NALEDZANI ENVIRONMENTAL SERVICES
Promoting sustainable use of our natural resources

TERRESTRIAL BIODIVERSITY ASSESSMENT REPORT

THE PROPOSED DEVIATIONS OF THE 1X 400KV PLUTO-MAHIKENG POWERLINE WITHIN JB MARKS LOCAL MUNICIPALITY OF THE DR. KENNETH KAUNDA DISTRICT MUNICIPALITY AND MAHIKENG LOCAL MUNICIPALITY OF THE NGAKA MODIRI MOLEMA DISTRICT MUNICIPALITY IN THE NORTHWEST PROVINCE

PREPARED FOR:

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DATE:

28 September 2026

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PROJECT DETAILS	
Project Title	Ecological survey for Pluto-Mahikeng 400kV deviation
Client	Vhubvo Consultancy cc
Description	The proposed deviation of the 1x 400kv Pluto-Mahikeng powerline within JB Marks Local Municipality of the Dr. Kenneth Kaunda District Municipality and the Mahikeng Local Municipality of the Ngaka Modiri District Municipality in the Northwest Province
Specialist	Naledzani Environmental Services
Document Status	V.3
Prepared by	Mpho Ramalivhana Pri Sci. Nat (Hons. Bot.; SAAB; SACNASP)  28 September 2026

DECLARATION OF INDEPENDENCE

I, Mpho Ramalivhana, declare that I:

- Act as an independent consultant;
- Have 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;
- Declare that there are no circumstances that may compromise my objectivity in performing such work;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability;
- Undertake to have my work peer reviewed on a regular basis by a competent specialist in the field of study for which I am registered; and
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member.



Mpho Ramalivhana Pri Sci. Nat (Hons. Bot.; SAAB; SACNASP)

SPECIALIST INFORMATION

Mpho Ramalivhana of Naledzani Environmental Consultant holds an Honours Degree in Botany from the University of Limpopo (Turfloop Campus) and has 15 years' professional experience in biodiversity assessment & management, and ecological research. He is a registered member for South African Council for Natural Scientist Professions (**400395/14**).

INDEMNITY

This report is based on survey and assessment techniques, which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of study. Therefore, the author reserves the right to modify aspects of the report, including the recommendations, if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

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ABBREVIATIONS

BGIS	Biodiversity Geographical Information System
CARA	Conservation of Agricultural Resources
CBA	Critical Biodiversity Area
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EN	Endangered
ESA	Ecological support area
MM	Millimetres
NEMA	National Environmental Management Act, 107 of 1998
NEMBA	National Environmental Management Biodiversity Act, 10 of 2004
NES	Naledzani Environmental Services
NWBSP	North West Biodiversity Support Plan
NWP	North West Province
ONA	Other Natural Area
PA	Protected Area
PRECIS	Pretoria Computerised Information System
QDGC	Quarter Degree Grid Cell
SANBI	South African National Biodiversity Institute
SFSD	Strategic Framework for Sustainable Development
VU	Vulnerable
WM	With mitigations
WOM	Without mitigations

GLOSSARY

Alien species - Plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity

Biodiversity - is the variability among living organisms from all sources including inter alia terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems

Biome - a major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions, but not including the abiotic portion of the environment.

Buffer zone - a space of land that filters edge effects.

Conservation - the management of the biosphere so that it may yield the greatest sustainable benefit to present generation while maintaining its potential to meet the needs and aspirations of future generations. The wise use of natural resources helps prevent the loss of ecosystem function and integrity.

Conservation concern - Plants of conservation concern are those that are important for South Africa's conservation decision-making processes and include all plants that are Threatened (see Threatened), Extinct in the wild, Data deficient, Near threatened, Critically rare, Rare, and Declining. These plants are nationally protected by the National Environmental Management: Biodiversity Act. Within the context of these reports, plants that are provincially protected are also discussed under this heading.

Conservation status - an indicator of the likelihood of that species remaining extant either in the present day or the near future. Many factors are taken into account when assessing the conservation status of a species: not simply the number remaining, but the overall increase or decrease in the population over time, breeding success rates, known threats, and so on.

Community – an assemblage of populations living in a prescribed area or physical habitat, inhabiting some common environment.

Critically Endangered - a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

Data Deficient - there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. However, "data deficient" is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

Declining - a taxon is declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Threatened or Near Threatened, but there are threatening processes causing a continuous decline in the population (Raimondo et al, 2009).

Ecological Corridors - are roadways of natural habitat providing connectivity of various patches of native habitats along or through which faunal species may travel without any obstructions where other solutions are not feasible

Ecosystem - organisms together with their abiotic environment, forming an interacting system, inhabiting an identifiable space

Endangered - taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future

Endemic - naturally only found in a particular and usually restricted geographic area or region

Exotic species - plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity

Forb - an herbaceous plant other than grasses.

Habitat - type of environment in which plants and animals live

Indigenous - any species of plant, shrub or tree that occurs naturally in South Africa

In Situ - "In the place" In Situ conservation refers to on-site conservation of a plant species where it occurs. It is the process of protecting an endangered plant or animal species in its natural habitat.

Invasive species - naturalised alien plants that have the ability to reproduce, often in large numbers.

Mitigation - the implementation of practical measures to reduce adverse Impacts

Near Threatened - a Taxon is Near Threatened when available evidence indicates that that it nearly meets any of the five IUCN criteria for Vulnerable, and is therefore likely to qualify for a threatened category in the near future (Raimondo et al, 2009).

Plant community - a collection of plant species within a designated geographical unit, which forms a relatively uniform patch, distinguishable from neighbouring patches of different vegetation types. The components of each plant community are influenced by soil type, topography, climate and human disturbance. In many cases there are several soil types within a given plant community (Gobbat et al, 2004)

Protected Plant - according to Provincial Nature Conservation Ordinances or Acts, no one is allowed to sell, buy, transport, or remove this plant without a permit from the responsible authority. These plants are protected by provincial legislation.

Red Data - a list of species, fauna and flora that require environmental protection - based on the IUCN definitions. Now termed Plants of Conservation Concern

Species diversity - a measure of the number and relative abundance of species

Species richness - the number of species in an area or habitat

Threatened - threatened Species are those that are facing a high risk of extinction, indicated by placing in the categories Critically Endangered (CR), Endangered (E) and Vulnerable (VU) (Raimondo et al, 2009)

Transformation - the removal or radical disturbance of natural vegetation, for example by crop agriculture, plantation forestry, mining or urban development.

Vegetation Unit - a complex of plant communities ecologically and historically (both in spatial and temporal terms) occupying habitat complexes at the landscape scale.

Vulnerable - a taxon is Vulnerable when it is not Critically Endangered or Endangered but meets any of the five IUCN criteria for Vulnerable and are therefore facing a high risk of extinction in the wild in the future

1 INTRODUCTION

The National Transmission Company South Africa SOC Ltd (NTCSA) proposes the construction of the Mahikeng-Pluto 400 kV Transmission Powerline within North West Province. During the detailed design and route optimisation phase, two localised deviations from the originally authorised alignment were identified as necessary to cater for the landowner conditions, and optimise tower placement on suitable terrain.

The deviations are

- Deviation 2: Towers 110-111 (approximately 42.8 m lateral deviation), situated within the Mahikeng Local Municipality, Ngaka Modiri Molema District Municipality; and
- Deviation 1: Towers 491-521 (approximately 14 km alignment span), situated within the JB Marks Local Municipality, Dr Kenneth Kaunda District Municipality.

Vhubvo Consultancy has then been appointed by National Transmission Company South Africa (NTCSA) as an Independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment (BA process) for the proposed deviations of the authorised 400 kV Pluto-Mahikeng powerline and associated infrastructure within JB Marks Local Municipality of the Dr. Kenneth Kaunda District Municipality and the Mahikeng Local Municipality of the Ngaka Modiri Molema District Municipality in the Northwest Province.

As part of the EIA process, Naledzani Environmental Services cc (herein after referred to as 'NES') was therefore appointed to conduct the terrestrial biodiversity impact assessment for the proposed project. The purpose of the study is to identify and assess all the possible impacts that may arise from the implementation of the proposed project development and to find the most effective way of enhancing environmental benefits and mitigating potential impacts to encourage sustainable development of the area.

1.1 Terms of reference

The proposed methodology includes both a desktop review and a field work component. A desktop review of distribution lists (including Red Data Listed (RDL) species) and available literature was conducted to guide the field work component. The principle aim of the assessment was to provide information to guide the risk of the proposed activity to the habitat, flora and fauna communities of the associated ecosystems within the project area/corridor. This was achieved through the following:

- Describe the physical and terrestrial ecological environment of both deviation spans;
- Desktop assessment to identify the relevant ecologically important geographical features within the proposed development area and surrounding landscape;
- Desktop assessment to compile an expected species list and possible threatened flora and fauna species that occur within the proposed landscape;
- Field survey to ascertain the species composition of the present flora and fauna community within the proposed development area;
- Delineate and map the habitats and their respective sensitivities that occur within the proposed development area;

- Identify the manner that the proposed development impacts the flora and fauna community and evaluate the level of risk of these potential impacts; and
- The prescription of mitigation measures and recommendations for identified risks.

1. REGULATORY AND LEGISLATIVE OVERVIEW

A summary of the relevant portions of the acts that govern the activities and potential impacts to the environment associated with the development is listed below. It should be noted that these acts are only related to biodiversity studies.

Table 1: Acts and regulations relating to the project

Legislation/Policy	Description
United Nations, 1992, The Convention on Biological Diversity.	The purpose of the Convention on Biological Diversity is to conserve the variability among living organisms, at all levels (including diversity between species, within species and of ecosystems). Primary objectives include (i) conserving biological diversity, (ii) using biological diversity in a sustainable manner and (iii) sharing the benefits of biological diversity fairly and equitably.
The Constitution of the Republic of South Africa Act No. 108 of 1996	The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socioeconomic right and not an environmental right. However, read with section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided.
Strategic Framework for Sustainable Development in South Africa	The development of a broad framework for sustainable development was initiated to provide an overarching and guiding National Sustainable Development Strategy. The Strategic Framework for Sustainable Development (SFSD) in South Africa (September 2006) is a goal orientated policy framework aimed at meeting the Millennium Development Goals. Biodiversity has been identified as one of the key crosscutting trends in the SFSD. The lack of sustainable practices

	in managing natural resources, climate change effects, loss of habitat and poor land management practices were raised as the main threats to biodiversity.
National Environmental Management Act 107 of 1998 and the associated Environmental Impact Assessment (EIA) Regulations	The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the impact. Section 24 of the NEMA, headed "Environmental Authorisations" sets out the provisions which are to give effect to the general objectives of Integrated Environmental Management, and laid down in Chapter 5 of the NEMA. In terms of section 24(1), the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged by the NEMA with granting of the relevant environmental authorisation. In terms of section 24F(1) of the NEMA no person may commence an activity listed or specified in terms of section 24(2)(a) or (b) unless the competent authority has granted an environmental authorisation for the activity. Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA (1998), when applying for environmental authorisation, the following are relevant to this study: - Protocol for the specialist assessment and report content requirements for environmental impacts on terrestrial biodiversity; and - Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species. - Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species.
National Environmental Management: Biodiversity Act No 10 of 2004	The objectives of this act are (within the framework of NEMA) to provide for: • The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity; • The use of indigenous biological resources in a sustainable manner; • The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;

	• To give effect to ratify international agreements relating to biodiversity which are binding to the Republic; • To provide for cooperative governance in biodiversity management and conservation; and • To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act. This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas is not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources. Furthermore, a person may not carry out a restricted activity involving either: a) A specimen of a listed threatened or protected species; b) Specimens of an alien species; or c) A specimen of a listed invasive species without a permit.
Government Notice No. R. 1020: Alien and Invasive Species Regulations as published in Government Gazette No. 43735 of 25 September 2020 as it relates to the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004)	NEMBA is administered by the Department of Forestry, Fisheries and the Environment and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of alien and invasive species. This act in terms of alien and invasive species aims to: • Prevent the unauthorized introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur, • Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and • Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats. Alien species are defined, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act no 10 of 2004) as: (a) A species that is not an indigenous species; or

	(b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention. Categories according to NEMBA (Alien and Invasive Species Regulations, 2017): • Category 1a: Invasive species that require compulsory control; • Category 1b: Invasive species that require control by means of an invasive species management programme; • Category 2: Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and • Category 3: Ornamentally used plants that may no longer be planted.
National Forest Act, 1998 (Act No. 84 of 1998) (as amended in September 2011)	Principles to guide decisions affecting forestry resources applicable to land development management are contained in the following principle: **Principle 3** (3) The principles are that: (a) natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits; (b) a minimum area of each woodland type should be conserved, and forests must be developed and managed to i. conserve biological diversity, ecosystems and habitats; ii. sustain the potential yield of their economic, social and environmental benefits. This section of the Act alludes to the fact that the conservation status of all vegetation types needs to be considered when any development is taking place to ensure that the adequate conservation of all vegetation types is ensured. **Principle 6** (6) Criteria and indicators may include but are not limited to, those for determining the level of maintenance and development of: i. forest resources,

	ii. biological diversity in forests, iii. the health and vitality of forests, iv. the productive functions of forests, v. the protective and environmental functions of forests; and vi. the social functions of forests.
South Africa's National Biodiversity Offset Guideline gazetted under section 24J of NEMA (GN 3569 in GG 48841 of 23 June 2023)	The purpose of this guideline is to indicate when biodiversity offsets are likely to be required as mitigation by any competent authority (CA), to lay down basic principles for biodiversity offsetting and to guide offset practice in the environmental authorisation (EA) application context. This guideline is an implementation guideline contemplated in section 24J of the National Environmental Management Act, 1998 (NEMA). Guidelines published in terms of that section give guidance on, inter alia, the implementation, administration and institutional arrangements of the Environmental Impact Assessment Regulations, 2014 (EIA Regulations) or subsequent regulations regarding the environmental impact assessment process. The desired outcome of biodiversity offsets is to ensure the following: - That biodiversity is secured in the long term through the protection and appropriate management of ecosystems and species. - That efforts to protect biodiversity in the long term contribute to the expansion of South Africa's protected area network, and are focussed in areas identified as biodiversity priorities, with particular emphasis on the consolidation of protected areas and biodiversity priority areas and securing effective ecological links between priority areas. - That ecological infrastructure and the services and benefits it provides are maintained and where necessary restored to an acceptable level.
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998).
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.

National Water Act, 1998 (Act No. 36 of 1998) and Riparian Areas	Riparian habitat is afforded protection under the National Water Act in a number of ways. Firstly, reference in the National Water Act to a watercourse includes its banks, on which riparian habitat is encountered. Riparian areas are thus afforded the same degree of protection as the river beds and channels alongside which they occur. Riparian habitat is also important in the context of resource quality objectives that are a critical part of the Act. In terms of Section 13(1) of the Act resource quality objectives must be determined for every significant water resource, and are a central part of data type specifications relating to national monitoring systems and national information systems as determined in Section 137(2) and Section 139(2) of the Act respectively. Resource quality is important in the context of riparian habitat as resource quality as defined in the Act means the quality of all aspects of a water resource and includes the character and condition of the riparian habitat. In terms of Section 26(4) of the Act, the need for the conservation and protection of riparian habitat must be taken into account in the determination and promulgation of regulations under the Act.
The North West Biodiversity Sector Plan 2025	A Biodiversity Sector Plan (BSP) is a tool that guides and informs land use and resource-use planning and decision-making by a full range of sectors whose policies, programmes and decisions impact on biodiversity, to preserve long-term functioning and health of National or regional priority areas known as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). It is therefore the official reference document for biodiversity priorities that need to be considered in all land-use planning and decision-making processes. The purpose of the Biodiversity Sector Plan is to provide a map of the priority biodiversity areas and develop associated land use management guidelines in order to reduce further loss or degradation to biodiversity priority areas and ecological support areas. The overarching objectives of a Biodiversity Sector Plan are therefore to: 1. Identify the minimum spatial requirements, based on set targets, needed to maintain a living landscape that continues to support all aspects of biodiversity and retain essential ecological infrastructure. 2. 2. Serve as the primary source of biodiversity information for land use planning and decision-making, such as Environmental Impact Assessment and Authorisations. 3. Inform conservation and restoration action in key biodiversity areas.

