrial elements that currently impact on the character of the site and its surroundings, these include;

- A quarry that is located approximately 13.5km to the north east of the site,
- An existing 220kV overhead power line that bisects the property
- The existing Paulputs Substation; and
- Two existing CSP Parabolic Trough projects that are located immediately east and south of the Paulputs Substation.

Landscape Character is a composite of a number of influencing factors including;

- Landform and drainage
- Nature and density of development
- Vegetation patterns

Landscape Character Areas (LCAs) are defined as “single unique areas which are the discrete geographical areas of a particular landscape type”

The affected landscape can be broadly divided into the following LCAs that are largely defined by the extent and nature of development:

#### **A) Upper Plain with isolated Inselberg LCA**

This LCA is primarily important as a productive agricultural area. It is the LCA within which the proposed project is located.

The low intensity grazing regimes that appear to be adopted has also resulted in a relatively natural outlook that is typical of the area. The low density of development combines with relatively pristine vegetation to provide an outlook that is close to wilderness. The only elements that perhaps currently detract from this natural appearance are the occasional farmsteads, wind pumps, roads, overhead power lines and sub stations. As the viewer moves away from existing infrastructure, the natural character of the area becomes stronger. This natural outlook no doubt helps to contribute to the general attraction of the area for local and regional tourism.

The inselbergs provide structure and focal points within the landscape. When travelling through the landscape, they compartmentalise the plain, foreshortening views and screening adjacent areas.



It is the contrast between what appears to be a planar topography and dramatic steep landforms as well as this compartmentalisation provided by the inselbergs that maintains the interest of the viewer in the dramatic and ever changing scene.

### **B) Ridgelines and Rugged Topography LCA**

The continuous series of ridgelines that form the southern edge of the Orange River Valley to the north of the study area provides a dramatic backdrop for the area. From a visual perspective these ridgelines provide visual continuity behind an ever-changing foreground.

In addition to the provision of a general backdrop that helps to define the regional character, the quiver tree forest currently provides additional local interest and has potential for use as a regional tourist attraction.

### **C) Industrial LCA**

This is comprised of the existing CSP projects and the Paulputs Substation at the western end of the proposed powerline elements of the project. This area is important for electricity generation and transmission. It should be noted that existing trough and substation infrastructure affect a limited area of the surrounding landscape due to, topography and the relatively low nature of the existing development.

Figure 38 provides visual reference to the different LCAs described above as observed on site.



**Industrial Landscape Character Area – Paulputs Substation**



**Industrial Landscape Character Area. Existing CSP parabolic trough project.**



**Upper Plain with isolated Inselberg Landscape Character Area.**



**Ridgelines / Rugged Topography Landscape Character Area.**

Figure 38: The different LCAs associated with the baseline environment

#### **9.1.6.2 VISUAL SENSITIVITY**

The site sensitivity analysis indicates that the proposed development is located within a landscape that is largely natural in character, with sections degraded by existing industrial activities such as CSP solar projects and the Paulputs Substation. The majority of the alignment falls within the Upper Plain with Isolated Inselberg Landscape



Character Area (LCA), which retains a relatively pristine outlook due to low-intensity grazing and sparse development. This contributes to a moderate level of Visual Absorption Capacity (VAC), although the openness of the terrain and low vegetation cover provide limited screening potential.

Key sensitivity observations comprise of the following:

**A) Main Roads (N14 and R357)**

In terms of 400kV overhead powerlines running in parallel to the N14, there is precedent (or example) in the area of Aggeneis close to the Aggeneis Substation where two such powerlines run parallel to the road. The closest of which is approximately 250m from the road (Figure 39). Whilst the closest powerline is visually obvious, it does not dominate views from the road. It is therefore recommended that in areas that it runs parallel to the road, the powerline should be located a minimum distance of 250m from the N14.



Figure 39: A 400kV overhead powerline running parallel and approximately 250m from the N14 close to the Aggeneis Substation.

**B) Uitkyk Hamlet and isolated homesteads**

The hamlet of Uitkyk and several isolated homesteads are located within the visual envelope. Two homesteads fall within 100 m of the proposed alignment, and Uitkyk is approximately 316 m away, making these receptors highly sensitive to visual change.

**C) Ridgelines and watercourses**

Ridgelines and inselbergs are identified as highly sensitive areas due to their role in defining the regional landscape character and their potential to amplify visual exposure if crossed. While not visually prominent, watercourses were identified through aerial photography and will be crossed by the proposed powerline. These areas are flagged for avoidance to prevent unnecessary disturbance and maintain ecological integrity.



## 9.2 BIOLOGICAL ENVIRONMENT

The terrestrial and aquatic environment has been assessed by The Biodiversity Company (TBC) and the associated specialist reports are included in APPENDIX D. The baseline biological environments and specialist findings are presented in the following subsections.

### 9.2.1 OVERALL ECOLOGICAL SENSIVITY

#### 9.2.1.1 RED LIST OF ECOSYSTEMS

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the proposed development overlaps with a LC ecosystem as captured in Figure 40.

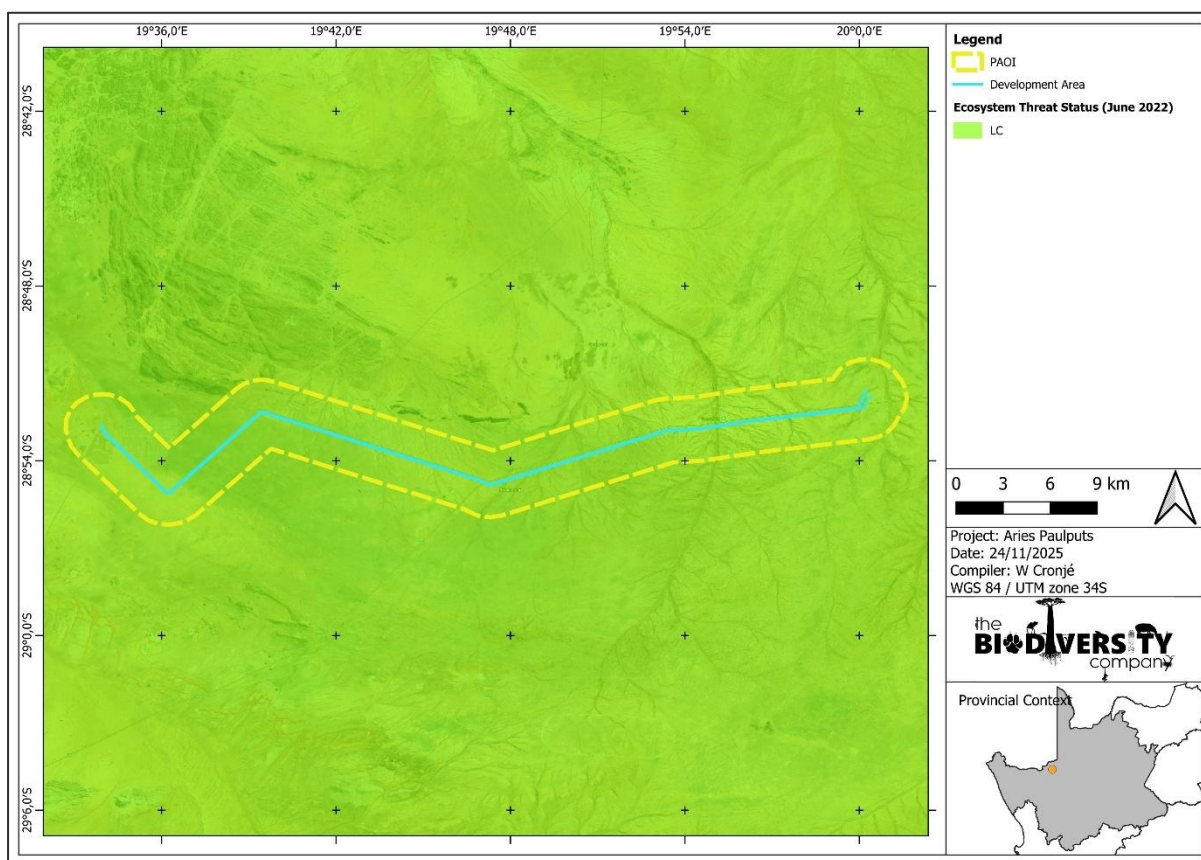


Figure 40: Ecosystem threat status of the project area

#### 9.2.1.2 ECOSYSTEM PROTECTION LEVEL

Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The project area overlaps with a the NPP and PP ecosystems as captured in Figure 41.

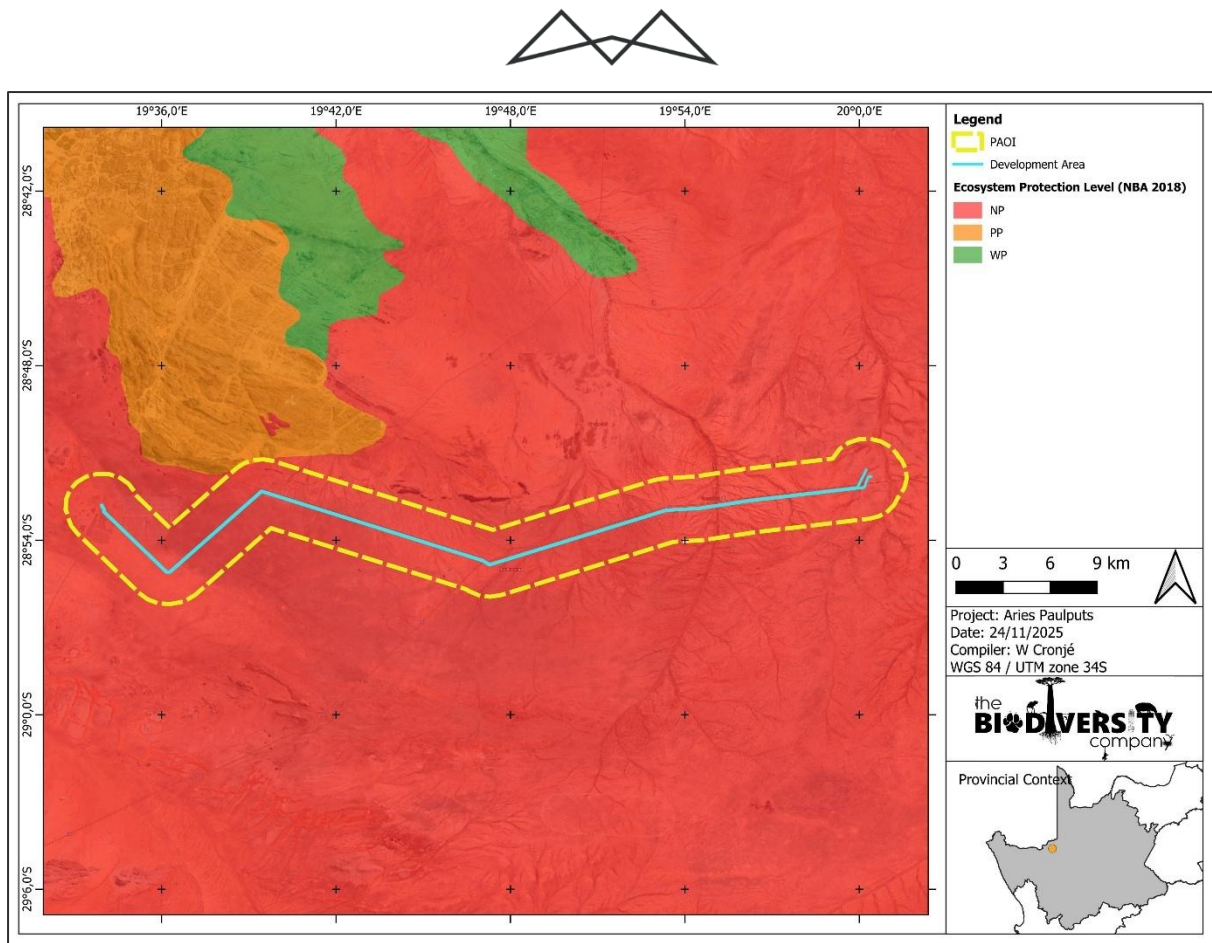


Figure 41: Ecosystem Protection Level of the project area

### 9.2.1.3 CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS

The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.

According to the Conservation Plan the project area and development area fall across an area classified as CBA1, CBA2 and ESA. Figure 42 is a map of the CBAs and ESAs intersecting the project area.

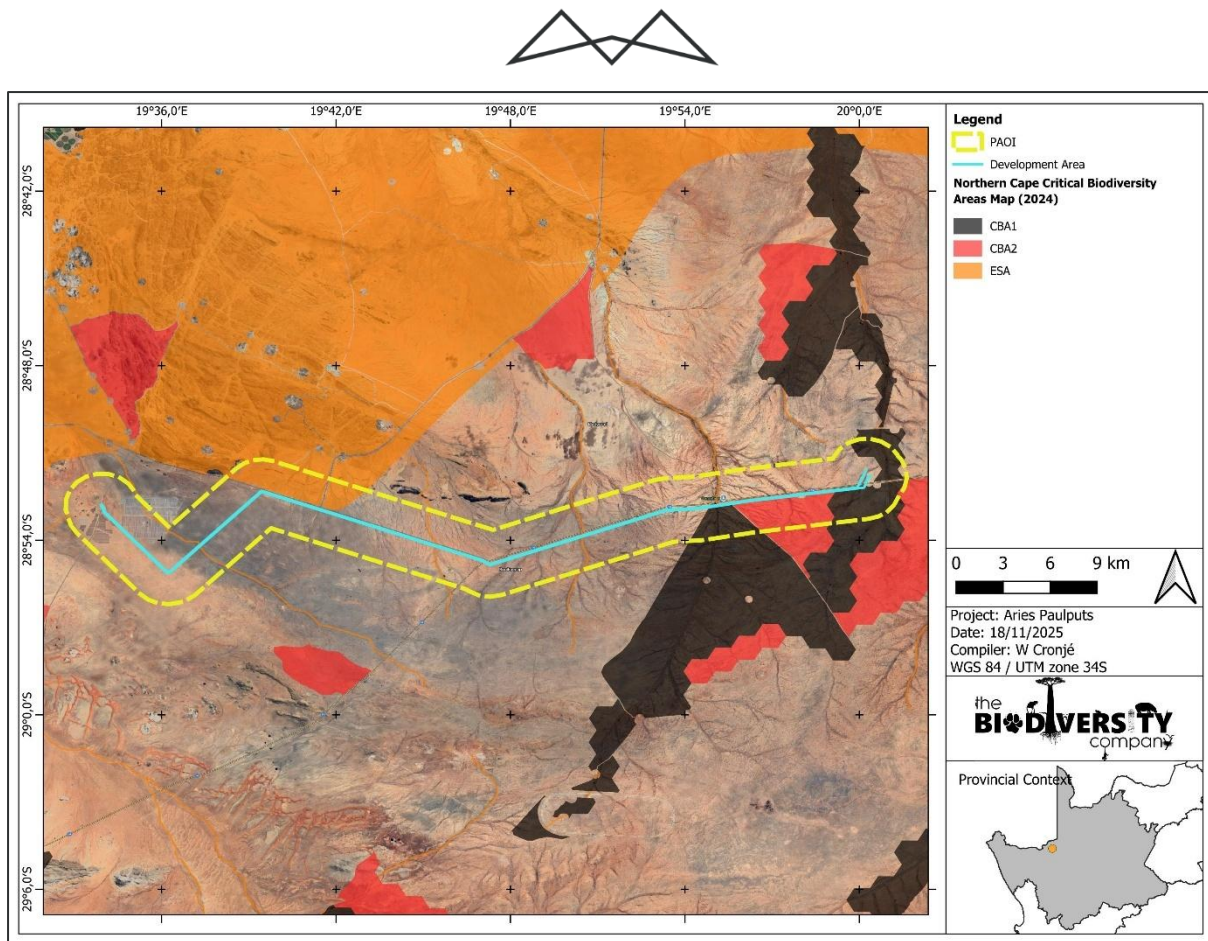


Figure 42: Map of CBAs and ESAs intersecting and in proximity of the project area

#### 9.2.1.4 PROTECTED AREAS

The Department of Forestry, Fisheries and the Environment maintains a spatial database on Protected Areas and Conservation Areas. Protected Areas and Conservation Areas (PACA) Database scheme that used for classifying protected areas (South Africa Protected Areas Database-SAPAD) and conservation areas (South Africa Conservation Areas Database-SACAD) into types and sub-types in South Africa.

The definition of protected areas used in these documents follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the “System of Protected Areas”, which consists of the following kinds of protected areas:

- Special nature reserves:
- National parks:
- Nature reserves and
- Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003);
- World heritage sites declared in terms of the World Heritage Convention Act;
- Marine protected areas declared in terms of the Marine Living Resources Act;
- Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and
- Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).



The types of conservation areas that are currently included in the database are the following:

- Biosphere reserves;
- Ramsar sites;
- Stewardship agreements (other than nature reserves and protected environments);
- Botanical gardens;
- Transfrontier conservation areas;
- Transfrontier parks;
- Military conservation areas; and
- Conservancies.

Figure 43 shows that the project area and development area does not overlap with any protected areas.

#### 9.2.1.5 NATIONAL PROTECTION AREA EXPANSION STRATEGY

National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints, and opportunities.

The project area overlaps with priority focus areas as captured in Figure 44.

#### 9.2.1.6 KEY BIODIVERSITY AREAS

A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2, applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation.

Figure 45 shows that the project area overlaps with the Aggeneys – Pella – Pofadder KBA.

#### 9.2.1.7 NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS

To better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals.

Figure 46 shows that the project area overlaps with a non-priority wetland, as well as largely natural and moderately modified NFEPA rivers.

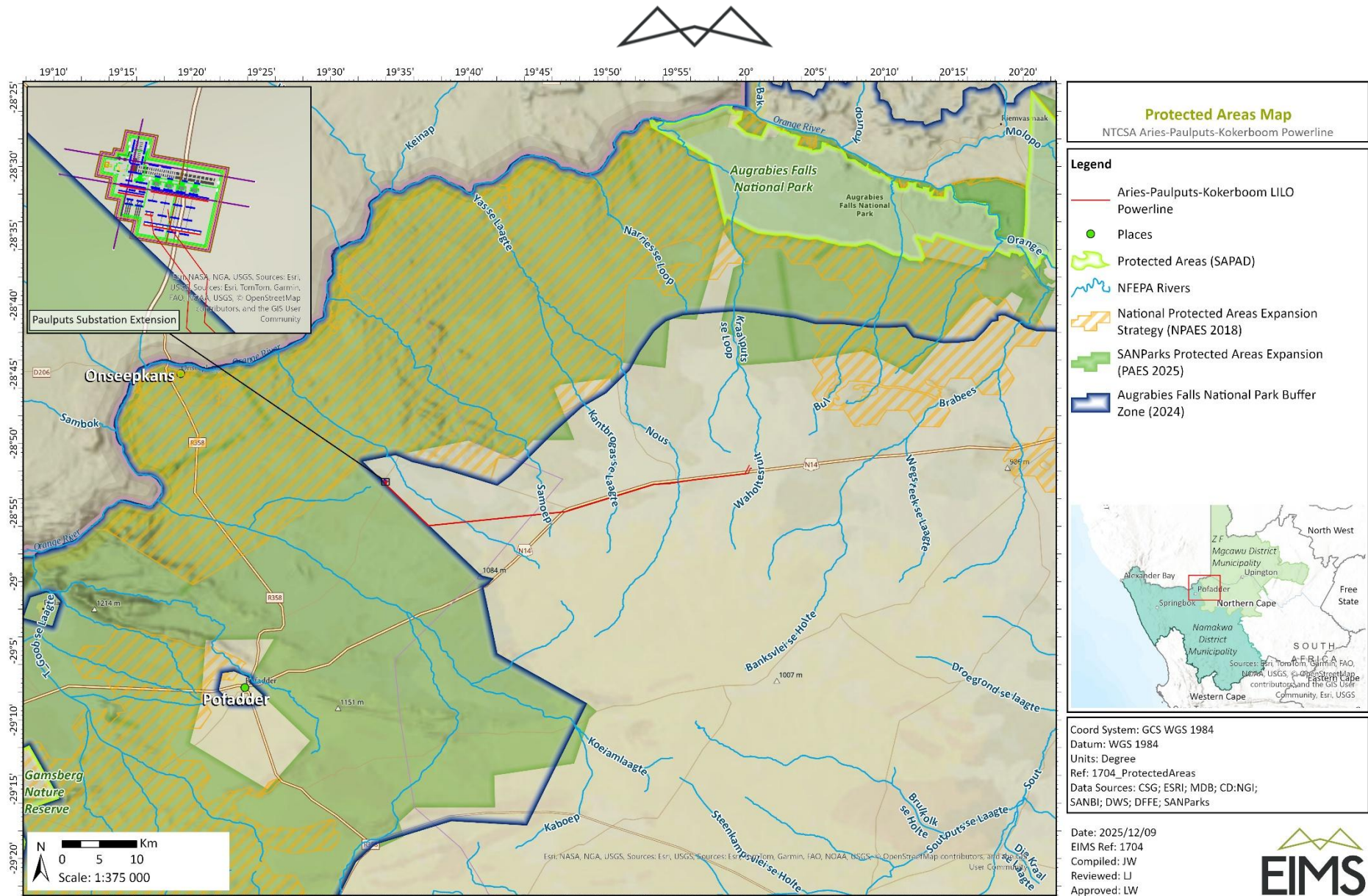


Figure 43: Protected Areas Map

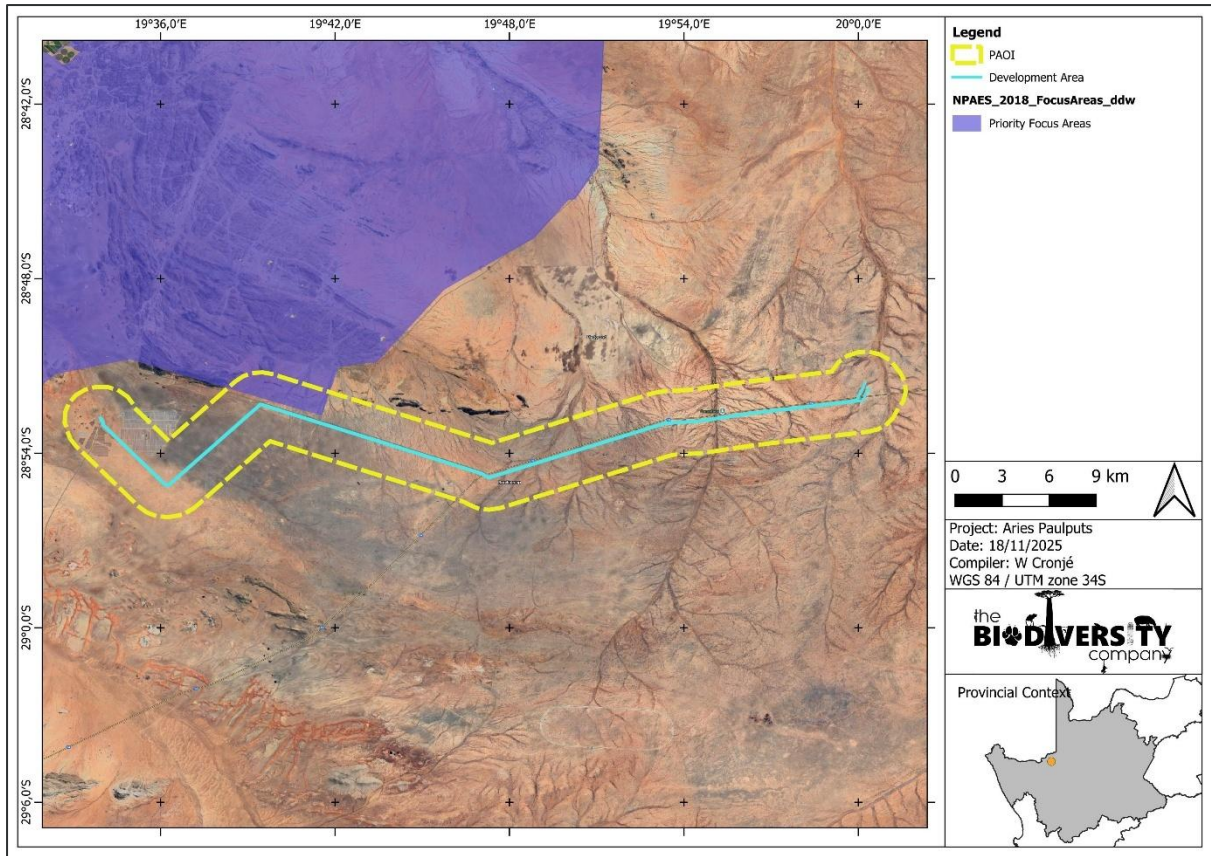


Figure 44: The project area in relation to the National Protection Area Expansion Strategy

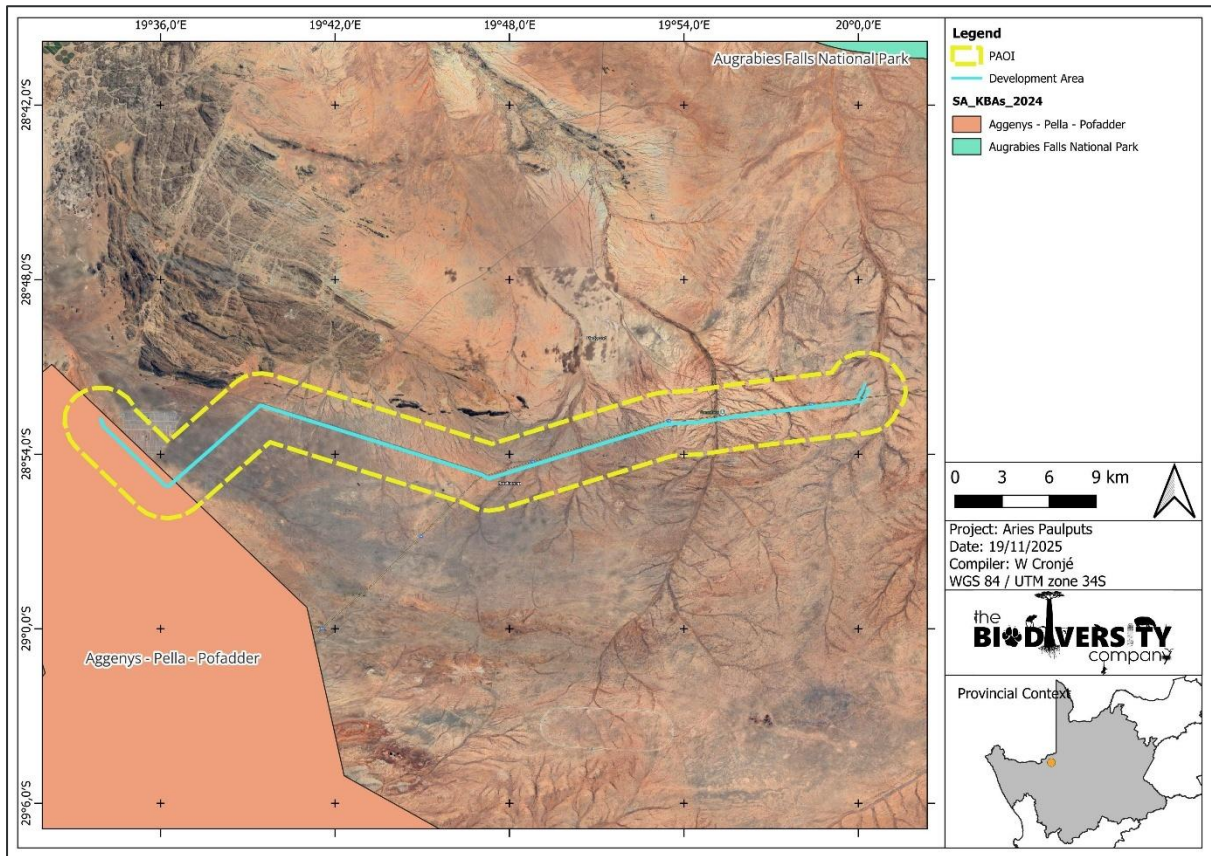


Figure 45: The project area in relation to the nearest Key Biodiversity Areas

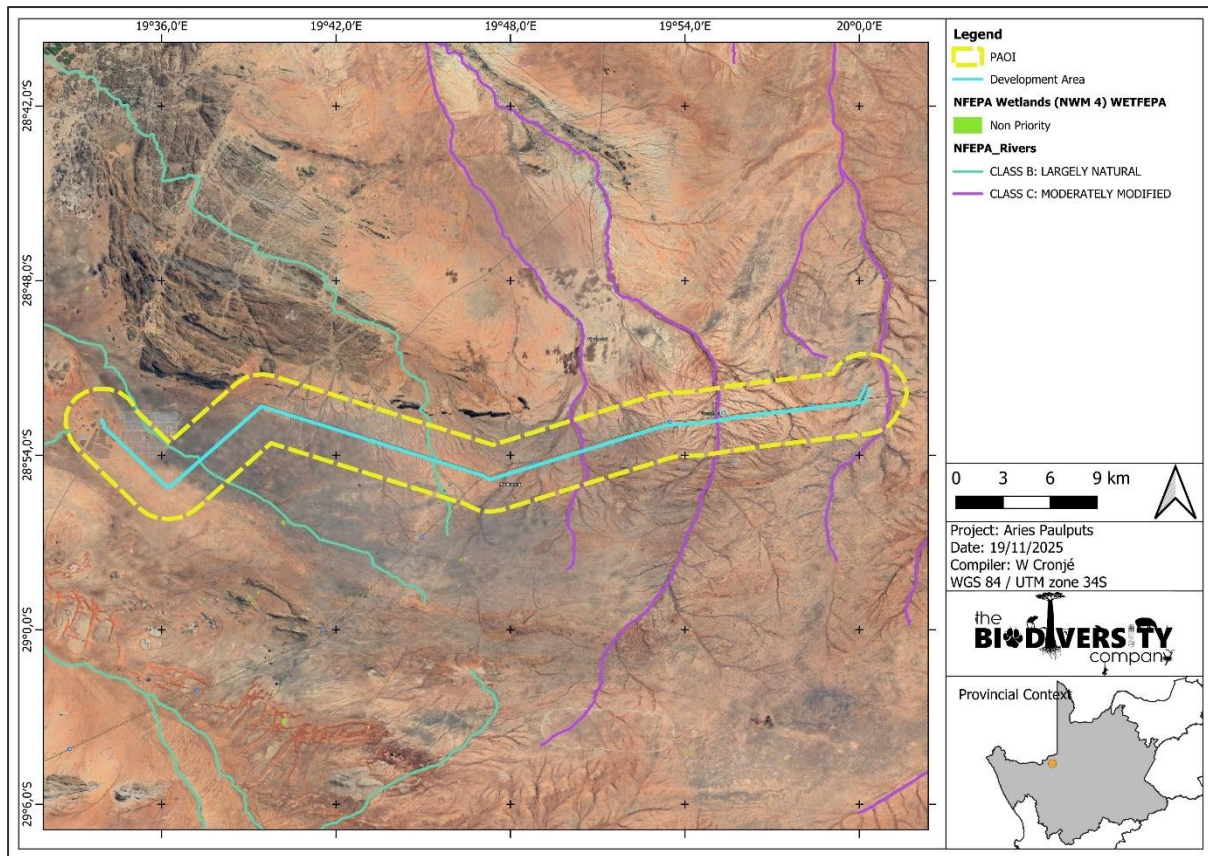


Figure 46: The project area in relation to the National Freshwater Ecosystem Priority Areas

## 9.2.2 FLORA

This section provides a description of the different floral species occurring and associated with the project area. Covered in this section are findings related to the desktop assessment as well as on-site observations.

The project area is situated within the Nama-karoo biome. This biome is found in the central plateau of the western half of South Africa.

The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Grazing rapidly increases the relative abundance of shrubs. Most of the grasses are of the C4 type and, like the shrubs, are deciduous in response to rainfall events (SANBI, 2019).

### 9.2.2.1 BUSHMANLAND ARID GRASSLAND

On a fine-scale vegetation type, the project area overlaps with the Bushmanland Arid Grassland vegetation type (See Figure 47 for overview of the vegetation types or status associated with the project area). The Bushmanland Arid Grassland consists of extensive to irregular plains on a slightly sloping plateau. It is sparsely vegetated by grasslands, mainly dominated by white grasses (*Stipagrostis* species) giving this vegetation type the character of semidesert 'steppe'. In places low shrubs of *Salsola* change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

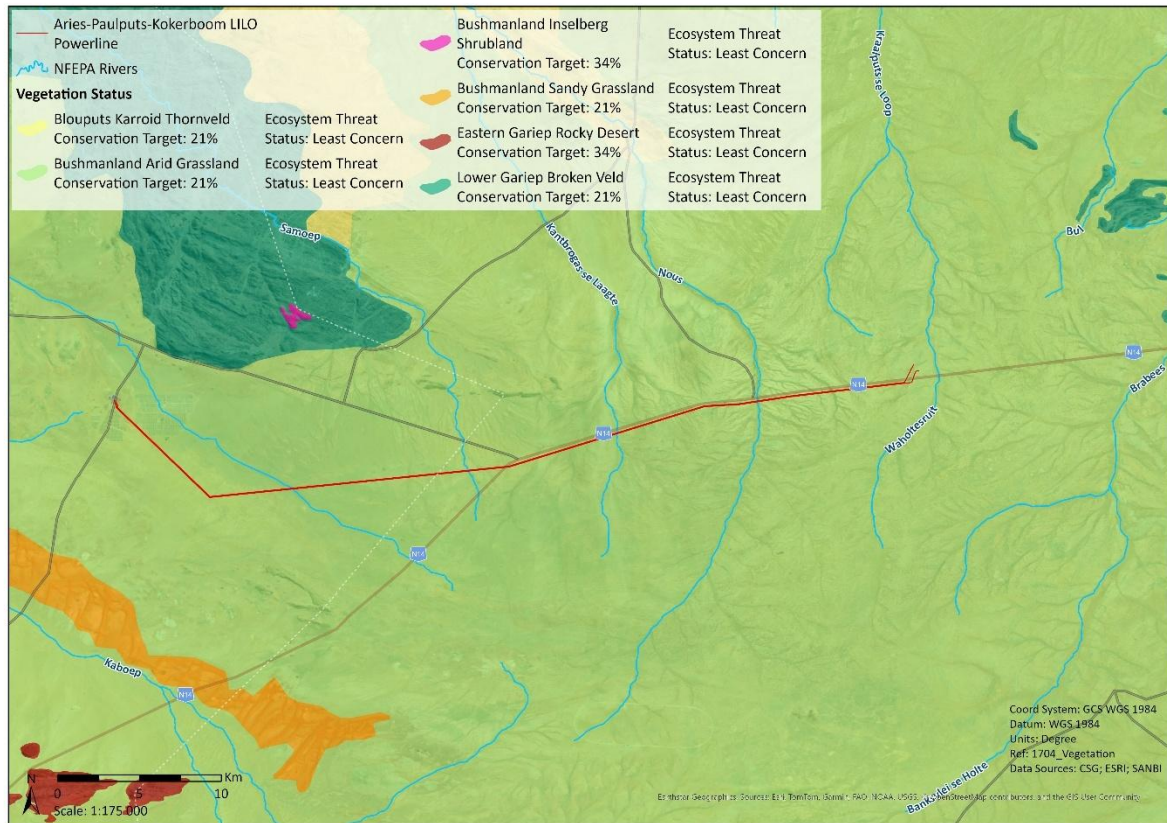


Figure 47: Map of vegetation status or type associated with the project area

According to Mucina and Rutherford (2006), this vegetation type is classified as Least Concern. The national target for conservation protection for this vegetation types is 21%, with only small patches statutorily conserved in Augrabies Falls National Park and Goegab Nature Reserve. Very little of the area has been transformed. The risk of erosion in this vegetation type is very low (60%) and low (33%).

#### 9.2.2.2 EXPECTED FLORA SPECIES

The Global Biodiversity Information Facility (GBIF) database, with all available datasets including iNaturalist, was accessed to compile a list of expected flora species within the proposed development area and surrounding landscape, which totalled 297 species as listed in Table 8. The Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2020) was utilized to provide the most current national conservation status of flora species.

