TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED HARMONY WEST WITS RECLAMATION PROJECT

Merafong City Local Municipality, West Rand District Municipality, Gauteng Province, South Africa

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Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

Report Name	**TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED HARMONY WEST WITS RECLAMATION PROJECT**
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Environmental Assessment Practitioner	EIMS ENVIRONMENTAL IMPACT MANAGEMENT SERVICES
Responsible Specialist	Andine de Villiers (Pr. Sci. Nat. 164894)
Technical Support	Carami Burger (Pr. Sci. Nat. 121757)
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

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Table of Abbreviations

Acronym	Full Form
AIP	Alien Invasive Plant
BI	Biodiversity Importance
CBA	Critical Biodiversity Area
CI	Conservation Importance
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental Assessment Practitioner
EI	Ecological Importance
EN	Endangered
ESA	Ecological Support Area
FI	Functional Integrity
GBIF	Global Biodiversity Information Facility
GIS	Geographic Information System
GN	Government Notice
IUCN	International Union for Conservation of Nature
LC	Least Concern
LOM	Life of Mine
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Area
NT	Near Threatened
NWA	National Water Act
PAOI	Project Area of Influence
PP	Poorly Protected
SACAD	South Africa Conservation Areas Database
SANBI	South African National Biodiversity Institute
SAPAD	South Africa Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
SWSA	Strategic Water Source Area
TSF	Tailings Storage Facility
VU	Vulnerable
WP	Well Protected

1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a Terrestrial Biodiversity Assessment for the proposed Harmony West Wits Reclamation Project, located in the Merafong City Local Municipality, West Rand District Municipality, Gauteng Province (Figure 1-1). The Project Area of Influence (PAOI) was defined as the boundary of the proposed developments, including a 250-meter (m) powerline corridor and 100 m pipeline corridor (Figure 1-2).

The purpose of the specialist studies is to provide relevant input into the impact assessment process and to provide a report for the proposed activities associated with the development. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