	For the NW BSP 2025, more specifically, it is aimed to: - Integrate up-to-date spatial biodiversity data. - Re-assess Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). - Incorporate climate resilience, ecosystem services, and landscape connectivity. - Identify new or modified biodiversity priorities. - Support municipalities and land use planners with revised BSP guidelines that more closely align with NEMA and SPLUMA. - Identify priority sites for Protected Area Expansion
Protocol for Terrestrial Biodiversity Assessment (GN 320 of 2020)	Sets minimum requirements for specialist assessments and reporting on terrestrial biodiversity. The primary aim of the Protocol for Terrestrial Biodiversity Assessment (GN 320 of 2020) is to provide standardized criteria for the assessment and reporting of environmental impacts on terrestrial biodiversity during activities requiring Environmental Authorisation. It explicitly replaces Appendix 6 of the EIA Regulations.
North West Biodiversity Management Act, 2016 (Act 4 of 2016)	The primary legislation governing environmental management in the North West province is the North West Biodiversity Management Act, 2016 (Act 4 of 2016). This provincial act functions alongside national mandates, specifically the National Environmental Management Act (NEMA), to conserve provincial ecosystems and regulate the sustainable use of biological resources. The North West Biodiversity Management Act governs species protection, translocation, damage-causing animals, and the management of invasive or alien species within the province
North West Parks and Tourism Board Act, 2022 (Act No. 2 of 2022)	Implements authority for conservation management in the province, by focusing on conservation and sustainable use of biodiversity, including flora, fauna, and aquatic ecosystems. Promotes and manage protected areas and ecotourism, and regulates permitting systems for activities involving wildlife and plants, and Trade in endangered species, aligned with international agreements such as CITES.

2. LIMITATIONS

- This report relied most on the walkdown survey that was undertaken in 2026.
- The entire length of the deviations was walked on foot and the specialist sampled representative and accessible areas during the walkdown.
- All species included in the plant species list (Appendix A) were observed and recorded in the study area.

- Any comments or observations made in this regard are based on observations, literature review, the expert knowledge and relevant professional experience of the specialist; and
- Naledzani Environmental Services reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

3. GENERAL DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1. Project Location

There are 2 proposed deviations. Deviation 1 is located between towers 491-521 and it extends approximately 14 km and is located within the JB Marks Local Municipality, Dr Kenneth Kaunda District Municipality, North West Province, on farm Nooitgedacht 69, Klipgat 18, and Goedgedacht 27. Whilst deviation 2 is located between Towers 110-111. This deviation is located within the Mahikeng Local Municipality, Ngaka Modiri Molema District Municipality, North West Province. The deviation comprises a short lateral shift of approximately 42.8 m between the two tower positions, situated on Farm Bauwel 128. Refer to Figure 1 for the locations.

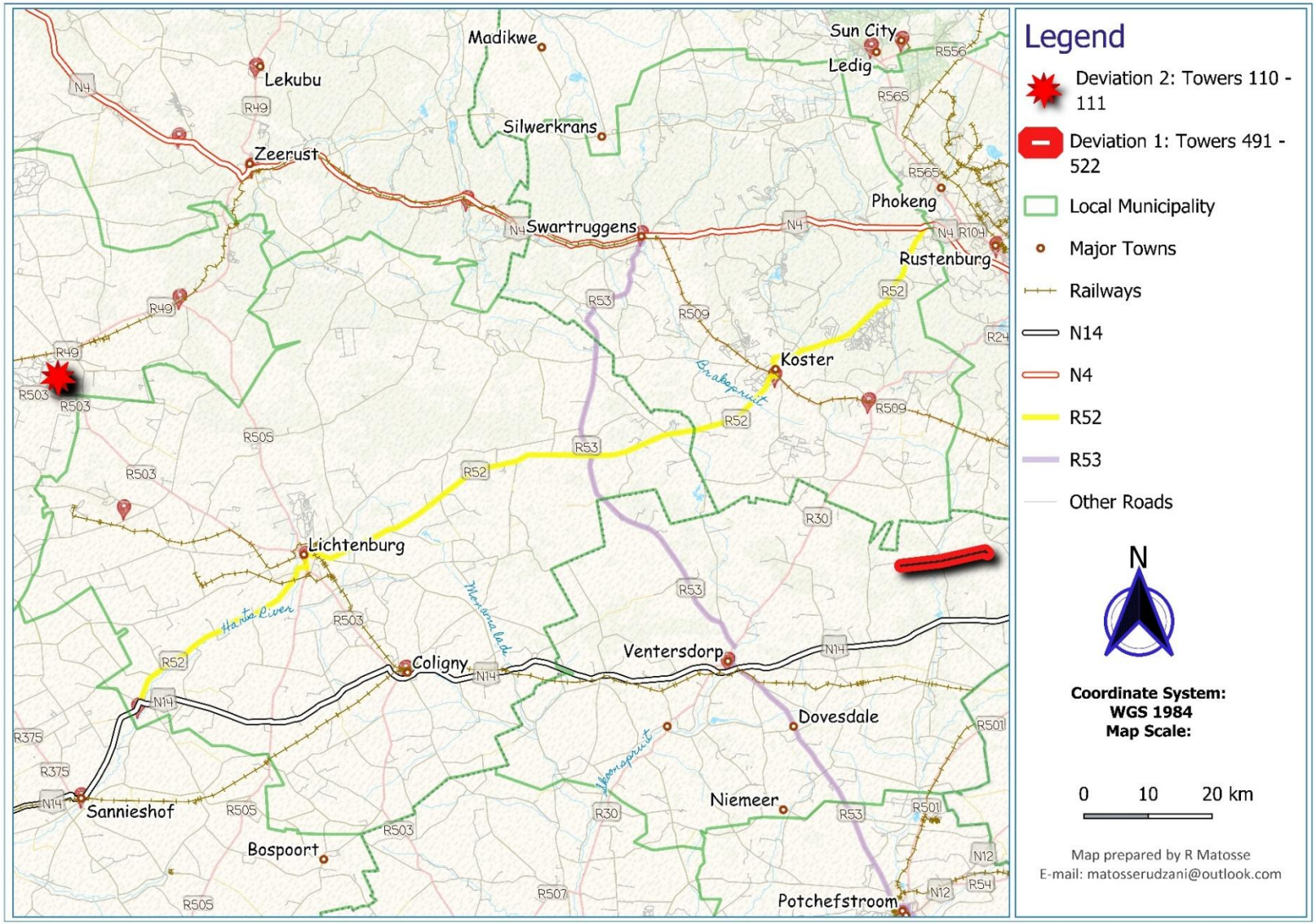


Figure 1: Project locality map

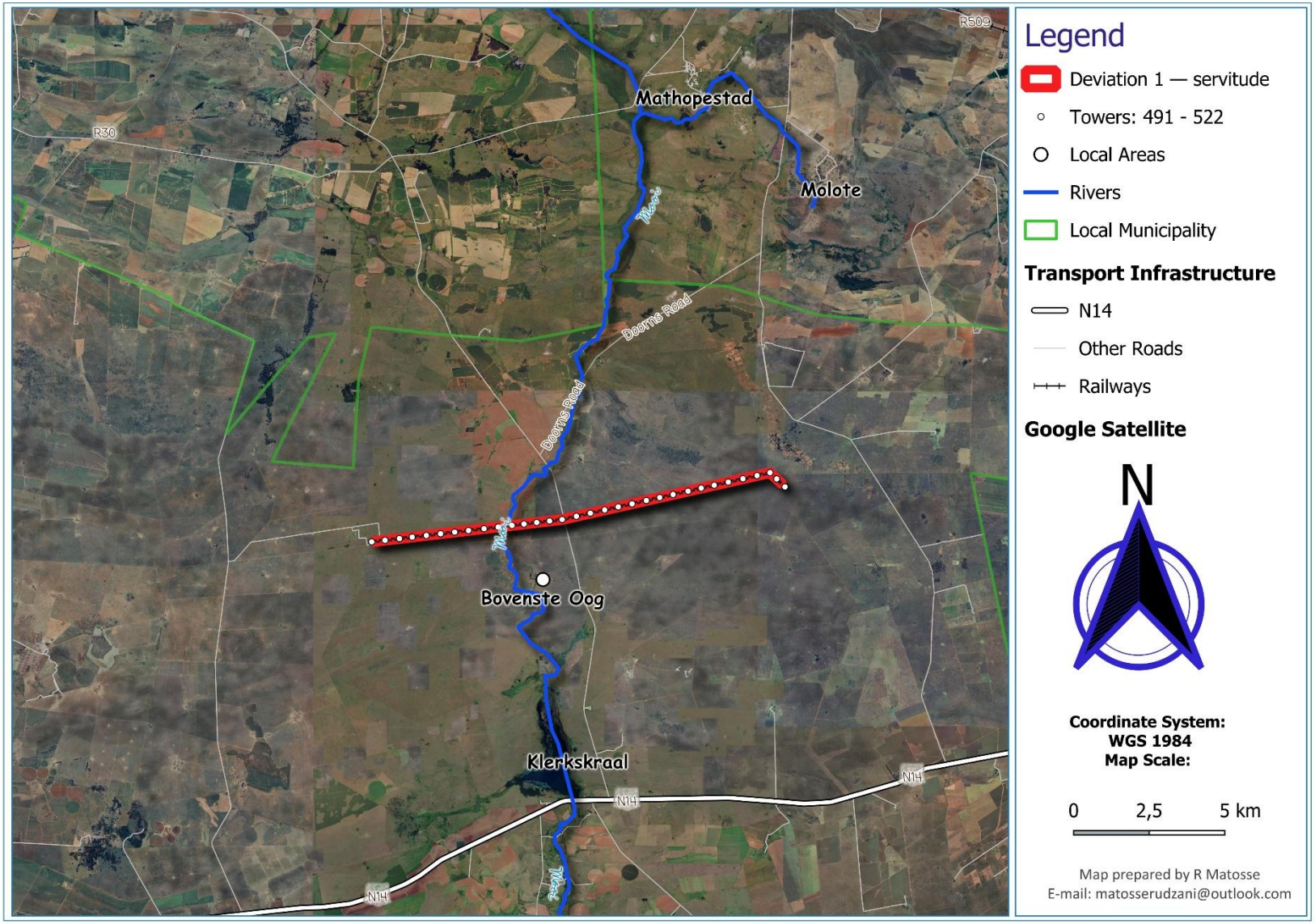


Figure 2: Google view of deviation 1

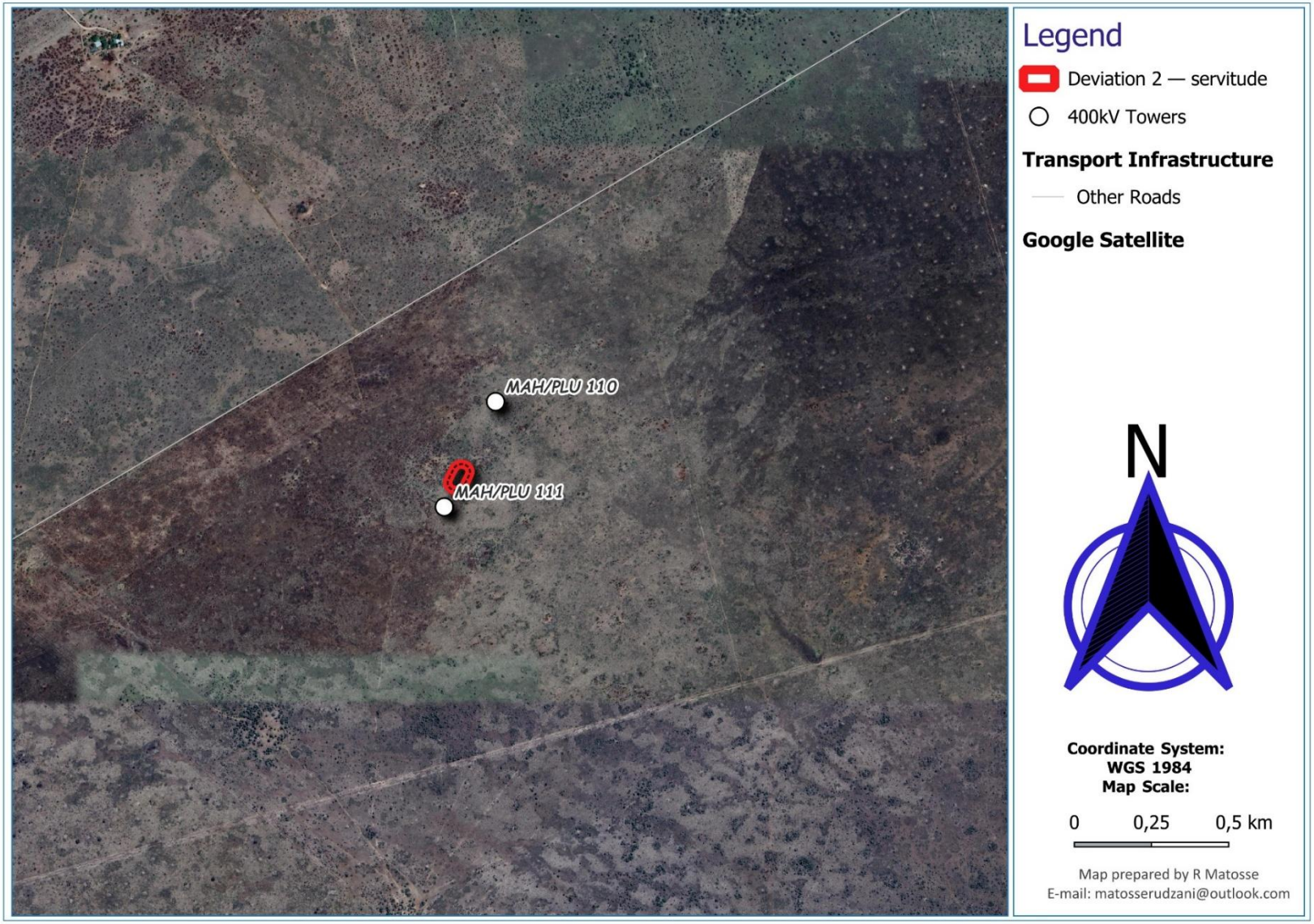


Figure 3: Google Earth view of deviation 2

3.2. Climatic Conditions

The North West Province features a hot, dry climate with abundant sunshine, characterized by warm summers and cool, dry winters. Climate patterns transition from temperate in the southeast and subtropical in the north to semi-arid in the west. Temperatures in the North West province ranges between 22°C and 34°C in summer with winters bringing clear, chilly nights often dropping to 2°C or lower, alongside daytime highs that can reach 20°C. Precipitation occurs mostly as brief, heavy afternoon thunderstorms during the summer months (October to April). Rainfall declines sharply from east to west, with the central regions receiving enough rain to support heavy agricultural production, while the western areas bordering the Kalahari Desert take on a more semi-arid nature.

3.3. Vegetation description

3.3.1. Biome type

Mucina and Rutherford (2006) described the project area (deviation 1 and 2) as falling within the Grassland Biome. The grassland biome is the second largest biome in South Africa, covering 28.4% of the country or more than 360 000 km^2. The grassland biome is found in summer rainfall areas, from sea level to above 2000 m. The Grassland Biome is very rich in plants, with nearly 3800 plant species recorded. Because fires are frequent, there are very few woody plants like trees (mainly in river courses and on rocky slopes). C4 grasses dominate throughout the biome, except at the highest altitudes where C3 grasses become prominent.