Table 8: List of expected species associated with the project area

Family Name	Scientific Name	RSA Status	Conservation status (Regional)
Aizoaceae	<i>Galenia africana</i>	Indigenous	LC
	<i>Galenia fruticosa</i>	Indigenous	LC
	<i>Galenia meziana</i>	Indigenous	LC
	<i>Galenia sarcophylla</i>	Indigenous	LC
	<i>Galenia secunda</i>	Indigenous	LC
	<i>Dinteranthus vanzylii</i>	Indigenous; Endemic	DDT
	<i>Drosantherum fulleri</i>	Indigenous; Endemic	DDT
	<i>Hereroa pallens</i>	Indigenous; Endemic	LC
	<i>Ihlenfeldtia vanzylii</i>	Indigenous; Endemic	LC
	<i>Lithops dorotheae</i>	Indigenous; Endemic	EN



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
	<i>Lithops julii</i> subsp. <i>fulleri</i>	Indigenous; Endemic	LC
	<i>Mesembryanthemum articulatum</i>	Indigenous	LC
	<i>Mesembryanthemum coriarium</i>	Indigenous	LC
	<i>Mesembryanthemum crystallinum</i>	Indigenous	LC
	<i>Mesembryanthemum inachabense</i>	Indigenous	LC
	<i>Mesembryanthemum subnodosum</i>	Indigenous	LC
	<i>Phyllobolus lignescens</i>	Indigenous	LC
	<i>Prenia tetragona</i>	Indigenous	LC
	<i>Psilocaulon coriarium</i>	Indigenous	LC
	<i>Psilocaulon subnodosum</i>	Indigenous	LC
	<i>Ruschia spinosa</i>	Indigenous	LC
	<i>Tetragonia calycina</i>	Indigenous	LC
	<i>Tetragonia fruticosa</i>	Indigenous	LC
	<i>Trianthesa parvifolia</i>	Indigenous	LC
	<i>Trianthesa parvifolia</i> var. <i>parvifolia</i>	Indigenous	LC
	<i>Trianthesa parvifolia</i> var. <i>rubens</i>	Indigenous	LC
Amaranthaceae	<i>Hermbstaedtia glauca</i>	Indigenous	LC
	<i>Leucosphaera bainesii</i>	Indigenous	LC
	<i>Salsola armata</i>	Indigenous	LC
	<i>Salsola barbata</i>	Indigenous	LC
	<i>Salsola columnaris</i>	Indigenous	LC
	<i>Salsola melanantha</i>	Indigenous	LC
	<i>Sericocoma avolans</i>	Indigenous	LC
	<i>Sericocoma pungens</i>	Indigenous	LC
Anacardiaceae	<i>Searsia burchellii</i>	Indigenous	LC
	<i>Searsia populifolia</i>	Indigenous	LC
Apocynaceae	<i>Fockea sinuata</i>	Indigenous	LC
	<i>Cryptolepis decidua</i>	Indigenous	LC
	<i>Hoodia gordonii</i>	Indigenous	DDD
	<i>Microloma incanum</i>	Indigenous	LC
	<i>Microloma sagittatum</i>	Indigenous; Endemic	LC
	<i>Pergularia daemia</i> subsp. <i>daemia</i>	Indigenous	LC
	<i>Sarcostemma viminale</i> subsp. <i>viminale</i>	Indigenous	LC
Asphodelaceae	<i>Gonialoe variegata</i>	Indigenous	LC
	<i>Trachyandra saltii</i>	Indigenous	LC
Asteraceae	<i>Eriocephalus decussatus</i>	Indigenous; Endemic	LC
	<i>Eriocephalus merxmuelleri</i>	Indigenous	LC
	<i>Eriocephalus pauperrimus</i>	Indigenous	LC
	<i>Euryops dregeanus</i>	Indigenous	LC
	<i>Felicia clavipilosa</i> subsp. <i>clavipilosa</i>	Indigenous	LC
	<i>Felicia hirsuta</i>	Indigenous	LC
	<i>Foveolina dichotoma</i>	Indigenous	LC
	<i>Dicoma capensis</i>	Indigenous	LC
	<i>Dimorphotheca pinnata</i>	Indigenous	LC



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
	<i>Dimorphotheca sinuata</i>	Indigenous	LC
	<i>Gazania jurineifolia</i> subsp. <i>scabra</i>	Indigenous	LC
	<i>Gazania lichtensteinii</i>	Indigenous	LC
	<i>Geigeria filifolia</i>	Indigenous	LC
	<i>Geigeria ornativa</i>	Indigenous	LC
	<i>Geigeria vigintiquamea</i>	Indigenous	LC
	<i>Helichrysum argyrosphaerum</i>	Indigenous	LC
	<i>Helichrysum gariepinum</i>	Indigenous	LC
	<i>Helichrysum herniarioides</i>	Indigenous	LC
	<i>Helichrysum pumilio</i> subsp. <i>pumilio</i>	Indigenous; Endemic	LC
	<i>Hirpicium echinus</i>	Indigenous	LC
	<i>Ifloga molluginoides</i>	Indigenous	LC
	<i>Kleinia longiflora</i>	Indigenous	LC
	<i>Lasiopogon muscoides</i>	Indigenous	LC
	<i>Leysera tenella</i>	Indigenous	LC
	<i>Myxopappus acutilobus</i>	Indigenous	LC
	<i>Nolletia chrysocomoides</i>	Indigenous	LC
	<i>Osteospermum armatum</i>	Indigenous	LC
	<i>Osteospermum microcarpum</i> subsp. <i>microcarpum</i>	Indigenous	LC
	<i>Osteospermum pinnatum</i> var. <i>breve</i>	Indigenous	NE
	<i>Osteospermum pinnatum</i> var. <i>pinnatum</i>	Indigenous	NE
	<i>Osteospermum rigidum</i> var. <i>rigidum</i>	Indigenous; Endemic	LC
	<i>Pentzia lanata</i>	Indigenous	LC
	<i>Pteronia leucoclada</i>	Indigenous	LC
	<i>Pteronia mucronata</i>	Indigenous	LC
	<i>Senecio arenarius</i>	Indigenous	LC
	<i>Senecio consanguineus</i>	Indigenous	LC
	<i>Senecio niveus</i>	Indigenous	LC
Boraginaceae	<i>Heliotropium ciliatum</i>	Indigenous	LC
	<i>Trichodesma africanum</i>	Indigenous	LC
Brassicaceae	<i>Coronopus integrifolius</i>	Not indigenous	NE
	<i>Heliophila deserticola</i>	Indigenous	LC
	<i>Heliophila deserticola</i> var. <i>deserticola</i>	Indigenous	LC
	<i>Heliophila deserticola</i> var. <i>micrantha</i>	Indigenous	LC
	<i>Heliophila seselifolia</i> var. <i>seselifolia</i>	Indigenous	NE
	<i>Heliophila trifurca</i>	Indigenous	LC
Campanulaceae	<i>Wahlenbergia psammophila</i>	Indigenous	LC
Capparaceae	<i>Maerua gilgii</i>	Indigenous	LC
Colchicaceae	<i>Ornithoglossum vulgare</i>	Indigenous	LC
	<i>Crassula corallina</i> subsp. <i>macrorrhiza</i>	Indigenous	LC



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
Crassulaceae	<i>Tylecodon rubrovenosus</i>	Indigenous	LC
Cucurbitaceae	<i>Corallocarpus dissectus</i>	Indigenous	LC
	<i>Cucumis africanus</i>	Indigenous	LC
	<i>Cucumis sagittatus</i>	Indigenous	LC
Ebenaceae	<i>Diospyros acocksii</i>	Indigenous	LC
Euphorbiaceae	<i>Euphorbia friedrichiae</i>	Indigenous	LC
	<i>Euphorbia glanduligera</i>	Indigenous	LC
	<i>Euphorbia inaequilatera</i>	Indigenous	LC
	<i>Euphorbia mauritanica</i>	Indigenous	LC
	<i>Euphorbia namaquensis</i>	Indigenous	NE
	<i>Euphorbia spinea</i>	Indigenous	LC
	<i>Euphorbia virosa</i>	Indigenous	LC
Fabaceae	<i>Indigastrum argyroides</i>	Indigenous	LC
	<i>Indigofera alternans</i> var. <i>alternans</i>	Indigenous	LC
	<i>Indigofera heterotricha</i>	Indigenous	LC
	<i>Indigofera heterotricha</i> subsp. <i>pechuelii</i>	Indigenous	LC
	<i>Indigofera pungens</i>	Indigenous	LC
	<i>Calobota angustifolia</i>	Indigenous	LC
	<i>Leobordea platycarpa</i>	Indigenous	LC
	<i>Lessertia annularis</i>	Indigenous	LC
	<i>Lessertia frutescens</i>	Indigenous	LC
	<i>Lessertia frutescens</i> subsp. <i>frutescens</i>	Indigenous	LC
	<i>Lessertia frutescens</i> subsp. <i>microphylla</i>	Indigenous	LC
	<i>Lotononis rabenaviana</i>	Indigenous	LC
	<i>Melolobium adenodes</i>	Indigenous	LC
	<i>Melolobium candicans</i>	Indigenous	LC
	<i>Melolobium humile</i>	Indigenous; Endemic	LC
	<i>Melolobium microphyllum</i>	Indigenous	LC
	<i>Prosopis velutina</i>	Not indigenous; Naturalised; Invasive	NE
	<i>Pomaria lactea</i>	Indigenous	LC
	<i>Prosopis glandulosa</i> var. <i>glandulosa</i>	Not indigenous; Naturalised	NE
	<i>Requienia sphaerosperma</i>	Indigenous	LC
	<i>Senegalia mellifera</i>	Indigenous	LC
	<i>Tephrosia dregeana</i> var. <i>dregeana</i>	Indigenous	LC
	<i>Vachellia erioloba</i>	Indigenous	LC
Geraniaceae	<i>Monsonia crassicaulis</i>	Indigenous	LC
	<i>Monsonia luederitziana</i>	Indigenous	LC
	<i>Monsonia parvifolia</i>	Indigenous	LC
	<i>Monsonia salmoniflora</i>	Indigenous	LC
Gisekiaceae	<i>Gisekia pharnaceoides</i> var. <i>pharnaceoides</i>	Indigenous	LC



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
Hyacinthaceae	<i>Dipcadi gracillimum</i>	Indigenous	LC
Iridaceae	<i>Gladiolus orchidiflorus</i>	Indigenous	LC
	<i>Tritonia karooica</i>	Indigenous; Endemic	LC
Kewaceae	<i>Kewa salsoloides</i>	Indigenous	LC
Lamiaceae	<i>Stachys burchelliana</i>	Indigenous	LC
Limeaceae	<i>Limeum aethiopicum</i>	Indigenous	LC
	<i>Limeum aethiopicum</i> var. <i>lanceolatum</i>	Indigenous	NE
	<i>Limeum argute-carinatum</i> var.	Indigenous	LC
	<i>Limeum myosotis</i> var. <i>myosotis</i>	Indigenous	LC
Lophiocarpaceae	<i>Lophiocarpus polystachyus</i>	Indigenous	LC
Loranthaceae	<i>Septulina glauca</i>	Indigenous	LC
	<i>Tapinanthus oleifolius</i>	Indigenous	LC
Malvaceae	<i>Hermannia abrotanoides</i>	Indigenous	LC
	<i>Hermannia bicolor</i>	Indigenous	LC
	<i>Hermannia gariepina</i>	Indigenous	LC
	<i>Hermannia grandiflora</i>	Indigenous	LC
	<i>Hermannia marginata</i>	Indigenous; Endemic	LC
	<i>Hermannia minutiflora</i>	Indigenous	LC
	<i>Hermannia modesta</i>	Indigenous	LC
	<i>Hermannia spinosa</i>	Indigenous	LC
	<i>Hermannia stricta</i>	Indigenous	LC
	<i>Radyera urens</i>	Indigenous	LC
Meliaceae	<i>Nymania capensis</i>	Indigenous	LC
Molluginaceae	<i>Kewa salsoloides</i>	Indigenous	LC
	<i>Hypertelis cerviana</i>	Indigenous	LC
	<i>Pharnaceum brevicaule</i>	Indigenous	LC
	<i>Pharnaceum croceum</i>	Indigenous	LC
	<i>Suessenguthiella scleranthoides</i>	Indigenous	LC
Montiniaceae	<i>Montinia caryophyllacea</i>	Indigenous	LC
Neuradaceae	<i>Grielum humifusum</i> var. <i>humifusum</i>	Indigenous	LC
	<i>Grielum humifusum</i> var. <i>parviflorum</i>	Indigenous	LC
Nyctaginaceae	<i>Phaeoptilum spinosum</i>	Indigenous	LC
Ophioglossaceae	<i>Ophioglossum polyphyllum</i> var. <i>polyphyllum</i>	Indigenous	LC
Oxalidaceae	<i>Oxalis pocockiae</i>	Indigenous; Endemic	LC
Pedaliaceae	<i>Rogeria longiflora</i>	Indigenous	LC
	<i>Sesamum capense</i>	Indigenous	LC
Phyllanthaceae	<i>Phyllanthus parvulus</i> var. <i>garipensis</i>	Present	LC
Poaceae	<i>Eragrostis procumbens</i>	Indigenous	LC
	<i>Eragrostis rotifer</i>	Indigenous	LC



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
	<i>Dactyloctenium aegyptium</i>	Indigenous	LC
	<i>Enneapogon cenchroides</i>	Indigenous	LC
	<i>Enneapogon desvauxii</i>	Indigenous	LC
	<i>Enneapogon scaber</i>	Indigenous	LC
	<i>Eragrostis annulata</i>	Indigenous	LC
	<i>Eragrostis biflora</i>	Indigenous	LC
	<i>Eragrostis homomalla</i>	Indigenous	LC
	<i>Eragrostis nindensis</i>	Indigenous	LC
	<i>Eragrostis porosa</i>	Indigenous	LC
	<i>Leucophrys mesocoma</i>	Indigenous	LC
	<i>Microchloa kunthii</i>	Indigenous	LC
	<i>Oropetium capense</i>	Indigenous	LC
	<i>Schmidtia kalahariensis</i>	Indigenous	LC
	<i>Setaria verticillata</i>	Indigenous	LC
	<i>Sporobolus ioclados</i>	Indigenous	LC
	<i>Sporobolus nervosus</i>	Indigenous	LC
	<i>Stipagrostis ciliata</i>	Indigenous	LC
	<i>Stipagrostis ciliata var. capensis</i>	Indigenous	LC
	<i>Stipagrostis hochstetteriana var. secalina</i>	Indigenous	LC
	<i>Stipagrostis obtusa</i>	Indigenous	LC
	<i>Stipagrostis uniplumis var. uniplumis</i>	Indigenous	LC
	<i>Tragus berteronianus</i>	Indigenous	LC
	<i>Tragus racemosus</i>	Indigenous	LC
	<i>Tricholaena capensis subsp. capensis</i>	Indigenous	LC
	<i>Triraphis ramosissima</i>	Indigenous	LC
Resedaceae	<i>Oligomeris dipetala var. dipetala</i>	Indigenous	LC
Rubiaceae	<i>Kohautia caespitosa subsp. brachyloba</i>	Indigenous	LC
	<i>Kohautia cynanchica</i>	Indigenous	LC
Ruscaceae	<i>Eriospermum flagelliforme</i>	Indigenous	LC
Santalaceae	<i>Lacomucinaea lineata</i>	Indigenous	LC
	<i>Thesium lineatum</i>	Indigenous	LC
	<i>Viscum capense</i>	Indigenous	LC
Sapindaceae	<i>Pappea capensis</i>	Indigenous	LC
Scrophulariaceae	<i>Diascia engleri</i>	Indigenous	LC
	<i>Jamesbrittenia aridicola</i>	Indigenous	LC
	<i>Lyperia tristis</i>	Indigenous	LC
	<i>Manulea schaeferi</i>	Indigenous	LC
	<i>Nemesia anisocarpa</i>	Indigenous	LC
	<i>Nemesia maxii</i>	Indigenous; Endemic	LC
	<i>Peliostomum leucorrhizum</i>	Indigenous	LC
	<i>Selago divaricata</i>	Indigenous	LC
	<i>Zaluzianskya diandra</i>	Indigenous	LC
Solanaceae	<i>Lycium bosciifolium</i>	Indigenous	LC



Family Name	Scientific Name	RSA Status	Conservation status (Regional)
	<i>Lycium horridum</i>	Indigenous	LC
	<i>Lycium pilifolium</i>	Indigenous	LC
	<i>Solanum burchellii</i>	Indigenous	LC
	<i>Solanum namaquense</i>	Indigenous	LC
Talinaceae	<i>Talinum caffrum</i>	Indigenous	LC
Tecophilaeaceae	<i>Cyanella lutea</i>	Indigenous	LC
Urticaceae	<i>Forsskaolea candida</i>	Indigenous	LC
Vahliaceae	<i>Vahlia capensis</i>	Indigenous	LC
	<i>Vahlia capensis subsp. vulgaris</i>	Indigenous	LC
Verbenaceae	<i>Chascanum garipense</i>	Present	LC
Zygophyllaceae	<i>Sisyndite spartea</i>	Indigenous	LC
	<i>Tetraena decumbens</i>	Indigenous	LC
	<i>Tribulus cristatus</i>	Indigenous	LC
	<i>Tribulus pterophorus</i>	Indigenous	LC
	<i>Tribulus zeyheri subsp. zeyheri</i>	Indigenous	LC

### 9.2.2.3 INDIGENOUS SPECIES

The flora assessments were conducted throughout the extent of the project area. Numerous indigenous flora species were recorded, characteristic of the vegetation types for the site. The list of plant species recorded is by no means comprehensive, and repeated surveys during different phenological periods not covered, may likely yield additional flora species for the project area. Selected species are presented in Figure 48.

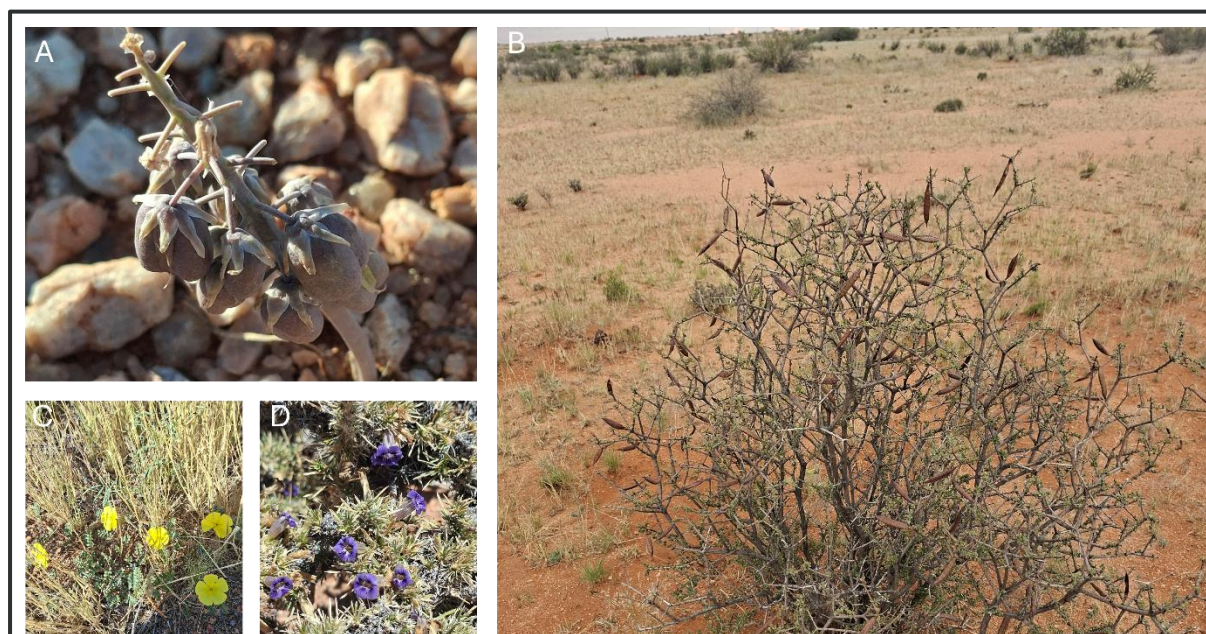


Figure 48: Photographs presenting some of the indigenous plant species recorded: (A) *Ledebouria apertifolia*, (B) *Rhigozum trichotomum*, (C) *Tribulus cristatus* and D) *Aptosimum spinescens*

### 9.2.2.4 SPECIES OF CRITICAL CONCERN (SCC)

The GBIF database combined with the Screening Tool listed a total of four (4) flora SCC that may occur on site as listed in Table 9.



Table 9: Species of Critical Concern considering the GBIF database and DFFE Screening Tool (Species confirmed on site highlighted in Gold)

Family	Species	Screening Tool	Conservation Status	Habitat	LoO	Reason
-	<i>Sensitive species 144</i>	Medium	VU	-	High-	Presence confirmed within the project area.
Aizoaceae	<i>Lithops dorotheae</i>	-	EN	Plants occur on fine-grained, sheared, feldspathic quartzite.	Medium	Suitable habitat present within the project area.
Apocynaceae	<i>Hoodia gordonii</i>	-	DDD	Occurs in a wide variety of arid habitats from coastal to mountainous, also on gentle to steep shale ridges, found from dry, rocky places to sandy spots in riverbeds.	High	Presence confirmed within the project area.
Fabaceae	<i>Crotalaria pearsonii</i>	Medium	VU	Dry ravines, in granite and quartzite derived soils.	Low	No suitable habitat present within the project area.

Two (2) floral SCC were recorded during the field survey (Table 10). An image of the *Hoodia gordonii* as observed on site is included as Figure 49. Following the site-specific walkdown, the locations of these species were recorded and subsequently mapped. Of the two species, the locations of *Hoodia gordonii* are included in the maps below (Figure 50/Figure 53). The locations of *Sensitive species 144* could not be mapped because of the species' high incidence of poaching.

Table 10: SCCs Observed on site

Family	Scientific Name	Red List (SANBI, 2025)
Apocynaceae	<i>Hoodia gordonii</i>	DD
-	<i>Sensitive species 144</i>	VU



Figure 49: *Hoodia gordonii* as observed on site

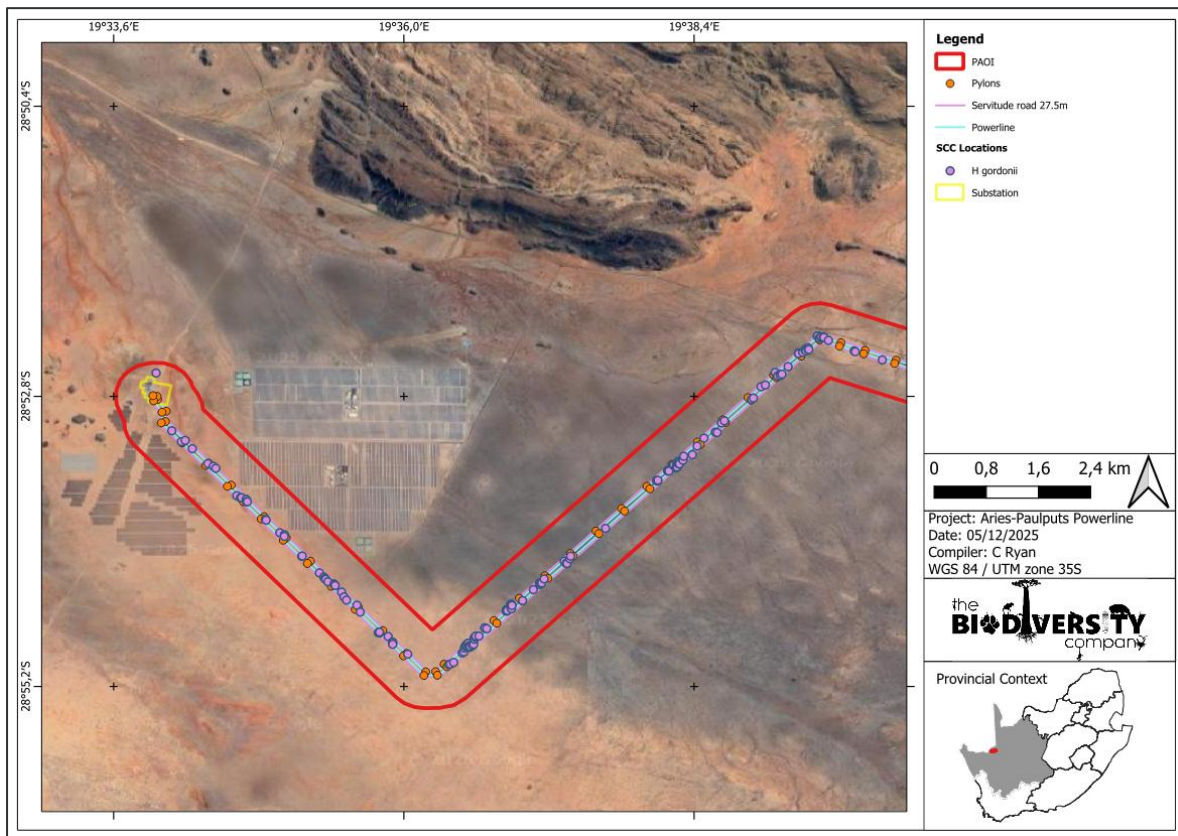


Figure 50: Map illustrating the locations of *H. gordonii* within the project area (Map 1)

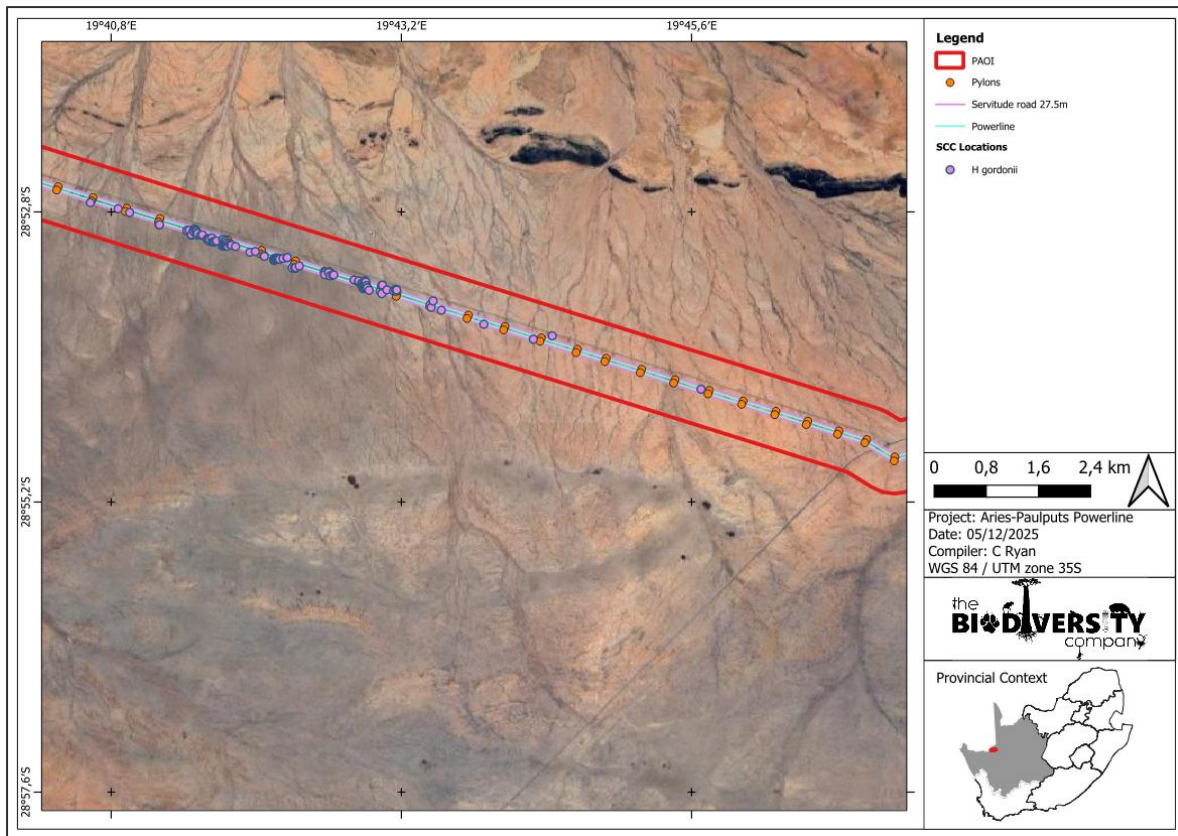


Figure 51: Map illustrating the locations of *H. gordonii* within the project area (Map 2)

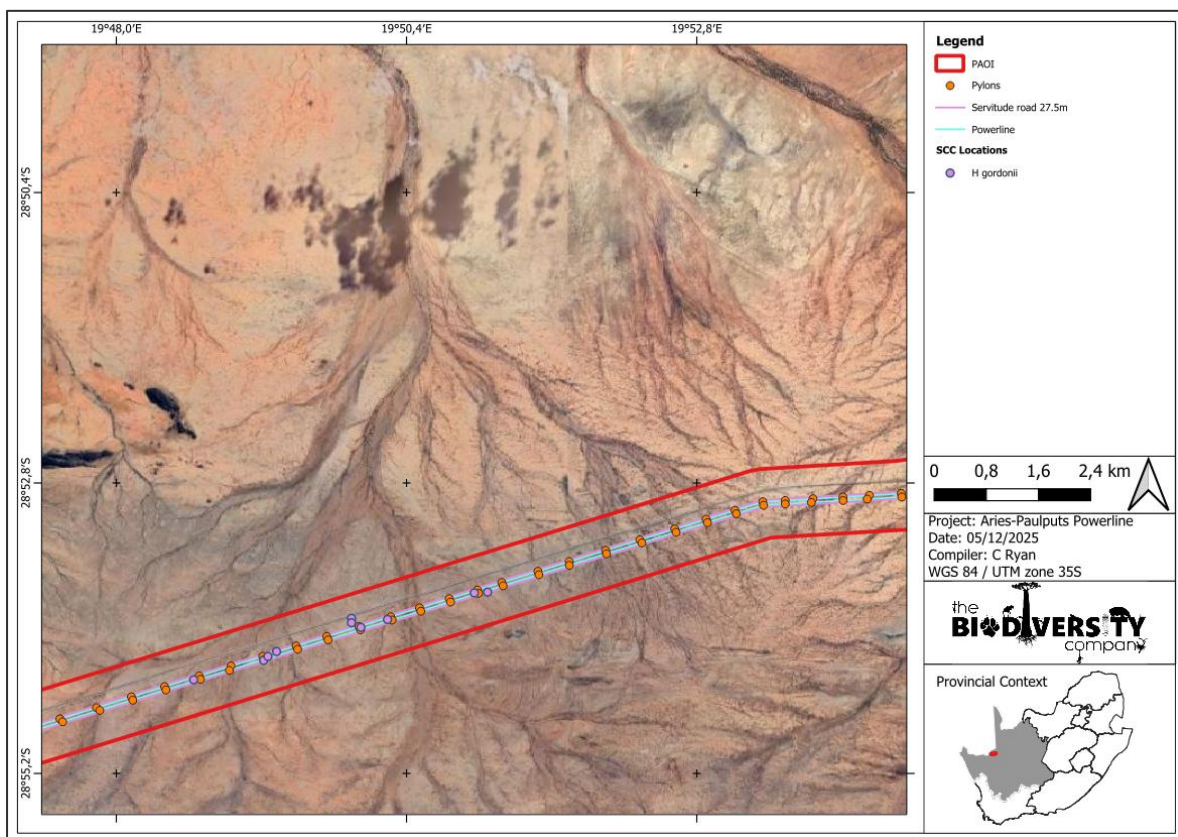


Figure 52: Map illustrating the locations of *H. gordonii* within the project area (Map 3)

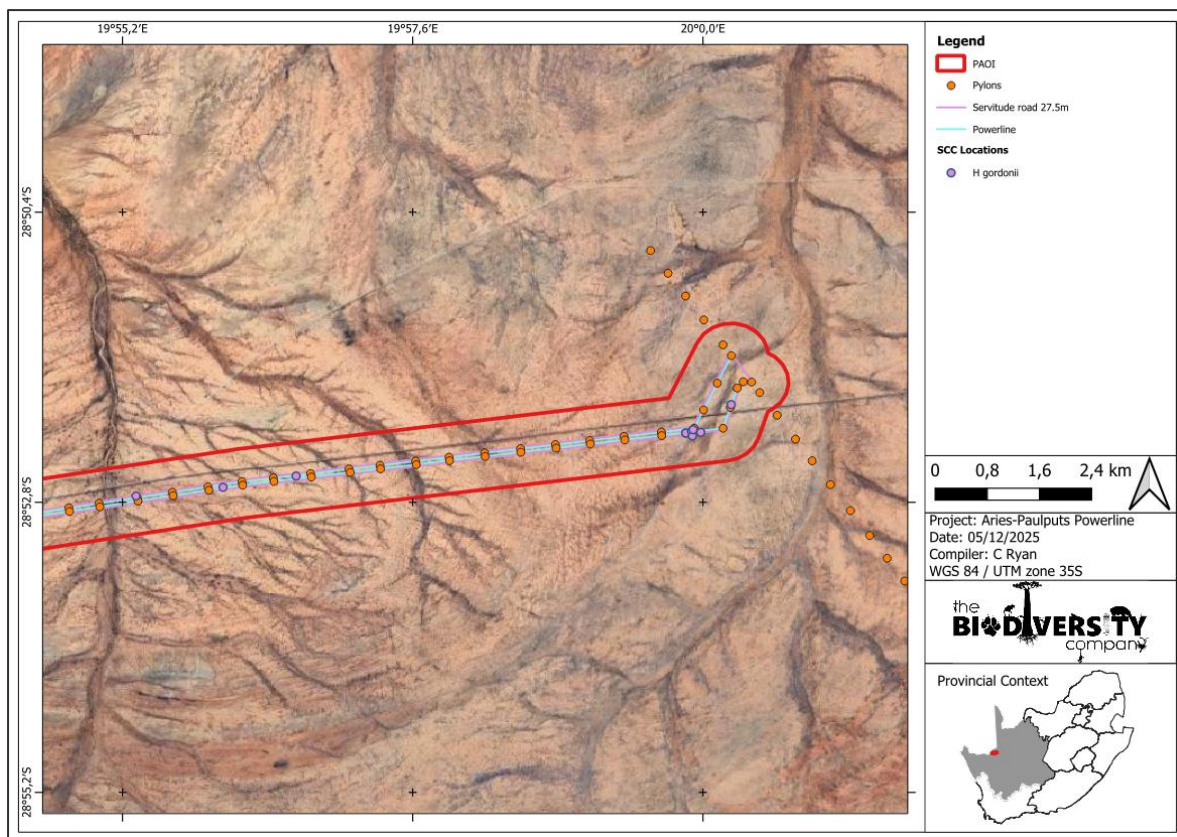


Figure 53: Map illustrating the locations of *H. gordonii* within the project area (Map 4)

#### 9.2.2.5 PROTECTED SPECIES

The presence of one (1) nationally protected tree species, *Vachellia erioloba* (see Figure 54 for photograph), as listed in the National Forests Act, 1998 (Vol. 681, 25 March 2022) was confirmed on site during the site visit. No person may cut, disturb, damage or destroy any protected tree except under a permit granted by the minister.

Four (4) provincially protected plant species were recorded during the site assessment; *Boscia foetida*, *Euphorbia spinea*, *Euphorbia hamata* and *Sensitive species 144*. Please note that *Sensitive species 144* is currently under a moratorium, where permits for destruction or relocation are not readily granted. All species of the *Euphorbia* and *Boscia* genera are provincially protected under Schedule 1 of the Northern Cape Nature Conservation Act, 2009 (Act 9 of 2009). Images of the protected species are here presented in Figure 55.

Table 11 lists all Nationally and provincially protected tree species identified with the project area.



Figure 54: Nationally protected *Vachellia erioloba* observed as on site.

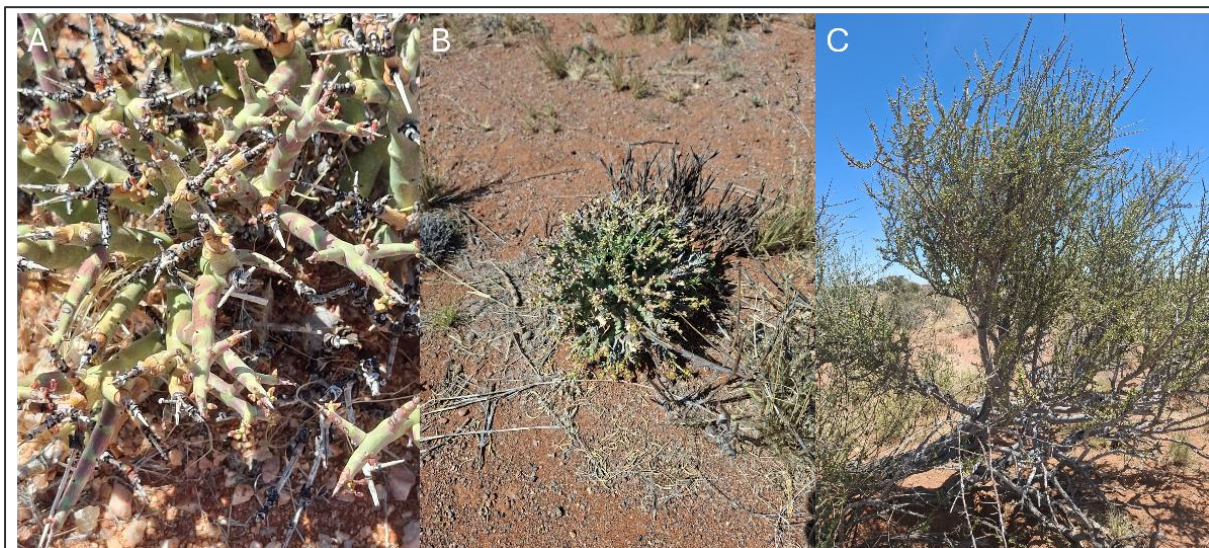


Figure 55: Provincially protected flora of the project area including (A) *Euphorbia spinea*, (B) *Euphorbia hamata*, (C) *Boscia foetida*

Table 11: List of nationally (highlighted in Gold) and provincially protected tree species within the project area.