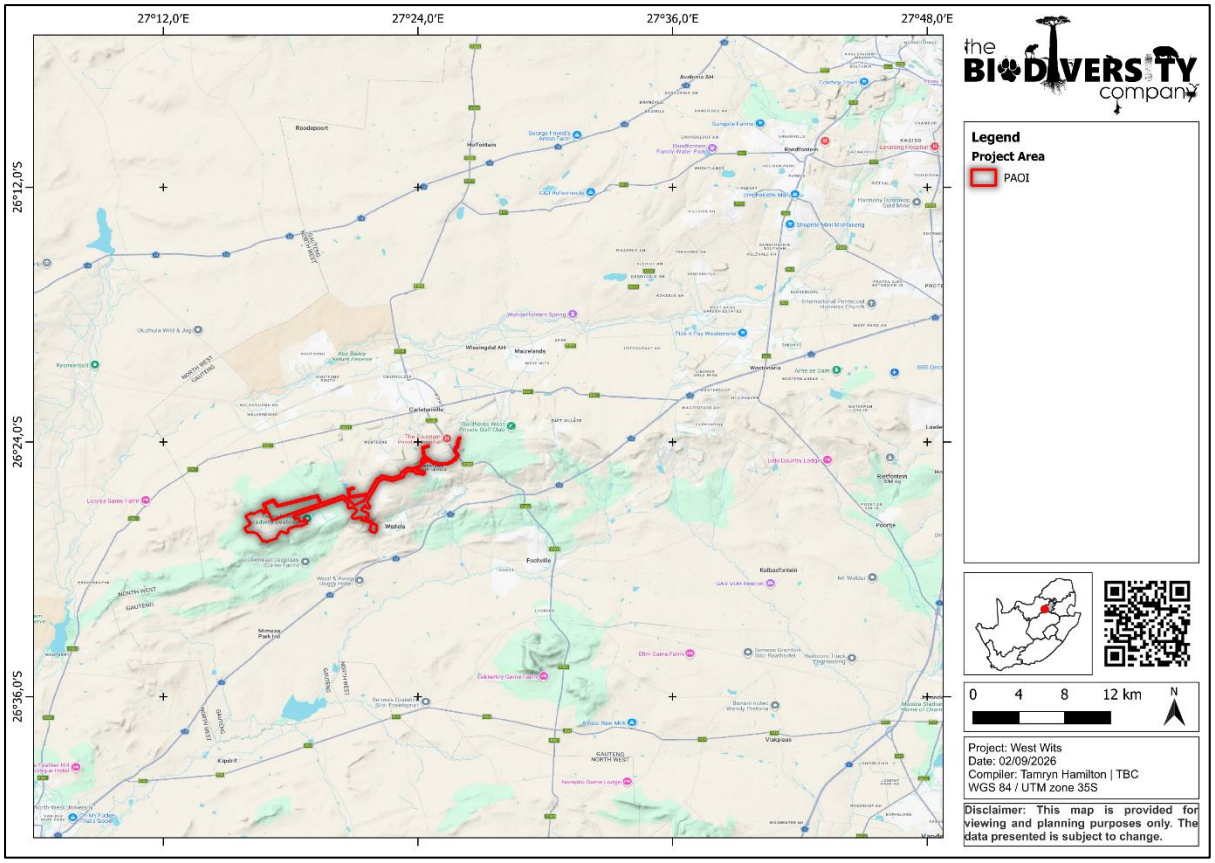


Figure 1-1 Map illustrating the regional context of the PAOI

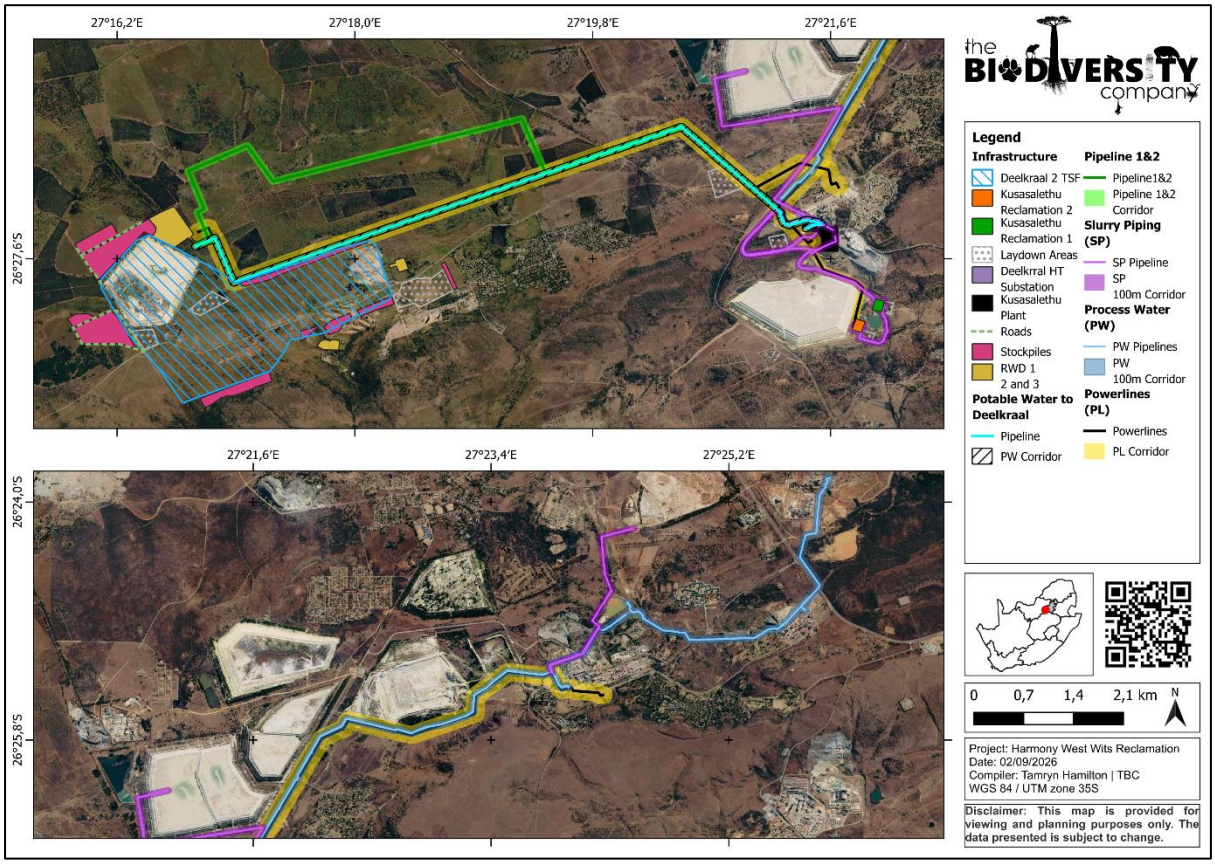


Figure 1-2 Details of the PAOI

1.2 Project Description

Randfontein Estates Limited (a subsidiary of Harmony Gold Mining Company) (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes and to compile and submit the required documentation in support of application for the proposed new Deelkraal II Tailings Storage Facility (TSF) project and associated infrastructure on a site located approximately 13 km southwest of Carletonville in the Merafong City Local Municipality, West Rand District Municipality, Gauteng Province (i.e. the Proposed Harmony West Wits Reclamation and Deposition Project).

The applicant requires additional deposition capacity for West Wits region's operations. The applicant plans on constructing the Deelkraal II Tailings Storage Facility (TSF) to cater for the additional future capacity. This TSF will receive residue from Kusasalethu, and Savuka plants and will also assist in returning process water for reclaiming the existing Deelkraal 1 TSF and Kusasalethu TSF for processing at Kusasalethu plant. Additional planned infrastructure includes slurry, potable, sewage and return water pipelines, access roads, pump stations, a return water dam and a power line. Proposed upgrades to the existing Kusasalethu plant are also proposed as part of the project.

The Savuka Plant treats tailings from the Savuka Dormant TSFs (Old North TSFs) at a rate of 330 000 tpm and deposits the subsequent tailings on Savuka 5 & 7 TSFs. Harmony plans on remining Deelkraal 1 Dormant TSF and Kusasalethu TSF amongst other potential future sources. These TSFs will be processed through the Kusasalethu Plant at 500 000 tonnes per month (tpm). The planned Life of Mine (LOM) for the West Wits region exceed the available deposition capacity of the existing TSFs. Therefore, additional deposition capacity is required.

The Kusasalethu Plant will accommodate future reclamation operations and will therefore need site/s to deposit the tailings. Harmony owns ground, located adjacent to the Deelkraal 1 Dormant TSF, that can be used i.e. for the proposed Deelkraal II TSF. The Deelkraal 1 Dormant TSF and adjacent virgin ground footprint combined geometry will accommodate the future reclamation operations deposition rate and capacity. The proposed TSF will cover an area of approximately 430 ha.

The West Wits Reclamation (WWR) Concept Study explores ways to unlock the potential of recycling historic gold tailings using the existing Kusasalethu and Savuka process plants and infrastructure. The Concept Study (SGS Bateman, 2024) evaluated different options for the treatment of the Deelkraal 1 and Kusasalethu Tailings Storage Facilities (TSF) at the existing processing plants. The reworked tailings will be deposited on a new TSF, referred to as Deelkraal II, assumed to be constructed on a site adjacent to the existing Deelkraal TSF. While reviewing the preliminary metallurgy testwork results it became evident that the Deelkraal TSF contained higher grades of accessible gold and it was agreed that that TSF would be reclaimed first, with the Kusasalethu TSF being reclaimed thereafter (SGS Bateman, 2024).