In the past, grasslands were home to large herds of animals like the Black Wildebeest, Blesbok and Eland. Today these animals mainly survive in nature reserves and on game farms. Grasslands are rich in birds, many of which eat seeds, e.g. Black Korhaan, Blue Crane and Helmeted Guinea fowl. Nearly half of the original Grassland Biome has been ploughed up to plant maize, sunflowers, sorghum and wheat. Grassland also supports livestock farming, including cattle and sheep. Most of Gauteng and the Mpumalanga highveld are found in the Grassland Biome. Much of this region has been developed for mining, industry and urban development. The Grassland Biome is considered to have an extremely high biodiversity, second only to the Fynbos Biome. Rare plants are often found in the grasslands, especially in the escarpment area. These rare species are often endangered, comprising mainly endemic geophytes or dicotyledonous herbaceous plants. Very few grasses are rare or endangered. The scenic splendour of the escarpment region attracts many tourists.

3.3.2. Broad vegetation classification

According to 2018 vegetation map by Mucina and Rutherford, deviation 1 is located within two broad vegetation unit. These are the Carletonville Dolomite Grassland (Gh 15), which covers most of the deviation, as well as the Rand Highveld Grassland (Gm 11). The entire of deviation 2 is located within the Klerksdorp Thornveld (Gh 13).

- The **Rand highveld grassland** (Gm 11) occurs across Gauteng, North-West, Free State and Mpumalanga Provinces on highly variable landscapes that include sloping and undulating plains interspersed with slightly elevated ridges. It is typically species rich with wiry grassland occurring on the plains and shrubland and sparse woodland occurring on the rocky outcrops (Mucina and Rutherford, 2012).
  Vegetation & Landscape Features: Highly variable landscape with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. Most common grasses on the plains belong to the genera *Themeda, Eragrostis, Heteropogon and Elionurus*. High diversity of herbs, many of which belong to the Asteraceae, is also a typical feature. Rocky hills and ridges carry sparse (savannoid) woodlands with *Protea caffra subsp. caffra, P. welwitschii, Acacia caffra and Celtis africana*, accompanied by a rich suite of shrubs among which the genus Rhus (especially R. magalismonata) is most prominent. According to According to Mucina and Rutherford, this vegetation is considered **Vulnerable.** See Figure 4.

- The **Carletonville Dolomite Grassland** (Gh 15) occurs mainly in the North West and Gauteng Provinces and marginally in the Free State Province. It occurs in the region of Potchefstroom, Ventersdorp and Carltonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng. Important taxa are graminoids (grasses) such as *Aristida congesta, Brachiaria serrata, Digitaria tricholaenoids, Themeda trianda, Aristida canescens, Melinis repens, M. nerviglumis and Cymbopogon caesius. Also herbs and geophytic herbs such as Acalypha angusta, Barleria macrostegia, Chamaecrista mimosies, Diathus mooiensis, Boophane Disticha, Senecio coronatus, Vernonia oligocephala and habenaria mossii* are some of the species that inhabit this vegetation (Mucina and Rutherford, 2006). Mucina and Rutherford classifies this conservation status of Carletonville Dolomite Grassland is **Vulnerable** with 24% target for conservation. Almost a quarter of this vegetation type is already transformed for cultivation, by urban sprawl or by mining activity as well as by the building of the Boskop and Klerkskraal Dams. See Figure 4.

- The **Klerksdorp Thornveld** (Gh 13) occurs in two patches, one in the Wolmaransstad, Ottosdal and Haarteesfontein and the other from Botsolano Game Park to the Madibogo. The dominating plant species

include *Acacia karroo, A. caffra, Celtis Africana, Acacia hebeclada, Gymnosporia senegalensis* with low shrubs such as *Asparagus laricinus, A suaveolens, Felicia muricata.* The grass layer is dominated by *Aristida congesta, Cynodon, dactylon, Eragrostis lehmanniana, Themenda triandra, Panicum coloratum, Sporobolus fimbriatus and Microchloa caffra.* This vegetation is regarded as **Vulnerable** and only about 2.5% is conserved in the Mafikeng Game Reserve, Botsolano Game Park and Faan Meintjes Nature Reserve. See Figure 5.

3.4. Terrestrial threatened ecosystem

The South African National Biodiversity Institute (SANBI), in conjunction with the Department of Environmental Affairs (DEA), released a draft report in 2009 entitled "Threatened Ecosystems in South Africa: Descriptions and Maps", to provide background information on the List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa's ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used in determining the status of threatened ecosystems:

- Irreversible loss of natural habitat;
- Ecosystem degradation and loss of integrity;
- Limited extent and imminent threat;
- Threatened plant species associations;
- Threatened animal species associations; and
- Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan.

In terms of section 52 (1) (a), of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), a national list of ecosystems that are threatened and in need of protection was gazetted on 9 December 2011 (Government Notice 1002 (Driver *et. al.*, 2004) and it was revised in 2022 (Government Notice No. 2747). The list classified all threatened or protected ecosystems in South Africa in terms of four categories: *Critically Endangered* (CR), *Endangered* (EN), *Vulnerable* (VU), or *Protected*. The purpose of categorising these ecosystems is to prioritise conservation areas to reduce the rates of ecosystem and species extinction, as well as prevent further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that threatened ecosystems make up 9.5% of South Africa, with critically endangered and endangered ecosystems accounting for 2.7%, and vulnerable ecosystems 6.8% of the land area. It is therefore vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, such as Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs), Environmental Management Frameworks (EMFs), Environmental Impact Assessments (EIAs), and other environmental applications (Mucina *et al.,* 2006*)*.

The revised list identified 120 threatened terrestrial ecosystem types (51 Critically Endangered, 55 Endangered, and 14 Vulnerable). The original extent of the vegetation types indicates that the proposed powerline deviation overlaps ecosystems classified as Vulnerable and Least Concern. However, the Red List of Ecosystems (RLE), 2025, remnant ecosystem spatial dataset indicates that no remnant areas of the Rand Highveld Grassland ecosystem, which is classified as Vulnerable, occur within the powerline deviation servitude. This suggests that the deviation does not affect the remaining extent of this threatened ecosystem.

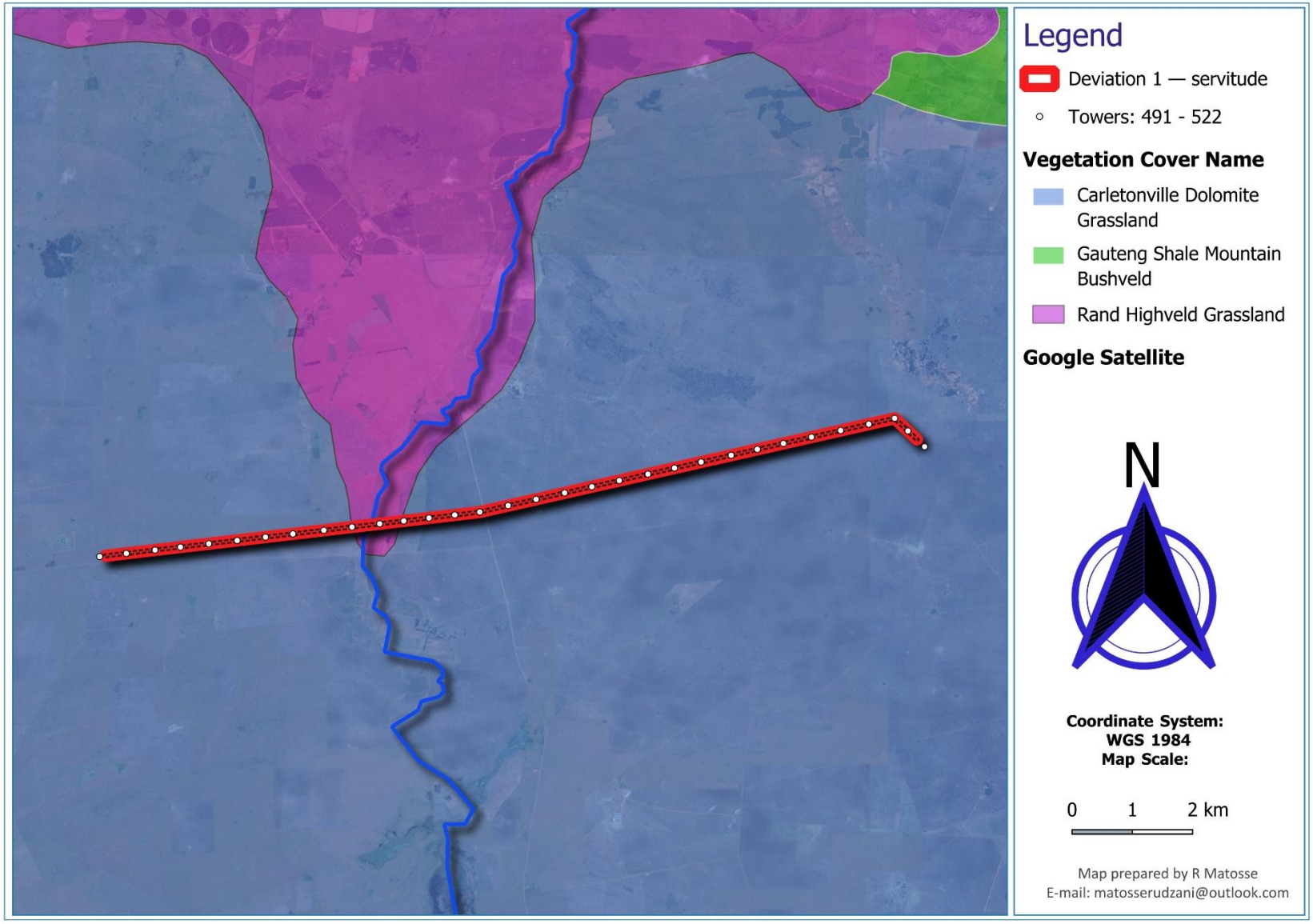


Figure 4: Broad vegetation map for deviation 1

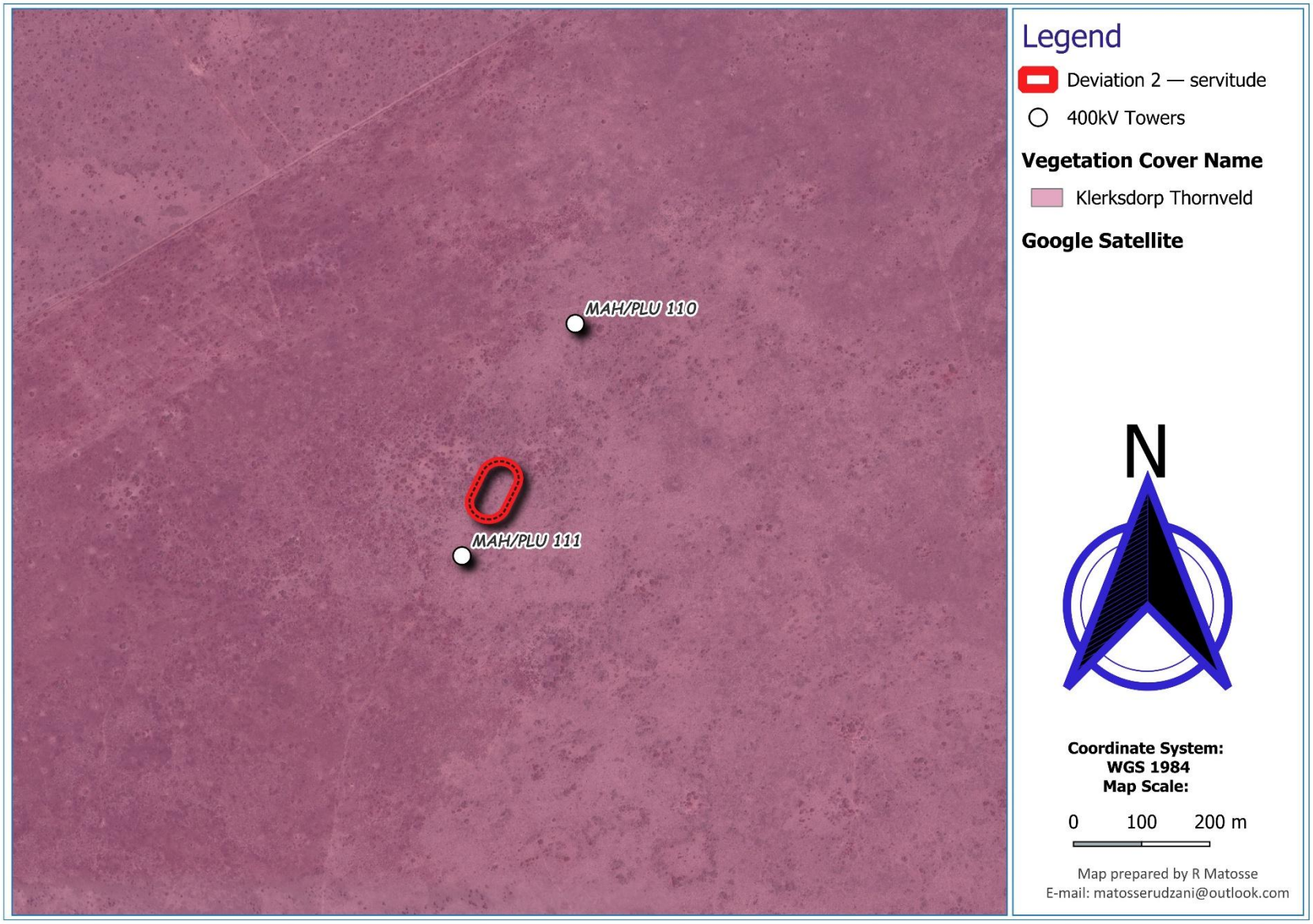


Figure 5: Broad vegetation map for deviation 2

4. METHODOLOGY AND REPORTING

The information provided in this terrestrial biodiversity report is based mainly on the observations that were made during the field survey and a review of the available reports that contain known and predicted biodiversity and ecological information regarding the four sites. A wide range of spatial data sets was interrogated, and relevant information was extracted for the study site. A basic ecological sensitivity analysis was performed to identify areas of special interest or concern. The various approaches used and aspects taken into account are detailed below:

4.1. General

A desktop survey utilising aerial images and photography was undertaken to assemble background information regarding the different features and vegetation type present within the proposed project footprint, including the buffer area. The site was assessed as part of the walkdown from the 16th to the 20th of March 2026 and continued from 23rd to the 27th of March 2026 in order to record the true floristic and faunal reflection of the sites.

4.2. Vegetation data

The PRECIS list of plants recorded in the quarter-degree grid squares was obtained from SANBI. This list was consulted to verify the record of occurrence of the plant species seen on the site. A desktop study of the habitats of the red-listed and orange-listed species known to occur in the area was done prior to site assessment. Visual assessment was used to assess the abundance of floral and faunal species. The vegetation types of Mucina & Rutherford (2006) were also used as reference. Still, where necessary, communities are named according to the recommendations for a standardised South African syntaxonomic nomenclature system (Brown, L.R., Du Preez, P.J., Bezuidenhout, H., Bredenkamp, G.J., Mostert, T.H.C., and Collins, N.B. 2013). By combining the available literature with the survey results, stratification of vegetation communities was possible.

4.3. Fauna survey

The majority of mammals and reptiles are either very secretive, nocturnal, hibernate (reptiles), migrate (birds), or prefer specific habitats, so sampling and identification were limited. Records of all faunal species recorded in the affected quarter-degree grid squares were obtained from the Virtual Museum (VM) website of the Animal Demographic Unit of the University of Cape Town before the site visits. The site assessment was conducted for mammal species by direct and indirect methods using sightings, burrows, and holes.

4.4. Methodology Adapted in Assessing the Impacts

The significance of the impacts will be assessed considering the following descriptors:

Table 2: Impact assessment table

Nature of the impact		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).

Extent		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.

Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the impact rating is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the Table 4 below.

Table 3: Definition of significance rating

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.

Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

5. FINDINGS OF THE ASSESSMENT

5.1. Protected Trees and geophytes

The National Forest Act, 1998 (Act No. 84 of 1998) enforces the protection of several indigenous trees. This national list of protected trees was developed through the application of objective scientific criteria, which was supported by a computerised scoring system.