Family	Scientific Name	Red List (SANBI, 2025)	Status
Capparaceae	<i>Boscia foetida</i>	LC	Indigenous; Provincially Protected
Fabaceae	<i>Vachellia erioloba</i>	LC	Indigenous; Nationally Protected
Euphorbiaceae	<i>Euphorbia hamata</i>	LC	Indigenous; Provincially Protected
Euphorbiaceae	<i>Euphorbia spinea</i>	LC	Indigenous; Provincially Protected



#### 9.2.2.6 ALIEN INVASIVE PLANTS

Alien Invasive Plants (AIPs) species tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude indigenous plant species.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43735, 25 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 or 3 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

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

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately: Notify the competent authority in writing, Take steps to manage the listed invasive species in compliance with: Section 75 of the Act; the relevant invasive species management programme developed in terms of regulation 4; and any directive issued in terms of section 73(3) of the Act.

One (1) AIP species was recorded within the project area (*Neltuma velutina*) as photographed in Figure 56.



Figure 56: Photograph of *Neltuma velutina* as occurring on site

### 9.2.3 FAUNA

This section provides a description of the different faunal species occurring and associated with the project area. Covered in this section are findings related to the desktop assessment as well as on-site observations.

The Screening Tool indicates that two (2) avifaunal SCC are predicted to occur within the project area, these SCC are discussed further in the accompanying Avifaunal report included together with other specialist reports (APPENDIX D). According to the Endangered Wildlife Trust Threatened Species No-Go Map (EWT, 2025), the project area does not overlap with any No-Go areas and no occurrence records of the SCC are present.

#### 9.2.3.1 MAMMALS

The GBIF database lists four (4) mammal species that could be expected to occur within the project area (listed in Table 12). None of these species are classified as an SCC. No mammal species are listed by the Screening Tool. Thirteen (13) mammal species were recorded during the field assessment and tower-to-tower walkdown (listed in Table 13). It is important to note that majority of the identification of carnivores within the project area was through skull identification as many skulls and carcasses were present. This indicates high predator persecution within the farming areas. Figure 57 includes photographic evidence of some of the mammal species recorded.



Table 12: Mammal species expected to occur within the project area as per the GBIF database.

Family	Species	Common Name	Conservation Status	
			Regional	Global
<b>Bovidae</b>	<i>Oreotragus oreotragus</i>	Klipspringer	LC	LC
<b>Canidae</b>	<i>Otocyon megalotis</i>	Bat-eared Fox	LC	LC
<b>Hyaenidae</b>	<i>Proteles cristatus</i>	Aardwolf	LC	LC
<b>Procaviidae</b>	<i>Procavia capensis</i>	Rock Hyrax	LC	LC

Table 13: Mammal species observed on site during the field assessment and walkdown.

Family	Species	Common Name	Conservation Status	
			Regional	Global
<b>Bovidae</b>	<i>Raphicerus campestris</i>	Steenbok	LC	LC
<b>Bovidae</b>	<i>Antidorcas marsupialis</i>	Springbok	LC	LC
<b>Canidae</b>	<i>Otocyon megalotis</i>	Bat-eared Fox	LC	LC
<b>Canidae</b>	<i>Lupulella mesomelas</i>	Black-backed Jackal	LC	LC
<b>Herpestidae</b>	<i>Suricata suricatta</i>	Suricate	LC	LC
<b>Herpestidae</b>	<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<b>Hyaenidae</b>	<i>Proteles cristatus</i>	Aardwolf	LC	LC
<b>Hystricidae</b>	<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
<b>Leporidae</b>	<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<b>Orycteropodidae</b>	<i>Orycteropus afer</i>	Aardvark	LC	LC
<b>Procaviidae</b>	<i>Procavia capensis</i>	Rock Hyrax	LC	LC
<b>Sciuridae</b>	<i>Xerus inauris</i>	Cape Ground Squirrel	LC	LC

#### 9.2.3.2 AMPHIBIANS

The GBIF database lists one (1) amphibian species that could be expected to occur within the project area (listed in Table 14). This species is not classified as a SCC. No amphibian species are listed by the Screening Tool. No amphibian species was observed or recorded during the field assessment and tower-to-tower walkdown.

Table 14: Amphibian species expected to occur within the project area as per the GBIF database

Family	Species	Common Name	Conservation Status	
			Regional	Global



<b>Pyxicephalidae</b>	<i>Tomopterna tandyi</i>	Tandy's Sand Frog	LC	LC
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### 9.2.3.3 REPTILES

The GBIF database lists twenty-five (25) reptile species that are expected to occur within the project area (listed in Table 15). One (1) species is listed as an SCC. No reptile species are listed by the Screening Tool. Two (2) reptiles were recorded within the project area during the field assessment and tower-to-tower walkdown (highlighted in Gold in Table 15).

Table 15: Reptile species expected to occur within the project area as per the GBIF database as well as identified (highlighted in Gold) during field assessment.

Family	Species	Common Name	Conservation Status	
			Regional	Global
<b>Scincidae</b>	<i>Acontias lineatus</i>	Striped Legless Skink	LC	LC
<b>Gekkonidae</b>	<i>Chondrodactylus turneri</i>	Turner's Gecko	LC	LC
<b>Gekkonidae</b>	<i>Pachydactylus purcelli</i>	Purcell's Gecko	LC	LC
<b>Scincidae</b>	<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	LC
<b>Gekkonidae</b>	<i>Lygodactylus bradfieldi</i>	Bradfield's Dwarf Gecko	LC	LC
<b>Scincidae</b>	<i>Trachylepis sulcata</i>	Westren Rock Skink	LC	LC
<b>Gekkonidae</b>	<i>Chondrodactylus bibronii</i>	Bibron's Gecko	LC	LC
<b>Cordylidae</b>	<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	LC	LC
<b>Typhlopidae</b>	<i>Rhinotyphlops schinzi</i>	Schinzi's Beaked Blind Snake	LC	LC
<b>Agamidae</b>	<i>Agama aculeata</i>	Ground Agama	LC	LC
<b>Psammophiidae</b>	<i>Psammophis leightoni</i>	Variable Sand Snake	LC	LC
<b>Testudinidae</b>	<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
<b>Viperidae</b>	<i>Bitis caudalis</i>	Horned Adder	LC	LC
<b>Gekkonidae</b>	<i>Chondrodactylus laevigatus</i>	Button-scaled Gecko	LC	LC
<b>Gekkonidae</b>	<i>Pachydactylus montanus</i>	Namaqua Mountain Gecko	LC	LC
<b>Psammophiidae</b>	<i>Dipsina multimaculata</i>	Dwarf Beaked Snake	LC	LC
<b>Scincidae</b>	<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	LC
<b>Psammophiidae</b>	<i>Psammophis notostictus</i>	Karoo Sand Snake	LC	LC
<b>Agamidae</b>	<i>Agama atra</i>	Southern Rock Agama	LC	LC
<b>Testudinidae</b>	<i>Psammobates tentorius verroxii</i>	Tent Tortoise	NT	NT



Family	Species	Common Name	Conservation Status	
			Regional	Global
Cordylidae	<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	LC	LC
Lacertidae	<i>Pedioplanis lineoocellata</i>	Spotted Sand Lizard	LC	LC
Gekkonidae	<i>Pachydactylus mariquensis</i>	Common Banded Gecko	LC	LC
Gekkonidae	<i>Chondrodactylus laevigatus</i>	Button-scaled Gecko	LC	LC
Scincidae	<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	LC
Agamidae	<i>Agama aculeata</i>	Ground Agama	LC	LC



Figure 57: Evidence of some of the mammal species recorded within the project area including (A) *Hystrix africae australis*, (B) *Proteles cristatus*, (C) *Orycteropus afer* and, (D) *Lupulella mesomelas*

#### 9.2.3.4 AVIFAUNA

SABAP2 data indicate that 88 avifauna species are expected for the project area and surroundings. Of these, 6 are considered SCC. The likelihood of occurrence within the project area is included here.

Table 16: Threatened avifauna species that are expected to occur within the project area. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

Common Name	Scientific Name	Regional	Global	Likelihood of Occurrence
Karoo Korhaan	<i>Eupodotis vigorsii</i>	NT	LC	Observed
Lanner Falcon	<i>Falco biarmicus</i>	NT	LC	Observed
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN	EN	Observed
Martial Eagle	<i>Polemaetus bellicosus</i>	EN	EN	High



Common Name	Scientific Name	Regional	Global	Likelihood of Occurrence
Red Lark	<i>Calendulauda burra</i>	VU	VU	High
Sclater's Lark	<i>Spizocorys sclateri</i>	NT	NT	Moderate
Secretarybird	<i>Sagittarius serpentarius</i>	VU	EN	High
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	LC	High

*Eupodotis vigorsii* (Karoo Korhaan) is found in dwarf arid shrubland of the Nama Karoo and Succulent Karoo. They are resident and sedentary species which means their movement is restricted to their home range and they do not migrate locally. Their diets consist mainly of invertebrates, reptiles and plant matter, on which they feed while walking along. The pairs are monogamous and often breed in family groups. Helpers can assist in defending the territory or feeding of the young. They nest on the ground with the main egg-laying season being between June and February. Main threats include habitat degradation due to agricultural practices and ecosystem stresses due to climate change. This species was observed in the assessment.

*Falco biarmicus* (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from open grassland to open cleared woodlands and agricultural areas. Global population estimates are more than 30000 breeding pairs; in South Africa it is estimated to be 1400 pairs. They may occur in groups up to 20 individuals but have also been observed solitary. They are partial and facultative migrants, that breeds from May to early September. Nests are mostly found on cliff ledges, and they may alternate between more than one nest. Their diet is mainly composed of small birds such as pigeons and francolins. Anecdotal evidence suggests these species are susceptible to agrochemicals, another threat to their population is the clearing of grassland habitats. The species was recorded in the assessment.

*Neotis ludwigii* (Ludwig's Bustard) is listed as EN on a global scale. The species has a large range centred on the dry biomes of the Karoo and Namib in southern Africa, being found in the extreme south-west of Angola, western Namibia and South Africa. This species inhabits open lowland and upland plains with grass and light thornbush, sandy open shrub-veld and semi-desert in the arid and semi-arid Namib and Karoo biomes. Ludwig's Bustard is nomadic and a partial migrant, moving to the western winter-rainfall part of its range in winter. The diet includes invertebrates, small vertebrates and vegetable matter. The global population is estimated to be 100 000 – 499 999 individuals. The primary threat to the species is collisions with overhead power lines, with potentially thousands of individuals involved in such collisions each. Collision rates on high voltage transmission lines in the Karoo may exceed one Ludwig's Bustard per kilometre per year. Bustards have limited frontal vision so may not see power lines, even if they are marked. Observed in the PAOI.

*Polemaetus bellicosus* (Martial Eagle) is listed as EN on a regional scale and EN on a global scale. This species has an extensive range across much of sub-Saharan Africa, but populations are declining due to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with powerlines. It inhabits open woodland, wooded savanna, bushy grassland, thorn-bush and, in southern Africa, more open country and even sub-desert. The likelihood of occurrence in the area is high.

*Calendulauda burra* (Red Lark) is listed as VU both locally and internationally. Their habitat consists of tropical dry shrubland to dry lowland grassland. This species is threatened by habitat destruction and loss. The likelihood of this species occurring in the project area is high due to the suitable habitat found in the project area.

*Spizocorys sclateri* (Sclaters Lark) is classified as NT both locally and internationally. This species is native to South Africa and Namibia. It is found in dry shrubland, where its habitat is threatened by increased numbers of livestock in its habitat. The species has a moderate likelihood of occurring.

*Sagittarius serpentarius* (Secretarybird) has a wide distribution across sub-Saharan Africa, but surveyed densities suggest that the total population size does not exceed a five-figure number. Ad-hoc records, localised surveys and anecdotal observations indicate apparent declines in many parts of the species' range, especially in South Africa where reporting rates decreased by at least 60% of quarter degree grid cells used in Southern African Bird Atlas Projects. Threats include excessive burning of grasslands that may suppress populations of prey species,



whilst the intensive grazing of livestock is also probably degrading otherwise suitable habitat. Disturbance by humans is likely to negatively affect breeding. The species is captured and traded; however, it is unknown how many deaths occur in captivity and transit. Direct hunting and nest-raiding for other uses and indiscriminate poisoning at waterholes are also further threats. A proposed conservation action is that landowners of suitable properties should join biodiversity stewardship initiatives and to manage their properties in a sustainable way for the species' populations. It has a high likelihood of occurring in the area.

*Aquila verreauxii* (Verreaux's Eagle) is found in mountainous and rocky cliff habitat. They are usually found in pairs that remain close for up to 95 % of the day. This monogamous pair are solitary nesters with two nests in their territories, a main and an alternative nest. The nest is a stick structure, up to 1.8m in diameter. They mainly breed on steep inaccessible cliffs, but artificial structures and in some instances large trees are also used. Breeding occurs from April to November. Their diet consists of Hyrax (60%), Vervet Monkeys, Chacma Baboons and smaller mammal species. The species is locally persecuted in southern Africa where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined. There is a high likelihood for this species to exist in the project area.

### Coordinated Waterbird Counts

The Animal demographic unit launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part of South Africa's commitment to International waterbird conservation. Regular mid-summer and mid-winter censuses are done to determine the various features of water birds including population size, how waterbirds utilise water sources and determining the health of wetlands. There are no CWAC sites within 15 km of the project area (see Figure 58).

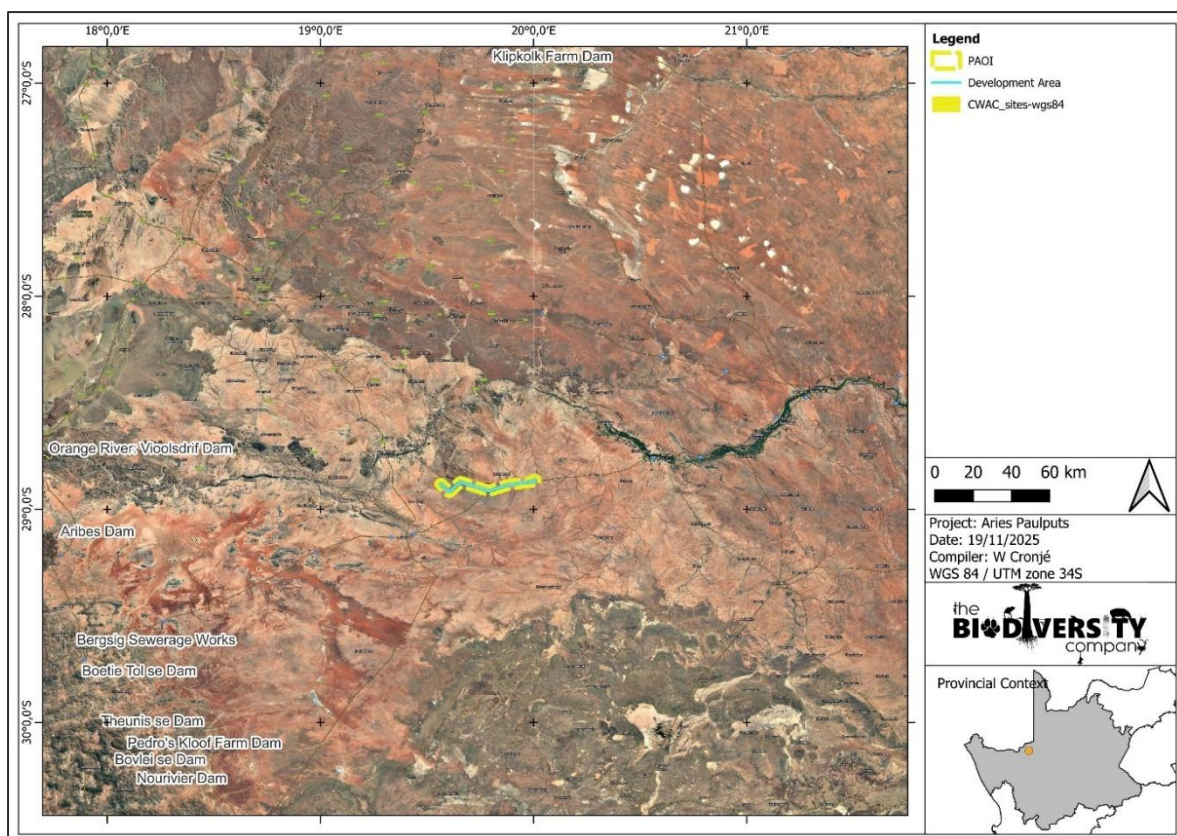


Figure 58: The project area in relation to the CWAC sites

### Coordinated Avifaunal Roadcount (CAR)

The ADU/Cape bird club pioneered avifaunal roadcount of larger birds in 1993 in South Africa. Originally it was started to monitor the Blue Crane *Anthropoides paradiseus* and Denham's Bustard *Neotis denhami*. Today it has



been expanded to the monitoring of 36 species of large terrestrial birds (cranes, bustards, korhaans, storks, Secretarybird and Southern Bald Ibis) along 350 fixed routes covering over 19 000 km. Twice a year, in midsummer (the last Saturday in January) and midwinter (the last Saturday in July), roadcounts are carried out using this standardised method. These counts are important for the conservation of these larger species that are under threat due to loss of habitat through changes in land use, increases in crop agriculture and human population densities, poisoning as well as man-made structures like power lines. With the prospect of wind and solar farms to increase, the use of renewable energy sources and monitoring of these species is most important. There are no CAR routes within 15 km of the project area as seeing in Figure...

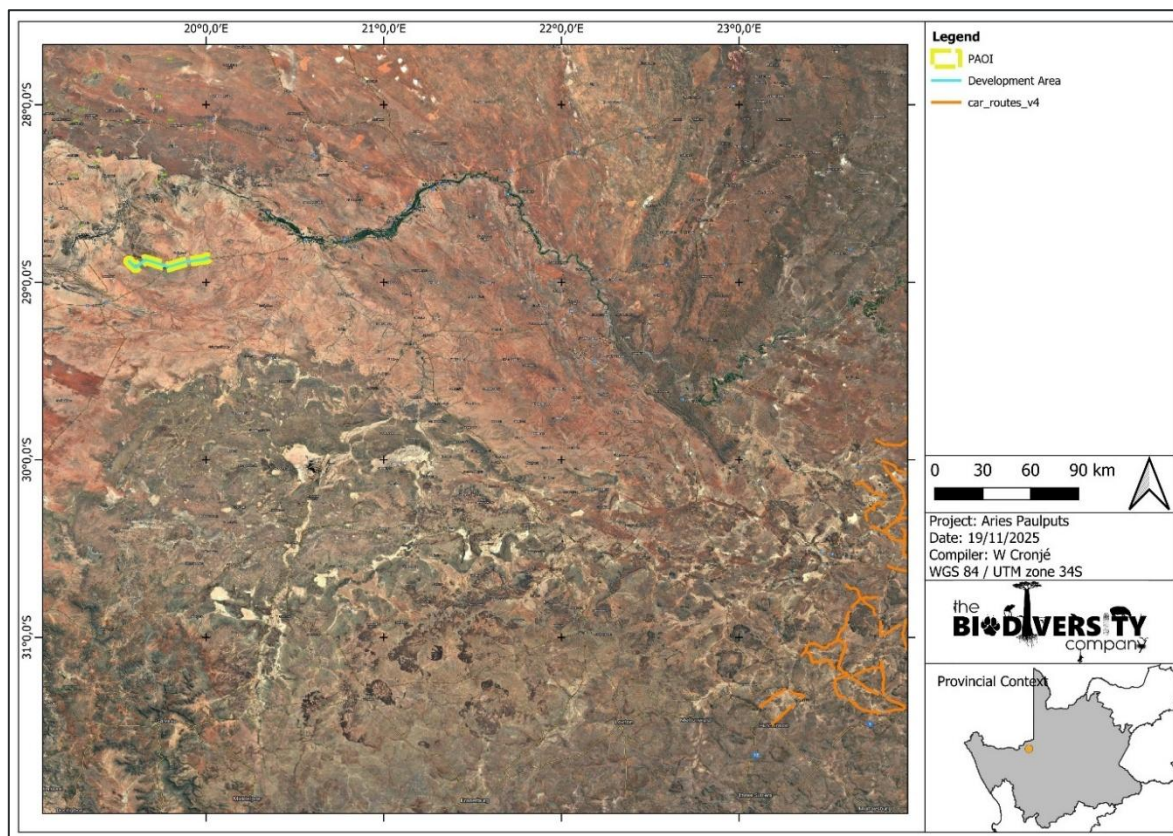


Figure 59: The CAR routes in relation to the project area

## 9.2.4 HABITATS

The following sections discuss the results from the field survey that was conducted for the proposed project, which was undertaken from the 3 to 6 November 2025.

### 9.2.4.1 NATURAL BUSHMANLAND ARID GRASSLAND

This habitat is characterised by the dominance of *Stipagrostis* species and low shrubs. Figure 60 includes photographs of the habitat type.

Dominant indigenous species characteristic of the vegetation type are present, including *Enneapogon desvauxii*, *Stipagrostis ciliata*, *S. obtusa*, *Tribulus cristatus*, *Cucumis africanus*, *Boscia foetida*, *Acanthopsis hoffmannseggiana* and *Kleinia longiflora*. Fauna observed within this habitat include *Vulpes chama* (Cape Fox), *Xerus inauris* (Cape Ground Squirrel), *Raphicerus campestris* (Steenbok), *Antidorcas marsupialis* (Sprinbuck), *Cynictis penicillata* (Yellow Mongoose) and *Herpestes pulverulentus* (Cape Grey Mongoose). Current impacts to this habitat type include historic excavations and farm roads or vehicle ingress. These impacts create edge effects to the surrounding natural habitat.

The main determining factor between the Natural Bushmanland Arid Grassland and the Disturbed Bushmanland Arid Grassland is the level of grazing pressure from agriculture depending on the management practices from

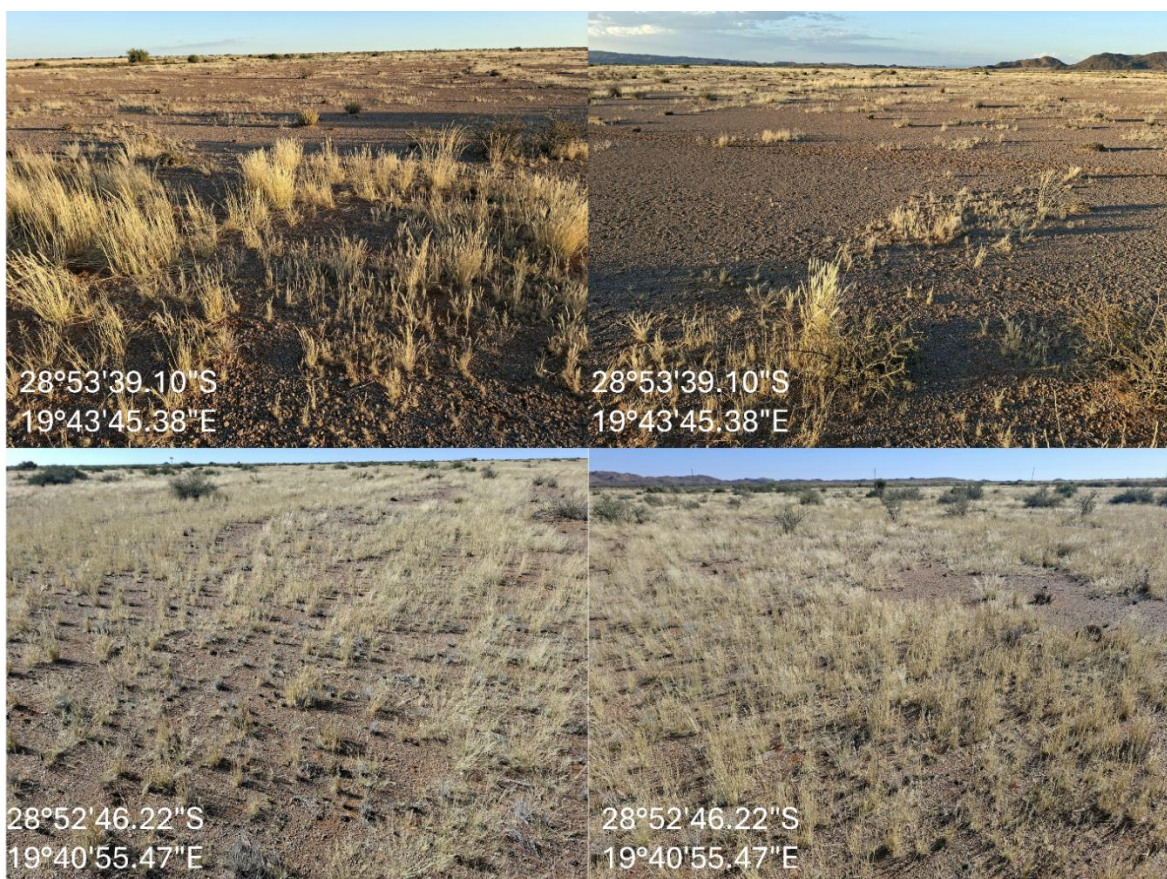


different farm owners. The fence line between farms showed clear differences in grass cover. This leads to the overall straight lines present within the delineations as seen in the full terrestrial ecology report included in APPENDIX D. This habitat type overlaps with CBA1, CBA2 and ESA.

Two plant SCC (*Hoodia gordonii* and Sensitive species 144) were found within this habitat type. No faunal SCC were observed within the project area, however, suitable habitat for SCC is present and it is expected that they can use the area as a movement corridor and for foraging. One (1) nationally protected tree species was found within this habitat type, *Vachellia erioloba* and three (3) provincially protected species (*Boscia foetida*, *Euphorbia hamata*, *E. spinea* and Sensitive species 144). One (1) AIP species was recorded (*Neltuma velutina*).

This habitat supports primary production, soil stabilization, nutrient cycling, and water regulation, enhanced by its substantial vegetation cover. This habitat provides ecological functions by offering structurally diverse habitat and refugia for multiple faunal species, while supporting pollination and seed dispersal through its flowering forbs and shrubs.

The mix of grasses and shrubs provides forage, and plant clumps offer shade and shelter, helping small mammals, reptiles, and ground-dwelling birds survive. The presence of SCC and protected plant species further underscores this habitat's importance in maintaining ecosystem functioning. It also facilitates the recruitment and dispersal of SCC into surrounding areas, supporting the persistence of these species and strengthening their population numbers.



#### 9.2.4.2 DISTURBED BUSHMANLAND ARID GRASSLAND

This habitat is representative of Bushmanland Arid Grassland, but in a disturbed state. Overgrazing and mismanagement has led to the grass layer being reduced to short tufts with sparse vegetation in between. Figure 61 includes photographs of the habitat type.



Indigenous species observed within this habitat include *Stipagrostis ciliata*, *Stipagrostis Obtusa*, *Boscia foetida* and *Aptosimum indivisum*.

The floral species richness within this habitat type is diminished due to anthropogenic influences. Current impacts include overgrazing, vehicle ingress and predator persecution.

Fauna observed within this habitat include *Otocyon megalotis* (Bat-eared fox), *Xerus inauris* (Cape Ground Squirrel), *Raphicerus campestris* (Steenbok), *Cynictis penicillata* (Yellow Mongoose) and *Orycteropus afer* (Aardvark). Two (2) floral SCC were observed within this habitat unit (*Hoodia gordonii* and Sensitive species 144) and potential fauna SCC may use the habitat as a movement corridor. This habitat type overlaps with ESA. One (1) nationally protected tree species was found within this habitat type, *Vachellia erioloba* and three (3) provincially protected species (*Boscia foetida*, *Euphorbia hamata*, *E. spinea* and Sensitive Species 144).

The ecosystem functioning and services of this habitat has been hindered due to the anthropogenic disturbances. This disturbed Bushmanland Arid Grassland habitat still however provides important ecosystem services, including soil stabilization through remaining grass and shrub cover, which helps reduce wind and water erosion. The habitat offers movement corridors for a variety of fauna such. The area also contributes to biodiversity conservation by supporting indigenous and protected species including SCC.

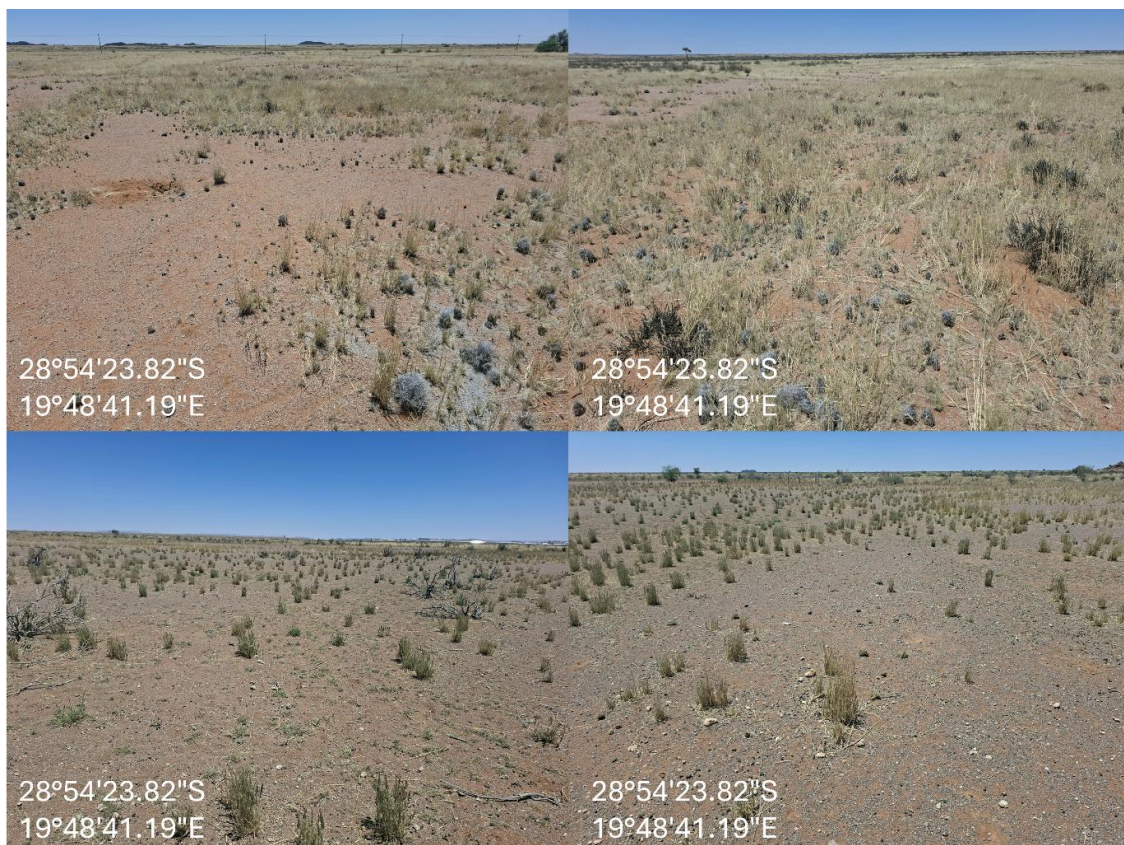


Figure 61: Photographs of Disturbed Bushmanland Arid Grassland habitat type as observed on site.



#### 9.2.4.3 BUSHMANLAND SANDY GRASSLAND

This habitat unit is defined by gently undulating patches of deep red sands >300 mm deep with dominating white grasses (*Stipagrostis spp.* and *Schmidtia spp.*) and abundant drought-resistant shrubs. Figure 62 includes photographs of the habitat type.

Indigenous species observed within this habitat include *Stipagrostis ciliata*, *S obtusa.*, *Schmidtia kalahariensis*, *Tribulus zehyri* and *Lycium sp.* Fauna observed within this habitat include *Trachylepis occidentalis* (Western Three-striped Skink). One flora SCC was found within this habitat (*Hoodia gordonii*). This habitat is representative of the Bushmanland Sandy Grassland.

Current impacts include edge effects from existing infrastructure (substation, roads and neighbouring solar farm). Disturbance to fauna include vehicle collisions, light disturbance and noise disturbance. Even though current disturbances to fauna are present, this unit offers foraging and nesting habitat for species, including potential SCC. This habitat provides erosion control and nutrient cycling. Carbon sequestration and nectar resources for pollinators is also provided. This habitat assists the neighbouring habitat with plant recruitment.

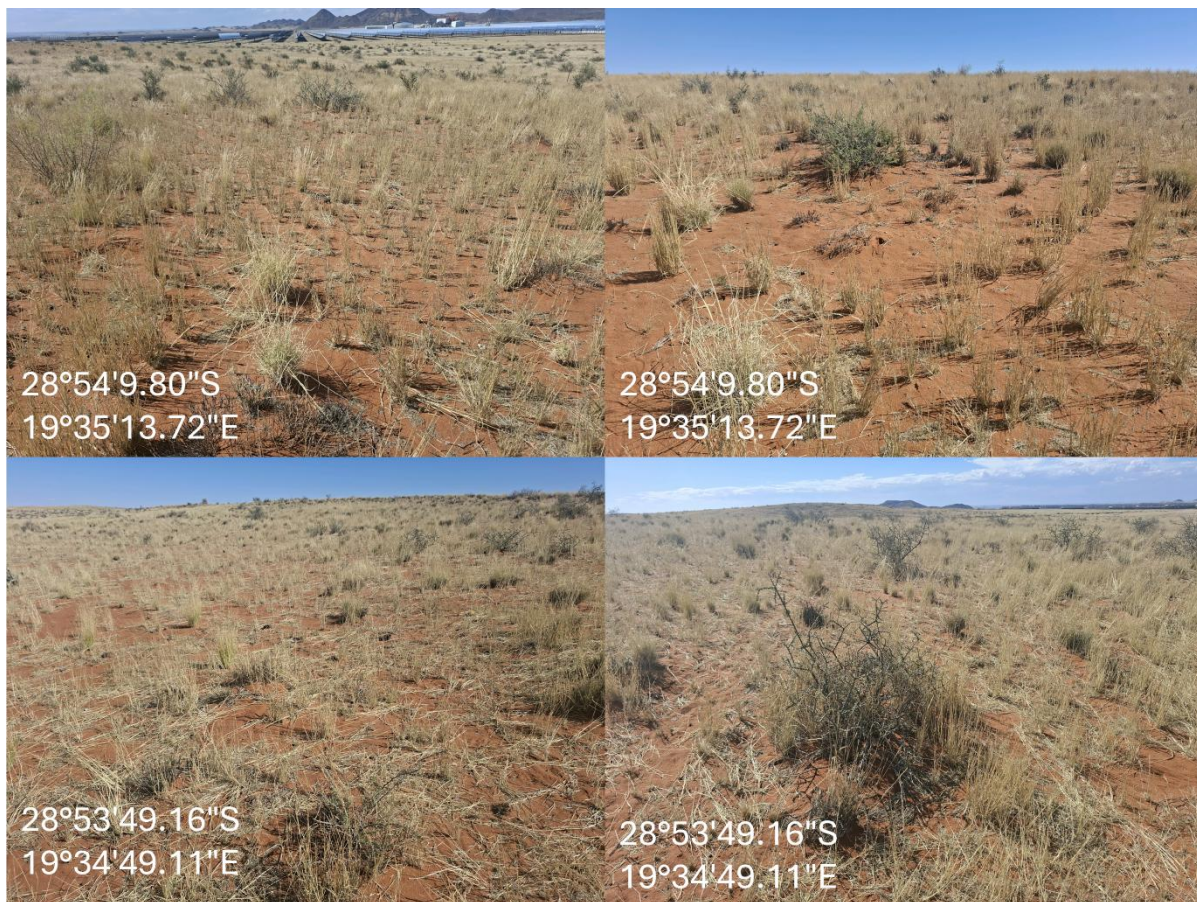


Figure 62: Photographs of Disturbed Bushmanland Sandy Grassland habitat type as observed on site.

#### 9.2.4.4 ROCKY OUTCROP

This habitat consists of zones with extensive rock cover, interspersed with vegetation typical of the Bushmanland Sandy Grassland. The size and structure of these areas vary, with some sections featuring flatter terrain and smaller rocks, while others are characterized by prominent outcrops and larger boulders. Figure 63 includes photographs of the habitat type.

Fauna observed include *Procavia capensis* (Rock Hyrax). One SCC was found within this habitat (*Hoodia gordonii*).



No fauna SCC were observed; however, this habitat is suitable for *Psammobates tentorius veroxii* and other herpetofauna species that utilise rocky substrate. This habitat experiences minimal anthropogenic impacts, remains largely natural, and provides important habitat for local fauna, including herpetofauna that may be limited to certain microhabitats. This habitat provides key ecosystem services, microclimate regulation, and nutrient cycling through its unique combination of rock cover and indigenous vegetation.

The natural state and structural diversity of the habitat offer essential shelter for local fauna with the possibility of herpetofauna such as *Psammobates tentorius veroxii* (NT). The presence of species of conservation concern like *Hoodia gordonii* highlights its role in supporting SCC populations.