In addition to the Deelkraal II TSF, additional infrastructure is also proposed, as follows:

- A new Return Water Dam in the vicinity of the Deelkraal II TSF;
- Upgrades to the existing Kusasalethu plant including new/upgrade of gold and new uranium sections;
- Slurry pipelines:
    - Reclaimed Slurry from Deelkraal 1 to Kusasalethu (~10,6 km[1]);
    - Kusasalethu Barren Tailings to Deelkraal II and booster pump station (~10,2 km);
    - Reclaimed Slurry from Kusasalethu TSF to Kusasalethu Plant (~2 km);
    - Slurry pipeline from Kusasalethu Plant to Savuka TSF (~4,97 km); and
    - Slurry pipeline from Savuka plant to DF5 TSF (~2,9 km).
- Process Water Pipelines:
    - Process Water Feed from Kusasalethu Plant to Deelkraal Reclamation (~9.54 km);
    - Return Water Feed to Kusasalethu Process Water Tank (~9,58 km); -
    - Driefontein DP2 Pump Station to North Boundary Dam (~4,78 km); -
    - DP2 feed to Tau Tona Reverse Osmosis Plant (~0,1 km); -
    - Nursery Pumpstation #3 to Kusasalethu Process Water Tank (~9 km); and
    - 2 Process Water pipelines from Kusasalethu Plant to Savuka White Tanks (~8 km).
- Powerlines (all powerlines will be 22kV or lower):

[1] Lengths of pipelines and powerlines provided are approximate and could change by 1 – 2 km depending on the routing alternative selected

- Powerline from Kusasalethu Plant to the existing Deelkraal TSF (~9.2 km);
- Powerline from Kusasalethu Plant to the Kusasalethu TSF (~1.8 km);
- Powerline from Savuka shaft to Kusasalethu Plant (~8.1 km);

- Potable Water pipeline from Rand Water supply point to the Deelkraal TSF (~8.52 km).
- Deelkraal 1 TSF Reclamation Pump Station.
- Kusasalethu TSF Reclamation Pump Station.
- New Access Roads (2x3,5 m double road) adjacent to pipeline routes/OH lines and around Deelkraal II TSF (where no access road is already in place).
- Topsoil Stockpiles and overburden stockpiles.
- Ancillary construction infrastructure including workshops and laydown areas.

All pipelines listed above will be flanged steel pipelines installed above-ground on pre-cast concrete plinths and two 3.5 m wide access roads (double road), adjacent to the pipelines, will be cleared/graded to provide access for construction, maintenance and inspections (for areas where no access road is already in place). The diameter of the pipelines will be confirmed in the EIA phase once further design information becomes available.

The layout of the proposed project is presented in Figure 1-3 to Figure 1-5.

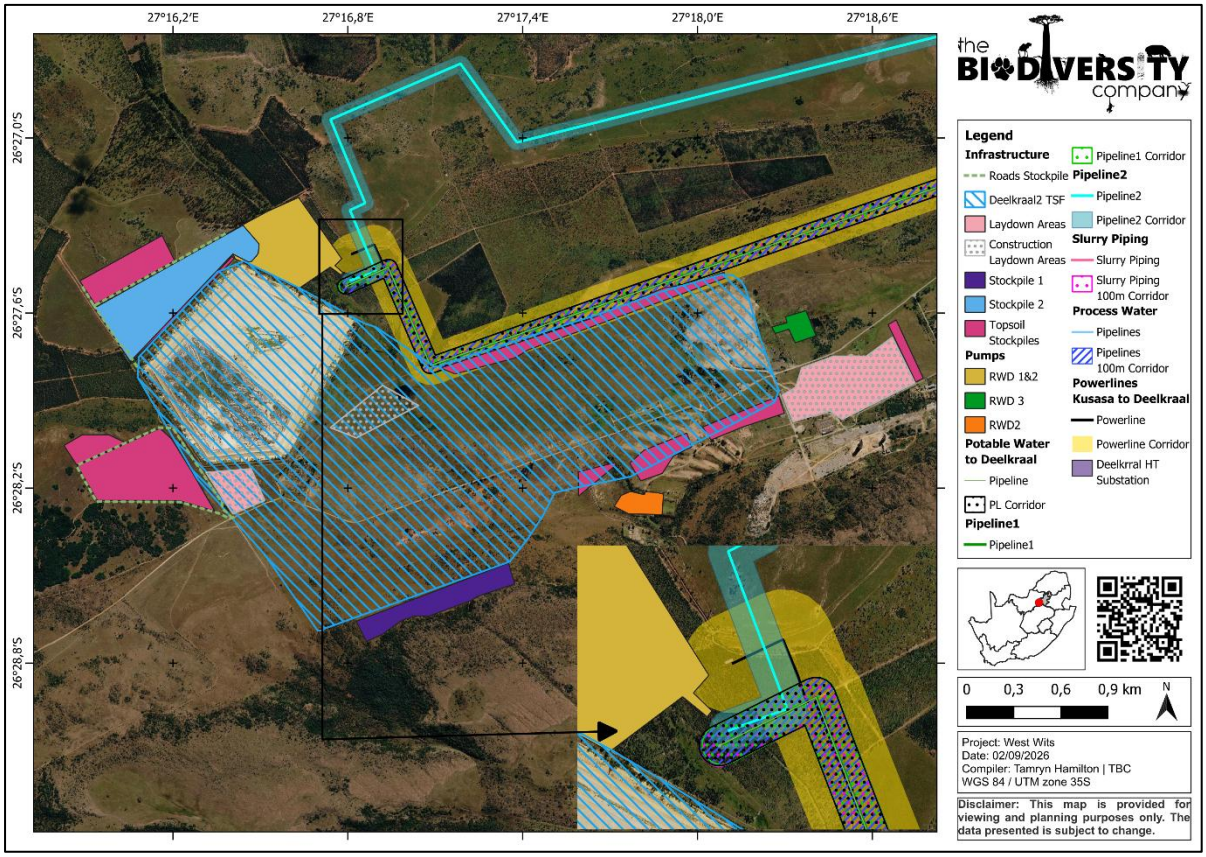


Figure 1-3 Proposed project layout components on the western portion of the PAOI.