The criteria for listing the trees as protected included:

- The rarity of the species;
- Importance of the species in the maintenance of an ecosystem, also known as keystone species;
- The utilization pressure on a species;
- Cultural or spiritual value (including landscaping) of the species; and
- The degree to which a species is already protected under provincial legislation.

From the site-based findings, no nationally protected trees were identified on site. However, the *Boophane disticha,* which is provincially protected was recorded. This species is regarded as declining by the South African National Biodiversity Institute (SANBI) Red List of South African Plants. Furthermore, *Gladiolus sericeovillosus* and *Hypoxis hemerocallidea* also provincially protected are classified as Declining per the North West Provincial Orange list. Both protected geophytes were recorded within deviation 1 of the power line. No protected geophytes can be cleared, cut or disturbed without a flora permit from the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT).



Figure 6: Boophane disticha

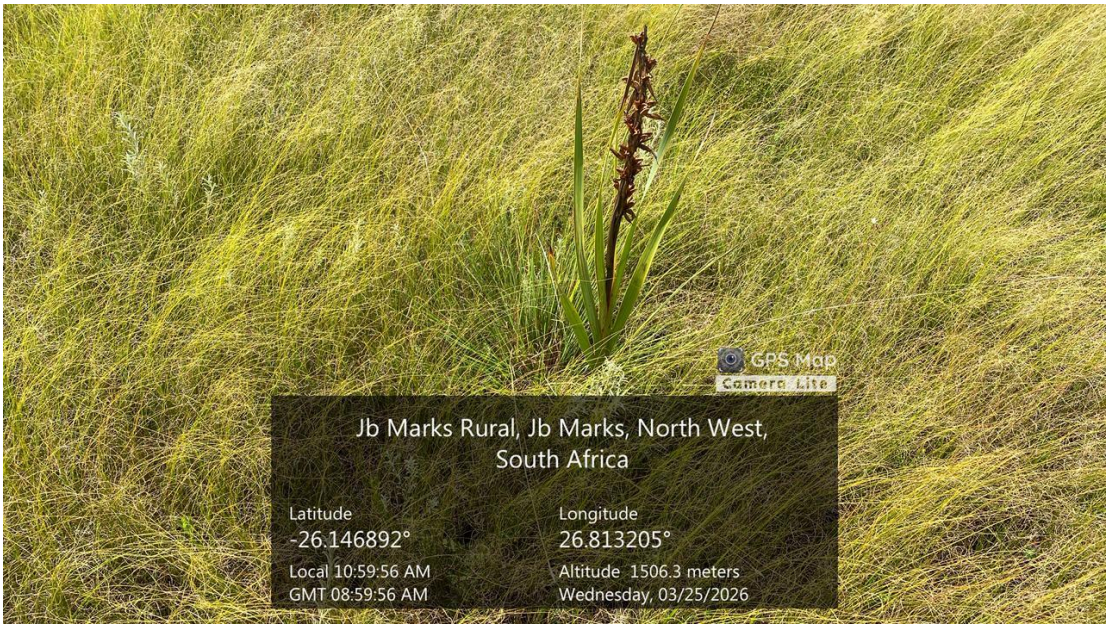


Figure 7: Gladiolus sericeovillosus

5.2. Vegetation

The vegetation along the proposed route for the construction of the powerline resembles a typical grassland biome characterised by well-developed grasses, shrubs, and tree layers. The assessment revealed that the proposed powerline is located within private and state farmland.

Deviation 1

Deviation 1 is characterised by natural grassland, secondary grassland, vegetation associated with the watercourse (by the Mooi river), cultivated area and the outcrop. The plant species recorded include *Salix mucronata, Searsia lancea, Typha capensis, Phragmites australis,* Cyperus *rupestris, Melia azedarach, Zea mays, Ziziphus mucronata, Gymnosporia buxifolia, Asparagus laricinus, Senecio inornatus, Andropogon eucomus, Eragrostis plana, Panicum coloratum, Setaria incrassate, Searsia lancea, Vachellia tortilis, and Acacia hebeclada. Tagetes minuta, Aloe Zebrina, Prosopis glandulosa, Asparagus densiflorus, Melinis repens, Trichanthecium natalense, Lasiosiphon cuneifolius, Hermannia depressa, Pentzia dentata, Themenda triandra, Panicum coloratum, Sporobolus africanus, Andropogon eucomus, Andropogon appendiculatus, Urochloa panicoides, Digitaria eriantha, Eragrostis plana, Hyparrhenia hirta, Eragrostis lehmanniana, Cynodon dactylon, Vigna vexillate, Lippia javanica, Eucomis autumnalis, Gladiolus sericeovillosus, Chrysocoma ciliata, Entada elephantina, Heteropogon contortus and Boophane disticha*



Figure 8: Aerial view of deviation 1



Figure 9: Crossing along the Mooi river



Figure 10: Stoebe plumosa



Figure 11: Tagetes minuta and Melinis repens

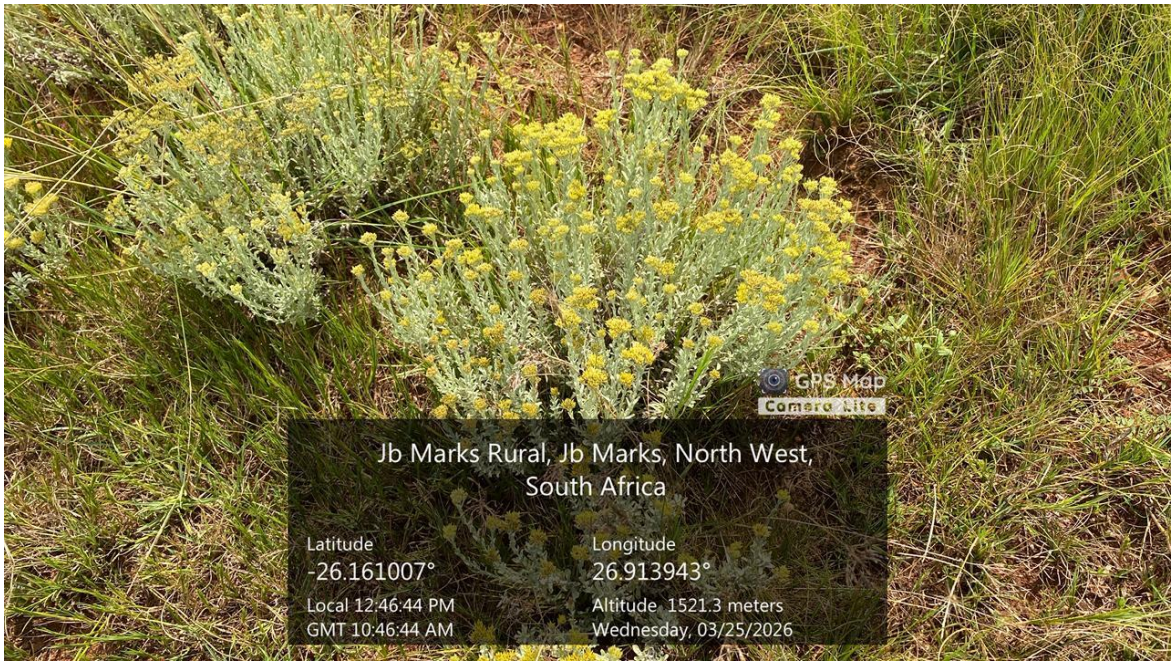


Figure 12: Pentzia dentata

Deviation 2

As indicated above in Section 5.1, no national or provincial protected plant species were recorded within deviation 2. The entire section of the deviation is still in a natural state and plants recorded include *Eriosema distinctum, Vachellia karoo, Vachellia tortilis, Ziziphus mucronata, Diospyros lycioides, Phoenicaulis cheiranthoides*, *Searsia lancea*, Stoebe plumosa, Asparagus laricinus, Tephrosia capensis, *Grewia occidentalis.* The grass species include *Melinis repens, Themenda triandra, Panicum coloratum, Sporobolus africanus, Andropogon eucomus, and Urochloa panicoides.*

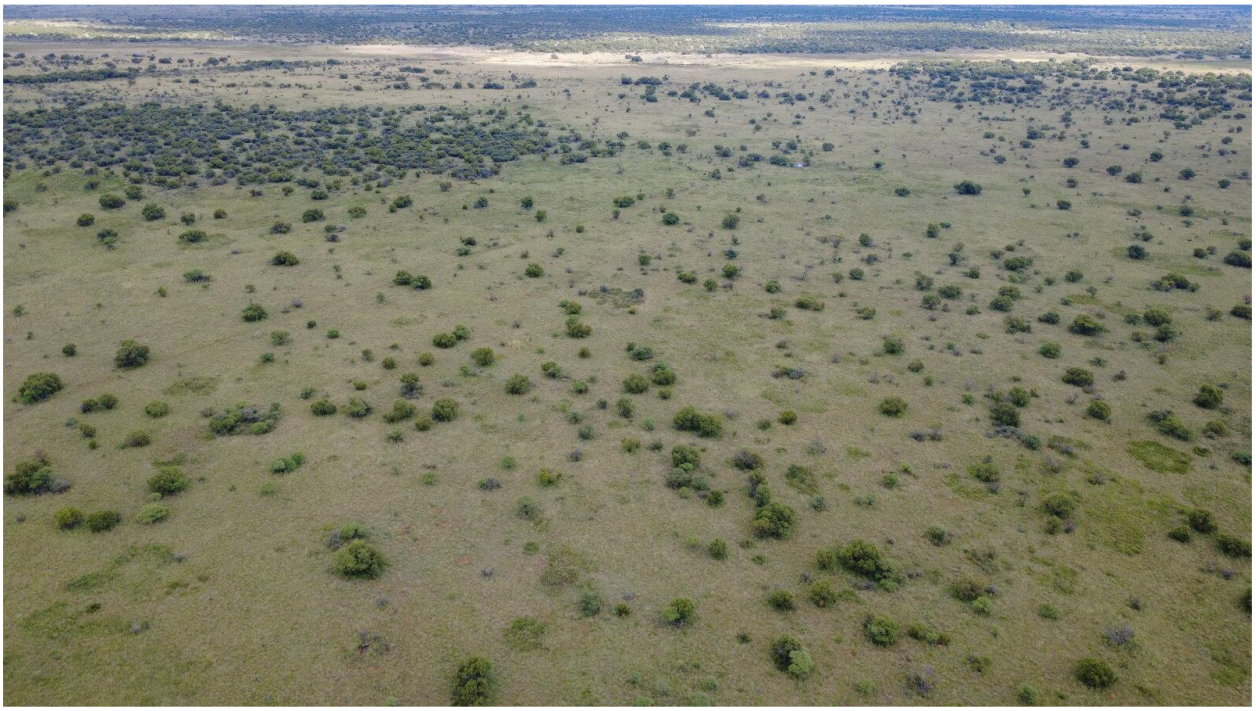


Figure 13: Aerial view of deviation 2 (Tower 110-111)



Figure 14: Grass layer within the deviation 2



Figure 15: Vachellia tortilis

5.3. Alien invasive plants

Declared weeds and invaders tend to dominate or replace the herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. Therefore, it is important that all these transformers be eradicated and controlled using an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

According to the published Alien and Invasive Species regulations in terms of section 97(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), four categories of problem plants are identified as:

- **Category 1a** plants are high-priority emerging species requiring compulsory control. All breeding, growing, moving and selling are banned.

- **Category 1b** plants are widespread invasive species controlled by a management programme.
- **Category 2** plants are invasive species controlled by area. Can be grown under permit conditions in demarcated areas. All breeding, growing, moving, and selling are banned without a permit.
- **Category 3** plants are ornamental and other species that are permitted on a property but may no longer be planted or sold.

Numerous alien plant species were recorded in the study area at the time of the survey; most notably, the extensive invasions by species such as *Acacia mearnsii al*so have the potential to form dense stands. Table 4 lists the alien species as well as the various NEMBA categories for the alien species recorded during the survey.

Table 4: Alien invaders within the deviations

Scientific name	Common name	NEMBA Category
Argemone Mexicana	Mexican prickly poppy	1b
Arundo donax	Giant reed	1b
Campuloclinium macrocephalum	Pom-pom weed	1b
Datura ferox	Large apple thorn	1b
Datura Stramonium	Downy thorn apple	1b
Melia azedarach	Syringa	1b
Solanum mariantanum	Bug weed	1b
Verbena bonariensis	Wild Verbena	1b
Cosmos bipinnatus	Cosmos	1b



Figure 16: Cosmos bipinnatus as one of the invaders

5.4. Protected Areas and National Protected Area Expansion Strategy

Within South Africa, not all 969 distinct ecosystems are equally protected. Of these, 21% are well protected, 13% are moderately protected, 30% are poorly protected and 37% are not protected at all (Department of Environmental Affairs, 2016). The goal of the National Protected Area Expansion Strategy (NPAES) "is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change". Under this strategy, priority areas that are suitable for protected areas have been mapped.

PAES in the North West were selected based on Critical Biodiversity priority areas (i.e. corridors and priority conservation nodes) and include under protected ecosystem types particularly in the Central Bushveld, Arid Highveld Grasslands and Eastern Kalahari Bushveld ecosystems. The aim of these areas is to improve landscape connectivity between reserves (Department of Environmental Affairs, 2016). The project footprint was overlaid on the South African Conservation Areas Database (SACAD, Quarter 4 2025), the South African Protected Areas Database (SAPAD, Quarter 4 2025), and the National Protected Area Expansion Strategy (NPAES) dataset. The assessment indicates

that the proposed 400 kV powerline deviations does not traverse an area identified as a priority for protected area expansion under the NPAES. The first deviation is located adjacent to the northern boundaries of the Fred Coetzee and Sommerville Private Nature Reserves which are not NPAES whereas deviation 2 occurs approximately 3km east of Mafikeng Game Reserve, a provincially proclaimed protected area.

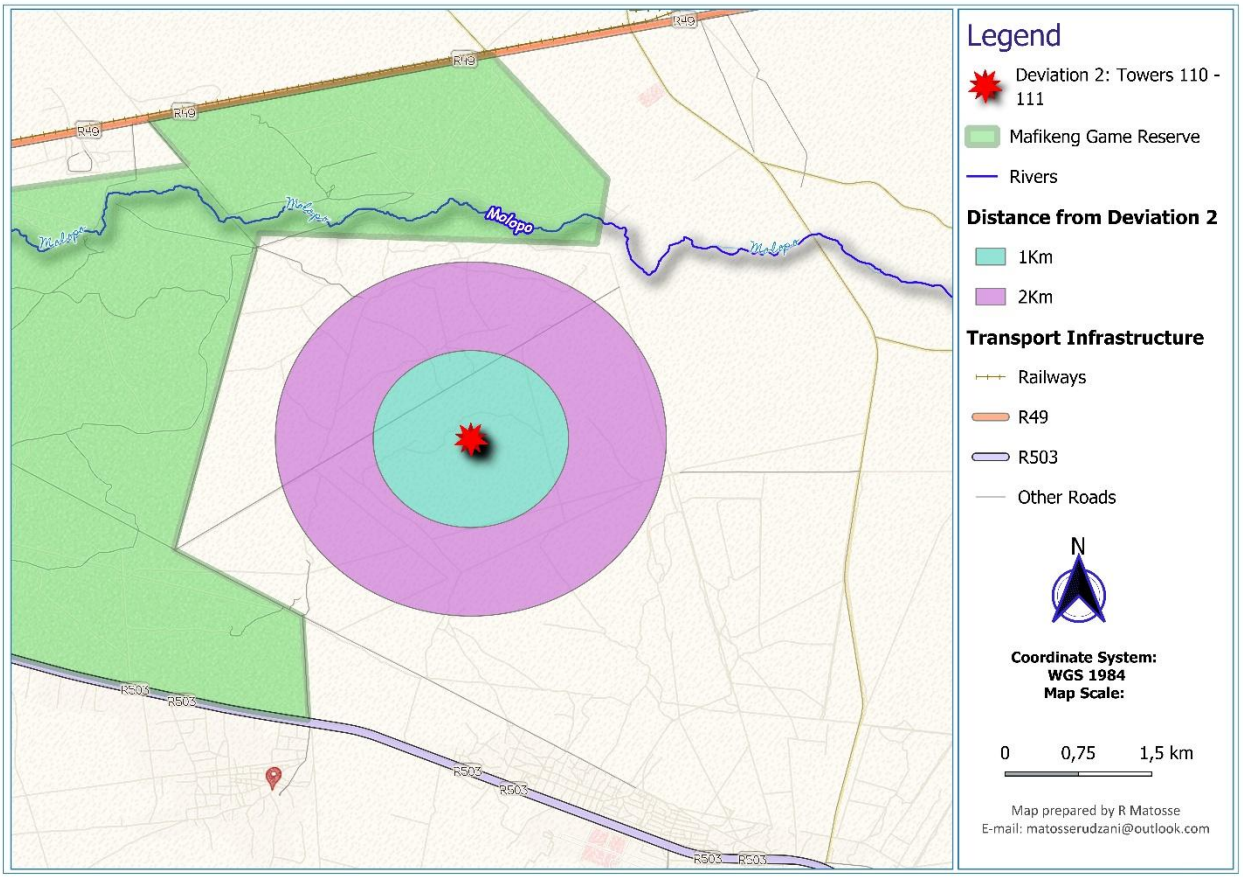


Figure 17: Distance of deviation 2 from the Mahikeng Nature Reserve

5.5. Description of the Critical Biodiversity Area

Critical Biodiversity Areas (CBA's) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. These form the key output of a systematic conservation assessment and are the biodiversity sector's inputs into multi-sectoral planning and decision-making tools. The guideline for bioregional plans defines three basic CBA categories based on three high-level land management objectives.