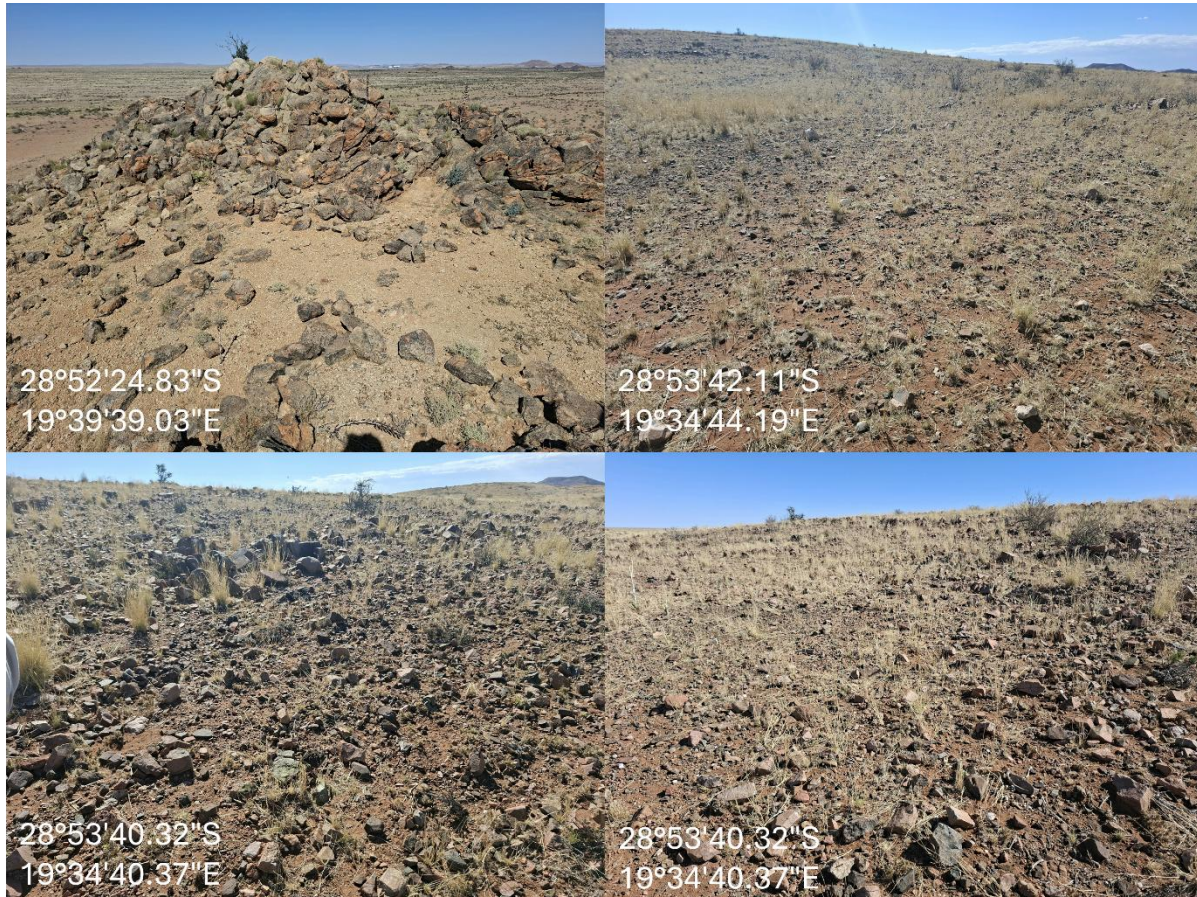


Figure 63: Photographs of Rocky Outcrop habitat type as observed on site.

#### 9.2.4.5 WATER RESOURCES AND ASSOCIATED INLAND AQUATIC ECOSYSTEMS

Seasonally wet portions of land as delineated by the aquatic specialists. These include Rivers, Tributaries and a Temporary Depression Wetland. Figure 64 includes photographs of the habitat type.

Additional information regarding this habitat unit may be found in the accompanying Aquatics Report (APPENDIX D). Please note that the delineations of this habitat were also provided by the Aquatic Specialist in the aquatic report.

Indigenous species observed within this habitat include *Rhigozum trichotomum* (dominant), *Boscia foetida* and *Parkinsonia africana*. Two (2) floral SCC were observed within this habitat unit (*Hoodia gordonii* and Sensitive species 144) and potential fauna SCC may use the habitat as a movement corridor. AIP observed include *Neltuma velutina*. The Water Resources provide water to faunal species during time of flow.

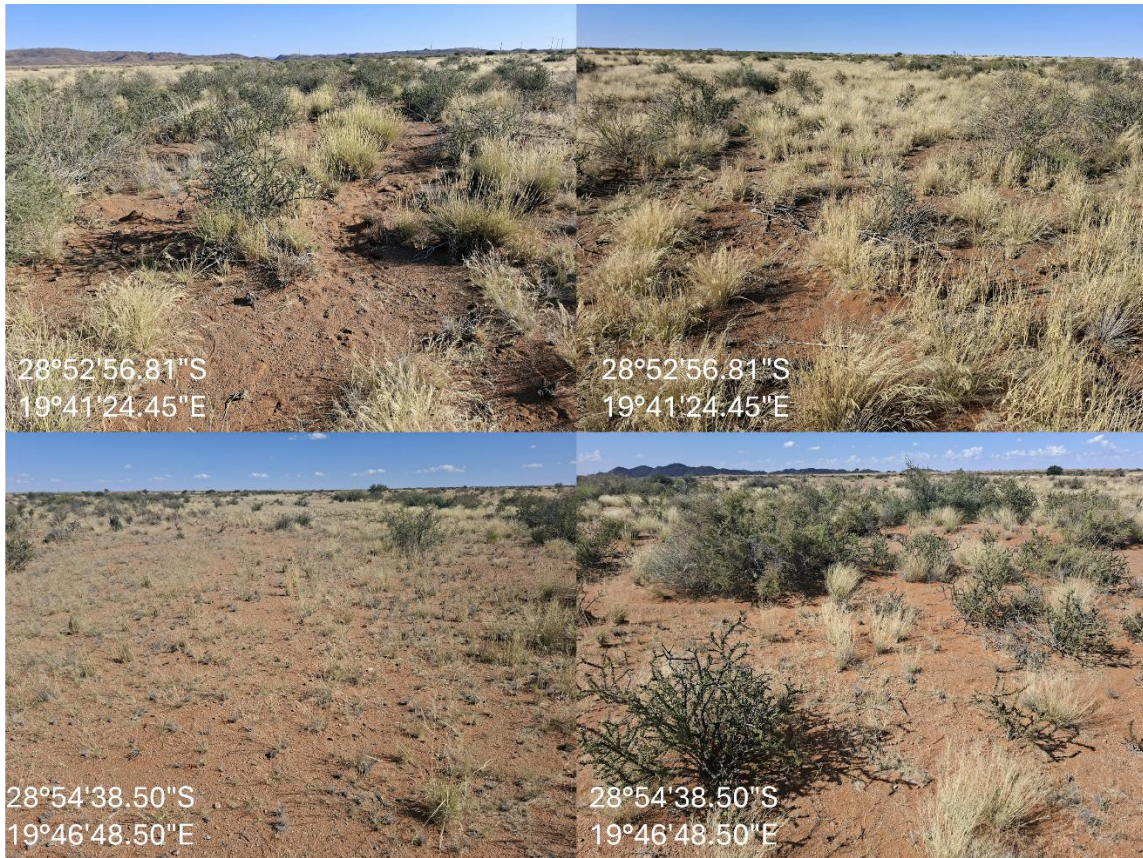


Figure 64: Photographs of water resources and associated habitat types as observed on site.

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened'.

The 500 m regulated zone surrounding the PAOI overlaps with a CR wetland and unclassified wetlands, as well as EN rivers (Waholtesruit and Nous), LT rivers (Kantbrogas se Laagte and Samoep), and one unclassified river (Figure 65).

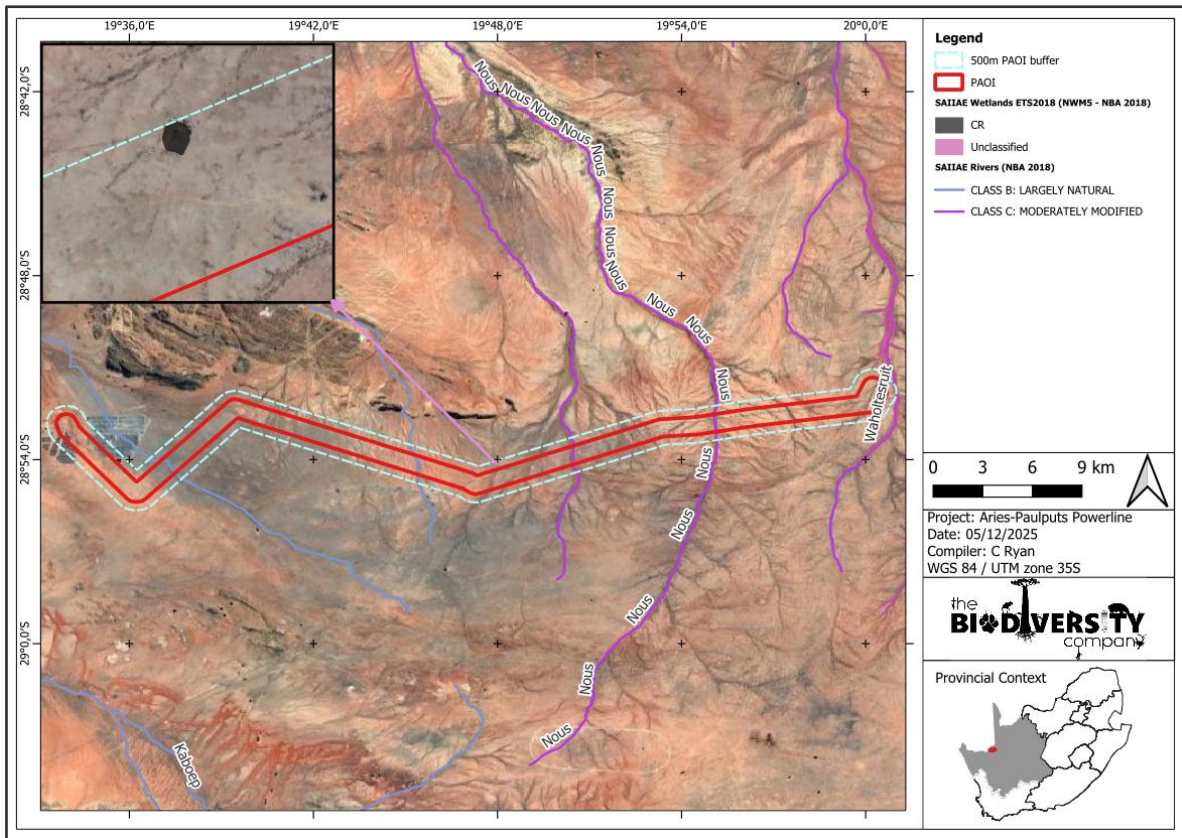


Figure 65: The project area in relation to the South African Inventory of Inland Aquatic Ecosystems

#### 9.2.4.6 MODIFIED

Modified habitats, in this instance, include, roads, historical excavations and infrastructure associated with the Paul-Puts Powerstation (substation and powerlines). They are largely ecologically dysfunctional and have plant species that are characteristic of disturbance (*Tetraena simplex*). Figure 20 includes photographs of the habitat type.

The ecosystem functions and services of this habitat have been severely compromised due to modification. However, it still offers some benefits, particularly by supporting the dispersal of wind-borne plant seeds, which aids in plant recruitment in surrounding areas.

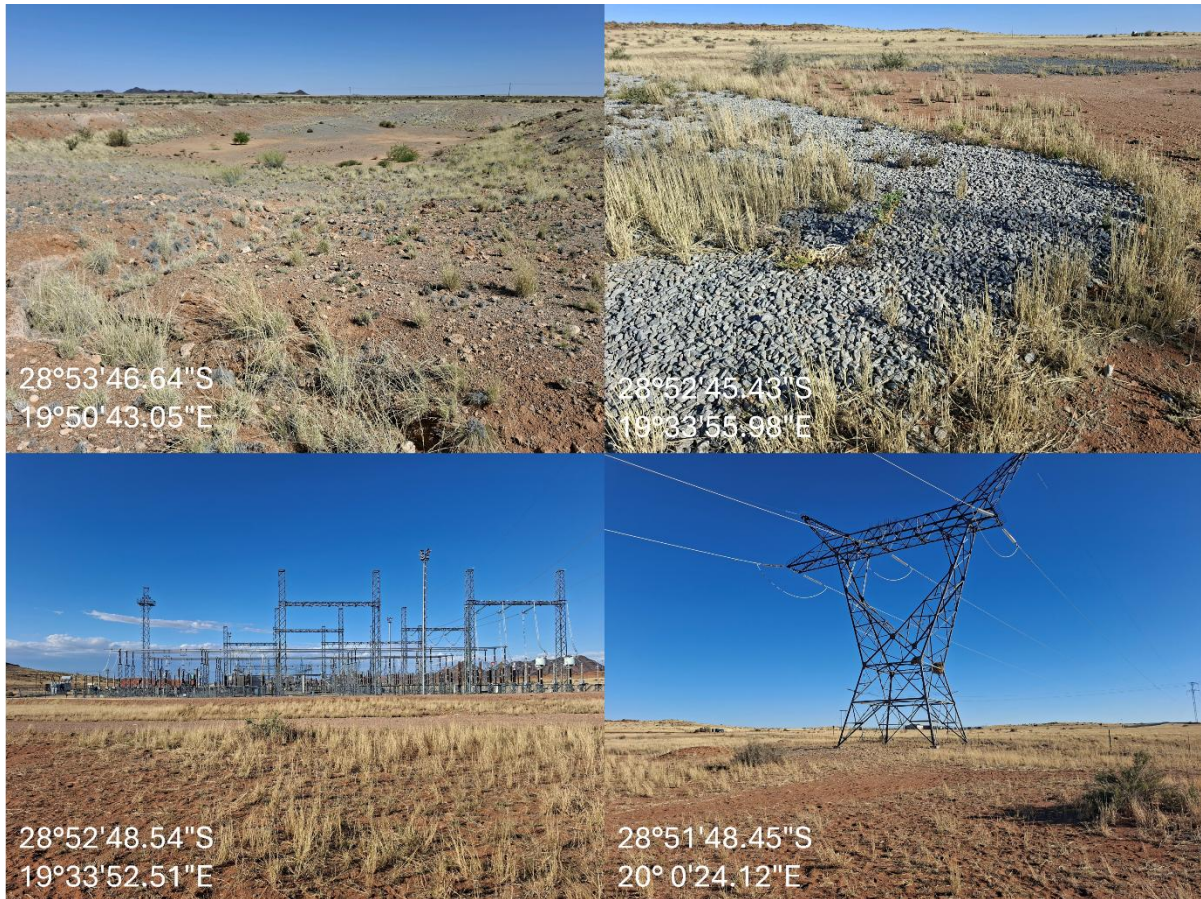


Figure 66: Photographs of modified habitat type as observed on site.

#### 9.2.4.7 HABITAT WALKDOWN ASSESSMENT

The different habitat types identified were mapped following the site-specific walkdown. This allowed for a more refined understanding of the spatial extent of the habitats associated with the project area.

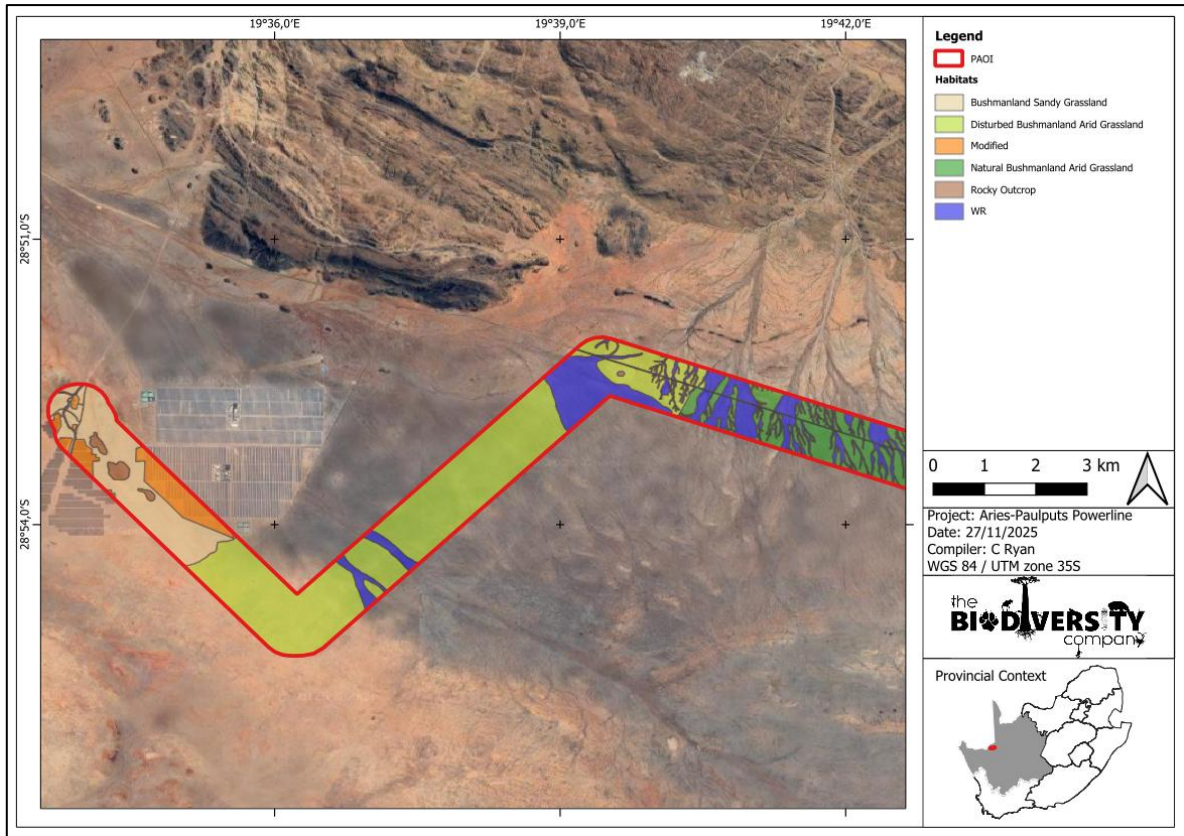


Figure 67: Habitats identified within the project area (Map 1).

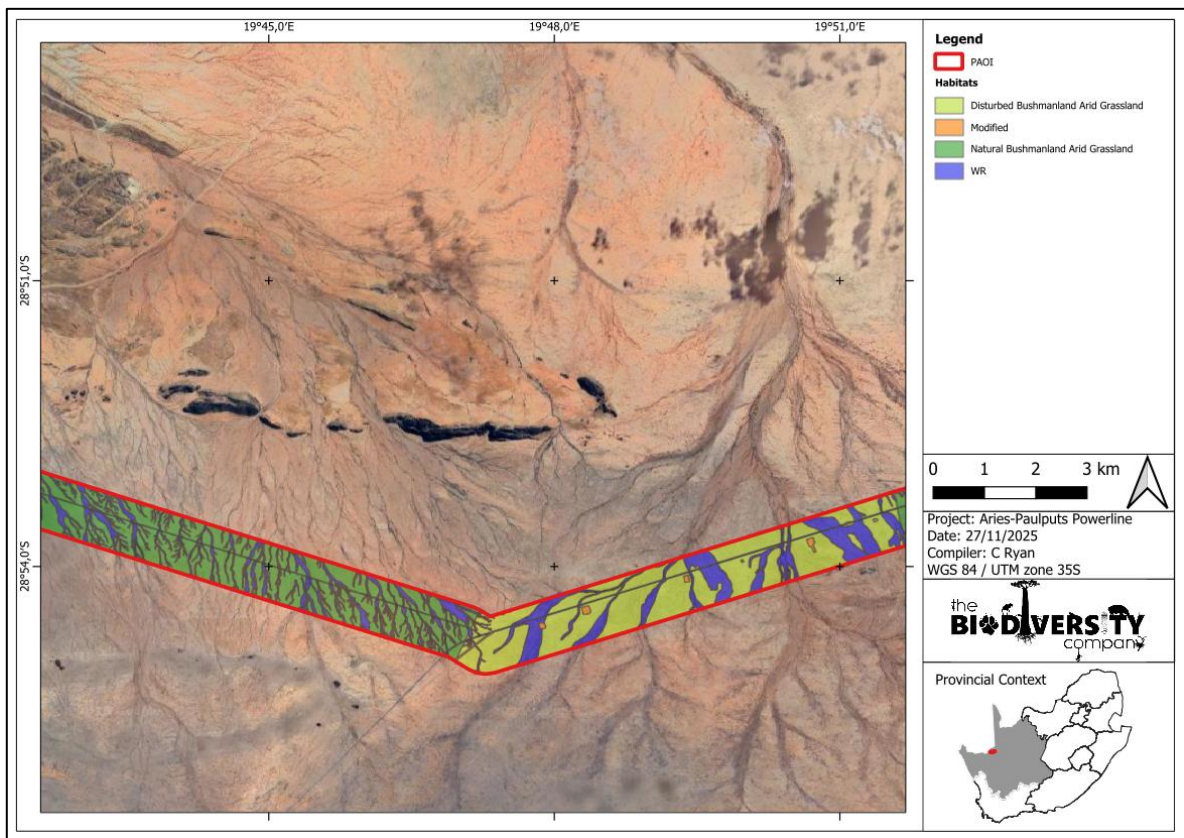


Figure 68: Habitats identified within the project area (Map 2).

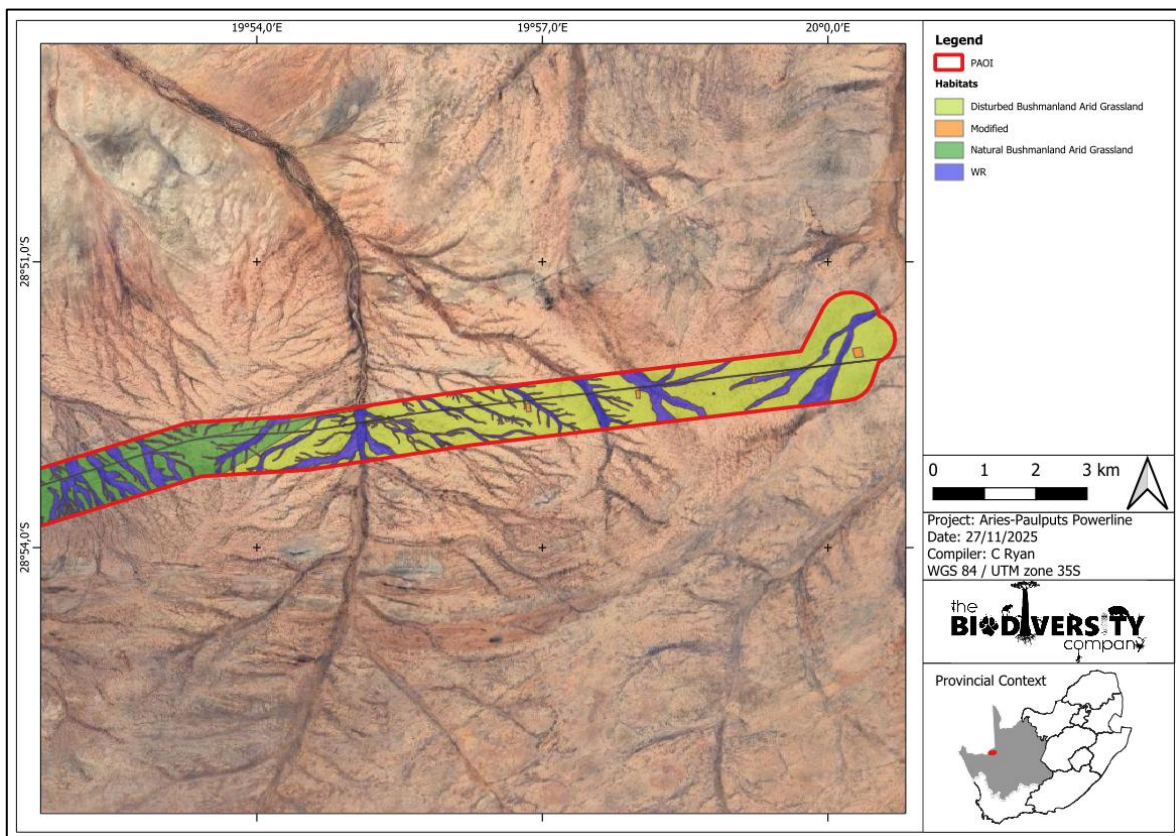


Figure 69: Habitats identified within the project area (Map 3).

#### 9.2.4.8 SITE ECOLOGICAL IMPORTANCE

the habitats recorded and its flora and fauna within the project area were assigned a sensitivity category, i.e., a Site Ecological Importance (SEI) category. The project area was categorised as possessing a 'High', 'Medium', 'Low' and 'Very Low' SEI across the five (5) habitats.

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience (RR)	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
Natural Bushmanland Arid Grassland	Medium Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	High Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance	Medium	Medium Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Medium Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.



		and good rehabilitation potential.			
	> 50% of receptor contains natural habitat with potential to support SCC.				
	Medium	Medium		Medium	Medium
<b>Disturbed Bushmanland Arid grassland</b>	<p>Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.</p> <p>&gt; 50% of receptor contains natural habitat with potential to support SCC.</p>	<p>Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.</p> <p>Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.</p>	Medium	<p>Will recover slowly (~ more than 10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality</p>	<p>Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.</p>
	Medium	Medium		Medium	Medium
<b>Bushmanland Sandy Grassland</b>	<p>Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.</p> <p>&gt; 50% of receptor contains natural habitat with potential to support SCC.</p>	<p>Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity.</p> <p>Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.</p>	Medium	<p>Will recover slowly (~ more than 10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality</p>	<p>Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.</p>
	Medium	High	Medium	Low	High



<p><b>Rocky Outcrop</b></p>	<p>Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.</p> <p>&gt; 50% of receptor contains natural habitat with potential to support SCC.</p>	<p>Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches.</p> <p>Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.</p>		<p>Habitat that is unlikely to be able to recover fully after a relatively long period: &gt; 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality</p>	<p>Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.</p>
<p><b>Modified</b></p>	<p>Low</p> <p>No confirmed or highly likely populations of SCC.</p> <p>No confirmed or highly likely populations of range-restricted</p>	<p>Very Low</p> <p>No habitat connectivity except for flying species or flora with wind-dispersed seeds.</p> <p>Several major current negative ecological impacts.</p>	<p>Very Low</p>	<p>High</p> <p>Habitat that can recover relatively quickly (~5–10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.</p>	<p>Very Low</p> <p>Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.</p>
<p><b>Water Resources (Rivers and Wetlands)</b></p>	<p>Medium</p> <p>Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.</p> <p>&gt; 50% of receptor contains natural habitat with potential to support SCC.</p>	<p>Very High</p> <p>No or minimal current negative ecological impacts, with no signs of major past disturbance.</p>	<p>High</p>	<p>Medium</p> <p>Will recover slowly (~ more than 10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality</p>	<p>High</p> <p>Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.</p>
	<p>Medium</p>	<p>High</p>	<p>Medium</p>	<p>Medium</p>	<p>Medium</p>



<b>Water Resources (Tributaries)</b>	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	> 50% of receptor contains natural habitat with potential to support SCC.			

## 9.3 SOCIAL AND CULTURAL ENVIRONMENT

### 9.3.1 LAND-USE

Land use is predominantly agricultural, with large farm portions forming the primary spatial units. These farms support low-intensity livestock grazing, mainly sheep and goats, due to the limited carrying capacity of the land.

Scattered farmsteads and associated infrastructure such as water troughs, windmills, and small farm dams are common features, providing essential water supply for livestock. The area is intersected by two main regional routes (the N14 and R357) which serve as important transport corridors for local communities and regional traffic.

In addition to agricultural activities, the landscape includes existing energy infrastructure. The Paulputs Substation is located within the project area, and nearby CSP and PV facilities have introduced industrial elements into an otherwise rural setting. A quarry is also present in the broader area, contributing to localized land transformation.

Overall, land use remains largely rural and agricultural, with industrial activities limited to energy and quarrying operations concentrated near the substation and along the main transport routes.

### 9.3.2 DEMOGRAPHICS

The Northern Cape has a small population of 1 355 629 people while being the largest province of South Africa. Afrikaans is the most spoken language in the province, followed by Setswana and isiXhosa. The two Local Municipalities, i.e., Kai !Garib and Khai-Ma, account for 93 000 people of this population. The ZF Mgcawu District Municipality accounts for 30% of the Northern Cape's land area. Given the district municipality's large expanse, a low person/km ration is noted. Kai !Garib Local Municipality supports 24% of the ZF Mgcawu's population. Figure 70 provides a summary of population statistics relating to the two district and two local municipalities intersected by the project area.

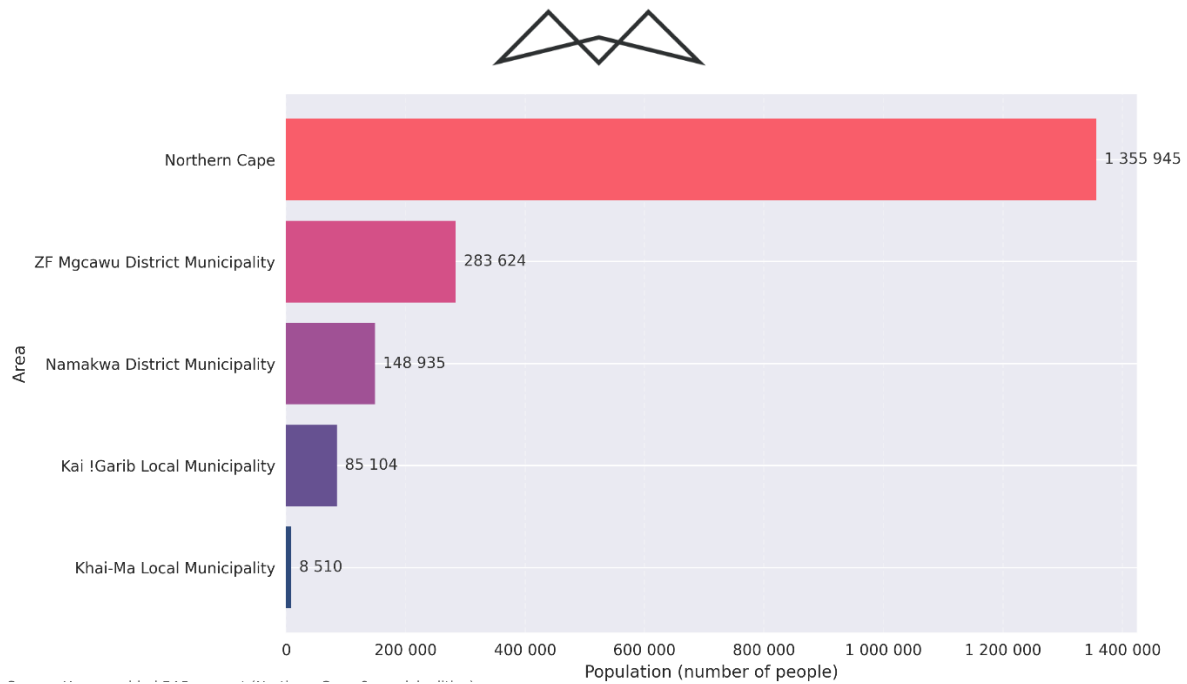


Figure 70: Population of Northern Cape and intersected municipalities

The province's population has slightly increased between 2011 and 2022. Approximately 66% of the population is of working age, i.e. between 15 and 64 years old, with 28% of the population being young children, and 6% being the elderly.

Considering the site itself, a few settlements or farmhouses are present in the area. The closest town to the site is Pofadder. Pofadder is a very small town in South Africa, with a population of about 3 000 people as per the 2011 Census statistics. Afrikaans is the dominant language of the town with approximately 95% of the population speaking it as a first language.

### 9.3.3 ECONOMY

Considering available data, the main economic activity of the Northern Cape is mining, followed by agriculture. Agricultural activities of the province relate to irrigation-based agriculture linked to the Orange River in the north. The Kai !Garib Local Municipality is characterised by this form of agricultural activities. The economic structure of the Namakwa District Municipality underpinning jobs is mining-led, with Mining contributing 39.8% to the district's total industry output.

Considering the project area itself, the main economic activities relate to livestock farming, as well as the renewable energy facilities.

### 9.3.4 EMPLOYMENT

The IDPs of the two District Municipalities, i.e., Namakwa and ZF Mgqawu were considered which provided detail on the employment statistics related to the project area.

#### 9.3.4.1 NAMAKWA DISTRICT MUNICIPALITY

Employment is concentrated in Nama Khoi (42.25%) and Khai-Ma (28.69%). As of 2022, the unemployment rate of the District Municipality was 28%.

#### 9.3.4.2 ZF MGCAWU DISTRICT MUNICIPALITY

This district municipality, while characterised by its low persons/km ratio, is also characterised by high poverty and high unemployment rates according to the IDP of 2022.

### 9.3.5 INFRASTRUCTURE AND PUBLIC SERVICES

The project area intersects with two main roads, the N14 and the R357. The N14 is a critical transport route which aids in traveling to the local communities and towns such as Kakamas and Pofadder. Further, farmers,



who make up the majority of the people traveling around the area, rely on the dirt roads which branch off from the main roads. The dirt roads are critical for farmer activities and serve as transport routes for employees and personnel working at the nearby CSPs and Paulputs Substation itself.

Public services in the surrounding area are limited due to its rural nature and low population density. Basic infrastructure such as water supply and sanitation is primarily managed at the farm level, with boreholes and windmills supporting livestock farming.

### 9.3.6 EDUCATION

Education statistics were accessible through census data of 2022 (StatsSA, 2022) relating to the two Local Municipalities intersected, i.e., Kai !Garib, and Khai-Ma Local Municipalities. These data are presented as such.

#### 9.3.6.1 EDUCATION IN THE KAI !GARIB LOCAL MUNICIPALITY

Education in Kai !Garib shows mixed progress. Among youth aged 5-24, about two-thirds (65,7%) attend an educational institution, while roughly one-third (34,3%) do not, indicating challenges with school access or retention (See Figure 71). For adults (20+ years), the largest share (49%, and nearly half) has some secondary education but did not complete it. Around a quarter have matric (Grade 12), and only a small proportion (3,5%) achieved higher education. A smaller segment has only primary schooling or no schooling at all. See Figure 72 for visual representation of these data.

Overall, this suggests that while basic education access is relatively strong, dropout rates during secondary school remain high, matric completion is moderate, and tertiary education attainment is very low. These patterns point to a need for interventions focused on improving retention through secondary school, boosting matric pass rates, and expanding access to post-school training and higher education opportunities.

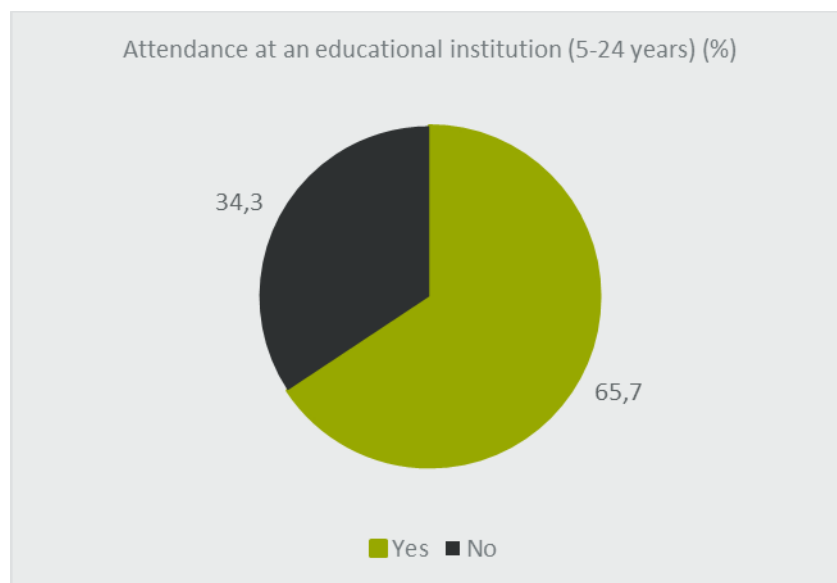


Figure 71: Attendance at an educational institution (5-24 years) in Kai !Garib Local Municipality

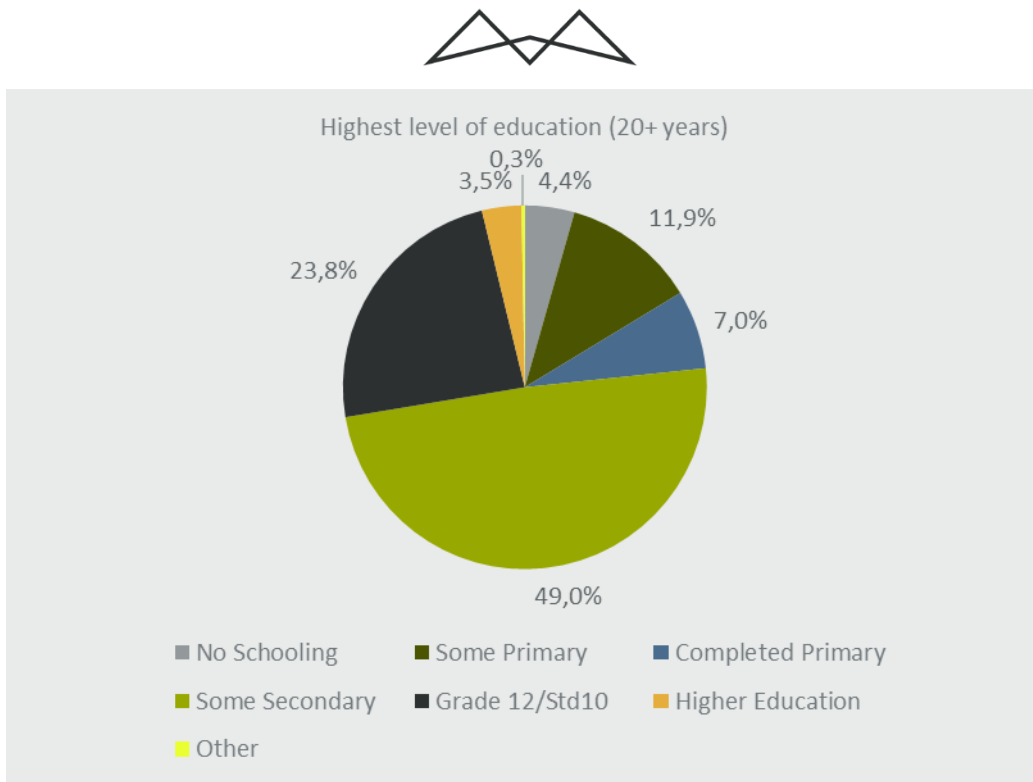


Figure 72: Highest level of education (20+ years) in Kai !Garib Local Municipality

### 9.3.6.2 EDUCATION IN THE KHAI-MA LOCAL MUNICIPALITY

Education in Khai-Ma reflects similar trends to other rural areas in the Northern Cape. Among youth aged 5-24, approximately 61% attend an educational institution, while about 39% do not, indicating notable challenges with school access and retention (see Figure 73).