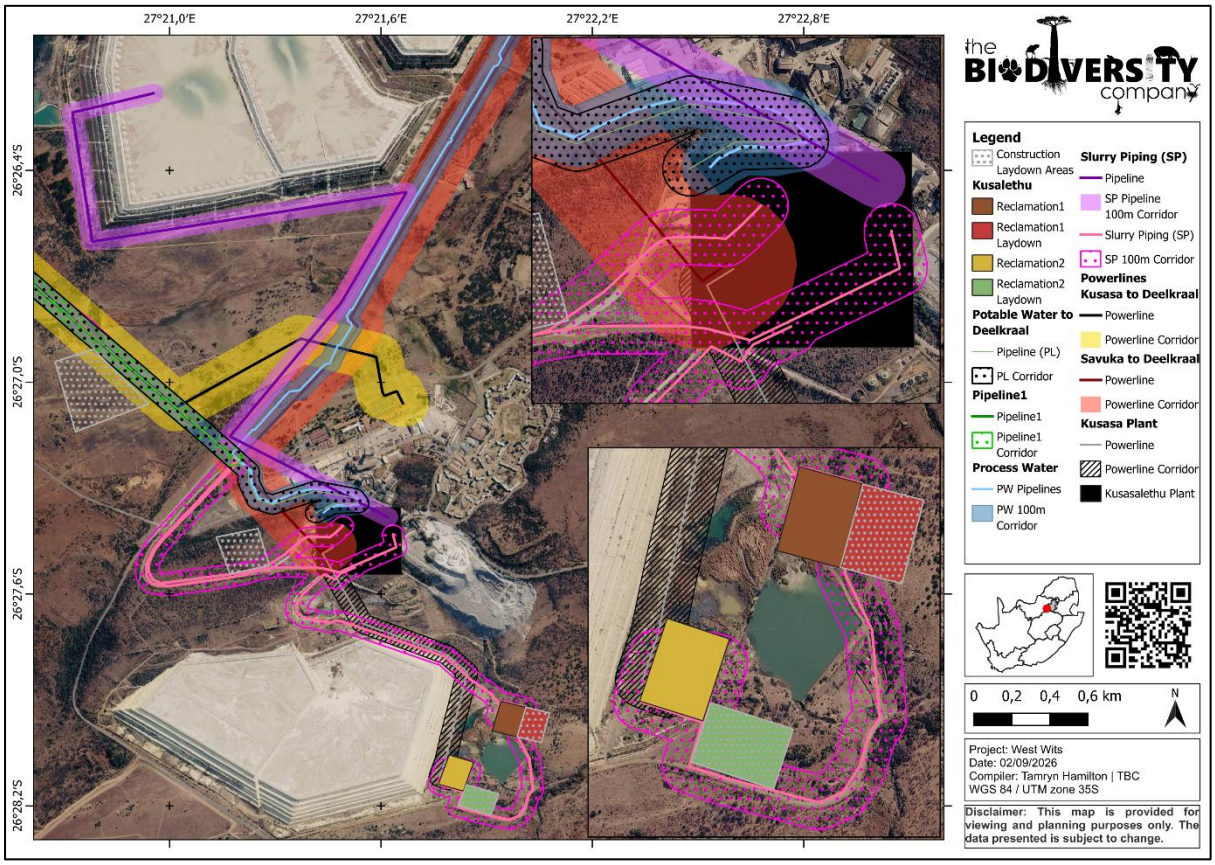


Figure 1-4 Proposed project layout components on the central portion of the PAOI.

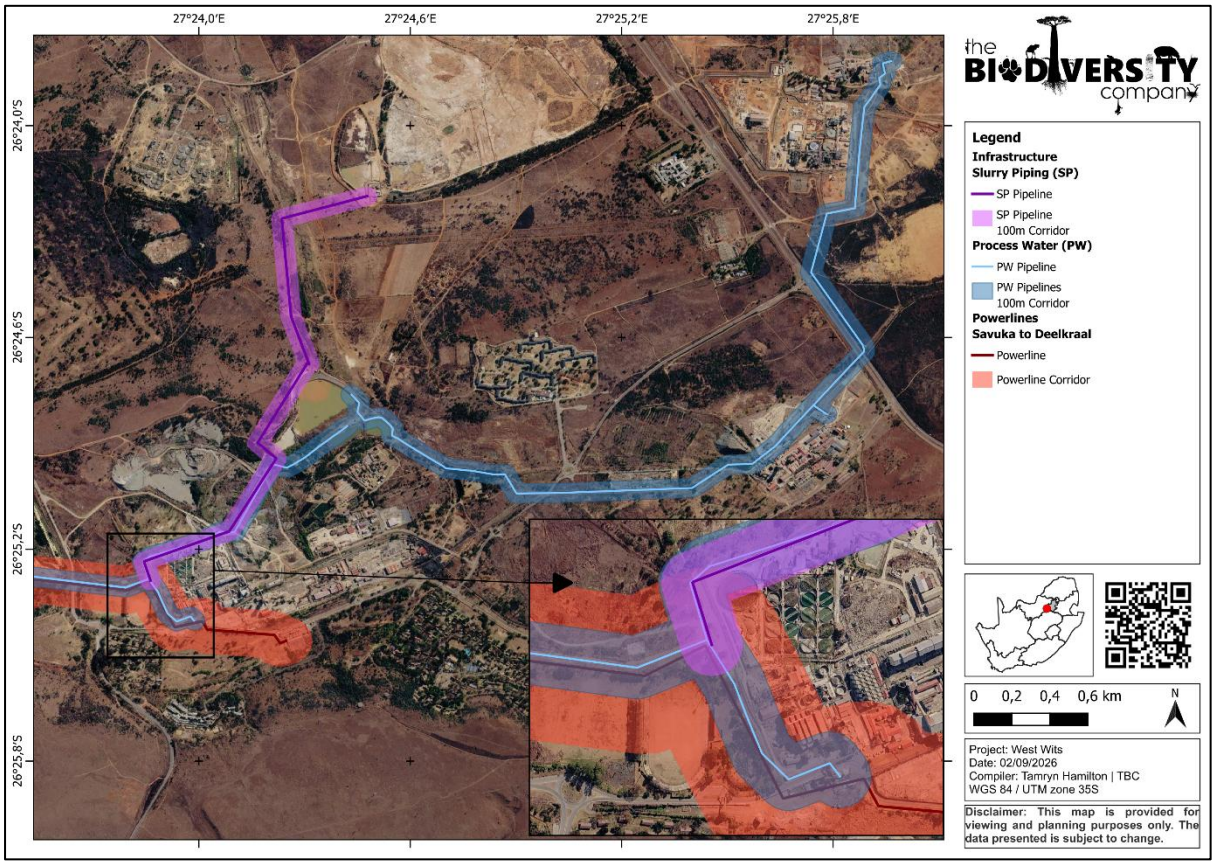


Figure 1-5 Proposed project layout components on the easter portion of the PAOI.