Table 5: A framework for linking spatial planning categories (CBAs) to land-use planning and decision-making guidelines based on a set of high-level land biodiversity management objectives

CBA category	Land Management Objective
PA & CBA 1	**Natural landscapes**: • Ecosystems and species fully intact and undisturbed • These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost, then targets will not be met. • These are landscapes that are at or past their limits of acceptable change.
CBA 2	**Near-natural landscapes**: • Ecosystems and species largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets. • These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESA)	**Functional landscapes**: • Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
Other Natural Areas (ONA) and Transformed	**Production landscapes**: manage land to optimize sustainable utilization of natural resources.

The North West Biodiversity Sector Plan assigns the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

- Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species. Thus, if these areas are not maintained in a natural or near-natural state, then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

- Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (SANBI-BGIS, 2017).

- Other Natural Areas (ONAs) consist of all those areas in a good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017).

The powerline corridor was overlaid on the North West Critical Biodiversity Areas Map to verify whether the powerline deviation traverses CBAs and ESAs. It was noted that in terms of the terrestrial realm, the Project Area overlaps with ESA1, CBA1 and CBA2. The proposed deviations will require the clearance of approximately 3 ha of vegetation within the NPAES, 6.58 ha within Critical Biodiversity Areas (CBAs), and 1.69 ha within Ecological Support Areas (ESAs), see Table 6. This will be for the establishment of a 3.5m access road and at tower positions. In terms of the aquatic realm, the deviations traverse the CBA2, ESA1 and ESA2 with CBA2 confined to the Mooi River. See Figures 17 and 18.

Table 6: Quantification of the CBA and ESA on site

No.	CBA Category	Exclusive area in servitude (ha)	Road Footprint (ha)	Tower clearance
1	CBA1	48.84	3.11	2.02
2	CBA2	12.31	0.78	0.67
3	ESA1	16	1.02	0.67
TOTAL (= servitude footprint)		**77.15**	**4.91**	**3.36**

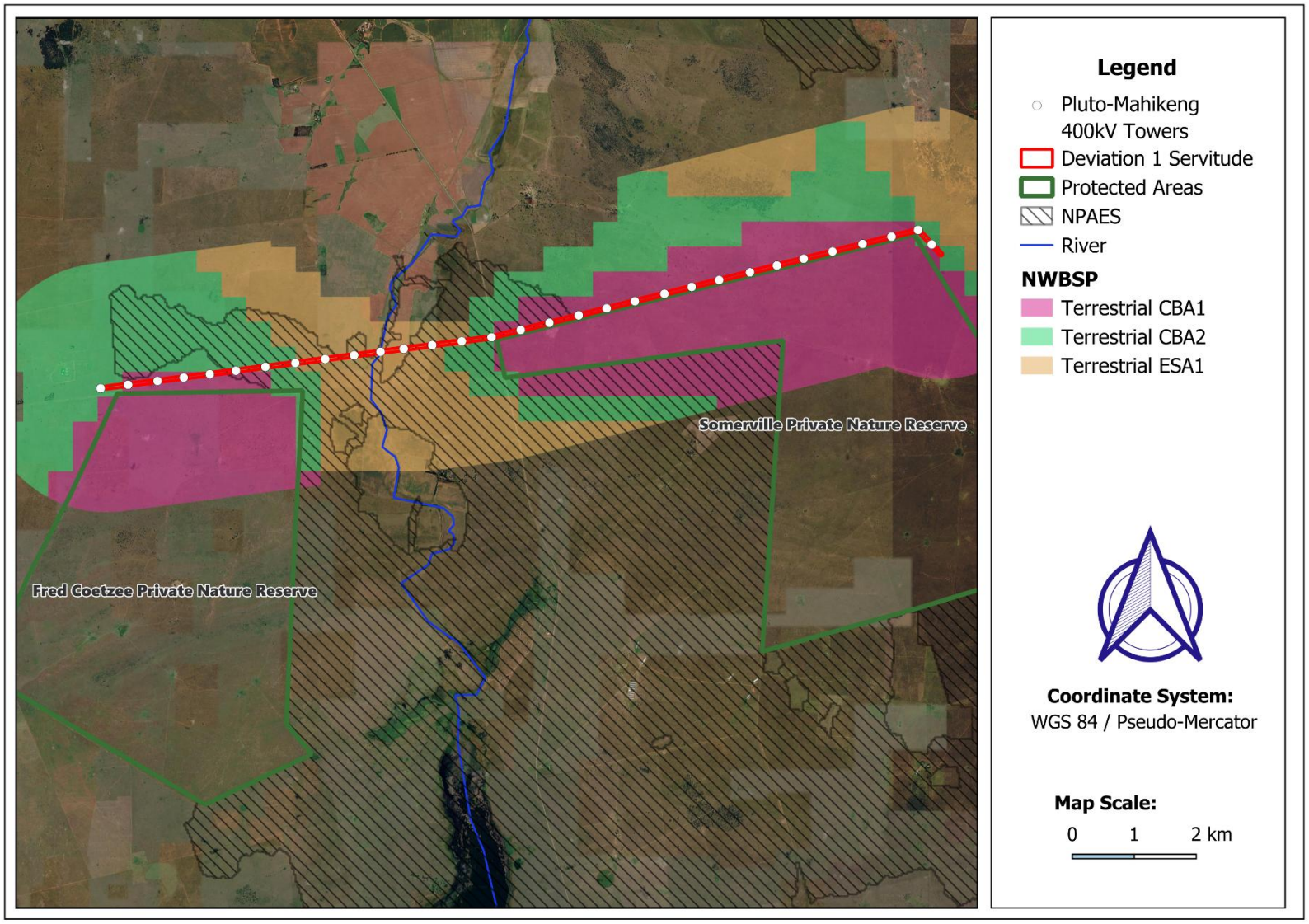


Figure 18: Sensitivity map for deviation 1 based on the North West Biodiversity Sector Plan

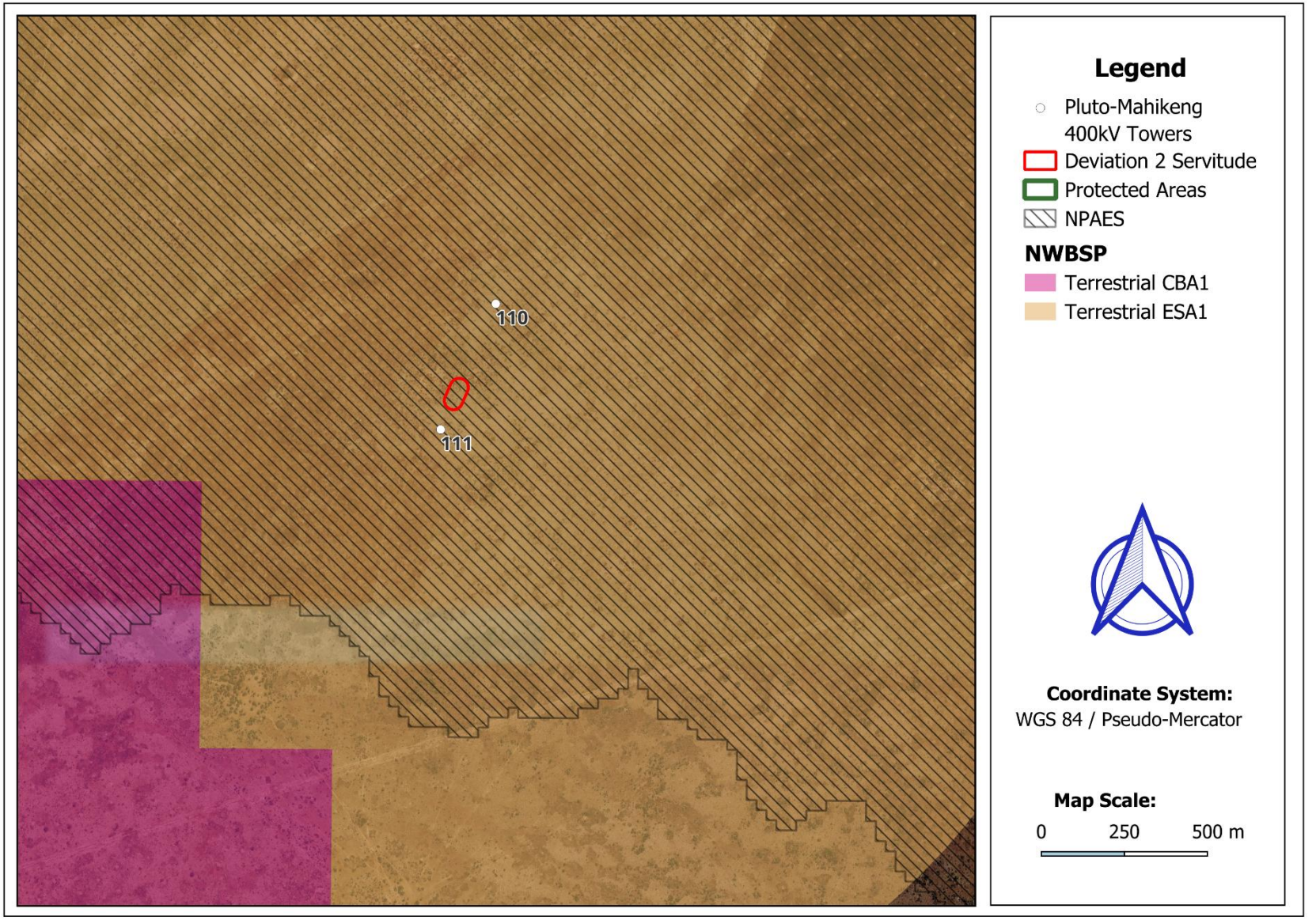


Figure 19: Sensitivity map for deviation 2 based on the North West Biodiversity Sector Plan

5.6. Terrestrial Biodiversity Site sensitivity verification

This Terrestrial Biodiversity site sensitivity verification relates to the Screening Tool Report completed for the site as well as the site survey conducted.

Table 7: Screening Tool Report Sensitivities

Environmental Theme	DFFE Screening tool sensitivity		Applicable protocol	Specialist sensitivity verification	
	Deviation 1	Deviation 2		Deviation 1	Deviation 2
Terrestrial Animal Species Theme	High	Low	Terrestrial Animal Species Specialist Assessment	Medium	Low
Terrestrial Plant Species Theme	Low	Low	Terrestrial Plant Species Specialist Assessment	Medium	Low
Terrestrial Biodiversity Theme	Very high	Very High	Terrestrial Biodiversity Specialist Assessment	High	High

5.6.1. Terrestrial Animal Species

The Animal Species Theme for Deviation 1 is assigned a High sensitivity by the DFFE Screening Tool due to the potential occurrence of avifaunal Species of Conservation Concern (SCCs). However, the terrestrial animal species assessment confirmed an overall Medium sensitivity based on the potential presence of SCC mammal species, including *Crocidura maquassiensis, Hydrictis maculicollis, and Mystromys albicaudatus.* The listed mammal species are generally associated with wetland habitats within savanna and grassland ecosystems, where habitat loss and degradation constitute the primary threats to their persistence. Although suitable habitat for these species is present within the study area, the extent and quality of such habitat are limited. Consequently, taking into account the likelihood of occurrence of these SCCs, the availability of suitable habitat, and the findings of the field assessment, the terrestrial animal species theme for Deviation 1 is confirmed as Medium sensitivity.

For Deviation 2, the specialist concurs with the DFFE Screening Tool, which assigns a Low sensitivity rating. This is because the deviation covers a relatively small area with limited habitat diversity and provides little suitable habitat for terrestrial Species of Conservation Concern. The likelihood of significant impacts on SCCs is therefore considered low, and the Low sensitivity rating is confirmed.

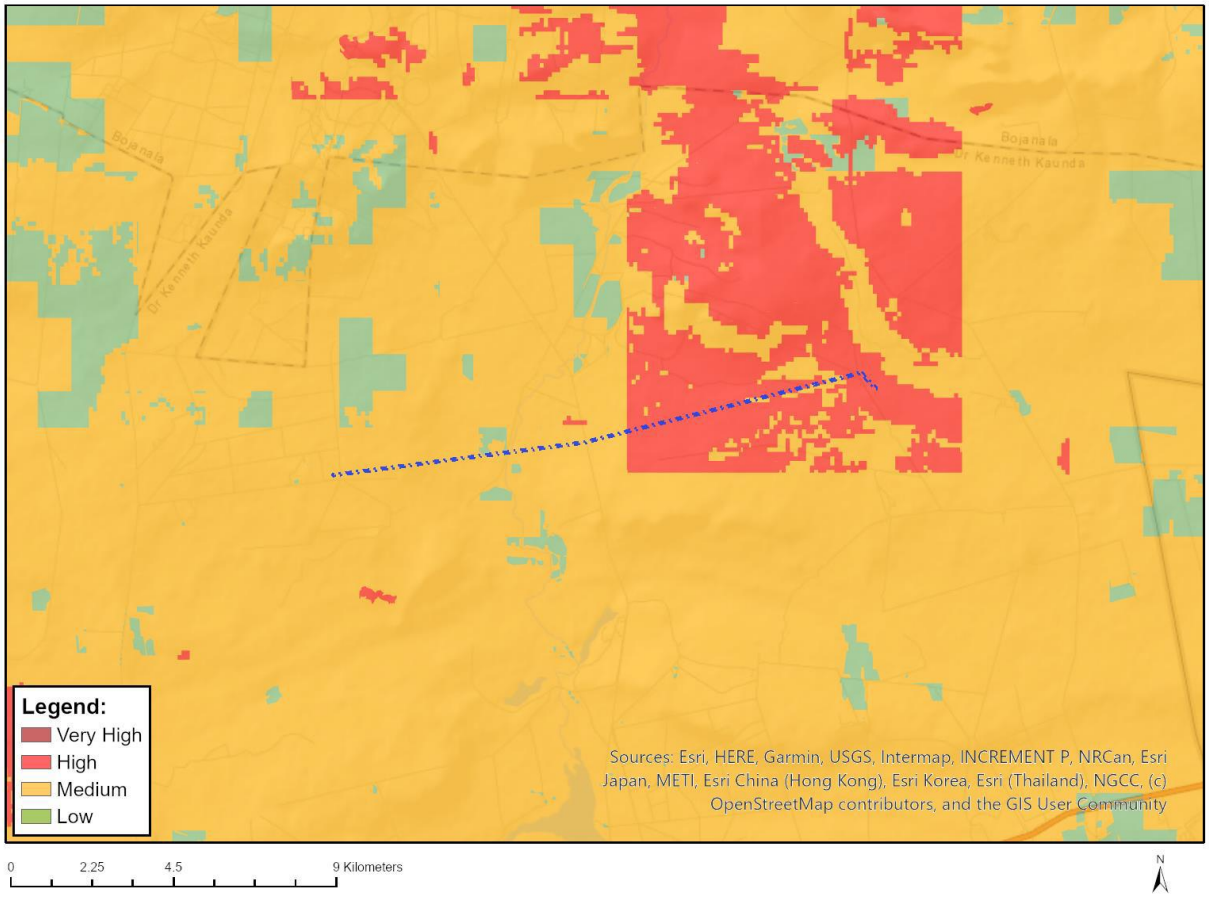


Figure 20: DEFF Screening Tool Results for deviation 1 - animal biodiversity theme