For adults (20+ years), the largest proportion, 48,4% has some secondary education but did not complete matric. 30,6% have matric (Grade 12), and only 4,6% achieved higher education. Smaller segments have only primary schooling (9%) or no schooling at all (0,6%). See Figure 74 for visual representation of these data.

Overall, this suggests that while basic education access is relatively strong, dropout rates during secondary school remain high, matric completion is moderate, and tertiary education attainment is very low. These patterns highlight the need for interventions to improve secondary school retention, matric pass rates, and access to post-school training and higher education opportunities.

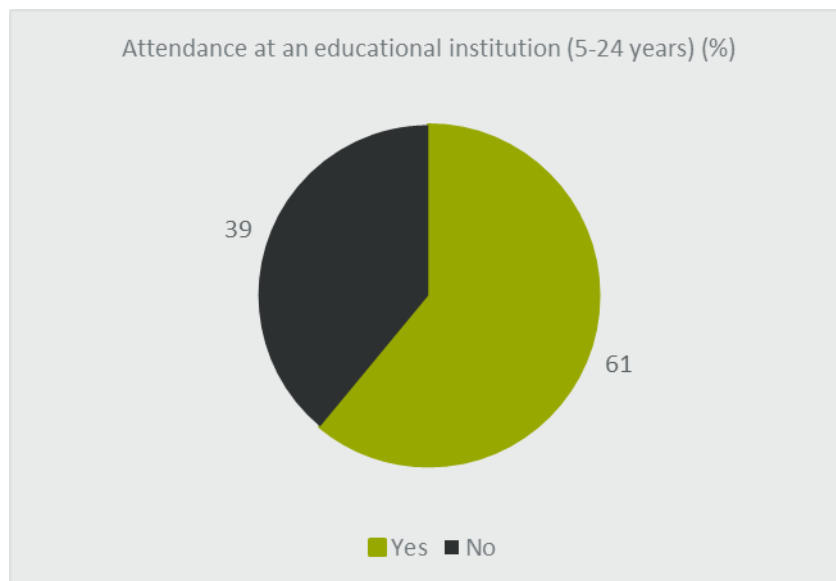


Figure 73: Attendance at an educational institution (5-24 years) in Khai-Ma Local Municipality

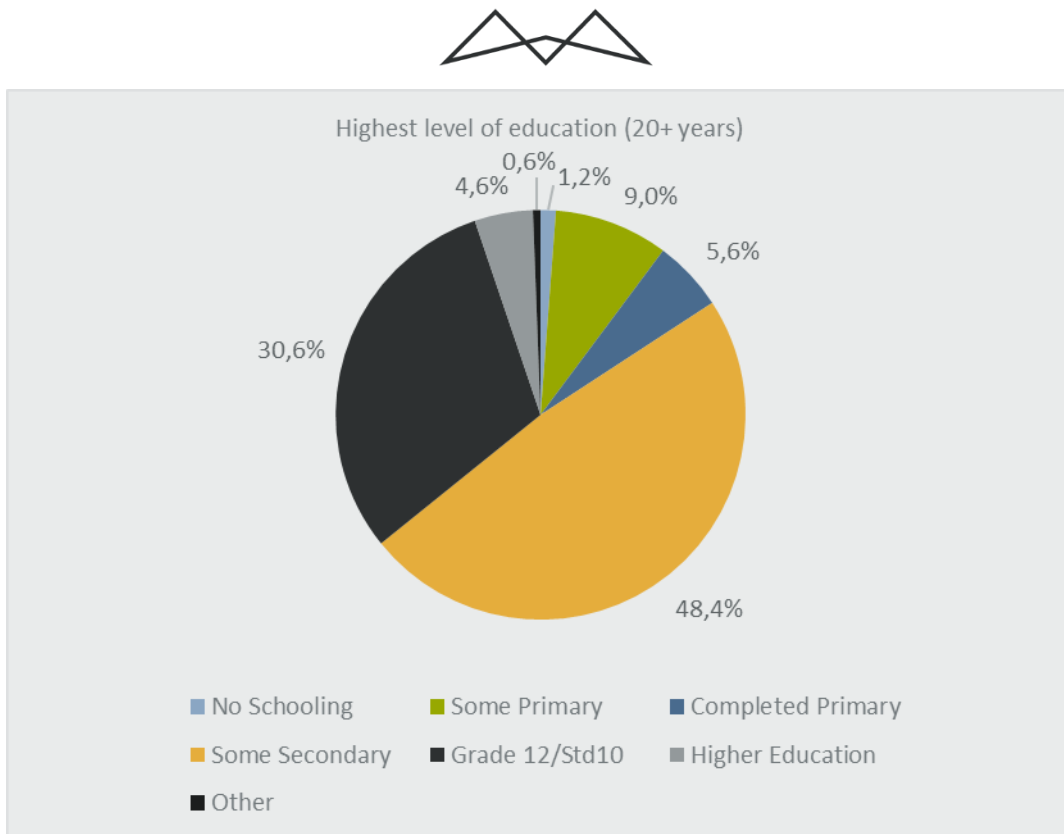


Figure 74: Highest level of education (20+ years) in Khai-Ma Local Municipality

### 9.3.7 HEALTH

The IDPs of the two District Municipalities, i.e., Namakwa and ZF Mgcawu were considered which provided detail on healthcare related to the project area.

#### 9.3.7.1 ZF MGCWU DISTRICT MUNICIPALITY

Health services in ZF Mgcawu are unevenly distributed, with most hospitals and community health centers concentrated along the N14 corridor. The district has five hospitals (located in Kakamas, Keimoes, Upington, and Postmasburg) and only two community health facilities (Kenhardt and Rietfontein). There are 52 clinics, with Kai !Garib hosting the most (18), followed by Dawid Kruiper (14), while smaller municipalities like Kgatelopele have as few as three. Despite this infrastructure, the IDP highlights shortages of skilled health personnel, irregular mobile clinic services, and inadequate coverage in remote areas. Public health challenges include high HIV and TB prevalence, compounded by poverty, malnutrition, and limited access to healthcare. Climate change adaptation measures are being considered to address health risks from extreme weather, air pollution, and occupational hazards.

#### 9.3.7.2 NAMAKWA DISTRICT MUNICIPALITY

Namakwa's health profile is shaped by its demographic trends and rural context. The population pyramid indicates a shrinking elderly population and a growing younger population, which has implications for healthcare planning. While the IDP does not provide detailed facility counts in the excerpt, it emphasises the need for age-specific health services, including senior care and maternal/child health programs. The district faces challenges typical of remote areas, such as limited access to specialized healthcare, reliance on small clinics, and the need for improved social services. Future planning must consider resource allocation for both aging residents and young families, ensuring adequate healthcare infrastructure and preventive programs.

### 9.3.8 CULTURAL HERITAGE

The Northern Cape Province is associated with a long archaeological record that spans across pre-historic and historic periods. Most notable is the region's significant role in terms of Hunter-gatherer activity. The closest



town to the site in question is Pofadder, which itself embodies rich heritage in relation to the colonial history and modern economic development of South Africa.

#### 9.3.8.1 EARLY HOMININ SUBSISTENCE BEHAVIOR AND LATER EMERGENT HUNTER-GATHERER ACTIVITY

Stone Age artefacts or finds and sites form a key component of the archaeological record of the Northern Cape. This is related to the extensive early hominin and later hunter-gatherer activity in the area. The Northern Cape Stone Age is defined by its lithic collection which includes examples of ESA, MSA, and LSA. Key examples of the lithic finds associated with the Northern Cape can be observed at Wonderwerk Cave and Canteen Kopje as previously discussed, and around the Kathu Townlands (Walker *et al.*, 2014). Figure 75 and Figure 76 includes some examples of the lithic finds one can expect associated with early hominin sites in the Northern Cape.

Other finds include the occurrence of graves and human remains as well as stone engravings or petroglyphs. Rock engravings have been observed in areas around the Northern Cape and have been attached to hunter-gatherer activity. Driekopseiland near Kimberley is a key example site including rock engravings in the Northern Cape. This site has been extensively studied and interpreted in relation to hunter-gatherer traditions and belief systems (Deacon, 1997; Morris, 2022, 2016; van Riet Lowe, 1952). Further, the petroglyphs observed in the Northern Cape (Figure 77) are but some examples of similar rock art found across the country.

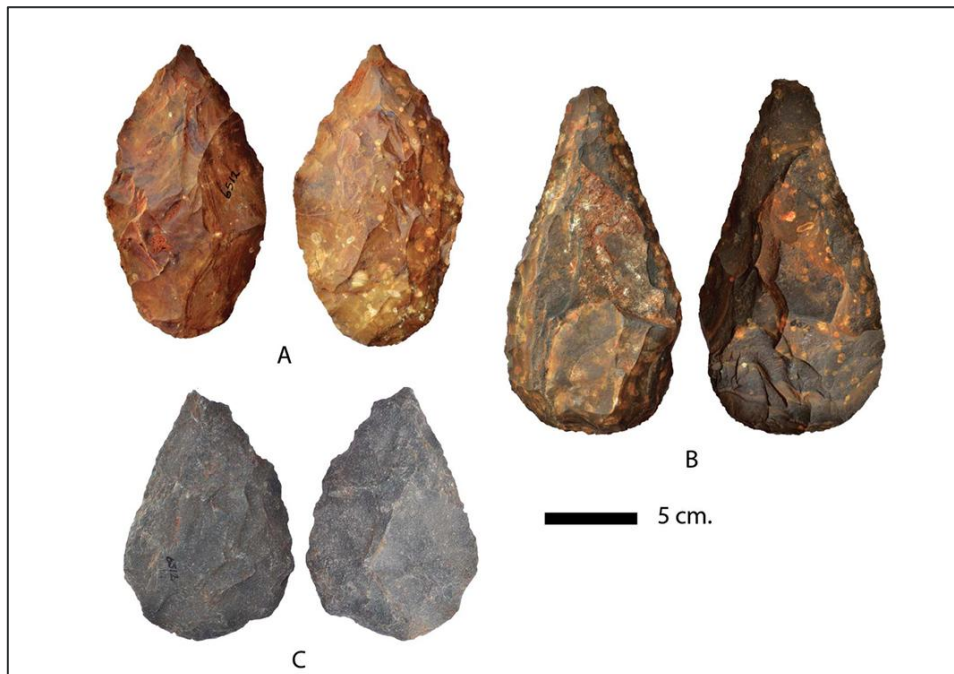


Figure 75: Some key examples of handaxes found near the Kathu Townlands. The examples are banded ironstone (A and B), and Quartzite (C) (After Walker *et al.*, 2014)

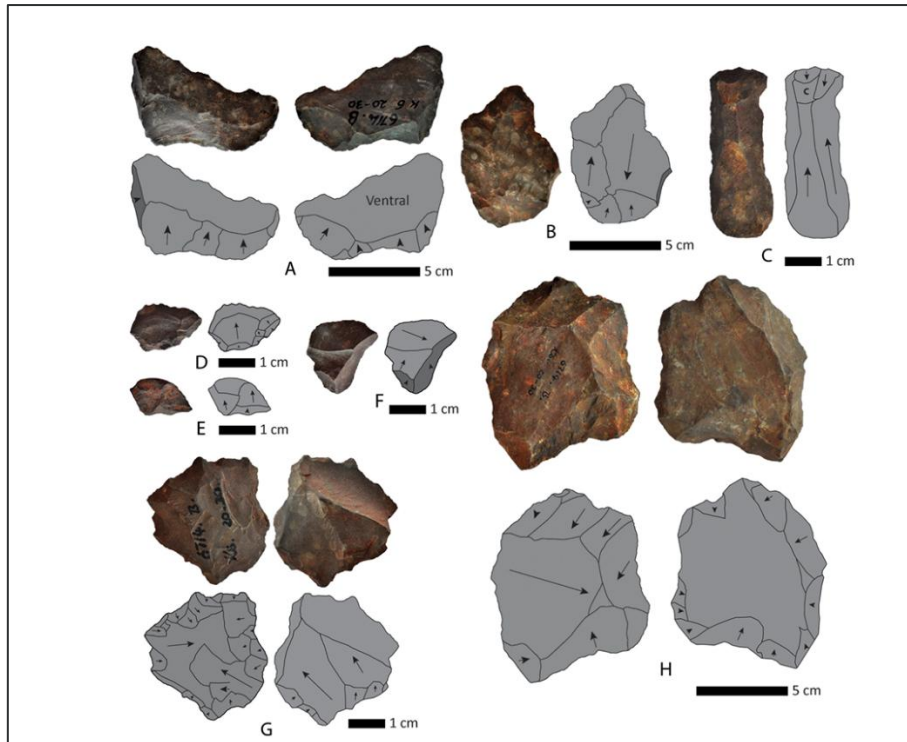


Figure 76: Examples of small flakes and cores. (A) Large flake off of the edge of the core consistent with biface shaping removal, (B) Large flake with dorsal scars (C) Blade (D–F) Small flakes (G–H) Discoidal cores. (After Walker et al., 2014)



Figure 77: A photograph taken of engraved motifs forming part of the petroglyphs identified at Driekopseiland near Kimberley, Northern Cape (After Morris, 2022).



### 9.3.8.2 CULTURAL HISTORY OF POFADDER

Established in 1875 as a mission station, Pofadder has a rich colonial history. The town was named after the Koranna chief, Klaas Pofadder. The town had been subsequently renamed to Theronville, but the name was never fully adopted hence why the town preserved its original name. A notable landmark of Pofadder is a Roman Catholic Church (Figure 78). Many of the original mission buildings and churches of the town continue to be used as cultural heritage markers.



Figure 78: Photograph of the Pofadder Catholic Church

### 9.3.8.3 ON-SITE HERITAGE FEATURES

A Heritage Impact Assessment (HIA) together with a site-specific tower-to-tower walkdown was conducted and compiled by Dr Lucien James. In summary, Three sites were identified through an initial desktop assessment, and 32 sites identified through the field survey activities. Refer to APPENDIX D for full HIA.

#### A) INITIAL DESKTOP ASSESSMENT RESULTS

An initial desktop assessment was undertaken to ascertain the overall sensitivity of the area in terms of heritage features. The DFFE Screening Tool was used as an initial point of reference in this regard. The Screening Tool suggested that the area to be developed is of Very High Sensitivity as captured in Figure 79.

This is because the proposed infrastructure and 1 km corridor intersects with Grade III features as well as ungraded heritage finds. In particular, it must be noted that a lot of those sensitivities are concentrated around the areas closer to Paulputs Substation overlapping with the footprints of the already-constructed PV facilities. It is here understood that the sensitivities noted in the screening tool were identified when the HIAs for those facilities were conducted.

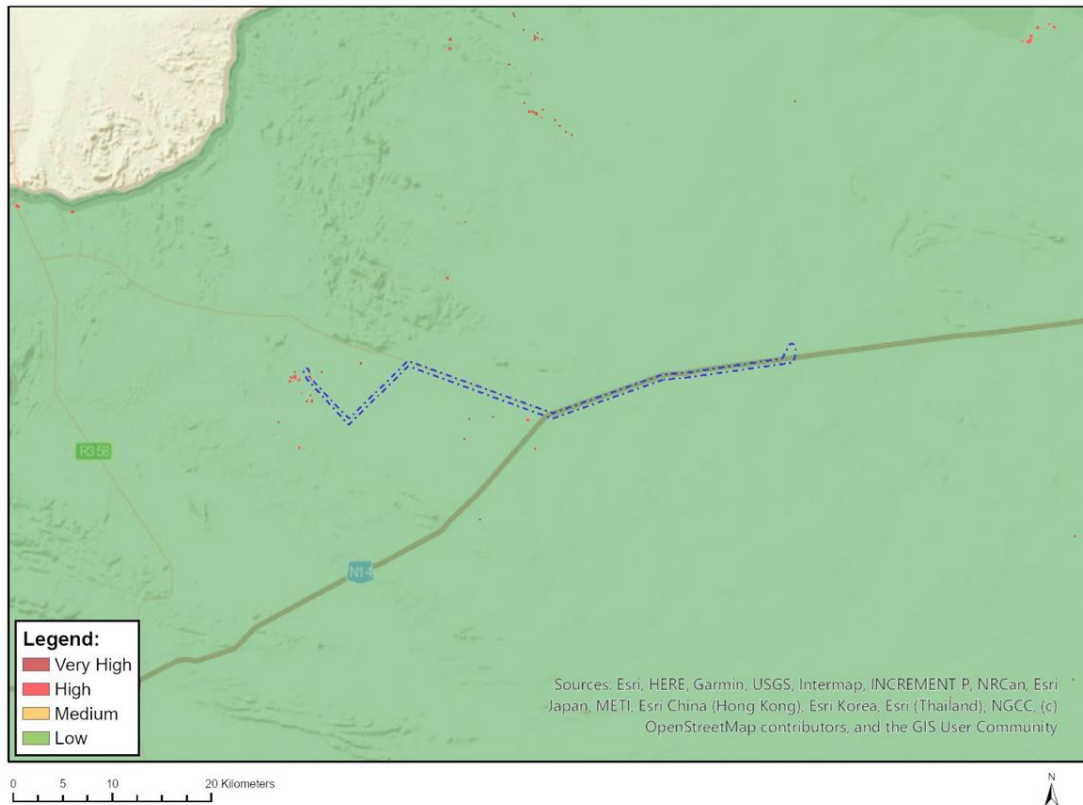


Figure 79: Map of relative Archaeological and Cultural Heritage Sensitivity (DFFE Screening Tool)

The affected area was assessed using Google Earth as well as available surveys and mapping resources via the CDNGI Geospatial Portal (<http://www.cdngiportal.co.za/cdngiportal/>). A First Edition Topographic map (2819DD) of the area was analysed. As the map was drawn in 1972, it would include information on observations within the footprint of the development, however, further verification regarding the features' age was necessary. This was achieved through the assessment of aerial photography. Three features were identified which appeared on the first edition topographic map. These included a windmill and associated farm infrastructure, Hellum farm complex, and the Bladgrond Farm Cemetery. Since the First Edition topographic map was dated 1972, further verification of the age of the sites was necessary through other available sources. Aerial photography was therefore consulted. All three features were confirmed to be older than 60 years. The Bladgrond Farm Cemetery has been recorded by the Genealogical Society of South Africa where records indicate that the cemetery's presence may date as far back as the 1900s (Figure 80).



Figure 80: Oldest grave plaque of the Bladgrond Farm Cemetery with date of death 1904

#### B) FIELD ASSESSMENT AND WALKDOWN RESULTS

The field survey was conducted over three days during Summer. A total of 32 key finds were noted during the field assessment, which mainly consisted of Stone Age artefacts, as well as historical artefacts and structures. Some of the main features identified through the field survey included scatters of and individual stone tools. Rubble was also noted along the proposed powerline route. Individual finds of the historical period were also noted including items such as glass bottles, cans, and a bullet shell.

##### Stone Age Finds

A range of different Stone Age finds and sites were noted along the powerline route. These mainly included individual ESA tools as well as scatters of LSA Quartz artefacts (Figure 81). Ostrich Egg Shell fragments were also noted in proximity to LSA Quartz pieces. ESA tools noted were individual stone tools or LCTs. For instance, large handaxes, cleavers and picks were among some of the ESA tools identified. While the individual noted stone tools are of Low sensitivity, a note is provided here that areas such as the hill site identified must be avoided.

Other sites included stone tool knapping sites which were considered of more significance as they represent areas in context with the potential to yield more information on the chaîne d'opérateur related to some of the stone tools noted on site.

The individual stone tools and stone tool scatters have been graded as Grade IV C and not worth further recording or conservation. Stone tool knapping sites have been graded as Grade IV B, with the recommendation to record these features before destruction or disturbance. The hill, given in what ways it adds to the cumulative heritage sensitivity of the region, has been graded as Grade III A, that is, of High Sensitivity.



Figure 81: Some of the Stone Age finds identified on site including LSA tools (left), and Ostrich Egg shell (right)

### Historical Period Finds

Apart from Stone Age, finds and sites of the historical period formed a large portion of the total heritage sensitivities noted. These included structures, discard or rubble, and individual items.

Importantly, several structures were noted which are not older than 60 years and are still in use. It is here advised that the landowner be liaised regarding these features should they be disturbed by the proposed activities.

While the discard or rubble sites could not be associated with dates, the midden (Referred to as ARI030 in the HIA) could be associated with a date through the identification of a well-preserved Sparletta bottle (Figure 82). Considering the logo on the bottle and the address of the bottle, “Nigel, Transvaal” the date of the bottle could be tied to no later than the early 1990s. Considering the logo, it is possible that the midden represents material deposited between the 1970s and 1980s.

Single items observed included a metal bullet, potentially from hunting activities in the area, a rusted metal can, large metal canisters, and a fully intact glass bottle (Figure 83).

All structures older than 60 years identified have been graded as Grade IIIA. Discard and rubble sites have been graded as Grade IV B, to allow for recording before these sites are disturbed should there be items of a higher heritage significance. Individual items, given that majority of their age could not be verified, have been given the graded as Grade IV C, and not worthy of conservation.



Figure 82: Sparletta bottle associated with the midden, ARI030. deposit likely dates to between the 1970s and 1980s



Figure 83: Photographs of single items found on site related to the historical period. These included a metal bullet (top left), a rusted metal can (top right), large metal canisters (lower left), and fully intact glass bottle (lower right)

### Graves

The Bladgrond Farm Cemetery (Figure 84) was the only grave site noted along the powerline, within the 1km corridor, and in proximity to Paulputs Substation. The cemetery includes between 30 to 50 graves belonging to several families. All graves have markers or tombstones, with some not including inscriptions. Information on the cemetery can be found online with a good deal of recording having been done (see <https://www.graves.eggssa.org/northerncape/KENHARDT-Rural/Bladgrond/> for more information on the individual graves of the site). The earliest date of death on record was 1904. The cemetery is fenced off, and access is controlled by the landowner. The feature has been graded as a Grade III A heritage feature.



Figure 84: ARI003 – The Bladgrond Farm Cemetery

#### 9.3.8.4 PALAEOLOGY

A Palaeontological Desktop Assessment (PDA) was undertaken by Elize Bulter of Banzai Environmental (Pty) Ltd. The full report is included in APPENDIX D.

The project area is mantled by superficial deposits of the Kalahari Group, with isolated inselbergs comprising Gembokvakte Gneiss and Koeipoort Gneiss of the Namaqua–Natal Metamorphic Province. According to the SAHRIS PalaeoMap, the Namaqua–Natal Metamorphic Province is assigned a Low Palaeontological Sensitivity, while the overlying Kalahari Group sediments are classified as Unknown (Almond and Pether, 2008; Almond *et al.*, 2013). While Kalahari sediments may very occasionally preserve Late Caenozoic fossil material—such as mammal bones and teeth, reptile remains, non-marine molluscs, ostrich eggshell, trace fossils (e.g. rhizoliths, termite nests and coprolites), and plant microfossils—such occurrences are rare, highly localised and unpredictable. The DFFE Environmental Screening Tool classifies the project area as having a Medium Palaeontology Theme Sensitivity.

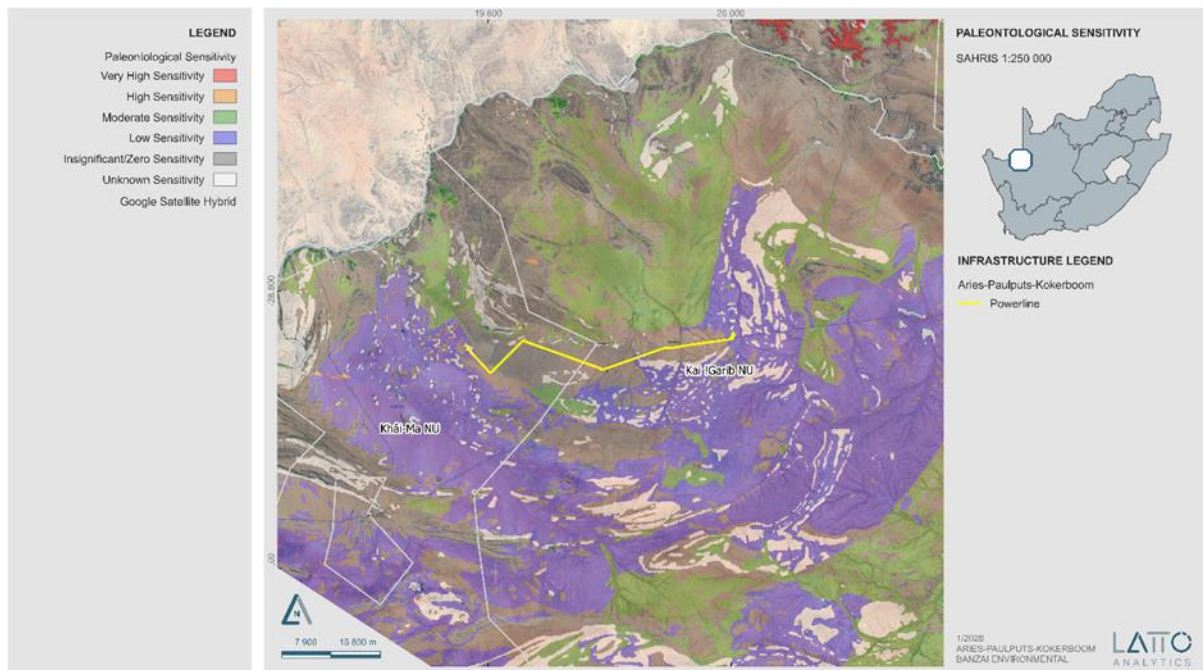


Figure 85: Extract of the SAHRIS PalaeoMap (Council of Geosciences) indicating the Low (blue) and Unknown (white) Palaeontological sensitivity



## 10 ENVIRONMENTAL IMPACT ASSESSMENT

### 10.1 IMPACTS IDENTIFIED

This Section presents the impacts that have been identified and assessed for the BA. Potential environmental impacts were identified by the EAP, the appointed specialists (where applicable), as well as the preliminary input from the public. The impacts are included in below.

When considering cumulative impacts, it is important to bear in mind the scale at which different impacts occur. The identification of impacts is an objective iterative process of considering the project components and activities and how these may interact with the different environmental components. An activity/ environmental component matrix is presented in Table 17 below. The matrix represents which environmental components are likely to be impacted upon by the project activities. Table 18 provides a list of the identified impacts associated with each environmental component.



Table 17: Impact identification matrix.

Phase	Activity	Environmental Component												
		Climate and Air Quality (AQ)	Geology and soils (G)	Avifauna (A)	Surface water/ wetlands (W)	Noise (N)	Topography (T)	Visual/ Landscape (V)	Flora (FL)	Fauna (FA)	Ecosystems/ habitats (EH)	Social (S)	Cultural Heritage (C)	Economic (E)
Planning and Design	Landowner liaison and access negotiation											-		
	Constructability assessments and pre-construction surveys					-						-		
Construction (including pre-construction and post construction rehabilitation)	Site Clearing (includes site clearing for Substation upgrade, servitude, and tower footprints)	-	-	-	-			-	-	-	-		-	
	Job Creation											+		+
	Increased traffic on roads	-		-		-				-	-			
	Increased human presence			-						-	-	+		
	Transportation and storage of equipment and construction material	-				-				-	-			
	Setting up of construction camps or temporary laydown areas		-						-	-	-			
	Development of two-spoor tracks	-	-	-		-			-	-	-		-	
	Establishing waste storage areas							-	-	-	-			
	Excavation and foundation works for towers and substation structures	-	-		-				-	-	-		-	
	Concrete works associated with tower and substation upgrades construction	-	-		-				-	-	-			
	Stringing: Tension stringing of conductors using trucks/tractors		-			-		-	-	-	-			
	Setting up or temporary ablution facilities and transport associated with their maintenance							-			-			
	Use of diesel/petrol generators for temporary power supply	-				-				-	-			
	Fuel storage and handling								-	-	-			



Phase	Activity	Environmental Component													
		Climate and Air Quality (AQ)	Geology and soils (G)	Avifauna (A)	Surface water/ wetlands (W)	Noise (N)	Topography (T)	Visual/ Landscape (V)	Flora (FL)	Fauna (FA)	Ecosystems/ habitats (EH)	Social (S)	Cultural Heritage (C)	Economic (E)	
	Stormwater management measures put in place where needed (e.g. berms, silt fences)		-		-										
	Security measures to control site access							-			-	-			
<b>Normal Operations</b>	Presence of energised overhead lines and towers			-	-			-		-	-	-	-		
	Management of additional infrastructure as part of Paulputs substation										+				
	Routine inspections and maintenance of infrastructure			-	-									+	
	Vegetation management along the servitude	-							-	-	-				
	Upkeep of access two-spoor track		-			-			-	-	-				
	Routine servicing of substation equipment to ensure compliance with technical standards.					-								+	
	Operation of vehicles along two-spoor track for maintenance purposes	-	-	-	-	-		-	-	-	-				
	Continued landowner engagement, liaison, and access negotiations											+			
	Remote monitoring of powerline and substation as part of the larger transmission network of NTCSA											+		+	
	Additional capacity for energy evacuation											+		+	
<b>Decommissioning, Rehabilitation and Closure</b>	Supporting of current and encouragement of development of additional renewable energy projects in terms of energy transmission	+									+		+		
	Removal of transmission towers and associated hardware	-		-	+			+	-	-	-				
	Removal of foundations where feasible	-	+						+	+	+				
	Rehabilitation of two-spoor tracks	+	+	-	+				+	+	+				
	Re-establishment of vegetation cover	+	+	-	+				+	+	+				



Phase	Activity	Environmental Component												
		Climate and Air Quality (AQ)	Geology and soils (G)	Avifauna (A)	Surface water/ wetlands (W)	Noise (N)	Topography (T)	Visual/ Landscape (V)	Flora (FL)	Fauna (FA)	Ecosystems/ habitats (EH)	Social (S)	Cultural Heritage (C)	Economic (E)
	Disposal of hazardous waste and material associated with decommissioned infrastructure													



Table 18: Impacts Identified and Assessed during the BA.