1.3 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI and surrounding landscape;
- Desktop assessment to compile an expected species list and identify possible Species of Conservation Concern (SCC) that occur within the PAOI and surrounding landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity;
- A biodiversity impact assessment; and
- The prescription of mitigation measures for identified risks, including assigning buffer areas, where necessary.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client/developer is accurate;
- The specialist was not provided with an architectural plan or any engineering drawings with regard to the planned development activities and, as such, the potential impacts arising from these activities may only be assumed based on previous experience;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- Insects and invertebrates do not form part of the scope. The likelihood of occurrence was assessed from a desktop perspective only;
- The assessment area (PAOI) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- A single early dry season site assessment was conducted. It is recommended that a protected and SCC flora species walkdown is completed during the wet season (October to March) for the development footprint;
- This assessment does not consider temporal trends (note that the data collected is, however, considered sufficient to derive a meaningful baseline);
- Whilst every effort was made to cover as much of the PAOI as possible, it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations. However, it is the opinion of the specialist that an accurate representative sample of the ecological components considered within this assessment was collected; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements

Region	Legislation / Guideline	Comment
National	NEMA	Environmental Impact Assessment Regulations. 2014 as amended (GN 517, 11 June 2021), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Assessment Protocol (March 2020)	The minimum criteria for reporting.
	Assessment Protocol (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	NEMWA;	The regulation of waste management to protect the environment.
	NWA	The regulation of water uses.
	GN 1003 of GG 43726 of 18 Sept 2020	The regulation and management of alien invasive species.

	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants.
Provincial	Gauteng Provincial Environmental Management Framework, 2014	To provide for the management and conservation of the Province's biophysical environment and protected areas. To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management.
	Transvaal Nature Conservation Ordinance No. 12 of 1983	
	Gauteng Conservation Plan (2024)	
	Gauteng Nature Conservation Bill, 2014 (Draft)	
	Gauteng Department of Agriculture and Rural Development Ridges Guideline	

2 Fieldwork

2.1 Biodiversity Field Assessment

One (1) early dry season field survey was undertaken for the project on the 27th and 28th of May 2026 to confirm the presence of SCC, as well as any sensitive habitat features. Effort was made to cover all the different habitat types within the limits of time and access. During the survey, notes were made regarding current impacts, recording of dominant vegetation species and any sensitive or important features (e.g., drainage lines, rock outcrops, termite mounds etc.). Effort was made to cover all the different habitat types, within the limits of time and access (Figure 2-1)

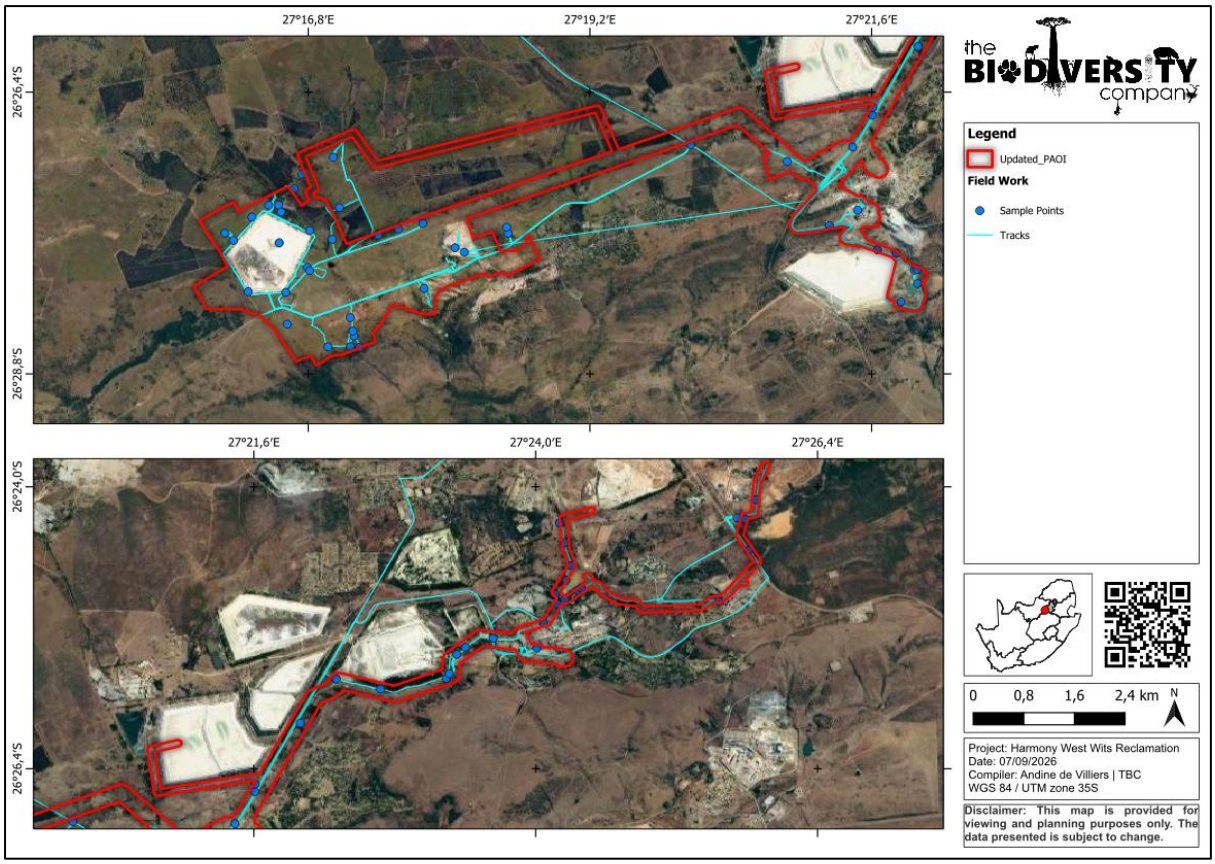


Figure 2-1 Map illustrating the tracks and sample points of the field survey of the PAOI.