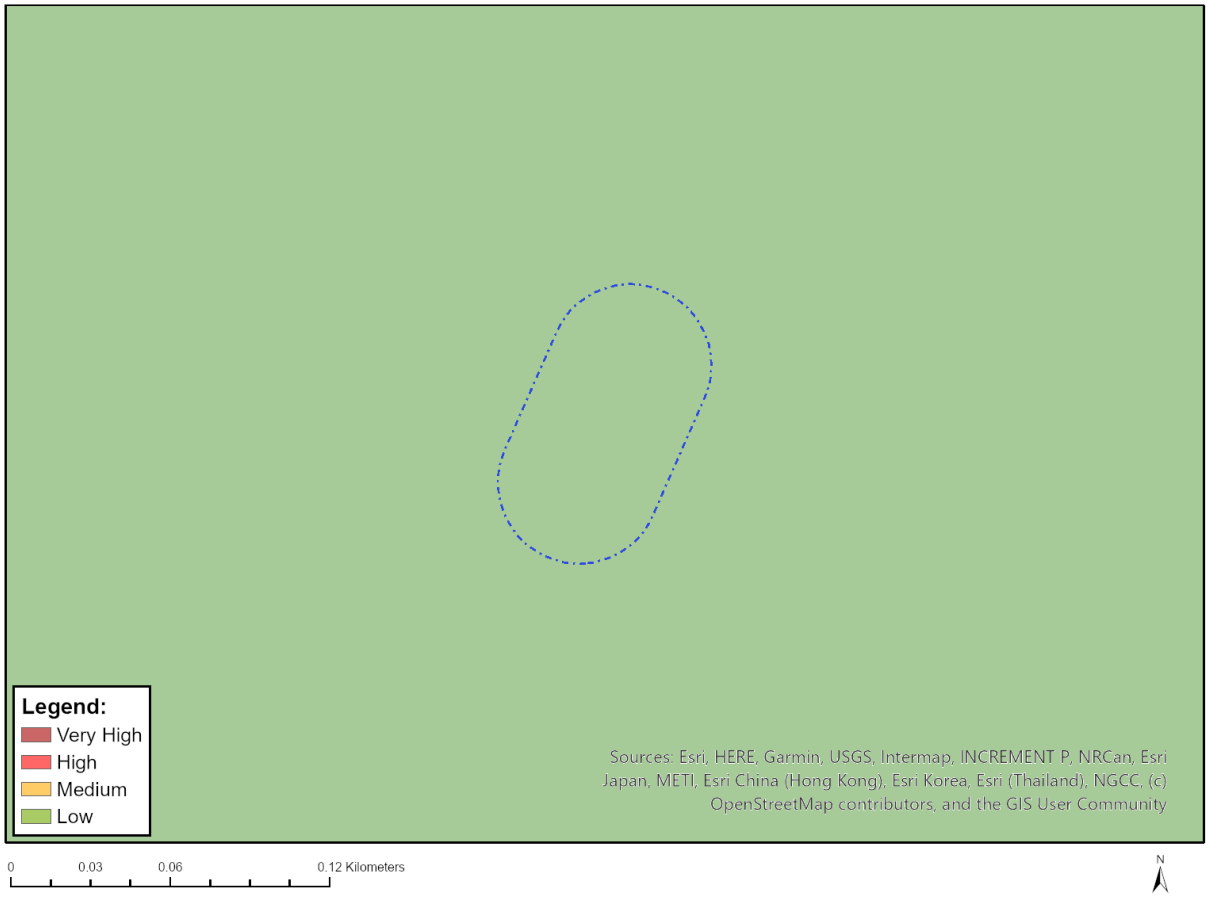


Figure 21: DFFE Screening Tool Results for deviation 2 - animal biodiversity theme

5.6.2. Terrestrial Plant Species

The sensitivity of the site based on the Terrestrial Plant Species theme is considered low for both deviations since no protected plant species or red listed plants were recorded during desktop. The site survey indicated that deviation 1 has a sensitivity of medium on account of there are provincial protected plant species.

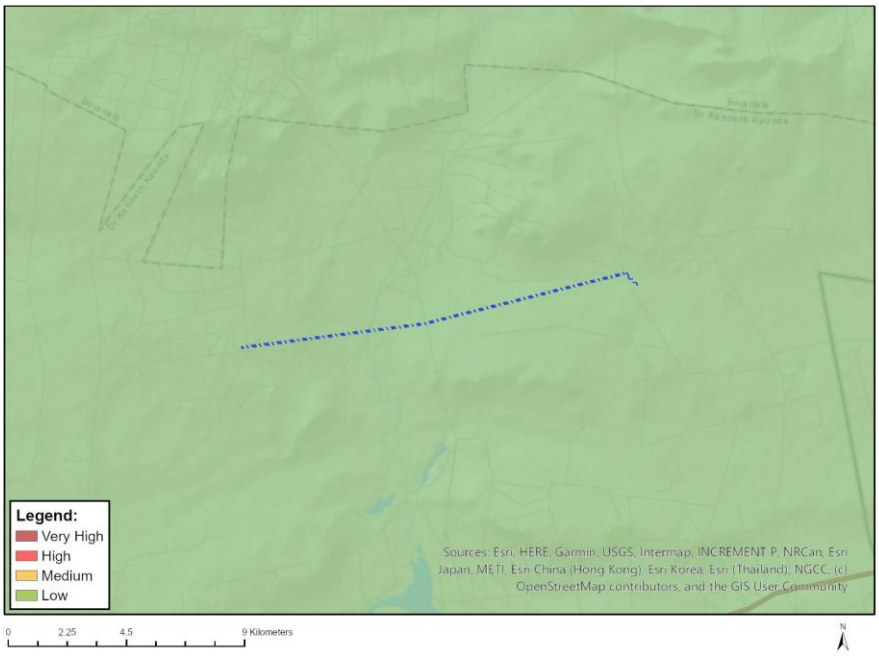


Figure 22: DFFE Screening Tool Results for deviation 1 - Plant biodiversity theme



Figure 23: DFFE Screening Tool Results for deviation 2 - Plant biodiversity theme

5.6.3. Terrestrial Biodiversity

The DFFE Environmental Screening Tool assigns the study area a Very High Terrestrial Biodiversity sensitivity due to the presence of Critical Biodiversity Areas (CBA1 and CBA 2), Ecological Support Areas (ESA 1), areas identified under the National Protected Area Expansion Strategy (NPAES), and Vulnerable ecosystem.

The field survey confirmed that the deviation servitudes intersect areas mapped as CBAs and ESAs. Based on the findings of the field assessment, supported by available baseline information, the Site Sensitivity Verification classified the deviation servitudes into four ecological sensitivity units:

- Intact Carletonville Dolomite Grassland within CBA and NPAES areas, characterised by rocky outcrops and the presence of SCC geophytes;
- The Mooi River watercourse and associated riparian habitat;
- Secondary grassland, old, cultivated lands, and transformed/alien-dominated areas; and
- Klerksdorp Thornveld occurring within CBA and ESA areas.

Based on the ecological condition, conservation importance, and presence of sensitive biodiversity features, the Site Ecological Importance (SEI) ranges from High to Low across the study area. The highest ecological importance is associated with the Mooi River watercourse and riparian corridor, while transformed and previously cultivated areas are of lower ecological importance.



Figure 24: DFFE Screening Tool Results for deviation 1 - Terrestrial biodiversity theme



Figure 25: DFFE Screening Tool Results for deviation 2 - Terrestrial biodiversity theme

6. SITE ECOLOGICAL IMPORTANCE (SEI) OF THE DEVIATION AREAS

Site Ecological Importance (SEI) is derived following the accepted SANBI Species Environmental Assessment framework, in which SEI is a function of Biodiversity Importance (BI) and Receptor Resilience (RR), where BI is itself a function of Conservation Importance (CI) and Functional Integrity (FI). CI captures the presence of biodiversity features of concern (Species of Conservation Concern, threatened ecosystems, CBAs, protected-area expansion priorities); FI captures the ecological condition and connectivity of the receptor; and RR captures the intrinsic capacity of the receptor to recover from disturbance. The deviation footprints were delineated into ecologically homogeneous habitat units and each was rated as summarised in Table 8.

Table 8: Site Ecological Importance of the deviation habitat units (CI = Conservation Importance; FI = Functional Integrity; BI = Biodiversity Importance; RR = Receptor Resilience).

Habitat unit	CI	FI	BI	RR	SEI
Deviation 1 –Carletonville Dolomite Grassland within CBA1, CBA2, and PAES, with SCC geophytes and rocky outcrops	High	Medium	High	Low	**Medium-High**
Deviation 1 – Mooi River watercourse and riparian fringe (aquatic CBA2; SWSA recharge; faunal movement)	High	Medium	High	Low	**High**
Deviation 1 – Secondary grassland, old, cultivated lands and transformed/alien-dominated areas	Low	Low	Low	High	**Low**
Deviation 2 – Intact Klerksdorp Thornveld within ESA (no SCC recorded; ~3 km from Mafikeng Game Reserve)	Medium	High	High	Low	**Medium**

SEI class	Development implication (mitigation-hierarchy guidance)
High	Avoidance and minimisation preferred. Development should proceed only where no feasible alternative exists; footprint must be minimised, no-go buffers demarcated, and rehabilitation/offset investigated for any unavoidable loss.
Medium	Minimise footprint and rehabilitate. Development is acceptable subject to strict application of the mitigation hierarchy and site-based restoration.
Low	Development acceptable with limited restrictions and standard construction controls.

The intact grassland habitat units of deviation 1 rate as **Medium-High SEI**. This is driven by their location within Critical Biodiversity Areas including CBA1 and CBA2; the presence of provincially protected geophytes and other SCC in Deviation 1 (notably *Boophane disticha, Eucomis autumnalis, Aloe zebrina* and *Gladiolus sericeovillosus*), the dolomitic/karst substrate, and the low receptor resilience of species-rich dolomite grassland, whose forb and geophyte diversity recovers only slowly and incompletely after disturbance. The Mooi River riparian corridor in Deviation 1 is rated High SEI given its watercourse status, aquatic CBA2 designation and role in groundwater recharge and faunal movement. Deviation 2 rates Medium: it is entirely natural and well connected toward the Mafikeng Game Reserve, but no SCC were recorded, moderating its Conservation Importance. Transformed, cultivated and alien-dominated portions of Deviation 1 rate Low SEI.

As the most sensitive habitat units are characterised by High Site Ecological Importance (SEI), the mitigation hierarchy (avoid → minimise → rehabilitate → offset) must be rigorously applied throughout the planning, construction and operational phases of the project. Notwithstanding the high ecological sensitivity, the additional biodiversity exposure associated with the proposed deviations is relatively limited and spatially confined. The deviations will result in the clearance of approximately 6.6 ha within Critical Biodiversity Areas (CBAs), 1.7 ha within Ecological Support Areas (ESAs), and 3 ha within the National Protected Area Expansion Strategy (NPAES) priority area.

Where residual impacts on CBAs cannot be avoided, the project may trigger the requirement for a biodiversity offset in accordance with the NWBSP (2025) and the National Biodiversity Offset Guideline (2023). The necessity, scope and implementation requirements of any offset must be determined through consultation with the relevant provincial conservation authority during the environmental authorisation process. Subject to the implementation of the recommended avoidance, minimisation and rehabilitation measures, together with any offset requirements identified by the competent authority, the residual impacts on terrestrial biodiversity are expected to be reduced to Moderate to Low, which is considered acceptable from an environmental impact assessment perspective.

7. ASSESSMENT OF IMPACTS

7.1. Introduction

The Regulations, in terms of Chapter 5 of the National Environmental Management Act No. 107 of 1998, require that a description be given of the potential impacts the proposed development will have on the environment. The details outlined the identified impacts of constructing a powerline and its associated structures and infrastructures, along with proposed mitigation measures.

7.2. Potential Impacts of Powerline

The most significant impact of electrical powerlines is expected to occur during the construction phase, as during the operational phase, the impacts on the vegetation can be successfully mitigated to limit or even negate the negative impacts. Arguably, the greatest threat to the rehabilitation of disturbed areas is the potential of invasive plant species to colonise the disturbed soil and spread into adjacent natural areas. If remedial measures and monitoring is employed correctly, as well as the invasive alien management plan is employed (e.g. ESKOM's erosion guidelines and environmental policies as well as mitigation as set out by this report), the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation and faunal habitats could thus be

minimal. Furthermore, where existing roads or servitudes are employed during construction and implementation, the impacts of these, when compared with extensive agriculture or rural settlements, can be considered as medium to low.

Table 9: Environmental Impacts assessed by combining the consequences (extent, duration, intensity) with the probability of occurrence before and after mitigation for the proposed project

Impact	Stage	Management measures	Magnitude	Scale	Duration	Probability	Significance
Destruction of listed or protected plant species	Construction	WOM	Medium (6)	Local (1)	Permanent (5)	Highly Probable (4)	Moderate (48)
		WM	Medium (6)	Local (1)	Permanent (5)	Probable (2)	Low (24)
Removal of the natural vegetation	Construction	WOM	High (8)	Regional (3)	Permanent (5)	Definite (5)	High (80)
		WM	Medium (6)	Local (1)	Permanent (5)	Highly Probable (4)	Moderate (48)
Increased soil erosion, increase in silt loads and sedimentation	Construction	WOM	Medium (6)	Local (1)	Permanent (5)	Highly Probable (4)	Moderate (48)
		WM	Medium (6)	Local (1)	Permanent (5)	Probable (2)	Low (24)
Establishment and spread of declared weeds	Construction	WOM	High (8)	Site (2)	Long term (4)	Definite (5)	High (70)
		WM	High (8)	Site (2)	Short term (2)	Highly Probable (4)	Moderate (48)
	Construction	WOM	High (8)	Regional (3)	Permanent (5)	Highly Probable (4)	High (64)

Impact	Stage	Management measures	Magnitude	Scale	Duration	Probability	Significance
Destruction, fragmentation and degradation of CBAs, ESAs, NPAES and ecosystems		WM	Medium (6)	Site (2)	Short term (2)	Highly Probable (4)	Moderate (40)
Faunal impacts	Construction	WOM	Medium (6)	Local (1)	Permanent (5)	Highly Probable (4)	Moderate (48)
		WM	Medium (6)	Site (2)	Short term (2)	Probable (2)	Low (20)
Positive impact by removing alien invasive plants, although care must be taken not to remove all vegetation at once, especially within the rainy season (could result in soil erosion and soil loss).	Operational and maintenance	WOM	High (8)	Local (1)	short terms (1)	Probable (2)	Low (12)
		WM	Medium (6)	Local (1)	Medium Term (3)	Probable (2)	Low (24)

Impact	Stage	Management measures	Magnitude	Scale	Duration	Probability	Significance
Bush encroachment	Operational	WOM	High (8)	Site (2)	Medium Term (3)	Highly Probable (4)	Moderate (52)
		WM	Medium (6)	Local (1)	medium terms (3)	Probable (2)	Low (20)

7.3. Destruction of natural vegetation

The construction of the powerline route would inevitably require the removal of vegetation for access roads, servitudes and the pylon footprint. Areas where structures are stored would flatten vegetation, which could be detrimental to the persistence of the vegetation. In addition, the illegal disposal of construction materials, such as oil and cement, could destroy natural vegetation.