#	Impact	Activity/ Aspect	Phase
<b>A1</b>	Habitat destruction within the footprint	Site Clearing Vehicle traffic Excavation and Concrete works	Construction
<b>A2</b>	Destruction, degradation and fragmentation of surrounding habitats due to noise pollution	Site Clearing Vehicle traffic Excavation and Concrete works	Construction
<b>A3</b>	Displacement/emigration of avifauna community (including SCC)	Site Clearing Vehicle traffic Excavation and Concrete works	Construction
<b>A4</b>	Direct mortality from persecution or poaching of avifauna species and collection of eggs	Increased human presence	Construction
<b>A5</b>	Direct mortality from increased vehicle and heavy machinery traffic	Vehicle traffic	Construction
<b>A6</b>	Collisions with gridlines if the line is located away from the existing gridline	Presence of energised overhead lines and towers	Operation
<b>A7</b>	Collisions with gridlines if the line is located alongside the existing gridline	Presence of energised overhead lines and towers	Operation
<b>A8</b>	Electrocution	Presence of energised overhead lines and towers	Operation
<b>A9</b>	Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs	Increased human presence	Operation
<b>A10</b>	Direct mortality due to earthworks, vehicle collisions and persecutions	Removal of transmission towers and associated hardware	Decommissioning
<b>A11</b>	Continued habitat degradation due to Invasive Alien Plant Encroachment and erosion	Removal of transmission towers and	Decommissioning



#	Impact	Activity/ Aspect	Phase
		associated hardware Re-establishment of vegetation cover	
<b>A12</b>	Collisions	Removal of transmission towers and associated hardware	Decommissioning
<b>AQ1</b>	Dust generation from construction activities	Site clearing Vehicle traffic Excavation and Concrete works	Construction
<b>AQ2</b>	Emissions from diesel/petrol generators	Temporary power generation	Construction
<b>AQ3</b>	Dust generation from operational routine maintenance along powerline and at Substation	Vehicle traffic	Operation
<b>AQ4</b>	Supporting of current and encouragement of development of additional renewable energy projects	Project implementation	Operation
<b>AQ5</b>	Dust generation during the removal and dismantling of infrastructure	Decommissioning of infrastructure	Decommissioning
<b>AQ6</b>	Re-establishment of natural ground cover	Site rehabilitation	Decommissioning
<b>G1</b>	Soil compaction, Soil erosion, Land degradation and Soil contamination	Site clearing Vehicle traffic Excavation and Concrete works	Construction
<b>G2</b>	Soil compaction, Soil erosion, Land degradation and Soil contamination	Vehicle traffic Routine maintenance	Operation
<b>G3</b>	Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning of infrastructure	Decommissioning
<b>G4</b>	Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials - Powerline	Site clearing Storage of waste and fuel on site Presence of vehicles of site	Construction



#	Impact	Activity/ Aspect	Phase
<b>G5</b>	Clearing of vegetation leading to soil erosion and loss of topsoil - Powerline	Site clearing	Construction
<b>G6</b>	Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials - Substation	Site clearing Storage of waste and fuel on site Presence of vehicles of site	Construction
<b>G7</b>	Clearing of vegetation leading to soil erosion and loss of topsoil - Substation	Site Clearing	Operation
<b>G8</b>	Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials - Substation	Maintenance of infrastructure Presence of vehicles on site	Operation
<b>G9</b>	Continuous stripping of topsoil, leading to ongoing land degradation, including erosion - Substation	Site clearing Presence of vehicles on site Stringing of conductors	Operation
<b>SW1</b>	Loss, disturbance and degradation of watercourses	Site clearing Transportation and construction of towers Storage and use of hazardous substances and equipment	Construction
<b>SW2</b>	Loss or degradation in ecosystem services	Site clearing Transportation and construction of towers Storage and use of hazardous substances and equipment	Construction
<b>SW3</b>	Altered hydrological regimes	Site clearing Transportation and construction of towers Storage and use of hazardous	Construction



#	Impact	Activity/ Aspect	Phase
		substances and equipment	
<b>SW4</b>	Increase in erosion of receiving systems	Site clearing Transportation and construction of towers Storage and use of hazardous substances and equipment	Construction
<b>SW5</b>	Introduction and spread of alien and invasive vegetation	Site clearing Transportation and construction of towers Storage and use of hazardous substances and equipment	Construction
<b>SW6</b>	Increased bare surfaces, flood peaks and potential erosion	Site clearing Transportation and construction of towers Storage and use of hazardous substances and equipment	Construction
<b>SW7</b>	Impaired water quality	Excavation and Concrete works	Construction
<b>SW8</b>	Decreased flow inputs into watercourses	Excavation and Concrete works	Construction
<b>SW9</b>	Increased sediment loads to downstream reaches	Excavation and Concrete works	Construction
<b>SW10</b>	Contamination of wetlands	Excavation and Concrete works	Construction
<b>SW11</b>	Disturbance and degradation of wetland vegetation	Excavation and Concrete works	Construction
<b>SW12</b>	Proliferation of alien and invasive species	Vehicle traffic Routine maintenance	Operation



#	Impact	Activity/ Aspect	Phase
		Operation of on-site Stormwater Management	
<b>SW13</b>	Nutrient enrichment of watercourse	Vehicle traffic	Operation
<b>SW14</b>	Increase in erosion and sedimentation of receiving systems	Routine maintenance	Operation
<b>SW15</b>	Degradation of wetland vegetation	Operation of on-site Stormwater Management	Operation
<b>N1</b>	Disturbance through presence of personnel undertaking pre-construction surveys	Pre-construction survey	Planning
<b>N2</b>	Noise generation through construction activities	Setup and presence of construction camps and laydown areas Vehicle traffic	Construction
<b>V1</b>	Change of character of the landscape - Substation	Site clearing Transportation and construction of towers Vehicle traffic	Construction
<b>V2</b>	Change of character of the landscape - Powerline	Site clearing Transportation and construction of towers Vehicle traffic	Construction
<b>V3</b>	Change of character of the landscape - Substation	Presence of additional infrastructure	Operation
<b>V4</b>	Change of character of the landscape - Powerline	Presence of powerlines and towers	Operation
<b>V5</b>	Change of landscape character as viewed from the R357 - Substation	Site clearing Transportation and construction of towers Vehicle traffic	Construction



#	Impact	Activity/ Aspect	Phase
V6	Change of landscape character as viewed from the R357 - Substation	Presence of additional infrastructure	Operation
V7	Change of landscape character as viewed from the R357 - Powerline	Site clearing Transportation and construction of towers Vehicle traffic	Construction
V8	Change of landscape character as viewed from the R357 - Powerline	Presence of powerlines and towers	Operation
V9	Change of landscape character as viewed from the N14 - Substation	Site clearing Transportation and construction of towers Vehicle traffic	Construction
V10	Change of landscape character as viewed from the N14 - Powerline	Site clearing Transportation and construction of towers Vehicle traffic	Construction
V11	Change of landscape character as viewed from the N14	Presence of powerlines and towers	Operation
V12	Change of landscape character as viewed from local homesteads	Site clearing Transportation and construction of towers Vehicle traffic	Construction
V13	Change of landscape character as viewed from local homesteads	Presence of powerlines and towers	Operation
V14	Potential light pollution and nuisance for neighbours	Site clearing Setup and presence of construction camps and laydown areas	Construction



#	Impact	Activity/ Aspect	Phase
		Transportation and construction of towers Vehicle traffic	
<b>V15</b>	Potential light pollution and nuisance for neighbours	Presence of powerlines and towers	Operation
<b>TE1</b>	Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC - Powerline	Site Clearing Excavation and Concrete works	Construction
<b>TE2</b>	Introduction of invasive and alien species, especially plants - Powerline	Site Clearing Setup and presence of construction camps and laydown areas Transportation and construction of towers Vehicle traffic Excavation and Concrete works	Construction
<b>TE3</b>	Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community - Powerline	Upkeep of access route Vegetation management Routine maintenance	Operation
<b>TE4</b>	Continued encroachment by alien and invasive plant species - Powerline	Upkeep of access route Vegetation management Routine maintenance	Operation
<b>TE5</b>	Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC - Substation	Site Clearing Setup and presence of construction camps and laydown areas	Construction



#	Impact	Activity/ Aspect	Phase
		Transportation and construction of towers Vehicle traffic Excavation and Concrete works	
<b>TE6</b>	Introduction of invasive and alien species, especially plants - Substation	Site Clearing Setup and presence of construction camps and laydown areas Transportation and construction of towers Vehicle traffic Excavation and Concrete works	Construction
<b>TE7</b>	Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community - Substation	Upkeep of access route Vegetation management Routine maintenance	Operation
<b>TE8</b>	Continued encroachment by alien and invasive plant species - Substation	Upkeep of access route Vegetation management Routine maintenance	Operation
<b>TE9</b>	Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Powerline	Site Clearing Setup and presence of construction camps and laydown areas Transportation and construction of towers Vehicle traffic Excavation and Concrete works	Construction



#	Impact	Activity/ Aspect	Phase
<b>TE10</b>	Destruction of non resilient habitats (Rocky Outcrops) - Powerline	Site Clearing Excavation and Concrete works	Construction
<b>TE11</b>	Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Powerline	Upkeep of access route Vegetation management Routine maintenance	Operation
<b>TE12</b>	Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Substation	Site Clearing Setup and presence of construction camps and laydown areas Transportation and construction of towers Vehicle traffic Excavation and Concrete works	Construction
<b>TE13</b>	Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Substation	Vegetation management Routine maintenance	Operation
<b>S1</b>	Disturbance of current landuses and landowner routines due to liaison with applicant and servitude	Pre-construction survey	Planning
<b>S2</b>	Creating of employment opportunities through construction contracts	Overall project construction	Construction
<b>S3</b>	Increased and continued human presence due to the need for personnel engaging in construction activities	Overall project construction	Construction
<b>S4</b>	Access restriction in certain areas along the powerline and along route to be affected by substation upgrade	Security measures to control site access	Construction
<b>S5</b>	Disturbance of sense of place with the continued presence of overhead powerline and towers	Project implementation	Operation
<b>S6</b>	Potential additional employment opportunities through substation upgrade and powerline maintenance	Vegetation management	Operation



#	Impact	Activity/ Aspect	Phase
		Routine maintenance	
<b>S7</b>	Building of relationships between applicant and landowners	Continued landowner liaison	Operation
<b>S8</b>	Building of NTCSA's and the province's overall transmission capacity	Project implementation	Operation
<b>C1</b>	Disturbance of identified Stone Age individual finds and scatters	Site Clearing Excavation and Concrete works	Construction
<b>C2</b>	Destruction or disturbance of identified historical period finds such as glass bottles, cans, and old metal canisters	Site Clearing Excavation and Concrete works	Construction
<b>C3</b>	Destruction or disturbance of rubble and middens which may include unidentified historical finds	Site Clearing Excavation and Concrete works	Construction
<b>C4</b>	Destruction or disturbance of Stone Age knapping sites	Site Clearing Excavation and Concrete works	Construction
<b>C5</b>	Disturbance of existing structures (ARI001 and ARI002) due to their proximity to the powerline	Site Clearing Excavation and Concrete works	Construction
<b>C6</b>	Disturbance of the Hill (ARI028) which is part of the landscape's cumulative heritage value	Site Clearing Excavation and Concrete works	Construction
<b>C7</b>	Disturbance of the Sense of Place	Overall project construction	Construction
<b>C8</b>	Destruction or disturbance of undiscovered below-ground heritage features.	Excavation and Concrete works	Construction
<b>C9</b>	Loss of fossil heritage	Excavation and Concrete works	Construction
<b>E1</b>	Additional employment created in the region through the project	Overall project construction	Construction
<b>E2</b>	Increased support of local industries and businesses through additional movement of persons around the project area	Vegetation management Routine maintenance	Operation



#	Impact	Activity/ Aspect	Phase
E3	Expansion of NTCSA's transmission grid in relation to required skilled and unskilled labour for maintenance thereof	Vegetation management Routine maintenance	Operation
E4	Encouragement of the development of renewable energy alternatives	Project implementation	Operation

## 10.2 IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence I of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives. Where possible, mitigation measures will be recommended for impacts identified.

The impact assessment matrix (including pre- and post-mitigation assessment) is included in APPENDIX E. The potential cumulative impacts have been identified, evaluated, and mitigation measures suggested and have been updated during the investigation.

### 10.2.1 DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence I of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent I, Duration (D), Magnitude (M), and reversibility I applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 19** below.

Table 19: Criteria for Determining Impact Consequence.

Aspect	Score	Definition
<b>Nature</b>	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
<b>Extent</b>	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site)



Aspect	Score	Definition
	5	Provincial / National (i.e. extends beyond 50 km from the site)
<b>Duration</b>	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
<b>Magnitude/ Intensity</b>	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
<b>Reversibility</b>	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per **Table 20**.

Table 20: Probability Scoring.

<b>Probability</b>	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or



	5	Definite (the impact will occur),
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The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 21: Determination of Environmental Risk.

<b>Consequence</b>	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	<b>Probability</b>					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in **Table 22**.

Table 22: Significance Classes.

Risk Score	Description
< 10	Low (i.e. where this impact is unlikely to be a significant environmental risk).
≥ 10; < 20	Medium (i.e. where the impact could have a significant environmental risk),
≥ 20	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

### 10.2.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 23: Criteria for Determining Prioritisation.

<b>Cumulative Impact (CI)</b>	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
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	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in **Table 23**. The impact priority is therefore determined as follows:

$$\text{Priority} = \text{CI} + \text{LR}$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to **Table 24**).

Table 24: Determination of Prioritisation Factor.

Priority	Ranking	Prioritisation Factor
2	Low	1
3	Medium	1.125
4	Medium	1.25
5	Medium	1.375
6	High	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 25: Environmental Significance Rating.

Value	Description
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ -10 < -20	Medium negative (i.e. where the impact could influence the decision to develop in the area).



Value	Description
≥ -20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
0	No impact
< 10	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ 10 < 20	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 20	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

### 10.3 DESCRIPTION AND ASSESSMENT OF IMPACTS

This section describes each identified environmental impact in the context of the activity and associated aspect and provides reasons why specific ranking/ rating of the component attributes of the impact assessment are given.

#### 10.3.1 AVIFAUNA (A)

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the project area, specifically the proposed development footprint area. Bennun et al (2021) describe three broad types of impacts associated with energy transmission development projects:

- Direct impacts – Impacts that result from project activities or operational decisions that can be predicted based on planned activities and knowledge of local biodiversity, such as habitat loss under the project footprint, habitat fragmentation as a result of project infrastructure and species disturbance or mortality due to project operations;
- Indirect impacts – Impacts induced by, or ‘by-products’ of, project activities within a project’s area of influence; and
- Cumulative impacts – Impacts that result from the successive, incremental and/or combined effects of existing, planned and/or reasonably anticipated future human activities in combination with project development impacts.

The assessment of impact significance considers pre-mitigation as well as implemented post-mitigation scenarios. Three phases were considered for the impact assessment:

- Construction Phase;
- Operational Phase; and



- Decommissioning Phase.

10.3.1.1 HABITAT DESTRUCTION WITHIN THE PROJECT FOOTPRINT – CONSTRUCTION (A1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Habitat destruction within the footprint (A1)</b>	Construction	High -	Medium to high -	High -
<b>Potential cumulative/ confounding effects</b>	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• The specialist recommended the following – “A nest walkdown must be performed prior to clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.” As a walkdown has already been done, the developer is reminded to be cognisant of nests prior to the clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.</li> <li>• Areas identified suitable for Red Lark during the walkdown should minimise habitat disturbance and should undergo active rehabilitation of these disturbed sites after construction. A detailed rehabilitation plan should be drawn up between a Red Lark avifauna specialist and a qualified botanist.</li> <li>• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.</li> <li>• The areas to be developed must be specifically demarcated to prevent movement into surrounding environments.</li> <li>• Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.</li> <li>• A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>• Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.</li> <li>• Leaking equipment and vehicles must be repaired immediately or be removed from the project area to facilitate repair.</li> <li>• Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.</li> <li>• Infrastructure must be consolidated where possible to minimise the amount of ground and air space used.</li> <li>• Use environmentally friendly cleaning and dust suppressant products.</li> </ul>				

10.3.1.2 **DESTRUCTION, DEGRADATION AND FRAGMENTATION OF SURROUNDING HABITATS – CONSTRUCTION (A2)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction, degradation and fragmentation of surrounding habitats (A2)</b>	Construction	High -	Medium to low -	Medium to high -
<b>Potential cumulative/confounding effects</b>	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.</li> <li>• All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region.</li> </ul>				



10.3.1.3 DISPLACEMENT/EMIGRATION OF AVIFAUNA COMMUNITY (INCLUDING SCC) – CONSTRUCTION (A3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Displacement/emigration of avifauna community (including SCC) (A3)	Construction	High -	Medium to low -	Medium to high -
<b>Potential cumulative/confounding effects</b>	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• The specialist recommended the following – “A nest walkdown must be performed prior to clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.” As a walkdown has already been done, the developer is reminded to be cognisant of nests prior to the clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.</li> <li>• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.</li> <li>• The duration of the construction must be kept to a minimum to avoid disturbing avifauna.</li> <li>• Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.</li> <li>• All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.</li> <li>• All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region.</li> <li>• Infrastructure must be consolidated where possible to minimise the amount of ground and air space used.</li> </ul>				



10.3.1.4 **DIRECT MORTALITY FROM PERSECUTION OR POACHING OF AVIFAUNA SPECIES AND COLLECTION OF EGGS – CONSTRUCTION (A4)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct mortality from persecution or poaching of avifauna species and collection of eggs (A4)	Construction	High -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs.</li> <li>Prior to commencing work each day, two individuals should traverse the working area to disturb any avifauna and so they have a chance to vacate the area.</li> <li>Any avifauna threatened by the construction activities that does not vacate the area should be removed safely by an appropriately qualified environmental officer or avifauna specialist.</li> </ul>				

10.3.1.5 **DIRECT MORTALITY FROM INCREASED VEHICLE AND HEAVY MACHINERY TRAFFIC (A5)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct mortality from increased vehicle and heavy machinery traffic (A5)	Construction	High -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			
<b>Mitigation Measures</b>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.</li> <li>Road users and contractors to undergo/receive Environmental Awareness Training. Discussions/training must include:               <ul style="list-style-type: none"> <li>Speed limits</li> <li>General rules of road use, not limited to:                   <ul style="list-style-type: none"> <li>Avoiding the widening of the road</li> <li>Environmental sensitivity of surrounding habitat</li> </ul> </li> </ul> </li> <li>Construction activity should be restricted to daylight hours, as nocturnal species are highly dependent on sound and/or vocalisations for behavioural processes. However, low impact and low noise construction activities with minimal light might be considered during night time.</li> </ul>				

10.3.1.6 COLLISIONS WITH GRIDLINES IF THE LINE IS LOCATED AWAY FROM THE EXISTING GRIDLINE – OPERATION (A6)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Collisions with gridlines if the line is located away from the existing gridline (A6)	Operation	High -	Medium to low -	Medium to high -
Potential cumulative/confounding effects	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All the parts of the infrastructure must be nest-proofed and anti-perched devices placed on areas that can lead to electrocution.</li> <li>All exposed parts must be covered (insulated) to reduce electrocution risk.</li> <li>All conductor wires in the same horizontal plane.</li> <li>The air space used by the gridlines /tie in lines must be minimised by placing them underground as far as possible.</li> <li>Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. Place pylons and associated infrastructure along existing infrastructure (e.g. roads, other power lines).</li> <li>Due to feasibility issues it has been agreed upon that every fourth overhead cables/lines must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<p>reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be. Bird flight diverters (BFDs) are to be spaced at a maximum of 15m apart on the shield wire as per the known technical knowledge or industry standards. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.</p>				

10.3.1.7 COLLISIONS WITH GRIDLINES IF THE LINE IS LOCATED ALONGSIDE THE EXISTING GRIDLINE – OPERATION (A7)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Collisions with gridlines if the line is located alongside the existing gridline (A7)	Operation	High -	Medium to high -	Medium to high -
Potential cumulative/ confounding effects	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution.</li> <li>All exposed parts must be covered (insulated) to reduce electrocution risk.</li> <li>It is recommended that all conductor wires be kept to the same horizontal plane.</li> <li>The air space used by the gridlines /tie in lines must be minimised by placing them underground as far as possible.</li> <li>Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. Place pylons and associated infrastructure along exciting infrastructure (e.g. roads, other power lines).</li> <li>Due to feasibility issues it has been agreed upon that every fourth overhead cables/lines must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be. Bird flight diverters (BFDs) are to be spaced at a maximum of 15m apart on the shield wire as per the known technical knowledge or industry standards. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.</li> </ul>				



### 10.3.1.8 ELECTROCUTION – OPERATION (A8)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Electrocution (A8)	Operation	High -	Medium to high -	High -
<b>Potential cumulative/confounding effects</b>	<p>Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Specific mitigation recommendations need to be in line with the EWT/ESKOM partnership Guidelines:</li> <li>• Removal of earth wire or increase wire thickness to make it more visible: <ul style="list-style-type: none"> <li>○ Use ‘Self Support’ structures and avoid ‘Cross Rope’ structures</li> <li>○ All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution</li> <li>○ All exposed parts must be covered (insulated) to reduce electrocution risk</li> <li>○ All conductor wires in the same horizontal plane</li> </ul> </li> <li>• Insulation where energised parts and/or grounded parts are covered with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered.</li> <li>• Perch discouragers can be used such as perch guards or spikes. Considerable success achieved by providing artificial bird safe perches, which are placed at a safe distance from the energised parts (Prinsen <i>et al.</i>, 2012).</li> <li>• An avifauna specialist needs to monitor the proposed powerline prior to construction and then 2 consecutive years after construction to identify any mortalities so that additional mitigations can be implemented.</li> <li>• Monitoring of bird fatalities must also be done following the BirdLife South Africa best practice guidelines (BirdLife South Africa, 2017). The entire line to be monitored quarterly in the first year from the start of the line being built, and second year line to be monitored biannually. First two years to be monitored by a registered avifaunal specialist. Quarterly and biannual ornithological management reports to be produced and actioned within a year of the reports being received. Further annual monitoring to be integrated into NTCSA’s annual line maintenance schedules by internal Environmental practitioners. Monitoring of the bird diverters must be done on a 6-month basis to ensure they are still functional for the lifetime of the development by the ECO. All data of fatalities need to be recorded in the national database (CIR), and incidents to undergo the NTCSA environmental incidents management procedure.</li> </ul>				



10.3.1.9 DIRECT MORTALITY FROM ROADKILL, PERSECUTION OR POACHING OF AVIFAUNA SPECIES AND COLLECTION OF EGGS – OPERATION (A9)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs (A9)	Operation	High -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs.</li> <li>• Prior to commencing work each day, two individuals should traverse the working area to disturb any avifauna and so they have a chance to vacate the area.</li> <li>• Any avifauna threatened by the construction activities that do not vacate the area should be removed safely by an appropriately qualified environmental officer or removal specialist.</li> </ul>				

10.3.1.10 DIRECT MORTALITY DUE TO EARTHWORKS, VEHICLE COLLISIONS AND PERSECUTIONS – DECOMMISSIONING (A10)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct mortality due to earthworks, vehicle collisions and persecutions (A10)	Decommissioning	High -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All personnel should undergo environmental awareness training including educating about not harming or collecting avifauna species.</li> <li>Prior to commencing work each day, two individuals should traverse the working area in order to disturb any avifauna and so they have a chance to vacate.</li> <li>Any avifauna threatened by the construction activities must be removed safely by an appropriately qualified environmental officer or removal specialist.</li> <li>All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.</li> <li>All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.</li> </ul>				

**10.3.1.11 CONTINUED HABITAT DEGRADATION DUE TO INVASIVE ALIEN PLANT ENCROACHMENT AND EROSION – DECOMMISSIONING (A11)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Continued habitat degradation due to Invasive Alien Plant Encroachment and erosion (A11)</b>	Decommissioning	High -	Low -	Low -
<b>Potential cumulative/ confounding effects</b>	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>The project area must be rehabilitated, and a management plan must be in place to ensure that it is done successfully to restore the avifauna community and their associated habitat.</li> </ul>				

**10.3.1.12 COLLISIONS – DECOMMISSIONING (A12)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Collisions (A12)</b>	Decommissioning	High -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Potential cumulative/ confounding effects</b>	Through the proposed activities, the project compounds existing pressures on avifauna in a landscape already affected by anthropogenic activities such as agriculture, historical land clearing, invasive species, and existing energy infrastructure. The project introduces additional risks of habitat loss, fragmentation, and disturbance during construction, as well as electrocution and collisions during operation, threats that are particularly severe for large, slow-flying species and those of conservation concern. These impacts do not occur in isolation; rather, they interact with ongoing pressures, amplifying the likelihood of population declines and reducing ecological resilience			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All infrastructure must be removed if the facility is decommissioned.</li> </ul>				

### 10.3.2 CLIMATE AND AIR QUALITY (AQ)

The main negative impacts related to Climate and Air Quality (AQ) relate to dust and emissions generated during construction and operational activities (AQ1 and AQ2). These impacts can be expected during the initial site clearance for the construction of the proposed infrastructure, and emissions from on-site diesel or petrol generators needed for power generation during construction. Given that the servitude maintenance route will consist of a two-spoor track, it is expected that minimal dust will be generated occasionally as vehicles traverse this path during routine operational maintenance activities (AQ3). Dust will likely also be generated during the decommissioning and dismantling of the infrastructure (AQ5). The project area is dry, and therefore, dust generation is highly expected at each phase of the project’s lifespan. These impacts are expected to be mitigated through the re-establishment and the re-encroachment of natural ground cover (AQ6).

While negative impacts can be expected in relation to AQ, the project presents opportunity through the supporting of current and the development of additional renewable energy projects (AQ4). A positive impact on climate and air quality is expected given that this project will support movement towards the Just Energy Transition, as well as South Africa’s development goals in relation to its Net Zero Carbon emissions targets.

To address the adverse effects of this project on AQ, mitigations to address dust generation have been proposed, rendering the impact being rated as negative Medium to Low.

#### 10.3.2.1 DUST GENERATION FROM ACTIVITIES - CONSTRUCTION (AQ1), OPERATION (AQ3), AND DECOMMISSIONING (AQ5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Dust generation from construction activities (AQ1)</b>	Construction	Medium to high -	Medium to low -	Medium to low -
<b>Dust generation from operational routine maintenance along powerline and at Substation (AQ3)</b>	Operation	Medium to low -	Low -	Low -
<b>Dust generation during the removal</b>	Decommissioning	Medium to low -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
and dismantling of infrastructure (AQ5)				
<b>Potential cumulative/confounding effects</b>	Dust emissions during construction, primarily from site clearing, excavation, and vehicle movement on unpaved tracks, will add to the baseline disturbance caused by other energy infrastructure developments such as CSP facilities and transmission lines. This incremental effect can lead to reduced air quality, increased soil erosion, and sedimentation, which in turn may degrade ecosystem services and affect sensitive habitats			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. This may include the use of dust suppression where excessive dust is observed.</li> <li>Dust netting may be used during construction where needed and in cases of excessive dust generation.</li> <li>Reduce the dust generated by operational vehicles and earth moving machinery under enforced speed limits reducing the probability and magnitude of dust generation.</li> </ul>				

#### 10.3.2.2 EMISSIONS FROM DIESEL/PETROL GENERATORS – CONSTRUCTION (AQ2)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Emissions from diesel/petrol generators (AQ2)	Construction	Medium to low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Make use of tooling and equipment which does not require as much energy to operate (example, rechargeable and wireless power tools) (where possible).</li> <li>Research and implement alternative solutions to tasks which require extensive energy usage on site (example solar-powered lamps for laydown area lighting) (where possible).</li> </ul>				



10.3.2.3 SUPPORTING OF CURRENT AND ENCOURAGEMENT OF DEVELOPMENT OF ADDITIONAL RENEWABLE ENERGY PROJECTS – OPERATION (AQ4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Supporting of current and encouragement of development of additional renewable energy projects (AQ4)	Operation	High +	High +	High +
Potential cumulative/confounding effects	By enabling renewable energy integration into the national grid, this project can potentially contribute to reducing reliance on fossil fuels, which in turn lowers greenhouse gas emissions and mitigates climate change. When combined with other similar projects across the Strategic Transmission Corridor and nationally, the cumulative effect amplifies South Africa’s progress toward its decarbonisation targets under the Integrated Resource Plan (IRP, 2019), the National Development Plan 2030, and international commitments such as the Paris Agreement. This collective impact strengthens energy security, promotes sustainable economic growth, and accelerates the transition to a low-carbon economy, creating long-term environmental and socio-economic benefits that extend beyond the immediate project footprint.			
Alternatives	A “no-go” alternative would negate the potential positive impacts of this project.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impact is High positive and will not require mitigation.</li> </ul>				

10.3.2.4 RE-ESTABLISHMENT OF NATURAL GROUND COVER – DECOMMISSIONING (AQ6)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Re-establishment of natural ground cover (AQ6)	Decommissioning	Medium to high +	Medium to high +	Medium to high +
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impact is Medium to High positive and will not require mitigation.</li> </ul>				

10.3.3 GEOLOGY AND SOILS (G)

Main impacts on Geology and Soils (G) are expected in the forms of soil compaction, soil erosion, land degradation, and soil contamination. While these impacts have been assessed holistically considering Construction (G1), Operation (G2), and Decommissioning (G3) phases, a more in-depth consideration of these



impacts was made in terms of construction and operation. Specifically, risks related to soil contamination during construction (G4 and G6), as well as during operation (G8) were assessed and addressed. Finally, soil erosion was considered in more detail related to the clearing and loss of vegetation on site (G5 and G7).

To address the adverse effects of this project on Geology and Soils, mitigations to address soil compaction, erosion, and land degradation have been proposed, rendering the impacts being rated as negative Medium to Low.

**10.3.3.1 SOIL COMPACTION, SOIL EROSION, LAND DEGRADATION AND SOIL CONTAMINATION – CONSTRUCTION (G1), OPERATION (G2), AND DECOMMISSIONING (G3)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Soil compaction, Soil erosion, Land degradation and Soil contamination (G1)	Construction	Medium to low -	Low -	Low -
Soil compaction, Soil erosion, Land degradation and Soil contamination (G2)	Operation	Low -	Low -	Low -
Soil compaction, Soil erosion, Land degradation and Soil contamination (G3)	Decommissioning	Low -	Low -	Low -
<b>Potential cumulative/ confounding effects</b>	During construction, clearing and excavation will disturb topsoil, increasing erosion risk and reducing soil fertility. In the operational phase, ongoing maintenance activities and vehicle movement along access tracks can perpetuate compaction and inhibit natural recovery, leading to long-term degradation of soil structure and ecosystem services such as water infiltration and vegetation growth. At decommissioning, dismantling infrastructure and removing foundations could exacerbate these impacts if rehabilitation is not properly implemented. When combined with similar projects in the region, these cumulative effects could result in widespread loss of soil integrity, reduced land capability, and increased vulnerability to desertification in an already arid environment. However, if mitigation measures are consistently applied across projects, the cumulative impact can be substantially reduced and even reversed over time			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Minimise project footprint as far as possible. Manage location of topsoil stripping stockpiling, demarcation of topsoil stockpiles and prevention of stockpile erosion and contamination. This can protect the topsoil stockpiles to keep it viable for rehabilitation purposes.</li> <li>• Make use of existing roads or upgrades tracks before new roads are constructed. The number and width of internal access routes must be kept to a minimum.</li> <li>• Implementation of embedded controls such as geotextiles, gabion baskets can effectively control soil erosion on-site.</li> <li>• Associated infrastructure foundations must be (preferably) located in already disturbed areas where possible.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.</li> <li>Dust suppressions methods should be implemented to reduce wind erosion during this phase.</li> <li>A stormwater management plan must be implemented for the development.</li> <li>Rehabilitation of the area must be initiated from the onset of the project. Soil stripped from tower placement can be used for rehabilitation efforts.</li> <li>Rehabilitate disturbed areas promptly by re-spreading stripped topsoil and re-vegetating with indigenous species.</li> <li>An alien invasive plant species and control programme must be implemented from the onset of the project.</li> <li>Install erosion and sediment control measures.</li> <li>Complete removal of infrastructures such as racking, inverters, and electrical infrastructure is the standard best practice to restore the site and prevent future hazards. Remove all above-ground and below-ground cabling, foundations, and concrete pads.</li> <li>Remove hazardous materials (batteries, oils, chemicals) for proper disposal to prevent soil contamination.</li> <li>Remove all construction debris and waste from the site to prevent pollution.</li> <li>Decompact soils in areas affected by heavy machinery (use subsoiling or deep ripping).</li> <li>Reseed or replant with native or pre-existing vegetation suited to the soil capability.</li> <li>Maintain erosion and sediment controls until vegetation is re-established.</li> <li>Conduct post-restoration soil assessments (compaction, fertility, structure).</li> <li>Document and report restoration outcomes to relevant authorities.</li> <li>Conduct a final site inspection with stakeholders and authorities.</li> </ul>				

**10.3.3.2 INCREASED RISK OF CONTAMINATION (SOIL AND WATER RESOURCE) FROM FUEL SPILLS, CONSTRUCTION WASTE, AND HAZARDOUS MATERIALS – CONSTRUCTION (G4 - POWERLINE) (G6 – SUBSTATION) - OPERATION (G8 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials – Powerline (G4)	Construction	Medium to high -	Medium to low -	Medium to low -
Increased risk of contamination (soil and water resource) from fuel spills,	Construction	Medium to high -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
construction waste, and hazardous materials – Substation (G6)				
Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials – Substation (G8)	Operation	Medium to high -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
Mitigation Measures				
<ul style="list-style-type: none"> <li>• A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. The water resources must be protected and all activities that could result in a spill should occur away from them.</li> <li>• Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such, although no servicing of equipment on site.</li> <li>• No non-environmentally friendly suppressants may be used as this could result in pollution of water sources and the ecosystem.</li> <li>• Compile and implement a Solid Waste Management Plan. Waste management must be a priority, and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum.</li> <li>• Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.</li> <li>• Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.</li> <li>• All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.</li> </ul>				

**10.3.3.3 CLEARING OF VEGETATION LEADING TO SOIL EROSION AND LOSS OF TOPSOIL – CONSTRUCTION (G5 - POWERLINE) (G7 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Clearing of vegetation leading to soil erosion	Construction	Medium to high -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
and loss of topsoil – Powerline (G5)				
Clearing of vegetation leading to soil erosion and loss of topsoil – Substation (G7)	Construction	High -	Medium to low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.</li> <li>• Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat.</li> <li>• Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.</li> <li>• Only existing access routes and walking paths may be made use of.</li> </ul>				

10.3.3.4 **CONTINUOUS STRIPPING OF TOPSOIL, LEADING TO ONGOING LAND DEGRADATION, INCLUDING EROSION – OPERATION (G9 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continuous stripping of topsoil, leading to ongoing land degradation, including erosion – Substation (G9)	Operation	Medium to high -	Medium to low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• All vehicles must utilize the authorized access routes only.</li> <li>• Environmental awareness and training should be conducted, with strict enforcement of a zero-tolerance policy on wildlife poaching, especially for tortoises.</li> <li>• A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>• Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat.</li> <li>• Only existing access routes and walking paths may be made use of.</li> </ul>				

### 10.3.4 SURFACE WATER/ WETLANDS (W)

The assessed watercourses exhibit limited impacts on both the catchment and local scale. These impacts result from present and historical land use relating to infrastructure development and agricultural practices in proximity to watercourses. The list below refers to the present-day local impacts associated with the assessed freshwater areas:

- Encroachment of invasive plant species (Mexican Poppy and Mesquite);
- Agricultural activities (livestock and farm dams);
- Erosion resulting from historic excavation and from hardened surfaces;
- Historic excavation areas;
- Dirt road crossings; and
- Existing pylon structures.

The impact assessment shows that the risks from the proposed project are generally of "Medium to High" significance prior to mitigation. With the application of mitigation measures, all impacts are reduced to "Low" significance, indicating effective management. The results confirm that, with proper controls, the long-term impacts on aquatic ecosystem health and function are minimal.

Impacts identified include the loss, disturbance and degradation of watercourses (SW1), ecosystems (SW2), and wetlands and wetland vegetation (SW 10, SW11 and SW15). The degradation of these environmental features could encourage the increase of bare surfaces, and potential erosion (SW6). Erosion was also noted as a potential impact to consider, both during construction (SW4) and operation (SW14). Erosion is expected to also lead to other impacts such as increased sediment loads to downstream reaches (SW9), and nutrient enrichment of watercourses (SW13). Impacts on watercourses as a result include altered hydrological regimes (SW3) and decreased flow inputs (SW8). Impaired water quality is therefore also expected (SW7). Finally, the activities of the project may encourage the introduction (SW5) and proliferation (SW12) of alien and invasive vegetation which will in turn affect watercourses.

#### 10.3.4.1 LOSS, DISTURBANCE AND DEGRADATION OF WATERCOURSES – CONSTRUCTION (SW1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Loss, disturbance and degradation of watercourses (SW1)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses,			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
		<p>impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>		
Mitigation Measures				
		<ul style="list-style-type: none"> <li>• The recommended buffer zones must be strictly adhered to during the construction phase.</li> <li>• Both sensitive and construction areas must be clearly demarcated. No activities should be allowed in the highly sensitive areas.</li> <li>• Once the final line and associated pylon have been confirmed, a walkthrough is required to ensure sensitive areas are excluded for construction of pylons.</li> <li>• The use of minimum pylons or pylons that span wide enough to avoid sensitive areas is recommended.</li> <li>• The placement of pylons must avoid all delineated water resources and buffers.</li> <li>• Avoid the creation of new access roads as far as possible; use existing roads where possible.</li> <li>• No vehicle or machinery is allowed to be washed within a watercourse or its buffer area.</li> <li>• Laydown yards, camps and storage areas must be beyond the watercourse areas.</li> <li>• Prevent uncontrolled access of vehicles through the watercourse.</li> <li>• Heavy vehicles must be parked outside of the riparian buffer zone except where needed for construction.</li> <li>• All areas upstream and downstream of construction footprint must be demarcated as a 'no-go' zone.</li> <li>• Rehabilitation of the riparian area, bed and banks must be budgeted for and completed as soon as construction is completed.</li> </ul>		

#### 10.3.4.2 LOSS OR DEGRADATION IN ECOSYSTEM SERVICES – CONSTRUCTION (SW2)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Loss, disturbance and degradation of watercourses (SW2)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>		<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p>		



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
		Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation		
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Landscape and revegetate all cleared areas as soon as possible to limit erosion potential.</li> <li>• Implement seasonal restrictions on operations to avoid sensitive periods for wildlife.</li> <li>• Develop a restoration and rehabilitation plan to mitigate long-term impacts.</li> <li>• Implement measures such as revegetation of disturbed areas or habitat enhancement to restore ecological functions.</li> <li>• An adaptive rehabilitation plan needs to be implemented from the onset of the project.</li> <li>• Measures must be implemented at alterations to prevent detrimental changes to aquatic biota and ecosystem services.</li> </ul>				

#### 10.3.4.3 ALTERED HYDROLOGICAL REGIMES – CONSTRUCTION (SW3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Altered hydrological regimes (SW3)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Install sedimentation/erosion protection measures prior to construction (sandbags, silt traps, fences).</li> <li>• Energy dissipation structures (stone berms or blocks) must be strategically placed along road margins.</li> <li>• A suitably qualified Hydrologist must develop a Stormwater management plan.</li> <li>• Erosion and sedimentation into drainage lines must be minimised through stabilisation and revegetation.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>All alterations or hardened surfaces must not induce sedimentation, erosion, or flooding, or cause detrimental changes in flow.</li> </ul>				

#### 10.3.4.4 INCREASE IN EROSION OF RECEIVING SYSTEMS – CONSTRUCTION (SW4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Increase in erosion of receiving systems (SW4)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Landscape and revegetate all cleared areas as soon as possible.</li> <li>Install sedimentation/erosion protection measures (sandbags, silt traps, fences).</li> <li>Energy dissipation structures must be placed along road margins.</li> <li>Signs of erosion must be addressed immediately.</li> <li>Temporary and permanent erosion control methods (silt fences, curtains, basins, ponds, ditches, seeding, riprap, mats, mulching).</li> <li>All removed soil and material must not be stockpiled within the system; stockpiles must be protected from erosion.</li> <li>Install sandbags around soil stockpiles.</li> <li>Areas exposed to erosion must be protected through sandbags, berms, and efficient construction processes.</li> <li>Erosion prevention and sediment control measures must be implemented.</li> </ul>				



#### 10.3.4.5 INTRODUCTION AND SPREAD OF ALIEN AND INVASIVE VEGETATION – CONSTRUCTION (SW5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Introduction and spread of alien and invasive vegetation (SW5)</b>	Construction	Medium to high -	Medium to low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Quarterly vegetation rehabilitation surveys need to be conducted.</li> <li>• An alien invasive plant management plan needs to be compiled and implemented prior to construction.</li> <li>• An alien invasive plant management plan needs to be compiled and implemented post construction.</li> <li>• Alien vegetation must not be allowed to encroach onto the sites and must be continually removed during construction.</li> </ul>				

#### 10.3.4.6 INCREASED BARE SURFACES, FLOOD PEAKS AND POTENTIAL EROSION – CONSTRUCTION (SW6)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Increased bare surfaces, flood peaks and potential erosion (SW6)</b>	Construction	Medium to high -	Medium to low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Landscape and revegetate all cleared areas as soon as possible.</li> <li>• Temporary and permanent erosion control methods (silt fences, seeding, mulching, etc.).</li> <li>• Areas exposed to erosion must be protected through sandbags, berms, and efficient construction processes.</li> <li>• Limit the extent and duration that areas are exposed.</li> </ul>				

#### 10.3.4.7 IMPAIRED WATER QUALITY – CONSTRUCTION (SW7)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Impaired water quality (SW7)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• All construction activities must be undertaken during the low flow (dry season) period.</li> <li>• All contractors and employees should undergo environmental awareness induction.</li> <li>• Contractors must have spill kits available for fuel or oil spills.</li> <li>• Action plans and training for spills, leaks, and other impacts to freshwater systems.</li> <li>• Prefabricate as much material as possible to avoid on-site contamination.</li> <li>• No vehicle or machinery washing within watercourses or buffer areas.</li> <li>• All chemicals and toxicants must be stored in bunded areas.</li> <li>• Machinery and equipment should be inspected regularly for faults and leaks; serviced off-site.</li> <li>• No dumping of construction material on-site.</li> <li>• All waste generated on-site must be adequately managed; support separation and recycling.</li> <li>• All removed soil and material must not be stockpiled within the system.</li> <li>• Install sandbags around soil stockpiles.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>Mixing of concrete must not take place within watercourses; clean area after use.</li> </ul>				