3 Results & Discussion

3.1 Desktop Baseline

3.1.1 Ecologically Important Landscape Features

The relevance of the proposed development to ecologically important landscape features are summarised in Table 3-1.

Table 3-1 Summary of relevance of the proposed project to ecologically important landscape features

Desktop Information Considered	Relevance	Reasoning	Section
Ecosystem Threat Status (Red List of Ecosystems (RLE) 2021)	Relevant	The PAOI overlaps with Least Concern (LC) ecosystems.	3.1.1.1
Ecosystem Protection Level	Relevant	The PAOI overlaps with Poorly Protected (PP) ecosystems.	3.1.1.2
Provincial Conservation Plan	Relevant	The PAOI overlaps with Critical Biodiversity Areas (CBA) 2, Ecological Support Areas (ESA) 1, and marginally ESA 2.	3.1.1.3
West Rand District Bioregional Plan	Relevant	The PAOI overlaps with ESA and Important Areas.	3.1.1.4
Gauteng Ridges	Relevant	The PAOI overlaps with Class 1 Ridges, the 200 m Class 1 Ridge buffer, and Class 2 Ridges.	3.1.1.5
National Protected Areas Expansion Strategy (NPAES)	Relevant	The PAOI overlaps with NPAES Priority Focus Areas.	3.1.1.6
South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD)	Irrelevant	No SAPAD or SACAD areas are located within 10 km of the PAOI.	-
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	The PAOI overlaps with unnamed Critically Endangered (CR) rivers and CR wetlands.	3.1.1.7
National Freshwater Ecosystem Priority Area (NFEPA)	Relevant	The PAOI overlaps with unnamed Class D Largely Modified FEPA rivers and non-priority FEPA wetlands.	3.1.1.8
Strategic Water Source Areas (SWSA)	Irrelevant	Does not overlap with any SWSA. However, the Far West Karst Region SWSA is located less than 500 m North of the PAOI.	-
Key Biodiversity Areas (KBA)	Irrelevant	No KBAs are located within 30 km of the PAOI.	-
Mining and Biodiversity Guidelines	Relevant	The PAOI overlaps with moderate, high and highest biodiversity importance, correlating to moderate, high and highest risk for mining.	3.1.1.9
Strategic Transmission Corridor	Relevant	The PAOI overlaps with the central corridor.	-

3.1.1.1 Red List of Ecosystems

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.

According to the Red List of Ecosystems dataset (Skowno & Monyeki, 2022) the PAOI overlaps with LC ecosystems (Figure 3-1). However, according to the 2025 NBA, the PAOI overlaps with EN and LC ecosystems. Please note, at the time of the original assessment, the Red List of Ecosystems (RLE) from June 2022 was utilised. Since then, the NBA 2025 has been released (although not formally gazetted), in which the RLE of the ecosystem is EN.

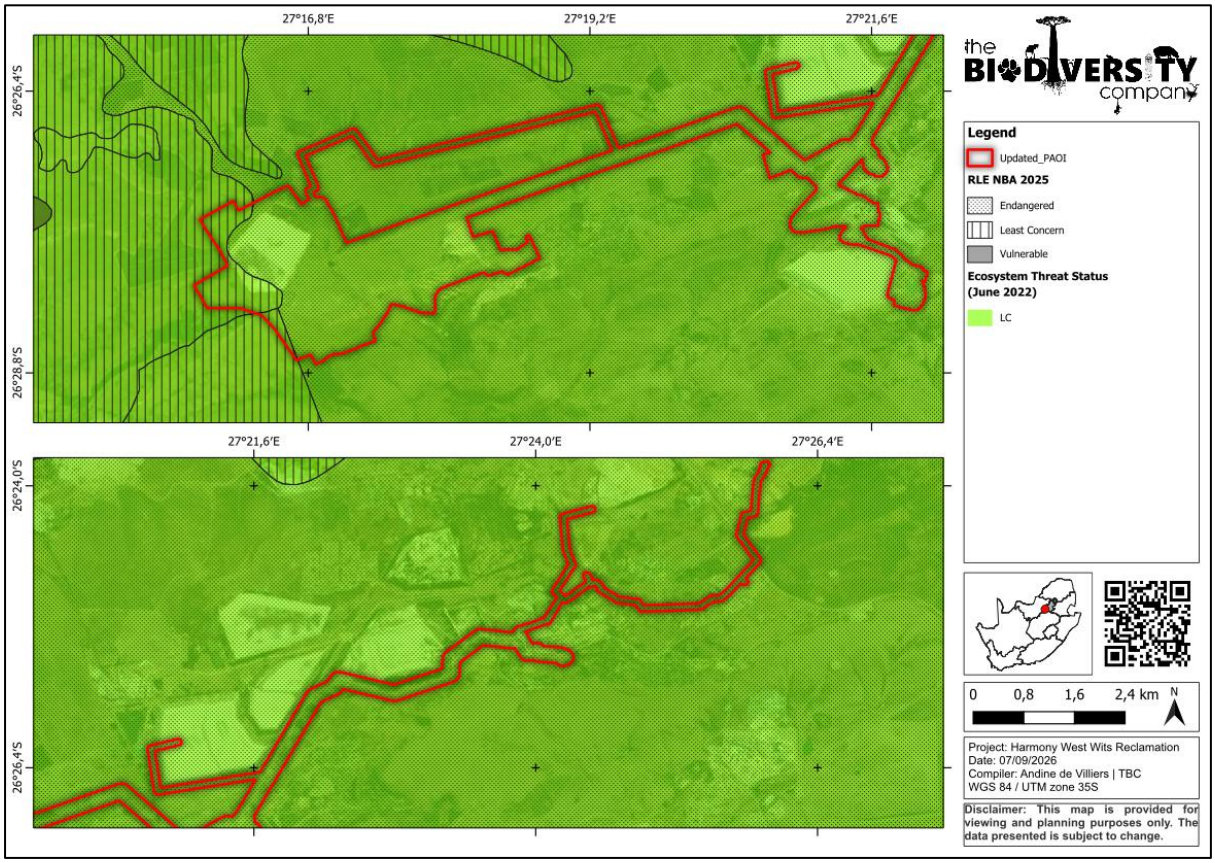


Figure 3-1 Map illustrating the ecosystem threat status associated with the PAOI

3.1.1.2 Ecosystem Protection Level

Indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

According to both the 2018 NBA, the PAOI overlaps with PP ecosystems, while according to the 2025 NBA, the PAOI overlaps predominantly with PP ecosystems, and marginally with MP ecosystems (Figure 3-2).