Mitigation Measures

- An independent Ecological Control Officer (ECO) should be appointed to oversee construction.
- Areas designated for vegetation clearing should be identified and visibly marked off.
- Vegetation clearing in natural areas should be kept to a minimum and restricted to the proposed development footprint only, i.e. the confirmed servitude and access road.
- A temporary fence or demarcation must be erected around the construction area (including the servitude, construction camps, areas where material is stored, and the actual footprint of the development) to prevent access to sensitive environments.
- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.
- No open fires are permitted within naturally vegetated areas.
- Formalise access roads and make use of existing roads, including farm roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.
- A vegetation rehabilitation plan should be implemented. Grass can be removed as sods and stored within transformed vegetation. However, alien invasive vegetation should be removed prior to storing grassland sods in transformed areas. Smaller shrubs and bulbs should also be removed and used for rehabilitation. The plants must preferably be removed during the winter months and be replanted by latest springtime. The grass sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.
- Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.

7.4. Exposure to erosion

The removal of surface vegetation will expose the soils, which in rainy events would wash down into nearby watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully, and seeds from proximate alien invasive plants can spread easily into these eroded soils.

Mitigation Measures

- Do not allow erosion to develop on a large scale before taking action.
- Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area.
- Runoff from roads must be managed to avoid erosion and pollution problems.
- Remove only the vegetation that is essential for construction, and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.
- Colonisation of the disturbed areas by plant species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resulting from activities within and adjacent to the construction camp and work areas.

7.5. Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community

The proposed vegetation clearance for the pylon footprint and the associated access roads; clearing new roads/servitudes as well as potential widening of existing roads/servitudes will physically remove vegetation as well as remove and fragment communities/ecosystems for terrestrial plant species. The exposed road surface will also result in direct and indirect erosion of the servitude due to the loss of vegetation cover. These disturbances will increase the potential for the establishment of alien and invasive vegetation; disruption in natural areas of phytomass and disturbance of the soil. The associated human activities will increase the potential and likelihood of establishment of alien and invasive vegetation. These will all result in the destruction, further loss and fragmentation of the vegetation community/ ecosystems.

- All very high sensitivity areas must be avoided and declared an outright “No-go” area. All high sensitivity areas should be cautiously considered. Should development take place in the high sensitivity areas, the pole spacing should be extended to reduce the number of poles in these areas. The footprint area must be minimised and clearing must also be restricted to the direct impact area and the 55m corridor may not be cleared as a whole.

- Drainage lines must be avoided for pole placement and access roads, and a no-go buffer as indicated in the freshwater report must be applied around them.

- Areas of indigenous vegetation, even secondary communities outside of the direct pylon footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to flat areas as far as possible. No further loss (unnecessary) of very high/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. All structure footprints to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the project 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.

- Existing access routes, especially 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

7.6. Destruction of listed and or protected plant species

The construction of the proposed deviations will result in the removal of plant species of conservation concern, impact on their habitat, pollinators and inevitably the persistence of these species. This could put further strain on the already declining populations.

- The plants of conservation concern should be removed by a suitably qualified specialist prior to construction. This can only be done if authorised by the local conservation authority (DEDECT) using a permit. Once construction is complete, the plants should be reused as part of the rehabilitation of the disturbed areas and replanted where they were removed.

- Where possible, construction activities must be restricted to previously disturbed areas.

- Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction (Note, these plants may only be removed with the permission of the provincial authority - permit).

- Adhere to the walkdown mitigations.

- Construction workers may not tamper with or remove these plants, and neither may anyone collect seed from the plants without permission from the local authority.

- Cordon off the sensitive vegetation that houses the protected plant species and the plants of conservation concern, and protect them from construction activities and vehicles.

- Slight deviations of access road/pylon alignments must be permitted to avoid plant populations of conservation concern (DWAF, 2005).

7.7. Faunal Impacts

Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as collisions, dust and noise). Sensitive and shy fauna would move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. Some mammals and reptiles would also be vulnerable to illegal collection or poaching.

Mitigation measures

- The walk-through of the powerline corridor conducted in March-April 2026 to identify areas of faunal sensitivity must be adhered to at all times.
- Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person.
- Existing roads and access routes should be used wherever possible.
- During construction all vehicles should adhere to demarcated tracks or roads and the speed limit should not exceed 40km/h on larger roads and should be 20-30km/h on smaller access tracks.
- No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to.
- A clause must be included in contracts for ALL construction personnel (i.e. including contractors) working on site stating that: “no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass.” A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC
- All construction staff should undergo environmental induction before construction commences in order to raise awareness and reduce potential faunal impacts.
- To avoid impacts on amphibians, all spills of hazardous material should be cleared in the appropriate manner according to the nature and identity of the spill and all contaminated soil removed from the site.
- Avoid sensitive faunal habitats such as drainage lines and wetlands where possible.
- No fires should be allowed within the site as there is a risk of runaway veld fires.
- Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and the records uploaded to iNaturalist.

- All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.
- A trained snake handler must be onsite during construction or on call to remove any snakes within construction areas.
- If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.
- All hazardous materials 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 as related to the nature of the spill.
- Ensure that cables and connections are insulated successfully to reduce electrocution risk.
- Any exposed parts must be covered (insulated) to reduce electrocution risk.

7.8. Establishment and spread of declared weeds

The seeds of alien invasive plant species present on and in the vicinity of construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites. They could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site.

Mitigation Measures

- Alien invasive species identified within the study area, particularly along the final route alignment, should be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds into disturbed soils will be prevented, which could have a positive impact on the surrounding natural vegetation.
- All alien seedlings and saplings must be removed as they become evident for the duration of construction.
- Manual/mechanical removal is preferred to chemical control.
- All construction vehicles and equipment, as well as construction material, should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access to the construction areas. The ECO should verify this.
- Adhere to the alien and invasive management developed for the project at all times.

7.9. Positive impact by removing alien invasive plants

Alien invasive plants could spread into the soils disturbed by the construction. In addition, the invasive species could out-compete natural vegetation, displace natural grassland and lead to a species poor transformed landscape. By removing alien vegetation along

the route alignment, the numbers of alien species, as well as the potential for these plants to spread into disturbed soil are reduced, provided that rehabilitation was successful.

Mitigation measures

- Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction.
- Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species.
- Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete.
- Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc.
- Ensure that only properly trained people handle and make use of chemicals.
- Dispose of the eradicated plant material at an approved solid waste disposal site.
- Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.

7.10. Deterioration of natural vegetation

The vegetation occurring along the constructed powerline could degrade over time if suitable rehabilitation of the disturbed soils does not take place. Furthermore, maintenance work and vehicles could damage the vegetation along the route which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern.

Mitigation Measures

- After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.
- Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached.
- Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.

7.11. Cumulative impacts

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a point in time may represent a significant change from the original state of the system. This section describes the potential impacts of the project that are cumulative for terrestrial fauna and flora.

The deviations occur within a landscape already under pressure from historical transformation of dolomite grassland, and within an actively developing electricity-transmission corridor. The cumulative assessment considers the deviations together with existing and planned infrastructure and land uses in the receiving environment.

- **Existing electricity transmission infrastructure —** the deviations re-route an already-authorised 400 kV line within an established NTCSA corridor that also carries the broader North West / Kimberley strengthening schemes; servitude clearance is additive to existing line and substation footprints.
- **Approved and proposed developments —** dolomite/aggregate mining, agriculture and cultivation, urban expansion around Potchefstroom (JB Marks) and Mahikeng, and further transmission projects collectively drive incremental habitat loss in the same ecosystems.
- **Cumulative habitat loss and fragmentation —** incremental loss of Poorly Protected Carletonville Dolomite Grassland and progressive fragmentation of CBA corridors, adding to a long history of transformation.
- **Ecosystem connectivity —** cumulative severance of CBA/ESA corridors and of the Mooi River and karst systems that link the two SWSAs.
- **Biodiversity pattern and ecological processes —** cumulative pressure on ecosystem representation targets, on SCC subpopulations, and on groundwater recharge and water security functions of the karst SWSAs.

The project is a deviation of an already-authorised line: its net additional footprint over the pre-existing authorised alignment is small, so the project's marginal contribution to the regional cumulative burden is low. However, the table below assesses the project cumulative impact in terms of the regional context.

Table 10: Cumulative Impact Assessment

Cumulative impact	Management measures	Magnitude	Scale	Duration	Probability	Significance
Cumulative loss and fragmentation of dolomite grassland, CBA/ESA corridors and karst-SWSA integrity across the regional transmission and land-use landscape.	WOM	Medium (6)	Regional (3)	Permanent (5)	Highly Probable (4)	Moderate (56)
	WM	Low (2)	Regional (3)	Long Term (4)	Highly Probable (4)	Moderate (36)

7.12. No-go areas and buffers

No-go areas and environmental buffers are applicable to this study. The proposed powerline deviation corridor is located adjacent to the Fred Coetzee and Sommerville Private Nature Reserves and traverses areas classified as NPAES priority areas, CBAs, ESAs, and ecological corridors. Accordingly, the protected areas, together with all NPAES, CBA and ESA features located outside the assessed servitude, are designated as no-go areas and must be avoided during construction and associated activities. The Mooi River is likewise regarded as a no-go area. In addition, the buffer zones and exclusion areas prescribed by the Freshwater Specialist must be implemented and maintained around all wetlands and the Mooi River throughout the construction and operational phases of the project.

It is the specialist's opinion that if none of the proposed activities be considered, that sensitive receptors will remain intact in most of the areas (especially the nature reserves and private land) if no unlawful anthropogenic developments take place. The current ecological state of the area holistically, is semi-intact, which will degrade taking into consideration the proposed activities.

7.13. Management Guidelines

Management guidelines recommend the following:

- For areas with a **high Site Ecological Importance (SEI)**, avoidance mitigation must be implemented where feasible and where this is not feasible, minimisation mitigation such as reducing the project footprint. Limited development activities of low impact are acceptable in these areas. Offset mitigation may be required for high impact activities.
- For areas of **medium SEI,** development activities of medium impact are acceptable provided appropriate mitigation and management measures are implemented.
- For areas of **low SEI,** development activities of medium to high impact are acceptable provided appropriate mitigation and management measures are implemented.
- For areas of **very low SEI**, development activities of medium to high impact are acceptable and mitigation and management measures may not be required although they are good practice.

8. ECOLOGICAL PLAN

The development of the 400-kV Powerline, if properly managed from construction to operational stage, will have low to moderate impact on the existing ecosystem. In most cases, ecological management plans are designed for once-off projects. With the existence of waterbodies in the project area, it would be advisable to develop an ecological monitoring schedule and/or system to frequently check and advise on the condition of the ecologically-sensitive parts in the peripheries of the project, e.g. water quality of the water-way and drainage system.

The area requires development of an active ecological buffer zone which should be managed with an active invasive species eradication, monitoring and management plan. This ecological management guideline will assist in setting up a proper management system for the project. As highlighted earlier, a few issues require attention, like waste management issues, handling of hydrocarbons,

storm-water management systems and invasive species management. Mechanical and biological removal of invasive species will be recommended, but monitoring of the latter should be ensured as this might result in abnormal population skewing of certain species in an ecosystem. The area's rehabilitation plan is discussed properly in the following section.

9. REHABILITATION PLAN

The rehabilitation should not be postponed until decommissioning; it must continue as a simultaneous effort from construction all the way to operation and decommissioning. Following every construction step/phase, the impacted site needs to be free of debris and restored to the ECO's approval. The zone must be drained to reduce water stagnation throughout construction and operation.

All impacted areas within the project development site must be restored to their original condition prior to development to harmonize the new environment with the existing one. The project budget typically encompasses planning for rehabilitation and associated expenses. This report describes rehabilitation as the restoration of areas temporarily disrupted by project development (specifically "construction or construction-related activities") to a state similar to conditions before the disturbance. Undisturbed systems ought not to be restored unless 400kV powerline operations greatly impact the system in question. The ECO will help pinpoint regions that may need rehabilitation and incorporate them into the process to guarantee that all project footprints (external) are considered. These extra factors will influence the budget and should be anticipated. In development planning, rehabilitation expenses must remain adaptable. The Powerline project (building and functioning) consists of three phases that will all affect the environment, thus necessitating conservation management and rehabilitation strategies. The recognized development stages for the Powerline project are as follows:

- Phase One: Clearing of the area where construction will be active.
- Phase Two: Construction of the infrastructure and all related features.
- Phase Three: operation of all the developed infrastructure and factories.

It is highly recommended that rehabilitation around the construction footprint takes place immediately after disturbance to limit detrimental effects resulting from, e.g., rainfall events after removal or clearing of the existing material (especially storm-water drainage towards the existing waterbodies and/or road drainage systems). This rehabilitation plan will assist in this. Rehabilitation measures must blend well with the existing ecological buffer of the area. It is imperative that rehabilitation of disturbed areas takes places after each construction phase. This will minimise costs and time.

Erosion and siltation should be minimised by construction of silt-traps and/or gabion rock blocks for surface run-off draining from service roads around the active portions of the project; this will be anchored or supported with soil binding grass. An active invasive species monitoring and management plan will form part of this rehabilitation. The final stage of rehabilitation requires that local and/or indigenous plant species be planted to enable the area to naturally recover (natural succession), as well as blend with the existing natural vegetation in the area. Sloping areas will be terraced or benched and topsoil covered (at least 30cm) to assist in encouraging natural growth of plants. A local agricultural expert will be consulted to assist in the determination of what plant species seed-mix should be applied. Proper care and maintenance should be carried out with independent supervision from the ECO. Monitoring of the rehabilitation process from each phase should be emphasised and the ECO must assist with blending mechanisms as promulgated in this report. Table 11 lists the rehabilitation measures that should be undertaken when monitoring post-construction

corrective actions. Each impact is followed by the corrective measure (in this instance rehabilitation) and the time frames will act as a guide, that can be altered depending on the on-site activities.