#### 10.3.4.8 DECREASED FLOW INPUTS INTO WATERCOURSES – CONSTRUCTION (SW8)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Decreased flow inputs into watercourses (SW8)	Construction	Medium to high -	Low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>The recommended buffer zones must be strictly adhered to.</li> <li>Avoid the creation of new access roads as far as possible; use existing roads where possible.</li> <li>Placement of pylons must avoid all delineated water resources and buffers.</li> </ul>				

#### 10.3.4.9 INCREASED SEDIMENT LOADS TO DOWNSTREAM REACHES – CONSTRUCTION (SW9)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased sediment loads to downstream reaches (SW9)	Construction	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The</p>			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
		cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation		
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Install sedimentation/erosion protection measures.</li> <li>• All removed soil and material must not be stockpiled within the system.</li> <li>• Install sandbags around soil stockpiles.</li> <li>• Erosion and sedimentation into drainage lines must be minimised.</li> </ul>				

#### 10.3.4.10 CONTAMINATION OF WETLANDS – CONSTRUCTION (SW10)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Contamination of wetlands (SW10)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/ confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Contractors must have spill kits available.</li> <li>• Action plans and training for spills, leaks, and other impacts.</li> <li>• All chemicals and toxicants must be stored in bunded areas.</li> <li>• Machinery and equipment should be inspected regularly for faults and leaks; serviced off-site.</li> <li>• No vehicle or machinery washing within watercourses or buffer areas.</li> <li>• Develop spill prevention and response plans.</li> <li>• Have spill containment materials readily available on-site and train personnel.</li> <li>• The contractor is responsible for cleaning up any spillages immediately.</li> </ul>				



10.3.4.11 **DISTURBANCE AND DEGRADATION OF WETLAND VEGETATION – CONSTRUCTION (SW11)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Disturbance and degradation of wetland vegetation (SW11)</b>	Construction	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Both sensitive and construction areas must be clearly demarcated.</li> <li>• Avoid the creation of new access roads as much as possible; use existing roads where possible.</li> <li>• The route for vehicles must be planned to avoid sensitive habitats, wetland/riparian vegetation, buffer areas, and other waterbodies.</li> <li>• Operators must be trained in operating machinery in wetland/sensitive environments.</li> <li>• Use machinery with low ground pressure to minimise soil compaction and damage.</li> <li>• Machinery can be equipped with attachments like swamp mats or bog mats.</li> </ul>				

10.3.4.12 **PROLIFERATION OF ALIEN AND INVASIVE SPECIES – OPERATION (SW12)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Proliferation of alien and invasive species (SW12)</b>	Operation	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The</p>			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
	cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Quarterly vegetation rehabilitation surveys need to be conducted.</li> <li>An alien invasive plant management plan needs to be compiled and implemented prior to and post construction.</li> <li>Alien vegetation must not be allowed to encroach onto the sites and must be continually removed during construction.</li> </ul>				

#### 10.3.4.13 NUTRIENT ENRICHMENT OF WATERCOURSE – OPERATION (SW13)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Nutrient enrichment of watercourse (SW13)</b>	Operation	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>No dumping of construction material on-site.</li> <li>All waste generated on-site must be adequately managed; support separation and recycling.</li> <li>All chemicals and toxicants must be stored in bunded areas.</li> </ul>				

#### 10.3.4.14 INCREASE IN EROSION AND SEDIMENTATION OF RECEIVING SYSTEMS – OPERATION (SW14)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Increase in erosion and sedimentation of receiving systems (SW14)</b>	Operation	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
		Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation		
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Landscape and revegetate all cleared areas as soon as possible.</li> <li>• Install sedimentation/erosion protection measures (sandbags, silt traps, fences).</li> <li>• Energy dissipation structures must be placed along road margins.</li> <li>• Signs of erosion must be addressed immediately.</li> <li>• Temporary and permanent erosion control methods (silt fences, curtains, basins, ponds, ditches, seeding, riprap, mats, mulching).</li> <li>• All removed soil and material must not be stockpiled within the system; stockpiles must be protected from erosion.</li> <li>• Install sandbags around soil stockpiles.</li> <li>• Areas exposed to erosion must be protected through sandbags, berms, and efficient construction processes.</li> <li>• Erosion prevention and sediment control measures must be implemented.</li> </ul>				

#### 10.3.4.15 DEGRADATION OF WETLAND VEGETATION – OPERATION (SW15)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Degradation of wetland vegetation (SW15)</b>	Operation	Medium to high -	Low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	<p>Localised cumulative impacts include the cumulative effects from anthropogenic activities that are close enough (such as nearby farming activities within the area) to potentially cause additive effects on the environment or sensitive receivers. These include disruption of ecological corridors or habitat such as watercourses, impacts to groundwater and surface water quality, and transport of soils and instream habitat smothering impacts.</p> <p>Long-term cumulative impacts due to the proposed electricity transmission footprint combined with the low density agricultural activities currently present has the potential to degrade watercourse habitat across the catchment. The cumulative impact of the project was rated as 'Low' should the project go ahead and involve the implementation of mitigation</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Both sensitive and construction areas must be clearly demarcated.</li> <li>• Avoid the creation of new access roads as far as possible; use existing roads where possible.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>The route for vehicles must be planned to avoid sensitive habitats, wetland/riparian vegetation, buffer areas, and other waterbodies.</li> <li>Operators must be trained in operating machinery in wetland/sensitive environments.</li> <li>Use machinery with low ground pressure to minimise soil compaction and damage.</li> <li>Machinery can be equipped with attachments like swamp mats or bog mats.</li> <li>Develop a restoration and rehabilitation plan.</li> <li>Implement measures such as revegetation of disturbed areas or habitat enhancement.</li> </ul>				

### 10.3.5 NOISE (N)

Consideration was made regarding noise as an impact of the project. Given that the site is remote with little to no noise generated from anthropogenic sources, the addition of construction activities (N1) and routine maintenance activities (N2) to follow will have an impact on the level of noise the project introduces to the environment.

Impacts were rated as Medium to low negative prior to mitigation, with some mitigations proposed to address the impact rendering it a Low negative overall impact.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Noise generation through construction activities (N1)	Construction	Medium to low -	Low -	Low -
Noise generation through maintenance activities (N1)	Operation	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Where possible, make use of machinery which does not produce excessive noise.</li> <li>Minimise the number of vehicles on site at a given time as far as possible.</li> <li>Reduce the noise generated by vehicles and earth moving machinery under enforced speed limits reducing the probability and magnitude of noise generation.</li> </ul>				

### 10.3.6 VISUAL/ LANDSCAPE (V)

Several sensitivities and Zones of Theoretical Visibility (ZTV) were identified through the Landscape and Visual Impact Assessment. These are mapped in Figure 86 and Figure 87. From the review of the proposed project and the nature of the affected landscape, the following possible landscape and visual impacts were identified:

- Landscape change due to the proposed project (V1-V4)**



The proposed development is located within an area that is largely natural in character although the proposed substation is located within an area that is largely industrial in character.

The proposed substation site is located within an area that has been developed with large solar projects as well as the existing Paulputs Substation.

The proposed power 400kV powerline is generally located within a largely natural landscape with relatively minor electrical infrastructure including smaller medium voltage powerlines largely beside roads.

The western most section of the proposed 400kV powerline is aligned away from roads and settlement. The eastern most section is aligned close to the N14 as well as a number of homesteads including a single homestead to the east of the N14 and the Uitkyk Hamlet that is located close to the western side of the N14.

With mitigation measures all possible landscape impacts were assessed as likely to have a low significance.

During construction potential landscape impacts due to the proposed substation were assessed as likely to have a medium low significance and the proposed 400kV powerline was assessed as likely to have a medium high significance. The difference was due to the fact that the proposed substation is located within an industrial area whereas the substation is located within a relatively natural landscape.

- **Change in the character of views as experienced by travelers on the R357 (V5-V8)**

At its closest the proposed 400kV powerline will be approximately 1km from the R357, at its furthest it will be approximately 7.7km from this road. Therefore neither the construction or operational phase powerline is likely to be visually obvious from this road.

Visual impacts associated with both the proposed substation and the 400kV powerline were assessed as likely to have a low significance both during the construction and operational phases of the project.

- **Change in the character of views as experienced by travelers on the N14 (V9-V11)**

Only the proposed 400kV powerline will impact on the N14. With the exception of the existing Aries – Kokerboom 400kV powerline road crossing at the eastern end of the proposed project, in most areas in the vicinity of the proposed site, existing high voltage powerlines are aligned away from main roads. The only area where high voltage powerlines are obvious running parallel to the road is close to Aggeneis which is approximately 95km west of the proposed site. Close to Aggeneis, high and medium voltage overhead powerlines converge on the Aggeneis Substation. In this area, 400kV powerlines are obvious running parallel to the N14. Apart from locations where these powerlines cross the road, the closest that they run adjacent to the road is approximately 250m. From this distance the powerlines are visually obvious, however, they do not dominate the view from the road.

The proposed 400kV powerline also appears to be located approximately 250m from the N14. At 250m from the road, the proposed powerlines will be conspicuous and will noticeably change the nature of views from the road but will not dominate views. Up to a distance of approximately 1km, the proposed 400kV powerline will be highly conspicuous. The further from the road they can be located, the less conspicuous that are likely to be.

The assessed impact during both the construction and the operational phases was assessed as medium high.

- **Change in the character of views as experienced by residents of local homesteads (V12 and V13)**

Only the proposed 400kV overhead powerlines are likely to be visually obvious from homesteads. Approximately twelve (12) homesteads are within 5km and could have a view of the proposed powerline.

There are two homesteads within 100m of the proposed 400kV powerline. Both of these homesteads are located on the eastern side of the N14, one opposite the small hamlet of Uitkyk and one approximately 4.6km north of the intersection of the N14 and the R357.

It is because of the two closest homesteads that the possible impact was assessed as likely to have a high medium significance during construction and a high significance during the operational phase. The main reason for the difference is that the construction phase is relatively short compared with the operational phase.



- **Lighting impacts (V14 and V15)**

The environment surrounding the proposed facility is largely dark at night. Existing lighting is typically comprised of:

- Low intensity lighting associated with individual dwellings;
- Lighting associated with the existing Paulputs Substation and solar projects at the western end of the proposed project; and
- Vehicle lights that may be driving through the area.

Permanent lighting associated with the proposed development could include:

- Security lighting within the proposed substation; and
- Operational lighting within the proposed substation.

Lighting during both the construction and operational phases of the proposed project was assessed as likely to have a low negative visual impacts.

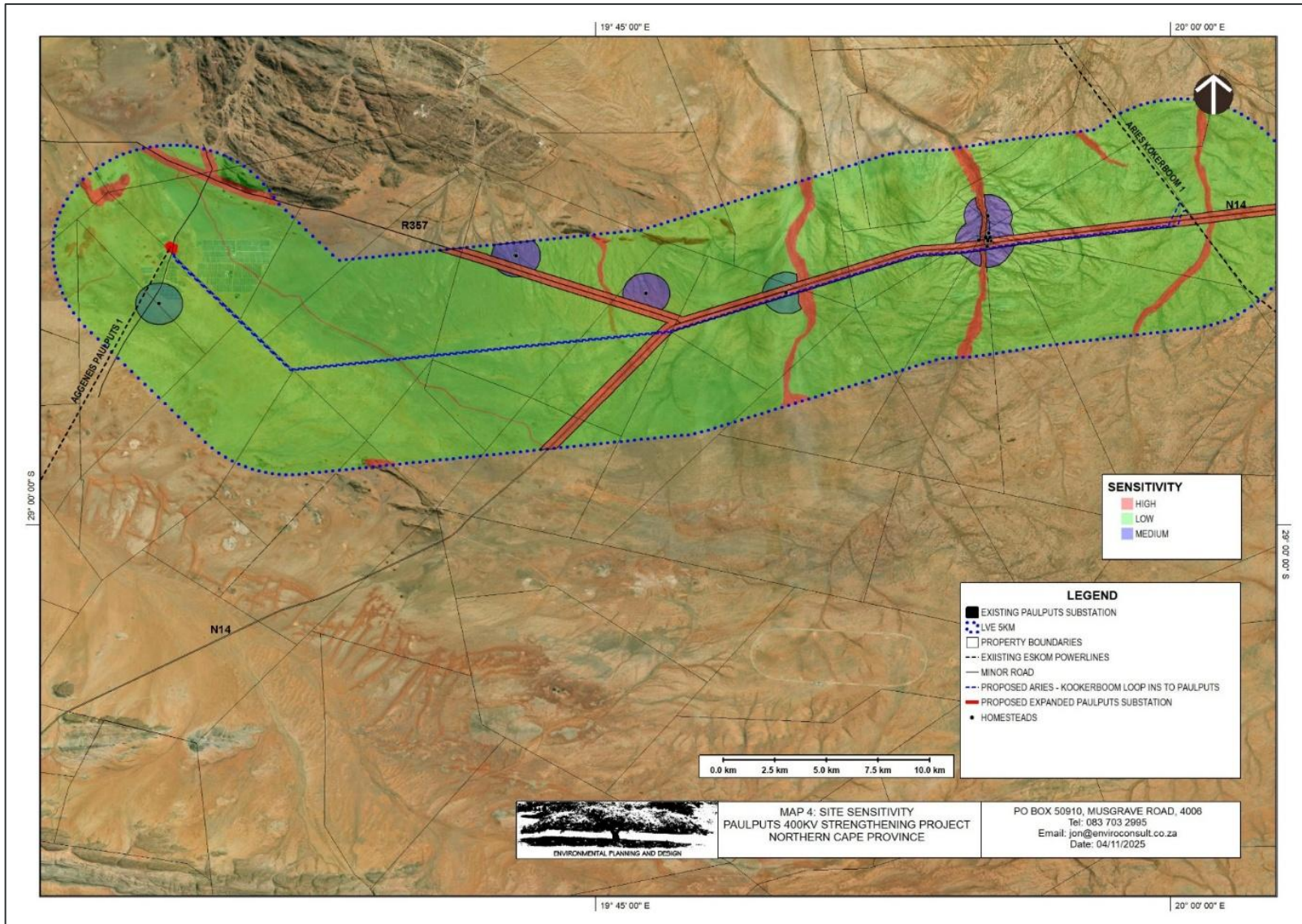


Figure 86: Site Sensitivity from a visual perspective

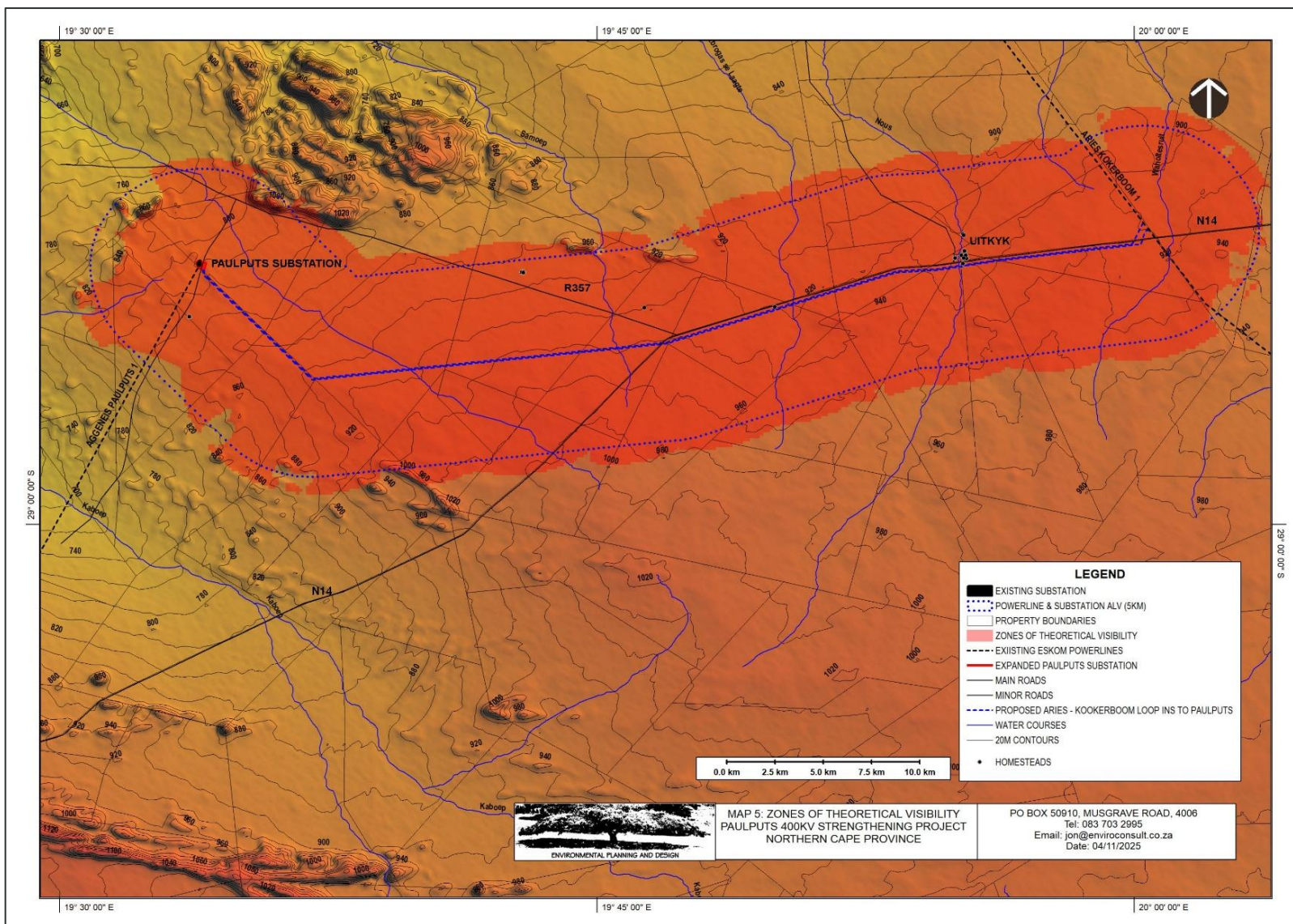


Figure 87: Zones of Theoretical Visibility associated with the project



10.3.6.1 CHANGE OF CHARACTER OF THE LANDSCAPE – CONSTRUCTION (V1 – SUBSTATION) (V2 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of character of the landscape – Substation (V1)	Construction	Medium to low -	Medium to low -	Medium to low -
Change of character of the landscape – Powerline (V2)	Construction	Medium to high -	Medium to low -	Medium to high -
<b>Potential cumulative/ confounding effects</b>	<p>The substation will intensify the existing impact of industrial elements within its vicinity. However, this will be a localised cumulative impact, it will not extend the existing area of impact.</p> <p>The 400kV powerline will extend the existing impact area of similar infrastructure within the surrounding otherwise relatively natural landscape.</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Control site access particularly during construction in order to minimise areas of disturbance.</li> <li>• Undertake waste management in order to minimise the spread of waste from the site.</li> <li>• Reinstate, augment and maintain retained natural vegetation.</li> <li>• Remove all temporary works.</li> <li>• Monitor rehabilitated areas post-construction and implement remedial actions.</li> <li>• Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.</li> </ul>				

10.3.6.2 CHANGE OF CHARACTER OF THE LANDSCAPE – OPERATION (V3 – SUBSTATION) (V4 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of character of the landscape – Substation (V3)	Operation	Medium to low -	Medium to low -	Medium to low -
Change of character of the landscape – Powerline (V4)	Operation	Medium to low -	Medium to low -	Medium to high -
<b>Potential cumulative/ confounding effects</b>	<p>The substation will intensify the existing impact of industrial elements within its vicinity. However, this will be a localised cumulative impact, it will not extend the existing area of impact.</p> <p>The 400kV powerline will extend the existing impact area of similar infrastructure within the surrounding otherwise relatively natural landscape</p>			



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Monitor rehabilitated areas post-construction and implement remedial actions as necessary.</li> </ul>				

#### 10.3.6.3 CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM THE R357 – CONSTRUCTION (V5 – SUBSTATION) (V7 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from the R357 – Substation (V5)	Construction	Low -	Low -	Low -
Change of landscape character as viewed from the R357 – Powerline (V7)	Construction	Low -	Low -	Low -
<b>Potential cumulative/ confounding effects</b>	<p>Views of the substation will marginally intensify the existing impact of industrial elements from the road. However, this will be a localised cumulative impact, it will not extend the existing area of impact.</p> <p>The 400kV powerline will be the only 400kV overhead powerline visible from this road</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Control site access particularly during construction in order to minimise areas of disturbance.</li> <li>Undertake waste management in order to minimise the spread of waste from the site.</li> <li>Reinstate, augment and maintain retained natural vegetation.</li> <li>Remove all temporary works.</li> <li>Monitor rehabilitated areas post-construction and implement remedial actions.</li> <li>Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.</li> </ul>				

#### 10.3.6.4 CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM THE R357 – OPERATION (V6 – SUBSTATION) (V8 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from the R357 – Substation (V6)	Operation	Low -	Low -	Low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from the R357 – Powerline (V8)	Operation	Low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	<p>Views of the substation will marginally intensify the existing impact of industrial elements from the road. However, this will be a localised cumulative impact, it will not extend the existing area of impact.</p> <p>The 400kV powerline will be the only 400kV overhead powerline visible from this road</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Control site access particularly during construction in order to minimise areas of disturbance.</li> <li>• Undertake waste management in order to minimise the spread of waste from the site.</li> <li>• Reinstate, augment and maintain retained natural vegetation.</li> <li>• Remove all temporary works.</li> <li>• Monitor rehabilitated areas post-construction and implement remedial actions.</li> <li>• Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.</li> </ul>				

10.3.6.5 **CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM THE N14 – CONSTRUCTION (V9 – SUBSTATION) (V10 – POWERLINE)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from the N14 – Substation (V9)	Construction	Medium to high -	Medium to low -	Medium to high -
Change of landscape character as viewed from the N14 – Powerline (V10)	Construction	Medium to high -	Medium to low -	Medium to high -
<b>Potential cumulative/confounding effects</b>	The 400kV powerline will be the only 400kV overhead powerline visible from this road			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Control site access particularly during construction in order to minimise areas of disturbance.</li> <li>• Undertake waste management in order to minimise the spread of waste from the site.</li> <li>• Reinstate, augment and maintain retained natural vegetation.</li> <li>• Remove all temporary works.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>Monitor rehabilitated areas post-construction and implement remedial actions.</li> <li>Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.</li> </ul>				

#### 10.3.6.6 CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM THE N14 – OPERATION (V11 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from the N14 (V11)	Operation	Medium to high -	Medium to high -	Medium to high -
Potential cumulative/confounding effects	The 400kV powerline will extend the existing impact area of similar infrastructure within the landscape surrounding the road which is generally a relatively natural landscape			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Monitor rehabilitated areas post-construction and implement remedial actions as necessary.</li> </ul>				

#### 10.3.6.7 CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM LOCAL HOMESTEADS – CONSTRUCTION (V12)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from local homesteads (V12)	Construction	Medium to high -	Medium to low -	Medium to high -
Potential cumulative/confounding effects	The 400kV powerline will be the only 400kV overhead powerline visible from the affected homesteads			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Control site access particularly during construction in order to minimise areas of disturbance.</li> <li>Undertake waste management in order to minimise the spread of waste from the site.</li> <li>Reinstate, augment and maintain retained natural vegetation.</li> <li>Remove all temporary works.</li> <li>Monitor rehabilitated areas post-construction and implement remedial actions.</li> <li>Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.</li> </ul>				



10.3.6.8 CHANGE OF LANDSCAPE CHARACTER AS VIEWED FROM LOCAL HOMESTEADS – OPERATION (V13)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Change of landscape character as viewed from local homesteads (V13)	Operation	Medium to high -	Medium to high -	High -
Potential cumulative/confounding effects	The 400kV powerline could extend the numbers of homesteads impacted by high voltage powerlines in the region			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Monitor rehabilitated areas post-construction and implement remedial actions as necessary.</li> </ul>				

10.3.6.9 POTENTIAL LIGHT POLLUTION AND NUISANCE FOR NEIGHBOURS – CONSTRUCTION (V14)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential light pollution and nuisance for neighbours (V14)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	The substation is likely to intensify the existing impact of lighting within its vicinity. However, this will be a localised and is unlikely to extend the cumulative effect of lighting			
<b>Mitigation Measures</b>				
Planning: <ul style="list-style-type: none"> <li>Careful design of security and operational lighting to minimise impacts on surrounding areas and receptors.</li> <li>Minimise lighting particularly in natural sections of the proposed project.</li> <li>High mast lighting should not be used.</li> </ul> Operation: <ul style="list-style-type: none"> <li>Ensure that the intention of the original lighting design is maintained throughout the construction phase.</li> </ul>				

10.3.6.10 POTENTIAL LIGHT POLLUTION AND NUISANCE FOR NEIGHBOURS – OPERATION (V15)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential light pollution and nuisance for neighbours (V15)	Operation	Medium to low -	Low -	Low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Potential cumulative/ confounding effects</b>	The substation is likely to intensify the existing impact of lighting within its vicinity. However, this will be a localised and is unlikely to extend the cumulative effect of lighting			
<b>Mitigation Measures</b>				
Planning: <ul style="list-style-type: none"> <li>Careful design of security and operational lighting to minimise impacts on surrounding areas and receptors.</li> <li>Minimise lighting particularly in natural sections of the proposed project.</li> <li>High mast lighting should not be used.</li> </ul> Operation: <ul style="list-style-type: none"> <li>Ensure that the intention of the original lighting design is maintained throughout the construction phase.</li> </ul>				

### 10.3.7 TERRESTRIAL ECOLOGY (TE)

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora, and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors, such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

Any development within the PAOI will result in the irreplaceable loss of:

- Portions of CBA 1, CBA 2, and ESA;
- Water resources; and
- Flora and fauna SCC

Due to the nature of the project, the actual footprint of the pole/pylon infrastructure has a small, localised impact in comparison to the creation of access/service roads which is an important aspect to note. The overhead powerline and access road route is available. However, due to portions of the project area being largely undisturbed one could assume that the powerline route will transverse large areas of undisturbed vegetation. This would increase the potential impact of the powerlines and the associated roads on the terrestrial biodiversity. The water resources along the route, which are sensitive systems, can be spanned by the powerline. Rocky outcrop areas which occur within the project area which and are considered to be of a high sensitivity will be impacted the infrastructure. The main significant risk to these habitats is the creation of roads as the outcrop areas will have to be completely modified to allow for the construction of roads.

The following impacts are expected throughout the different phases:

- Destruction, further loss and fragmentation of the vegetation community/ecosystems. The proposed use of the existing road may lead the widening of existing roads/servitudes which will physically remove vegetation as well as remove and fragment communities/ ecosystems for flora species. Human movements, which lead to soil disturbance and the introduction of invasive and alien plant species, along with disruptions in natural areas of phytomass, will further enhance the likelihood and potential for these invasive plants to establish themselves;



- The removal of vegetation will result in the direct loss of habitat forcing fauna species (including expected and confirmed SCC) to move into new areas leading to disruption of faunal populations by interfering with their movements and/or breeding activities. Direct mortalities may result from vehicles and increased traffic due to construction work and the transportation of staff/materials. The unregulated movement of local people will also increase the likelihood of poaching of species in what was previously seen as secluded habitat for fauna species;
- Continued habitat degradation (dust, pollution, infringement and alien vegetation encroachment) are the main impacts considered for the operational phase. The edges of the linear infrastructure, especially the access roads and servitudes will likely be degraded by impacts such as dust (reduces the effectiveness of photosynthesis and pollination), livestock and alien vegetation will become a concern in these disturbed areas. The unregulated movement of local people into the areas surrounding the footprint will likely result in plant poaching, this is especially true for areas not under management. The continued use of the road surface will result in severe erosion, ultimately loss in topsoil over time. There is a high potential for spills, leaks of fuel and hydrocarbons., ultimately polluting the environment, and further spreading during rainfall events; and
- Ongoing displacement and mortality due to sensory disturbance and collisions during operation (noise, light, traffic, dust, pollution and vibrations) from the maintenance vehicles. The footprint area will likely be impacted by poaching and poaching. Increased mortalities of fauna through collisions with vehicles is also anticipated.

The following potential main impacts on the biodiversity were considered for the construction phase of the project. This phase refers to the period when construction of the proposed infrastructure is built/installed. This phase usually has the largest direct impact on biodiversity. The construction phase is expected to have the following impacts in general:

- Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC (TE1 and TE5)
- Destruction of non-resilient habitats (Rocky Outcrops) (TE10)
- Direct loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna (TE9 and TE12)
- Introduction of alien species, especially plants (TE2 and TE6)

This phase refers to when construction has been completed, and the proposed infrastructure has been built and is functional. Due to the use of the, and most likely not being decommissioning the of the linear features, the following impacts in general can be expected:

- Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community (TE3 and TE7)
- Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna (TE11 and TE13)
- Continued encroachment by alien and invasive plant species (TE4 and TE8)



10.3.7.1 DESTRUCTION, FURTHER LOSS AND FRAGMENTATION OF THE HABITATS, ECOSYSTEMS VEGETATION COMMUNITY, AND THE LOSS OF FLORAL SCC – CONSTRUCTION (TE1 – POWERLINE)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC – Powerline (TE1)</b>	Construction	High -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Pylon locations must avoid all floral SCC and buffers found within the project area. It is imperative that the recommended pylon movements advised by ecology specialists are adhered to. This will ensure no SCC are destroyed by vegetation clearance (powerline and servitude roads). All floral SCC located directly outside of the 10 m pylon buffer should be marked with high visibility flags to ensure that they are not affected by vehicles and machinery.</li> <li>• A 100 m buffer placed around individuals of Sensitive Species 144 must be considered for pylon and servitude road placement. The final layout must show that the servitude road has avoided SCC and Sensitive Species 144 buffers.</li> <li>• It is recommended that the pylons be moved out of CBA's. Construction within CBA's may trigger offsets according to the National Offset Guidelines. Discussion of potential offsets with the relevant authorities are required. Offsets are at the discretion of the department.</li> <li>• Existing access roads must be made use of and any new roads need to be two track roads and the construction of gravel roads should be avoided. Clearing of vegetation for the servitude roads needs to be limited.</li> <li>• The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.</li> <li>• Proposed new servitude roads should be constructed on existing roads, where possible, to limit clearance of vegetation and impacts. Existing roads and servitudes need to be used before new areas are considered. All new roads must be authorised.</li> <li>• Areas of indigenous vegetation, even secondary communities outside of the direct pylon and servitude road footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible.</li> <li>• No unnecessary further loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.</li> <li>• All structure footprints are to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the proposed development area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>• Mitigation measures and buffers outlined in the Aquatic assessments should be adhered to (TBC, 2025).</li> <li>• Any individual of any protected plant species that is present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed, the sensitivity and importance of these species needs to be part of the environmental awareness program. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.</li> <li>• Vegetation clearing commences only after the necessary permits have been obtained. Vegetation clearing must be isolated to pylon locations.</li> <li>• Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.</li> <li>• Compilation and implementation of an alien vegetation management plan. An acceptable plan must be in place prior to the commencement of construction activities.</li> <li>• Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such.</li> <li>• There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous plants from the area. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.</li> <li>• Reduce the dust generated by vehicles/machines, creating of 'speed bumps', putting up signs to enforce speed limits to enforce reduced speeds.</li> <li>• No non-environmentally friendly suppressants may be used as this could result in pollution of water sources and the ecosystem.</li> <li>• Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures, apart from approved structures, must be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated areas.</li> <li>• A suitable stormwater plan must be compiled for the development footprint. This plan should include mitigation measures for the construction as well as the operational phase. This plan must attempt to displace and divert stormwater from the road network and construction areas and discharge the water into adjacent areas without eroding the receiving areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses.</li> <li>• It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area apart from rehabilitation purposes. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.</li> </ul>				

**10.3.7.2 INTRODUCTION OF INVASIVE AND ALIEN SPECIES, ESPECIALLY PLANTS – CONSTRUCTION (TE2 – POWERLINE) (TE6 – SUBSTATION)**



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Introduction of invasive and alien species, especially plants – Powerline (TE2)	Construction	Medium to high -	Low -	Medium to low -
Introduction of invasive and alien species, especially plants – Substation (TE6)	Construction	Medium to high -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual changed in AIP composition.</li> <li>• It must be made an offence for any staff member to remove any indigenous plant species from the project area or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.</li> <li>• Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species.</li> <li>• A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.</li> </ul>				

10.3.7.3 **CONTINUED DESTRUCTION, FURTHER LOSS AND FRAGMENTATION OF THE HABITATS, ECOSYSTEMS AND VEGETATION COMMUNITY – OPERATION (TE3 – POWERLINE) (TE7 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community – Powerline (TE3)	Operation	Medium to high -	Medium to low -	Medium to low -
Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community – Substation (TE6)	Operation	Medium to high -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Potential cumulative/confounding effects</b>	Cumulative impacts contemplated here consider the impacts of Construction phase as well as present impacts on biodiversity in the project area including, overgrazing, possible plant poaching, presence of infrastructure associated with agriculture, as well as roads and associated vehicle traffic contributing to road kills.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Vehicles and machinery should only utilise authorized access roads and servitude roads.</li> <li>• Servicing of the powerlines should only be done from the authorised servitude roads to prevent the destruction of SCC within the project area and to prevent the further fragmentation of habitat.</li> <li>• It must be made an offence for any staff member to remove any indigenous plant species (especially SCC) from the project area.</li> <li>• Restrict all activities to authorised footprint areas only.</li> <li>• Implement stormwater management plan.</li> <li>• Address any observed erosion promptly using suitable erosion control structures and revegetation methods.</li> <li>• Conduct follow-up rehabilitation and re-vegetation of any bare areas with local indigenous grasses, shrubs, and trees.</li> </ul>				

10.3.7.4 **CONTINUED ENCROACHMENT BY ALIEN AND INVASIVE PLANT SPECIES – OPERATION (TE4 – POWERLINE) (TE8 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Continued encroachment by alien and invasive plant species – Powerline (TE4)</b>	Operation	Medium to high -	Low -	Low -
<b>Continued encroachment by alien and invasive plant species – Substation (TE8)</b>	Operation	Medium to high -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	Cumulative impacts contemplated here consider the impacts of Construction phase as well as present impacts on biodiversity in the project area including, overgrazing, possible plant poaching, presence of infrastructure associated with agriculture, as well as roads and associated vehicle traffic contributing to road kills.			
<b>Mitigation Measures</b>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual change in AIP composition.</li> <li>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species.</li> <li>It must be made an offence for any staff member to remove any indigenous plant species from the project area or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.</li> </ul>				

**10.3.7.5 DESTRUCTION, FURTHER LOSS AND FRAGMENTATION OF THE HABITATS, ECOSYSTEMS VEGETATION COMMUNITY, AND THE LOSS OF FLORAL SCC – CONSTRUCTION (TE5 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC – Substation (TE5)</b>	Construction	High -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Areas of indigenous vegetation, even secondary communities outside of the substation road footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. This is especially important as one SCC (<i>Hoodia gordonii</i>) individual was located 70 m north of the proposed substation footprint.</li> <li>Existing access roads must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.</li> <li>Proposed new roads should be constructed on existing roads, where possible, to limit clearance of vegetation and impacts. Existing roads and servitudes need to be used before new areas are considered. All new roads must be authorised.</li> <li>All structure footprints are to be rehabilitated and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the proposed development area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>Mitigation measures and buffers outlined in the Aquatic assessments should be adhered to (TBC, 2025).</li> <li>Any individual of any protected plant species that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed, the sensitivity and importance of these species needs to be part of the environmental awareness program. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/re-planted in similar habitats.</li> <li>Vegetation clearing commences only after the necessary permits have been obtained.</li> <li>Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.</li> <li>There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous plants from the area. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.</li> <li>Reduce the dust generated by vehicles/machines, creating of 'speed bumps', putting up signs to enforce speed limits to enforce reduced speeds.</li> <li>Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures, apart from approved structures, must be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated areas.</li> <li>A suitable stormwater plan must be compiled for the development footprint. This plan should include mitigation measures for the construction as well as the operational phase. This plan must attempt to displace and divert stormwater from the road network and construction areas and discharge the water into adjacent areas without eroding the receiving areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses.</li> <li>It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area apart from rehabilitation purposes. No plant species whether indigenous or exotic should be brought into/taken from the PAOI, to prevent the spread of exotic or invasive species or the illegal collection of plants</li> </ul>				

**10.3.7.6 DIRECT LOSS AND DISPLACEMENT OF FAUNAL COMMUNITY (INCLUDING SCC) DUE TO HABITAT LOSS, MORTALITY AND DISTURBANCE (ROAD COLLISIONS, NOISE, DUST, VIBRATION), INCLUDING THE REDUCED DISPERSAL/MIGRATION OF FAUNA – CONSTRUCTION (TE9 - POWERLINE) (TE12 – SUBSTATION)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust,	Construction	Medium to high -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
vibration), including the reduced dispersal/migration of fauna – Powerline (TE9)				
Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna – Substation (TE13)	Construction	High -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	Cumulative impacts contemplated here consider the impacts of Construction phase as well as present impacts on biodiversity in the project area including, overgrazing, possible plant poaching, presence of infrastructure associated with agriculture, as well as roads and associated vehicle traffic contributing to road kills.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• A qualified environmental control officer must be on site when construction begins.</li> <li>• No trapping, killing, or poisoning of any wildlife is to be permitted. This should be included in Environmental Awareness Training and signs must be put up to enforce this.</li> <li>• Outside lighting, if used, should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.</li> <li>• Considering that many of the mammal fauna recorded within the project area are nocturnal, no road activity is to occur at night.</li> <li>• Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.</li> <li>• Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. If any excavations are to be dug these must not be left open for more than a few hours without ramps for trapped fauna to leave and must be filled at night. Holes must be subsequently inspected for fauna prior to backfilling.</li> <li>• All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.</li> <li>• All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.</li> </ul>				



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<ul style="list-style-type: none"> <li>Environmental Awareness Training discussions/training must include (but not limited to): Speed limits, General rules of road use, not limited to Avoiding the widening of the road and Environmental sensitivity of surrounding habitat.</li> <li>The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.</li> <li>The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.</li> </ul>				

#### 10.3.7.7 DESTRUCTION OF NON-RESILIENT HABITATS (ROCKY OUTCROPS) – CONSTRUCTION (TE10)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction of non resilient habitats (Rocky Outcrops) – Powerline (TE10)</b>	Construction	High -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All terrestrial areas designated as High SEI must be avoided, the pylons and access roads should deviate around these areas.</li> <li>Existing access roads must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.</li> <li>Proposed new servitude roads should be constructed on existing roads, where possible, to limit clearance of vegetation and impacts. Existing roads and servitudes need to be used before new areas are considered. All new roads must be authorised.</li> </ul>				

#### 10.3.7.8 ONGOING LOSS AND DISPLACEMENT OF FAUNAL COMMUNITY DUE TO HABITAT LOSS, MORTALITY AND DISTURBANCE (ROAD COLLISIONS, NOISE, DUST, VIBRATION), INCLUDING THE REDUCED DISPERSAL/MIGRATION OF FAUNA – OPERATION (TE11 – POWERLINE) (TE13 – SUBSTATION)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust,</b>	Operation	Medium to high -	Medium to low -	Medium to low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
vibration), including the reduced dispersal/migration of fauna - Powerline				
Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna - Substation	Operation	Medium to high -	Medium to low -	Medium to low -
<b>Potential cumulative/confounding effects</b>	Cumulative impacts contemplated here consider the impacts of Construction phase as well as present impacts on biodiversity in the project area including, overgrazing, possible plant poaching, presence of infrastructure associated with agriculture, as well as roads and associated vehicle traffic contributing to road kills.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions with animals. Appropriate speed control measures and signs must be erected.</li> <li>To mitigate potential impacts on faunal species it is recommended that vehicle movements are avoided at night. If night driving is unavoidable, vehicle speed should be reduced to a maximum of 20 km/h to minimize the risk of harm to wildlife.</li> <li>No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.</li> <li>All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.</li> <li>Waste management must be a priority and a Solid Waste Management Plan must be developed and implemented. All waste must be collected and stored effectively. All solid waste collected shall be disposed of at a licensed disposal facility.</li> <li>Litter, spills, fuels, chemical and human waste in and around the project area must be minimised and controlled according to the waste management plan.</li> <li>Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction or bare ground. This includes wetting of exposed soft soil surfaces.</li> </ul>				

### 10.3.8 SOCIAL (S)

The social impacts contemplated in this report relate to:

- Stakeholder engagement,
- Landowner liaison,



- Additional human presence in the area,
- The presence of overhead powerlines in the otherwise remote area,
- The implications of the project in the broader context of stakeholder and international relations.