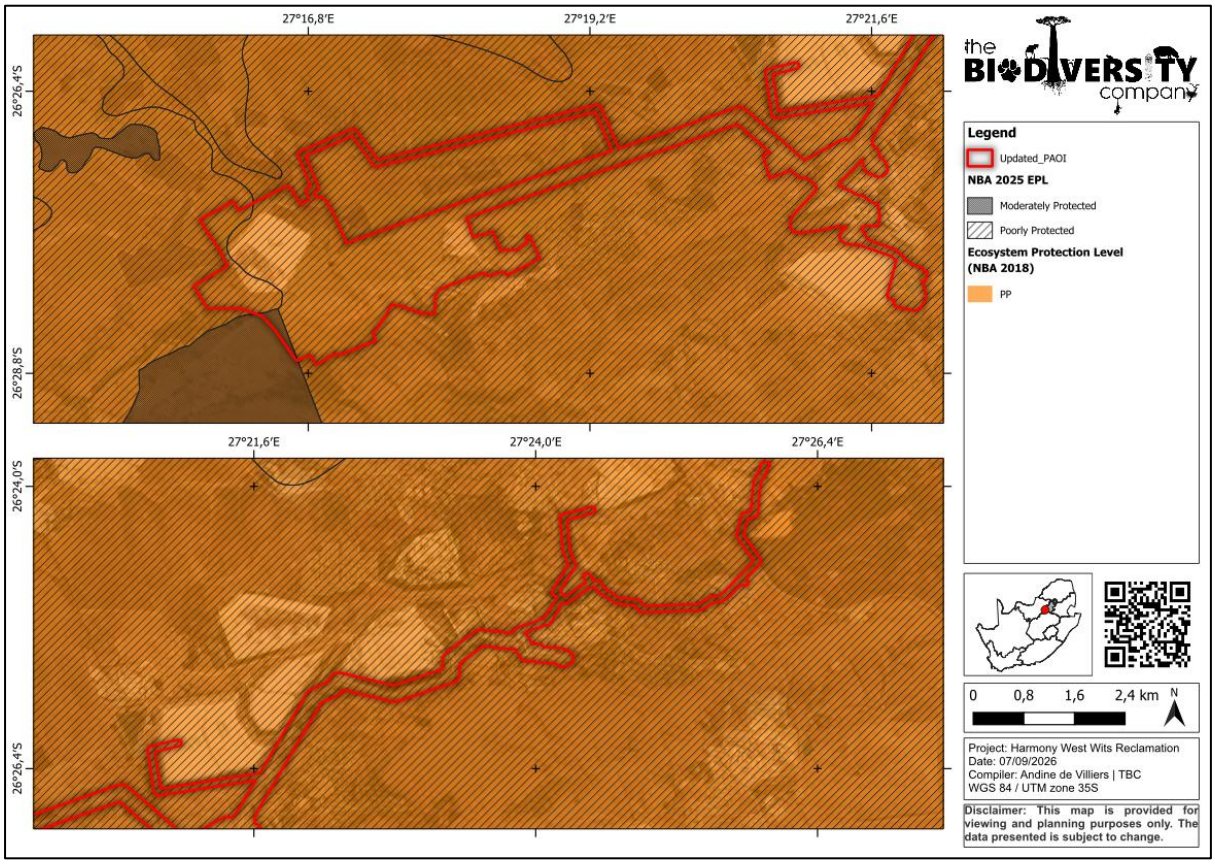


Figure 3-2 Map illustrating the ecosystem protection level associated with the PAOI

3.1.1.3 Provincial Conservation Plan

The Gauteng Conservation Plan (C-Plan) Version 4 (GDARD, 2024), developed using a systematic conservation planning approach, is the standard for conservation planning in South Africa. It is designed for use at a 1:50,000 scale to integrate biodiversity into land use planning and decision-making. It identifies biodiversity priority areas, including Critical Biodiversity Areas and Ecological Support Areas.

According to the Gauteng Conservation Plan dataset, the PAOI overlaps with CBA 1, ESA 1 and ESA 2 (marginally) (Figure 3-3).