Table 11: Rehabilitation related impacts

Impact	Rehabilitation	Timeframe
Vegetation clearing: On portions where structures will be built.	- Restrict vegetation clearing to the mapped engineering design pegging, as spelt in the planning stage. - Where some concrete structures are removed, disturb as little vegetation as possible. - Soil clearing to establish proper foundation for the structures and stockpiling areas should be done by clearing topsoil and separating stockpiling for later use during rehabilitation. - It is advisable not to store the removed structures, stockpiles and material for use in ecologically-sensitive areas like riparian belts, watercourses and ecological buffer areas. - Where vegetation removal is imminent, remove it with roots and parts of their structures to ensure replanting on disturbed portions. If the area will be re- used to construct the new structures, temporary measures to prevent topsoil wash-out during rainfall must be implemented. - Reseed using seed-mix of indigenous species on the affected zones. - Minimise uncontrolled slope attenuation and heavy erosion by constructing storm-water control berms, gabion rock blocks as velocity dissipaters, and installing culverts to spread the flowing surface run-off especially on service routes. Rehabilitation should be assisted by ripping compacted soil and sowing a tree species naturally occurring in the savannah biome of the same area. Ripping should be done to a depth of 250mm in two directions at right angles to the slope; this aids in loosening	- After clearing demarcated areas, particularly where the existing footprint will not be used. - As and when monitoring indicates degradation of vegetation or failure of the rehabilitation.

	soil and allowing seed germination.	
Soil compaction: Likely to occur on all portions where construction will be prevalent and even at Operational stage of the project, especially on service road routes. This impact will decrease permeability of the soil resulting in disturbance of the sub-surface flows and natural vegetation establishment.	- Do not rip and/or scratch areas under wet conditions, as the soil will not break up and compaction will be worsened. - Do not permit vehicular or pedestrian access into natural or seasonally wet areas during and immediately after rainy periods, until that soil has dried out (DAWF, 2005). - Areas where soil has been compacted should be ripped to encourage vegetation growth.	- Immediately after any construction phase (except where the next phase follows immediately and makes use of the same construction footprint). - As and when monitoring indicates severe compaction due to maintenance, especially when the ECO considers it necessary.
- Removal of vegetation for new drain ways/ditches: Impact from construction of drain ways for surface water drainage from the service routes (compaction, vegetation clearing, and noise creation, pollution from site leakages, erosion and siltation).	- Where possible, remove vegetation as turfs or territories that can be replanted as part of the rehabilitation of vegetation around the exact portions of the footprint. - Where soils are removed, topsoil and subsoil must be stockpiled separately in low heaps of less than 2m high. Top soil is a valuable resource for rehabilitation and vegetation of disturbed areas. After construction, compacted areas should be ripped and topsoil replaced from the areas where it was removed. - All sloped areas must be re-vegetated by using removed plant tufts or by seeding with a grass-mix containing species naturally occurring in the area. Sloped areas where vegetation has been removed or destroyed should be replanted immediately after completion of construction to avoid erosion. - Areas with minimal disturbance can be ripped and allowed to naturally re- vegetate. This excludes sloped areas and re-vegetation must be monitored to ensure that alien invasive plant species do not colonies the disturbed areas. - If natural re-vegetation is unsuccessful, corrective action should be taken, including	- Immediately after construction and stringing of conductors. - As and when monitoring indicate degradation of vegetation along the project area.

	seeding and planting by a specialist as stipulated in the EMPr.	
Pollutants released during service and construction: Construction can expose hydrocarbons to the watercourse area and vegetation through machinery leaks and biogeochemical reactions of bedrock resulting in disturbed sensitive environs.	- In case of emergencies or unforeseen events, the problem must be remediated immediately and any spillage into any watercourses be reported to the Department of Water Affairs. The soil must be stabilized (import additional topsoil if necessary) and re-vegetated as soon as possible. Re- vegetation should include seeds from the adjacent grassland and any rescued protected plants and/or plants of conservation concern that might have been impacted. - Remove all project-related material/support equipment immediately on completion of any construction phases.	- Immediately after a construction phase. - Anytime during operational phase of the piggery project, especially when maintenance activities might have resulted in pollution.
Invasive and alien species spreading.	- Appoint a specialist in invasive species control, eradication, management and monitoring. Identified invasive species should be removed prior to construction. This will prevent seed spreading into disturbed soils or to downstream areas. - Mechanical removal is the preferred control mechanism using machinery depending on how congested the area is and this should be a continuous Programme. Biological eradication mechanisms will work, but requires an ecological specialist for population blooming management. - A register of the methods used, dates undertaken, and herbicides (if used) and dosage used must be kept and available on site. The register must include incidents of poisoning or spillage.	- Immediately after vegetation clearing, project commissioning and during progression of the project; and - Should be an on-going process and at decommissioning phase.

10. CONCLUSION AND RECOMMENDATIONS

The proposed deviations traverse areas of low to high ecological sensitivity. Deviation 1 is of particular significance: it lies within a landscape characterised by CBA1, CBA2 and ESA1, it abuts the northern boundary of the Fred Coetzee and Sommerville Private Nature Reserves, and it crosses the Mooi River, a watercourse designated as an aquatic CBA2 and forming part of the recharge system of the Ventersdorp/Schoonspruit and Bo-Molopo Karst Belt Groundwater Strategic Water Source Areas. Deviation 2 traverses intact Klerksdorp Thornveld within a CBA mosaic, approximately 3 km from the Mafikeng Game Reserve.

The walkdown recorded provincially protected geophytes: *Boophane disticha, Hypoxis hemerocallidea and Gladiolus sericeovillosus* together with sensitive rocky outcrops and the Mooi River riparian zone. Their removal or relocation accordingly requires a provincial flora permit from the North West conservation authority. No protected tree species listed under the National Forests Act were recorded within the deviation footprints. Should any such species be identified, a DFFE licence would be required.

Because the deviation corridor is characterised by CBA1, avoidance of CBA1 by re-siting is not feasible. After full application of the mitigation hierarchy; footprint minimisation to a 3.5 m access road and discrete tower bases, spanning of sensitive features, use of existing tracks, no-go demarcation and rehabilitation; an unavoidable residual negative impact of moderate significance on CBA1 and 2 biodiversity remains, amounting to approximately 5.1 ha of CBA1 and 1.5 ha of CBA2 clearance. In terms of the National Biodiversity Offset Guideline, 2023 (GN 3569, GG 48841), this residual may trigger a biodiversity offset. Accordingly, consultation with the relevant provincial Department is recommended to obtain guidance on whether a biodiversity offset is required and whether the proposed mitigation measures are considered adequate for the nature and scale of the development. It does not, however, constitute a fatal flaw: the affected ecosystem (Carletonville Dolomite Grassland, Gh15) is of Least Concern status and remains extensive, so ecologically equivalent like-for-like habitat is securable, and a narrow linear overhead-line footprint does not prevent the CBA biodiversity target from being met.

Impacts on the Fred Coetzee and Sommerville Private Nature Reserves are indirect only. No clearing, tower placement or access is proposed within either reserve, or both are designated no-go areas in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003). The anticipated impact is edge effect across the shared boundary, i.e., dust, noise, faunal disturbance and the spread of alien invasive plants which reduces to Negligible significance with boundary buffers, dust suppression, alien plant control, restriction of construction to daylight hours, and a strict prohibition on construction access into the reserves.

The Mooi River crossing is to be achieved by spanning the watercourse and its riparian zone, with no tower placement within the channel or the riparian buffer. Construction within the regulated area of the watercourse must be authorised under the National Water Act, 1998 (General Authorisation or WULA for sections 21(c) and (i)), and managed in accordance with the risk-based approach of GN 4167 of 2023. Given the karst substrate and the high vulnerability of the underlying Strategic Water Source Areas to surface pollution, hazardous materials storage, refuelling and concrete batching must be excluded from the riparian zone and from the vicinity of sinkholes and springs.

To minimise the direct and cumulative loss of these sensitive ecosystems, the micro-siting of tower positions and access to avoid rocky outcrops, riparian habitat and SCCs subpopulations wherever a feasible position exists. Where rehabilitation or active

restoration is required, it must use indigenous plant species, preferably of local provenance and representative of the habitat types typical of the ecological landscape.

In the specialist's opinion, the proposed deviations can be authorised, provided that all recommendations and mitigation measures are strictly implemented, that the required provincial flora permits and water use authorisation are obtained, and that the provincial department be consulted with regards to the biodiversity offset requirement in terms of the National Biodiversity Offset Guideline (2023).

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APPENDIX A: PLANT SPECIES RECORDED WITHIN THE PROPOSED CORRIDOR

Acacia hebeclada

Aloe Zebrina

Andropogon appendiculatus

Andropogon eucomus

Argemone Mexicana

Arundo donax

Asparagus densiflorus

Asparagus laricinus

Boophane disticha

Campuloclinium macrocephalum

Chrysocoma ciliata

Cosmos bipinnatus

Cynodon dactylon

Cyperus *rupestris*

Datura ferox

Datura Stramonium

Digitaria eriantha

Diospyros lycioides

Entada elephantina

Eragrostis lehmanniana

Eragrostis plana

Eriosema distinctum

Eucomis autumnalis

Gladiolus sericeovillosus

Grewia occidentalis

Gymnosporia buxifolia

Hermannia depressa

Heteropogon contortus

hragmites australis

Hyparrhenia hirta

Lasiosiphon cuneifolius

Lippia javanica

Melia azedarach

Melinis repens

Panicum coloratum

Pentzia dentata

Phoenicaulis cheiranthoides

Prosopis glandulosa

Salix mucronata

Searsia lancea

Senecio inornatus

Setaria incrassate

Solanum mariantanum

Sporobolus africanus

Stoebe plumosa

Tagetes minuta

Tephrosia capensis

Themenda triandra

Themenda triandra

Trichanthecium natalense

Typha capensis

Urochloa panicoides

Vachellia karoo

Vachellia tortilis

Verbena bonariensis

Vigna vexillate

Zea mays

Ziziphus mucronata

APPENDIX B: SPECIALIST CV

CURRICULUM VITAE

PERSONAL DETAILS:

Name and Surname : Mpho Ramalivhana

Date of Birth : 07 February 1987

Nationality : South African

ID number : 8702075633084

Driver's License : Code C1 (10)

Residential Address : 09 Krinkhout Avenue, Glen Marais, 1619

Cell No : 078 901 4833

Fax-mail No : 086 606 4760

Email : ramalivhanam@naledznaies.co.za or ramalivhanam@gmail.com

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EDUCATION:

Tertiary Qualification:

Institution : University of Limpopo

Degree : Honours in Botany (Plant Ecology)

Year Obtained : 2008

Institution : University of Limpopo

Degree : Bachelor of Science (Botany and Microbiology)

Year Obtained : 2007

High School Qualification:

School : Mudinane Secondary School

Qualification : Matriculation (Grade 12)

Year Obtained : 2004

ACCREDITATIONS:

- South African Council of Natural Scientific Professions (400395/14)
- South African Association of Botanists
- International Association of Impact Assessment South Africa

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LANGUAGE PROFICIENCY:

Language	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Tshivenda	Excellent	Excellent	Excellent
Xitsonga	Good	Basic	Basic
Sepedi	Good	Basic	Basic

AREAS OF SPECIALISATION:

- Environmental Impact Assessment (EIA);
- Environmental Management Plan (EMP);
- Environmental Management System (EMS);
- Ecological and Wetland Assessment;
- Stakeholder engagement;
- Environmental Monitoring;
- Environmental Due Diligence;
- Ecological Assessment.

EXPERTISE:

- Environmental monitoring and auditing in construction, industrial and mining areas.
- Environmental consulting experience covering a broad range of projects (mining, energy, infrastructure, water, etc) including EIA, EMP, SIA, and PPP.
- Experience in conducting ecological and wetland assessment
- Experience in undertaking projects to best International management standards such:
  - Equator Principles (EP III);
  - IFC Performance Standards (PS1 – PS 8)

COMPETENCIES:

- Analytical ability;
- Quality oriented;
- Learning oriented;
- Time management;
- Project management; and
- Proactive.

SUMMARY OF KEY QUALIFICATIONS AND KNOWLEDGE:

Mpho Ramalivhana is currently the Senior Environmental Consultant and Managing Director at Naledzani Environmental Services. He is also an associate Environmental Assessment Practitioner at Joan Construction and Projects. He matriculated at Mudinane Secondary School in 2004 with a merit. He then went to the University of Limpopo (Turfloop Campus) to further his career from 2005 to 2007. He obtained a BSc Degree majoring with Microbiology and Botany. Then in 2008 he graduated top of his Honours Botany Class in the field of plant ecology. His honours project involved "*the investigation of the floral composition of the granite hills within the campus of the University of Limpopo*".

He has extensive experience in conducting Environmental Impact Assessment, developing Environmental Management Plans and implementation of Environmental Monitoring Systems. He also has remarkable experience in conducting Environmental Audit, Environmental Due Diligence, Land Quality Assessment, Ecological Assessment and Environmental Site Assessment.

His recent experience has focused upon formal environmental authorisation processes, particularly the management of public participation processes, environmental screening process projects. He has experience in energy related projects, including alternative energy (solar and wind) and power transmission projects as well as projects for social infrastructure including *inter alia* road, housing and waste management. He is familiar in compiling the requisite documentation for Environmental Impact Assessments (EIA) and Environmental Management Plans (EMP). Furthermore, he has experience in undertaking environmental compliance monitoring and the bio-monitoring of water resources.

Prior joining ThomaTree Family, Mpho worked for companies such as Parsons Brinckerhoff Africa (Now WSP), Muondli Consulting, Tshikovha Environmental and Communication Consulting, South African National Biodiversity Institute and Limpopo Department of Economic, Environment and Tourism where his professional working career started.

Mpho is a member of the South African Council of Natural Scientific, Profession (**400395/14**), South African Association of Botanists (SAAB) as well as the International Association of Impact Assessment – South Africa (IAIAsa)

EMPLOYMENT RECORD:

Name of company: **ThomaTree Family**
Position: **Managing Director / Senior Environmental Consultant**
Year: **November 2023 – Current**

Principal duties:

- Undertake:
  - Site visit (baseline data collection)
  - Environmental monitoring
  - Environmental audit
- Peer review of reports, methodologies and proposals
- Project management
- Give environmental inputs into projects within other units
- Undertake business development.

Name of company: **Joan Construction and Projects (Pty) Ltd**
Position: **Associate Environmental Assessment Practitioner**

Principal duties:

- Conduct environmental impact assessment reports for mining and construction projects
- Peer-review for EIA reports conducted by junior employees
- Conduct Wetland and ecological assessments
- Project management

Name of Company: **Tshikovha Environmental and Communication Consulting**
Position: **Senior Environmental Consultant**
Year: **February 2011 to February 2013**

Principal duties:

- Project management and administration.
- Managing, co-ordinating and compiling Basic Assessment Reports, EIAs and EMPs for environmental authorisation as per EIA Regulations.
- Planning and execution of Public Participation Process for a proposed project.
- Technical reviews.
- Proposal (Technical and financial) preparation.
- Client and stakeholder management.
- Assisting with attracting talent and development and mentoring of junior staff.
- Assist in other company project such as SHERQ and Training.

Reasons for leaving:

- Career advancement and need to acquire international experience.

Name of Company: **South African National Biodiversity Institute**
Position: **Data Management Co-ordinator Trainee**
Year: **April 2010 to January 2011**

Principal duties:

- Identify and name plants with current scientific names.
- Collect plants to fill the gaps in distribution data of southern African plants.
- To update the aromatic plants database.
- Mapping the distribution of aromatic plants in Southern Africa using POAC GIS.

ECOLOGICAL ASSESSMENT PROJECTS:

- Terrestrial biodiversity assessment for the proposed mixed development on a portion of the remaining extent of the farm greater Giyani 891 LT within Greater Giyani Local Municipality of the Mopani District in Limpopo Province.
- Terrestrial biodiversity assessment for the demarcation of 500 sites on portion 60 and 61 of the farm Grootvalley 530 KR, Mookgophong Local Municipality, Limpopo Province.
- Terrestrial biodiversity report for the prospecting right application of Rrietput Delwery cc for the prospecting of alluvial diamonds near Windsorton on portion 16, portion 6 (Langverwacht) and portion 7 (Oskamp) of the farm Slyklip south estate 36, Kimberley in Northern Cape.
- Terrestrial ecological assessment (Biomonitoring) for Glencore Merafe Venture: Boshoek Smelter, North West Province.
- Biodiversity assessment for the proposed prospecting right on the farm Zwartrand no 145 IP in the magisterial district of Ventersdorp under North West Province.

- Biodiversity impact assessment for the proposed construction of the new Eskom132/11/6.6kv calcined products and associated 2x132kv loop in and out servitude Westonaria Local Municipality in the Gauteng Province.
- Terrestrial biodiversity report for the proposed deviation of the Westgate Randfontein 10km 132kv servitude within the Randfontein Local Municipality in the Gauteng Province.
- Terrestrial biodiversity report for the proposed township establishment on the remainder of farm Fouriestrust 2525 district Mangaung Metropolitan Municipality, Bloemfontein in the Free State Province
- Terrestrial ecological assessment for the proposed of a lodge on 17 hectares of land in extent on Kheto agricultural farm on the farm Greater Giyani 891 LT within Greater Giyani Local Municipality of the Mopani District, Limpopo Province.
- Terrestrial ecological assessment report for the proposed development of ±5km 88kv power line from Eskom Tweedracht substation to the existing SAR Kameel – SAR Kleinfontein power line within the jurisdiction of City of Tshwane Metropolitan Municipality, Gauteng Province

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REFERENCES:

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Relationship : Colleague / Mentor
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Name : Mr. Moudy Mudzielwana
Institution : Tshikovha Environmental and Communication Consulting
Position : Managing Director
Relationship : Supervisor
Contact no. : 012 343 9820 / 076 431 1016
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Name : Mr. Errol Tukiso Moeng
Institution : Limpopo Economic Development, Environment and Tourism
Position : Director: Biodiversity Management Division
Relationship : Mentor
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