It was concluded by the EAP that a full Social Impact Assessment would not be applicable to the project given that the area is generally remote, and stakeholder engagement would be undertaken as part of the Basic Assessment altogether.

Identified social impacts are more positive than negative, with potential disturbances to current landowner routines during planning (S1), and access restriction due to additional security during construction (S4) being the only two negative minor to medium impacts. The disturbance to sense of place (S5) was noted as a medium to high negative impact. However, cumulatively, this impact is not as severe given the presence of infrastructure and roads in the area already.

Employment opportunities and job creation (S2 and S6), as well as increased and continued human presence (S3) being seen as potential positive impacts also affecting the area's economic upliftment.

It is also expected that relations between landowners and NTCSA will strengthen through continued engagement, building towards more symbiotic interactions between the public and the applicant (S7). Through the project, it is also anticipated that the Northern Cape's overall transmission capacity will be improved enabling further socio-economic growth in a province which has potential regarding renewable energy production (S8).

#### 10.3.8.1 DISTURBANCE OF CURRENT LANDUSES AND LANDOWNER ROUTINES DUE TO LIAISON WITH APPLICANT AND SERVITUDE – PLANNING (S1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Disturbance of current landuses and landowner routines due to liaison with applicant and servitude (S1)	Planning	Medium to low -	Low -	Low -
Potential cumulative/ confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Ensure continued transparency with landowners and establishment of flexibility throughout the planning of the development and its timelines.</li> <li>• Consideration of landowner preferences in terms of access and availability where applicable.</li> </ul>				



10.3.8.2 CREATING OF EMPLOYMENT OPPORTUNITIES THROUGH CONSTRUCTION CONTRACTS AND POTENTIAL ADDITIONAL EMPLOYMENT OPPORTUNITIES THROUGH SUBSTATION UPGRADE AND POWERLINE MAINTENANCE – CONSTRUCTION (S2) AND OPERATION (S6)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Creating of employment opportunities through construction contracts (S2)	Construction	Medium to high +	Medium to high +	Medium to high +
Potential additional employment opportunities through substation upgrade and powerline maintenance (S6)	Operation	Medium to high +	Medium to high +	Medium to high +
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to High positive and will not require mitigation.</li> </ul>				

10.3.8.3 INCREASED AND CONTINUED HUMAN PRESENCE DUE TO THE NEED FOR PERSONNEL ENGAGING IN CONSTRUCTION ACTIVITIES (S3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased and continued human presence due to the need for personnel engaging in construction activities (S3)	Construction	Low to medium +	Low to medium +	Medium to low +
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Low to Medium positive and will not require mitigation.</li> </ul>				



10.3.8.4 ACCESS RESTRICTION IN CERTAIN AREAS ALONG THE POWERLINE AND ALONG ROUTE TO BE AFFECTED BY SUBSTATION UPGRADE – CONSTRUCTION (S4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Access restriction in certain areas along the powerline and along route to be affected by substation upgrade (S4)	Construction	Medium to low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Ensure continued transparency with landowners and establishment of flexibility throughout the planning of the development and its timelines.</li> <li>• Consideration of landowner preferences in terms of access and availability where applicable.</li> <li>• Formulation of a Grievance Procedure through which landowner concerns can be articulated and recorded.</li> <li>• Appoint a community liaison officer or responsible party who will be able to manage stakeholder engagement.</li> </ul>				

10.3.8.5 DISTURBANCE OF SENSE OF PLACE WITH THE CONTINUED PRESENCE OF OVERHEAD POWERLINE AND TOWERS - OPERATION (S5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Disturbance of sense of place with the continued presence of overhead powerline and towers (S5)	Operation	Medium to high -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Make use of different tower types where possible to limit tower visibility from visual receptors</li> </ul>				



10.3.8.6 BUILDING OF RELATIONSHIPS BETWEEN APPLICANT AND LANDOWNERS – OPERATION (S7)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Building of relationships between applicant and landowners (S8)</b>	Operation	Medium to high +	Medium to high +	Medium to high +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to high positive and will not require mitigation.</li> </ul>				

10.3.8.7 BUILDING OF NTCSA'S AND THE PROVINCE'S OVERALL TRANSMISSION CAPACITY – OPERATION (S8)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Building of NTCSA's and the province's overall transmission capacity (S9)</b>	Operation	High +	High +	High +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to high positive and will not require mitigation.</li> </ul>				

10.3.9 CULTURAL HERITAGE (C)

The potential disturbance or destruction of the various observed finds and sites is noted as a potential impact the project may have. However, the extent, duration, magnitude, reversibility, and probability of the impact varies depending on the heritage feature(s) affected. Features considered were (1) Stone Age finds, (2) Historical finds, (3) rubble and middens, (4) knapping sites, (5) structures including ARI001 and ARI002, and (6) ARI028, or the hill site. For the most part, mitigations proposed address the probability of the impact occurring. In this regard, impacts can be managed through avoidance of the features. The Bladgrond Farm Cemetery was also considered as it falls within the 1km corridor. It is, however, expected that the site can be comfortably avoided given the corridor, and current planned tower positions.

It is important to note that the impact on Stone Age and Historical finds is considered Low even post-mitigation given the low heritage value of these features. At the same time, the potential impact on rubble and middens was noted as Medium to Low, given the potential of the impact to be of a greater magnitude should middens



include items of higher heritage value. The potential impact on Stone Age knapping sites was considered higher in significance given that the disturbance of the context of these sites would be irreversible.

The Hellum Farm Complex and the Windmill at ARI001 will be affected by the proposed infrastructure. Both of these features are older than 60 years and protected by the NHRA. This was noted as an impact of Medium to High significance pre-mitigation. Key contributors to the increased significance of the impact include the irreversibility of the damage or disturbance the activities may have on the features.

The hill site (ARI028) contributes to the cumulative understandings of human behaviour of the area. Hence, impacts on this feature would have a greater extent as well as be irreversible as compared with singular finds which could be collected.



As an additional consideration made in terms of impacts, the project will have an impact on the sense of place associated with the largely undisturbed and natural landscape. It is important to note that not much can be done to mitigate this impact. As such it will remain a Medium to Low impact on area affected.

While the features identified outside of the site represent markers of heritage significance (in particular, individual finds, scatters, and structures), the occurrence of below-ground heritage finds is still possible. For this reason, as a mitigation measure proposed, a Heritage Finds or Chance Find Procedure for addressing heritage finds must be adopted as part of construction processes. Should finds of an alarming significance, for example, a grave or high density of small finds be discovered during construction, this procedure will inform the next steps taken to ensure the documentation of these finds, and further action to be taken should a heritage professional deem it necessary.

A heritage procedure can present opportunity to limit the impact of development on heritage finds to construction activities, with the potential to document and further assess finds should they be related to broader sites. This ultimately presents opportunity to diminish the adverse effects of development on heritage resources and features, given that their value can be evaluated through documentation. This also presents opportunity to better understand the heritage significance of the area to be developed.



10.3.9.1 **DISTURBANCE OF IDENTIFIED STONE AGE INDIVIDUAL FINDS AND SCATTERS (C1)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Disturbance of identified Stone Age individual finds and scatters (C1)</b>	Construction	Low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	Stone Age material as well as landscape features of the project area contribute to the overall cumulative understanding of human behaviour of the region. Disturbing these features will affect this cumulative understanding depending on the extent of disturbance.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>No specific mitigation advised as features are of Low significance.</li> </ul>				

10.3.9.2 **DESTRUCTION OR DISTURBANCE OF IDENTIFIED HISTORICAL PERIOD FINDS SUCH AS GLASS BOTTLES, CANS, AND AND OLD METAL CANISTERS (C2)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction or disturbance of identified historical period finds such as glass bottles, cans, and and old metal canisters (C2)</b>	Construction	Low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>No specific mitigation advised as features are of Low significance.</li> </ul>				

10.3.9.3 **DESTRUCTION OR DISTURBANCE OF RUBBLE AND MIDDENS WHICH MAY INCLUDE UNIDENTIFIED HISTORICAL FINDS (C3)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction or disturbance of rubble and middens which may include unidentified historical finds (C3)</b>	Construction	Medium to low -	Low -	Low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Sites must be avoided considering a buffer of 30 meters.</li> </ul>				

#### 10.3.9.4 DESTRUCTION OR DISTURBANCE OF STONE AGE KNAPPING SITES (C4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction or disturbance of Stone Age knapping sites (ARI022, ARI034) (C4)</b>	Construction	Medium to high -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	Stone Age material as well as landscape features of the project area contribute to the overall cumulative understanding of human behaviour of the region. Disturbing these features will affect this cumulative understanding depending on the extent of disturbance.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Sites must be avoided considering a buffer of 30 meters.</li> </ul>				

#### 10.3.9.5 DISTURBANCE OF EXISTING STRUCTURES DUE TO THEIR PROXIMITY TO THE POWERLINE (C5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Disturbance of existing structures (ARI001 and ARI002) due to their proximity to the powerline (C5)</b>	Construction	Medium to high -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Sites must be avoided considering a buffer of 30 meters.</li> </ul>				



10.3.9.6 **DISTURBANCE OF THE HILL WHICH IS PART OF THE LANDSCAPE'S CUMULATIVE HERITAGE VALUE (C6)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Disturbance of the Hill (ARI028) which is part of the landscape's cumulative heritage value (C6)</b>	Construction	Low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	<p>Stone Age material as well as landscape features of the project area contribute to the overall cumulative understanding of human behaviour of the region. Disturbing these features will affect this cumulative understanding depending on the extent of disturbance.</p> <p>The hill (ARI028) is a key feature contribution to the heritage value of the area. Impacts on this feature will have implications on the cumulative value of the region.</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Sites must be avoided considering a buffer of 30 meters.</li> </ul>				

10.3.9.7 **DISTURBANCE OF THE SENSE OF PLACE (C7)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Disturbance of the Sense of Place (C7)</b>	Construction	Medium to high -	Medium to high -	Medium to high -
<b>Potential cumulative/confounding effects</b>	<p>Stone Age material as well as landscape features of the project area contribute to the overall cumulative understanding of human behaviour of the region. Disturbing these features will affect this cumulative understanding depending on the extent of disturbance.</p>			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impact cannot easily be mitigated. Hence impact will remain the same.</li> </ul>				

10.3.9.8 **DESTRUCTION OR DISTURBANCE OF UNDISCOVERED BELOW-GROUND HERITAGE FEATURES (C8)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Destruction or disturbance of undiscovered below-ground heritage features (C8)</b>	Construction	Medium to low -	Low -	Low -



Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Potential cumulative/confounding effects</b>	Stone Age material as well as landscape features of the project area contribute to the overall cumulative understanding of human behaviour of the region. Disturbing these features will affect this cumulative understanding depending on the extent of disturbance.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>A chance find procedure as exemplified in the HIA is advised to be followed should additional heritage finds or sites be encountered.</li> </ul>				

#### 10.3.9.9 PALAEOLOGY: LOSS OF FOSSIL HERITAGE – CONSTRUCTION (C9)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Loss of fossil heritage (C9)</b>	Construction	Low -	Low -	Low -
<b>Potential cumulative/confounding effects</b>	The SAHRIS PalaeoMap indicates that the general Palaeontological Sensitivity, in a radius of 30 km of the development is Zero to Moderate. However, it is important to note that the quality of preservation of fossils at different sites will most probably vary, and it is thus difficult to allocate a Cumulative Sensitivity to the project.			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Mitigation involves the collection and documentation of fossils, together with recording data on the surrounding sedimentary matrix within the proposed development footprint by a qualified palaeontologist.</li> <li>In the unlikely event that, Palaeontological Heritage is uncovered during surface clearing and mining excavations, the ECO/site manager must report the find to the South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out.</li> <li>Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).</li> </ul>				

#### 10.3.10 ECONOMIC (E)

An overall positive economic impact is anticipated should the project implemented. Besides for job creation during the construction phase (E1), other impacts will follow during operation. This includes the support of local industries and businesses through additional movement of persons around the project area (E2) which will boost the local economy.

The expansion of NTCSA's transmission capacity will also allow for the potential for additional skilled and unskilled labour to be required for the upkeep and maintenance of the infrastructure (E3). The



project is motivated by the premise that more power evacuation is needed in the region to accommodate renewable energy generation. The infrastructure will support upcoming and current Independent Power Producers (IPPs), further boosting the regions economic development through the supporting of emerging businesses (E4).

**10.3.10.1 ADDITIONAL EMPLOYMENT CREATED IN THE REGION THROUGH THE PROJECT – CONSTRUCTION (E1)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Additional employment created in the region through the project (E1)</b>	Construction	Medium to high +	Medium to high +	Medium to high +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to high positive and will not require mitigation.</li> </ul>				

**10.3.10.2 INCREASED SUPPORT OF LOCAL INDUSTRIES AND BUSINESSES THROUGH ADDITIONAL MOVEMENT OF PERSONS AROUND THE PROJECT AREA – OPERATION (E2)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
<b>Increased support of local industries and businesses through additional movement of persons around the project area (E2)</b>	Operation	Medium to low +	Medium to low +	Medium to low +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to low positive and will not require mitigation.</li> </ul>				



10.3.10.3 EXPANSION OF NTCSA'S TRANSMISSION GRID IN RELATION TO REQUIRED SKILLED AND UNSKILLED LABOUR FOR MAINTENANCE THEREOF (E3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Expansion of NTCSA's transmission grid in relation to required skilled and unskilled labour for maintenance thereof (E3)	Operation	Medium to high +	Medium to high +	Medium to high +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to high positive and will not require mitigation.</li> </ul>				

10.3.10.4 ENCOURAGEMENT OF THE DEVELOPMENT OF RENEWABLE ENERGY ALTERNATIVES (E4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Encouragement of the development of renewable energy alternatives (E4)	Operation	Medium to high +	Medium to high +	Medium to high +
<b>Potential cumulative/confounding effects</b>	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change			
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>Impacts are Medium to high positive and will not require mitigation.</li> </ul>				



## 11 CONCLUSIONS AND RECOMMENDATIONS

The BA process identified potential issues and impacts associated with the proposed project. The BA addresses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with applicable phases and activities of the project and recommends appropriate mitigation measures for potentially significant environmental impacts. The BA report provides sufficient information regarding the potential impacts and the acceptability of these impacts in order for the Competent Authority to make an informed decision regarding the proposed project. The release of a draft BA Report for public review and comment provides stakeholders with an opportunity to verify that the issues they have raised throughout the process to date has been captured and adequately considered. All issues raised throughout the public participation process have been captured and responded to as far as possible.

The BA report aims to achieve the following:

- Provide an overall assessment of the social and biophysical environments affected by the proposed project.
- Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed project.
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

### 11.1 CONCLUSIONS FROM SPECIALIST STUDIES

The conclusions and recommendations of this BA are the result of the assessment of identified impacts by specialists where applicable, and the parallel process of public participation. The main conclusions from each of the specialist studies are presented below.

#### 11.1.1 AVIFAUNA

The main expected impacts of the proposed infrastructure will include the following:

- Habitat loss and fragmentation;
- Disturbance and displacement caused during the construction and operational phases;
- Electrocutions; and
- Collisions.

The project poses moderate potential risks to avifauna SCC, especially in areas of very high and high ecological sensitivity; these risks can be substantially reduced if all recommended mitigation and monitoring actions are strictly implemented. The project is considered acceptable from an avifaunal perspective only under the condition that these measures are fully adopted and enforced throughout the project lifecycle. This approach will help balance the region's energy infrastructure needs with the imperative to conserve its unique and vulnerable birdlife. It is the opinion of the specialist that the development can only be favourably considered should all the mitigations and monitoring requirements are completed.

#### 11.1.2 HERITAGE

Through the methodology adopted as part of this assessment, heritage features were identified which can all be avoided during the implementation of the proposed activities. Apart from unassessed chance finds and the project's impact on Sense of Place, an overall Low impact on heritage features can be expected should the proposed mitigation measures be followed. Therefore, from an Archaeological perspective, the development will not have any significant foreseeable impacts and can proceed as long as the recommended mitigation measures are implemented.



### 11.1.3 LANDSCAPE AND VISUAL

As long as the identified mitigation measures are used, due to the likely relatively low levels of landscape and visual impact, there is no reason from a landscape and visual impact perspective why the proposed development should not be authorised.

### 11.1.4 PALAEOLOGY

A Low Palaeontological Significance has been allocated for impacts associated with the construction phase of the development pre-mitigation and post-mitigation. The construction phase will be the only development phase with the potential of impacting Palaeontological Heritage, and no significant impacts are expected to impact the Operational and Decommissioning phase. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the development are considered to be Low (as the area is not highly fossiliferous), and falls within the acceptable limits for the project. It is therefore considered that the study Project will not lead to damaging impacts on the palaeontological resources of the area. The development may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required, pending the discovery of newly discovered fossils.

### 11.1.5 SOILS AND AGRICULTURE

The proposed development area will have an overall low residual impact on the agricultural production capability of the area. The proposed development can be favourably considered for authorisation. The following serves to substantiate this statement:

- The site verified land capability of the proposed project area ranges from low to medium;
- The agricultural potential of the area ranges from low to medium;
- No active crop farming was identified within the 50 m buffer of the project area; and
- The overall agricultural sensitivity for the project area is categorised as low and medium

The project may be favourably considered for authorisation and is not subject to any conditions. Possible land fragmentation can occur with the proposed powerline from pylon placements; careful placement should be considered only where feasible.

### 11.1.6 TERRESTRIAL ECOLOGY

It is the opinion of the specialists that the proposed project may be favourably considered, provided all prescribed mitigation measures and supporting recommendations are implemented (including all protected species and SCC mitigations), particularly adjusting layouts to incorporate predominantly 'Very Low' sensitivity areas, with 'High' and 'Medium' areas demonstrating avoidance mitigation and reducing the impacts associated with the project.

### 11.1.7 WETLANDS AND AQUATICS

Based on desktop analysis, field assessments, and the risk rating, it is the opinion of the specialist that the project is considered "Low Risk" and may be considered for authorisation, on condition that all prescribed mitigation measures and recommendations are implemented. This includes but is not limited to, the avoidance of sensitive freshwater habitats and their buffer zones (as far as is feasible) as well as the minimisation of development/disturbances within these areas. The activities qualify under Section 21(c) and (i) water uses and may be authorised under a General Authorisation in terms of GN 4167, assuming the applicant qualifies under Appendix D2.



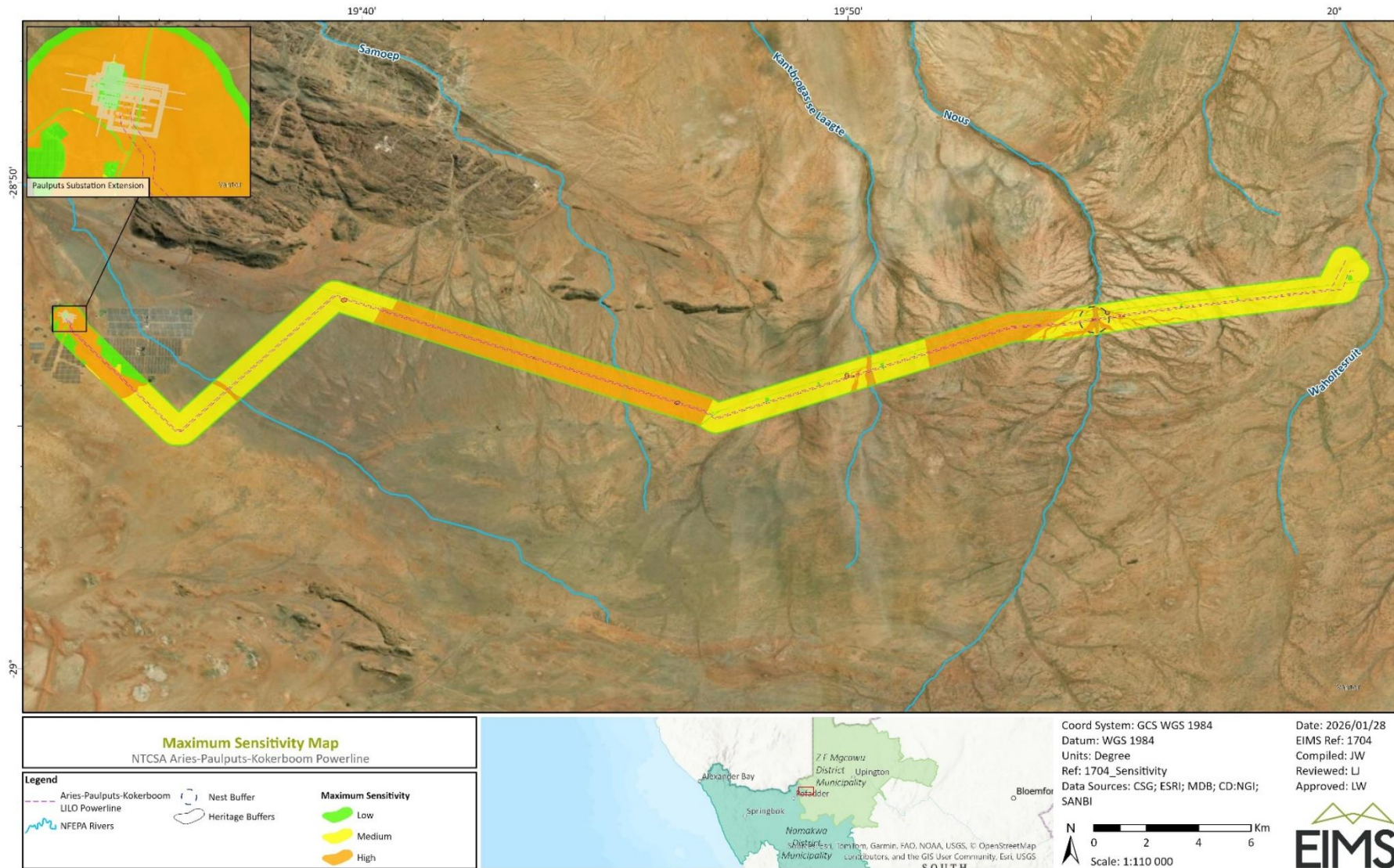
## 11.2 SENSITIVITY MAP

Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is refined by specialists' input within each respective specialist field based on aerial or ground-surveys. Therefore, the sensitivity mapping exercise assists in the identification of sensitive areas within and surrounding the proposed application area

Figure 88 superimposes the proposed activity and its associated structures and infrastructure on the combined environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.



Figure 88: Composite sensitivity map.





## 11.3 ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the reconnaissance activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the BA project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorised.

The following impacts were determined to have a potentially moderate to high negative final significance after mitigation:

- Avifauna:
  - Habitat destruction within the footprint
  - Destruction, degradation and fragmentation of surrounding habitats
  - Displacement/emigration of avifauna community (including SCC)
  - Collisions with gridlines
  - Electrocutation
- Biophysical and ecological impacts:
  - Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC
  - Loss, disturbance, and degradation of watercourses
  - Altered hydrological regimes
  - Increase in erosion and sedimentation of receiving systems
  - Impaired water quality
  - Introduction and proliferation of alien and invasive vegetation
  - Loss and fragmentation of vegetation communities and ecosystems
  - Direct loss and displacement of fauna (including SCC)
  - Continued habitat degradation during operation
  - Destruction of non-resilient habitats (Rocky Outcrops)
- Landscape and Visual:
  - Change of character of the landscape in relation to the proposed powerline
  - Change of landscape character as viewed from the N14
  - Change of landscape character as viewed from local homesteads
- Social and Cultural Heritage:
  - Disturbance of sense of place



## 11.4 RECOMMENDATIONS FOR INCLUSION IN ENVIRONMENTAL AUTHORIZATION

This section contains key recommendations for inclusion in the EA.

- No additional site-specific tower-to-tower walkdown would be needed should the identified, surveyed, and subsequently adjusted tower positions be constructed. Should the alignment of the powerline be altered while remaining within the 1km corridor, a verification walkdown is advised to confirm the results of the site-specific tower-to-tower walkdown undertaken as part of this assessment.

In addition to the standard conditions of an integrated Environmental Authorisation, the following specific conditions must be included in the EA. This section will be expanded upon to include any additional conditions identified during the BAR comment period:

- All mitigation measures included in the Basic Assessment Report, EMPr and associated specialist studies must be adhered to.
- The proposed infrastructure and powerline route must avoid all high environmental sensitivities and buffers identified in this BAR and associated specialist studies.
- A suitably qualified and independent Environmental Control Officer (ECO) must be appointed for the proposed project to monitor compliance with the conditions of the Environmental Authorisation and EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to. The ECO must monitor all construction activities and ensure the demarcation of all applicable areas and approve the locations of all infrastructure prior to construction.
- The Contractor shall inform all adjacent landowners of the commencement of construction activities at least 30 days prior to commencement of construction.
- Rehabilitation of the disturbed areas must be made a priority, especially wetlands.
- The developer is reminded to be cognisant of nests prior to the clearance of the site.
- If nests are found a suitably qualified specialist must be contacted to advise on the way forward.
- Areas identify suitable for Red Lark during the walkdown should minimise habitat disturbance and should undergo active rehabilitation of these disturbed sites after construction.
- Every fourth overhead cables/lines must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species.
- Monitoring of bird fatalities must also be done following the BirdLife South Africa best practice guidelines (BirdLife South Africa, 2017).

## 12 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations relating to this assessment should be considered in evaluating and decision-making on this assessment:

### 12.1 AVIFAUNA

- Whilst every effort was made to cover as much of the project area as possible it is possible that some species that are present within the project area were not recorded during the field investigations due to their secretive behaviour;
- The GPS used in the assessment has an accuracy of 5 m and, consequently, any spatial features delineated may be offset by up to 5 m.



## 12.2 HERITAGE

### 12.2.1 GENERAL LIMITATIONS

Firstly, heritage investigations are limited to desktop and field surveys from which findings are drawn. In this regard, the findings presented in the HIA are limited to surface observations. Below-ground archaeological contexts would only apply in cases where the methodology includes components involving excavations and test pits. To mitigate this limitation, the HIA advises the application of heritage procedures adopted by the developer in cases where construction activities lead to the identification of unexpected finds.

The field survey conducted for the HIA does not account for any finds further than immediate surrounding areas which are not potentially affected by the proposed development. To mitigate this, the initial desktop assessment of the HIA considers surrounding pre-identified heritage resources and prior heritage studies done in the area.

Although an extensive methodology was adopted to address the desktop assessment and field survey, one must remain cognisant of the fact that this assessment may not identify all heritage features possibly existing. For this reason, mitigation measures have been proposed to accommodate for chance finds as well as features that may not have been encountered and identified through the implementation of this study's methodology.

### 12.2.2 PROJECT-SPECIFIC LIMITATIONS

The field survey itself was limited to a three-day site visit which may present as a limitation to the extent of the investigation. The study area itself, being extensive in nature covering over 50kms and a 1km corridor presented as a site which would have been too extensive to survey altogether and in fine detail. However, strategic points were identified prior to the survey to ensure that an adequate representation of the site could be obtained through the site visit. Further, the exact locations of proposed infrastructure were obtained which served as a guideline. The site visit was undertaken in Summer, with temperatures easily reaching more than 40°C during the day. For this reason, survey time had to be extended to allow for breaks. As a key limitation of this project, the 1km corridor on either side of the proposed 50km powerline servitude would have been too extensive to cover through walking. Therefore, observations related to this area were drawn from desktop-available information, previous studies, and archival information. It is expected, however, that minor changes to the layout would be expected as opposed to major changes leading to the realignment of the entire powerline. Therefore, the area covered would have effectively addressed the area earmarked for development

## 12.3 LANDSCAPE AND VISUAL

The assessment tables the subjective judgement as to whether an impact is negative or positive is based on the assumption that the majority of people are likely to prefer to view a natural or a rural landscape than an industrial landscape.

A site visit was undertaken on the 11 November 2025 to verify the current landscape characteristics, potential receptors and potential impacts. The site visit was planned to ensure that weather conditions were clear ensuring reasonable visibility.

The timing of photography was planned to ensure that the sun was as far as possible behind the photographer. This was to ensure that as much detail as possible was recorded in the photographs.

Visibility of the proposed facility has been assessed using the Global Mapper Viewshed tool. The visibility assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASA and is freely available on the CIAT-CCAFS website (<http://www.cgiar-csi.org>). This data has been ground truthed using a GPS as well as online mapping. Calculation of visibility is based purely on the Digital Elevation Model and does not take into account the screening potential of vegetation or other development.

Table 26 includes a list of the GIS data sets which were used in undertaking and presenting the assessments.



Table 26: GIS Data sets used for the LVIA

<b>Data set</b>	<b>Source</b>	<b>Year</b>
<b>South Africa Protected Areas Database (SAPAD)</b>	Department of Environmental Affairs	2021
<b>SRTM Worldwide Elevation Data</b>	CIAT-CCAFS	2018
<b>World Imagery</b>	ESRI	2009 (updated 2021)
<b>SA NLC (National Land Cover)</b>	Department of Environmental Affairs	2022
<b>1:50,000 raster mapping</b>	Chief Directorate National Geo-Spatial Information of South Africa	Unknown
<b>South African rivers in drainage region ALL</b>	Department of Water Affairs	2012
<b>Update of vegm2009</b>	South African National Biodiversity Institute	2015
<b>South Africa /Lesotho Roads</b>	Open Street Map	2014

## 12.4 PALAEOLOGY

The geology of the area is the focal point of geological maps, and the sheet explanations of the Geological Maps were not intended to focus on palaeontological heritage. Many inaccessible areas of South Africa have never been examined by palaeontologists, and data is typically dependent solely on aerial pictures. Locality and geological information in museums and university databases is out of date, and data acquired in the past is not always adequately documented.

Comparable Assemblage Zones in other places are also used to provide information on the existence of fossils in areas that have not before been recorded. When similar Assemblage Zones and geological formations are used for Desktop studies, it is commonly assumed that exposed fossil exists within the footprint.

## 12.5 SOILS AND AGRICULTURE

- The 1 km corridor of the powerline was delineated using the soil desktop data.
- It has been assumed that the extent of the development area provided by the responsible party is accurate.
- No heavy metals have been assessed, nor fertility been analysed for the relevant classified soils.

## 12.6 TERRESTRIAL ECOLOGY

- The assessment area was based on the spatial data provided for by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed.
- The area was only surveyed during a single dry season site visit (3 to 6 November 2025), therefore, this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline):



- As the sampling occurred in the dry season, some floral species were not visible above ground; nevertheless, the vegetation state was still identifiable as many species were present.
- The walkdown was conducted at the same time as the impact assessment survey, which could have limited the detection of SCC that are typically dormant during the dry season. This could have limited the detection of SCC that are typically dormant during the dry season. However, the expected SCC were not dormant during this period, and those present within the project area were identifiable. Therefore, the walkdown was successful in locating SCC and protected species. Nevertheless, because the walkdown was conducted in the dry season, there remains a possibility that additional, unexpected SCC may have been missed.
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m.
- This assessment was conducted from a terrestrial perspective only and must be considered in conjunction with the accompanying avifauna and aquatic reporting.
- Effort was made to cover as much of the project area as possible within access and time constraints; and
- Whilst every effort is made to cover as much of the project area as possible, representative sampling is completed and by its nature, it is possible that some plant and animal species that are present across the project area were not recorded during the field investigations. Time and access constraints should be kept in mind regarding this. The coverage of the project area during the assessment is considered sufficient for deriving a meaningful baseline.
  - As the project area was 1 km wide, field coverage focused on the infrastructure locations (pylon locations, servitude road and substation), with the remaining areas delineated from desktop analysis by extrapolating from ground-truthed segments

## 12.7 WETLANDS AND AQUATICS

- The 1 km corridor was assessed using a desktop-based approach.
- It is assumed that the extent of the project area provided to the specialist is accurate.
- The specialist was not provided with an architectural plan or any engineering drawings with regard to the planned development activities and, as such, the potential impacts arising from these activities may only be assumed based on previous experience.
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes.
- The assessment area was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment.
- A single-season survey was conducted for the respective study, which would constitute a wet season/high flow survey. Thus, temporal trends were not investigated. Despite this it is the specialist's opinion that the findings are conclusive, and no further fieldwork would be required.
- All regional and site-specific environmental information are contained within the original (submitted) documents and were therefore not repeated within this document. This document focuses only on the very specific mandate and findings of the walkdown and its associated ecosystem evaluations.
- Due to the ephemeral, dry nature of the watercourses within the PAOI, standard aquatic methods could not be conducted.



- The GPS used for watercourse delineations is accurate to five metres. Therefore, the delineation plotted digitally may be offset by a maximum of five metres to either side.



## 13 AFFIRMATION REGARDING CORRECTNESS OF INFORMATION

I John von Mayer declare that:

### **General declaration:**

- I act as the independent environmental practitioner in this application
- 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 declare that there are no circumstances that may compromise my objectivity in performing such work;
- 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 take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- 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;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F 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 Environmental Impact Assessment Regulations, 2014.



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**Signature of the EAP**

Environmental Impact Management Services (Pty) Ltd

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**Name of company:**

**DATE**

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**Date:**



I Lucien James declare that:

**General declaration:**

- I act as the independent environmental practitioner in this application
- 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 declare that there are no circumstances that may compromise my objectivity in performing such work;
- 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 take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- 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;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F 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 Environmental Impact Assessment Regulations, 2014.



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**Signature of the EAP**

Environmental Impact Management Services (Pty) Ltd

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**Name of company:**

2026/01/14

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**Date:**



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## 15 APPENDICES



APPENDIX A: EAP CV



APPENDIX B: SCREENING TOOL REPORT AND SSVR



APPENDIX C: PUBLIC PARTICIPATION



APPENDIX D: SPECIALIST REPORTS



APPENDIX E: IMPACT ASSESSMENT MATRIX



APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME



## APPENDIX G: ADDITIONAL INFORMATION