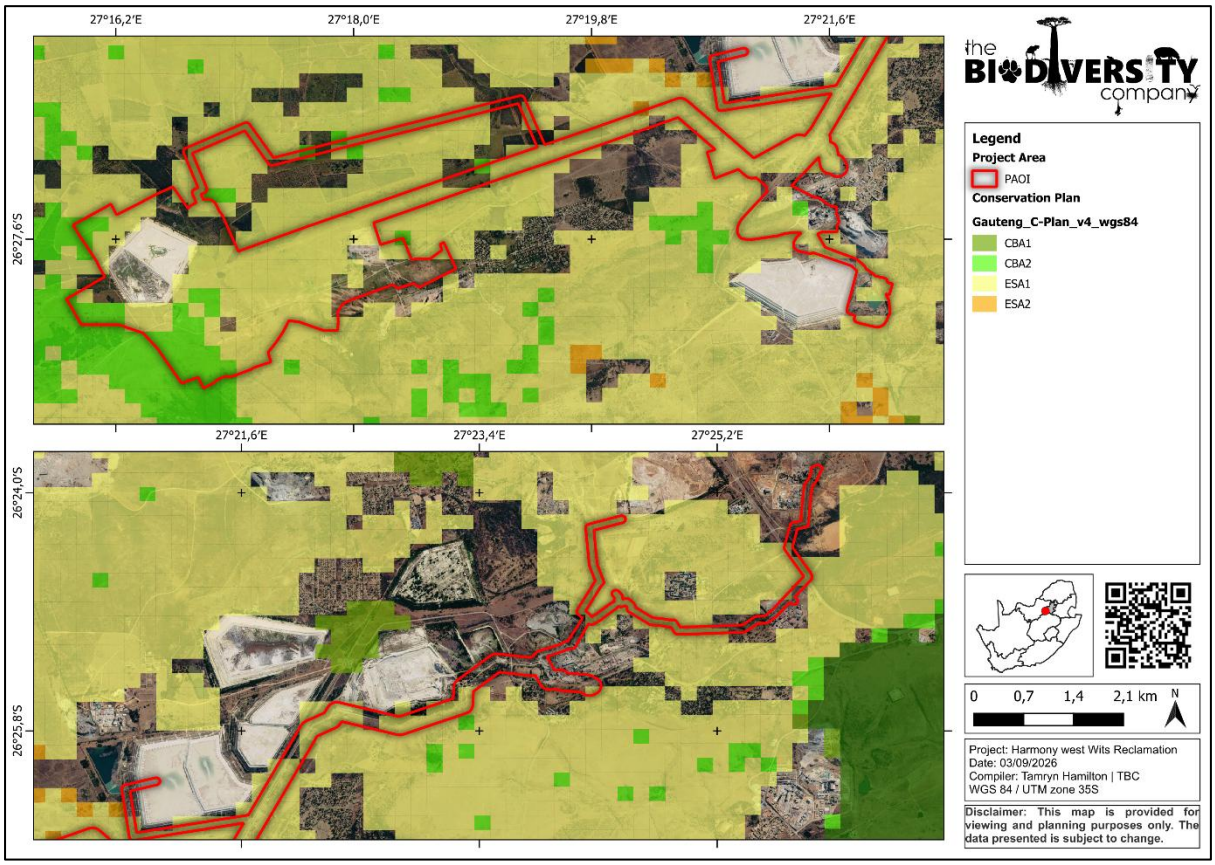


Figure 3-3 Map illustrating the PAOI in relation to the Gauteng Conservation Plan

3.1.1.4 West Rand Bioregional Plan

According to the West Rand Bioregional Plan, the PAOI overlaps with ESA and Important Areas (Figure 3-4).

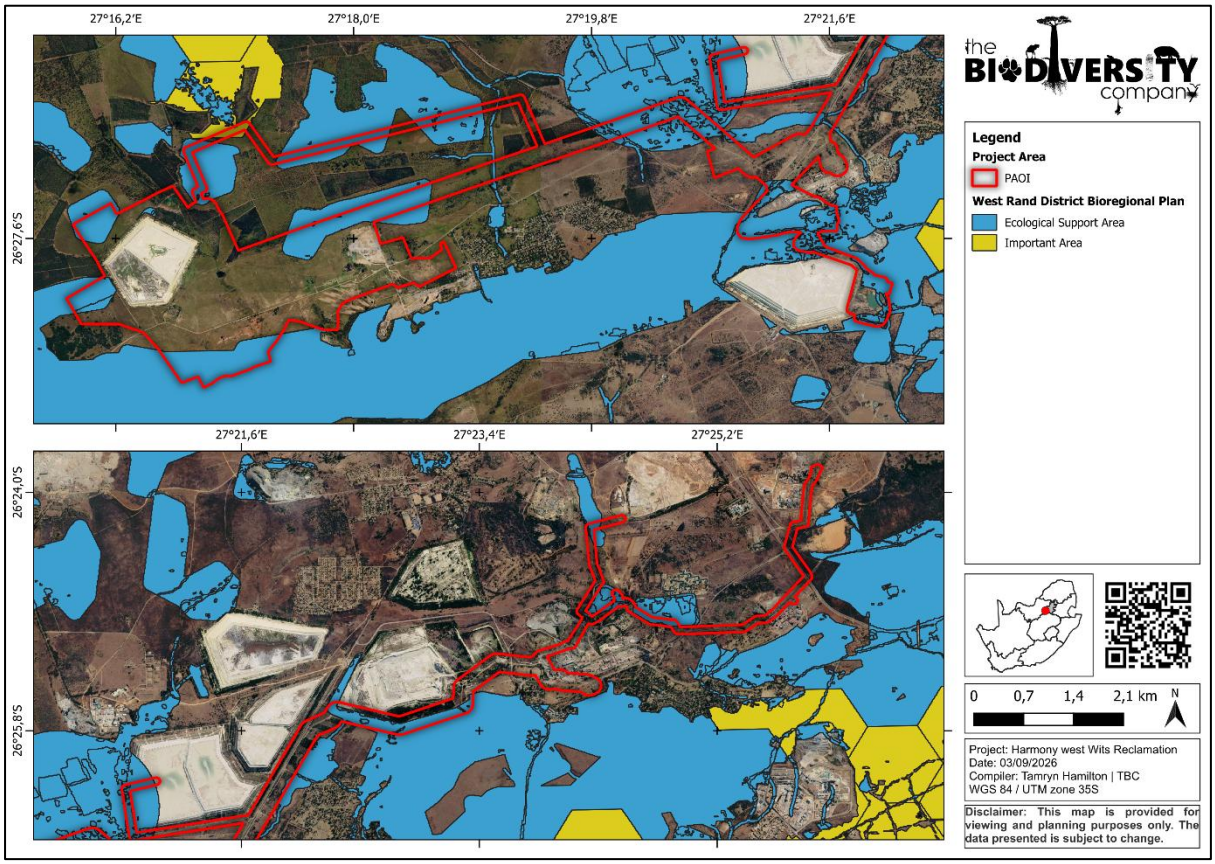


Figure 3-4 The PAOI in relation to the West Rand District Bioregional Plan

3.1.1.5 Gauteng Ridges

The quartzite ridges of Gauteng are one of the most important natural assets in this northern province of South Africa. This is because these ridges, and the areas immediately surrounding them, provide unique habitat for a wide variety of fauna and flora, some of which are Red-Listed, rare or endemic species, or in the case of certain plant species, are found nowhere else in South Africa or around the world.

Figure 3-5 indicates that the PAOI overlaps with Class 1 Ridges and their associated 200 m buffer zones, and Class 2 Ridges.

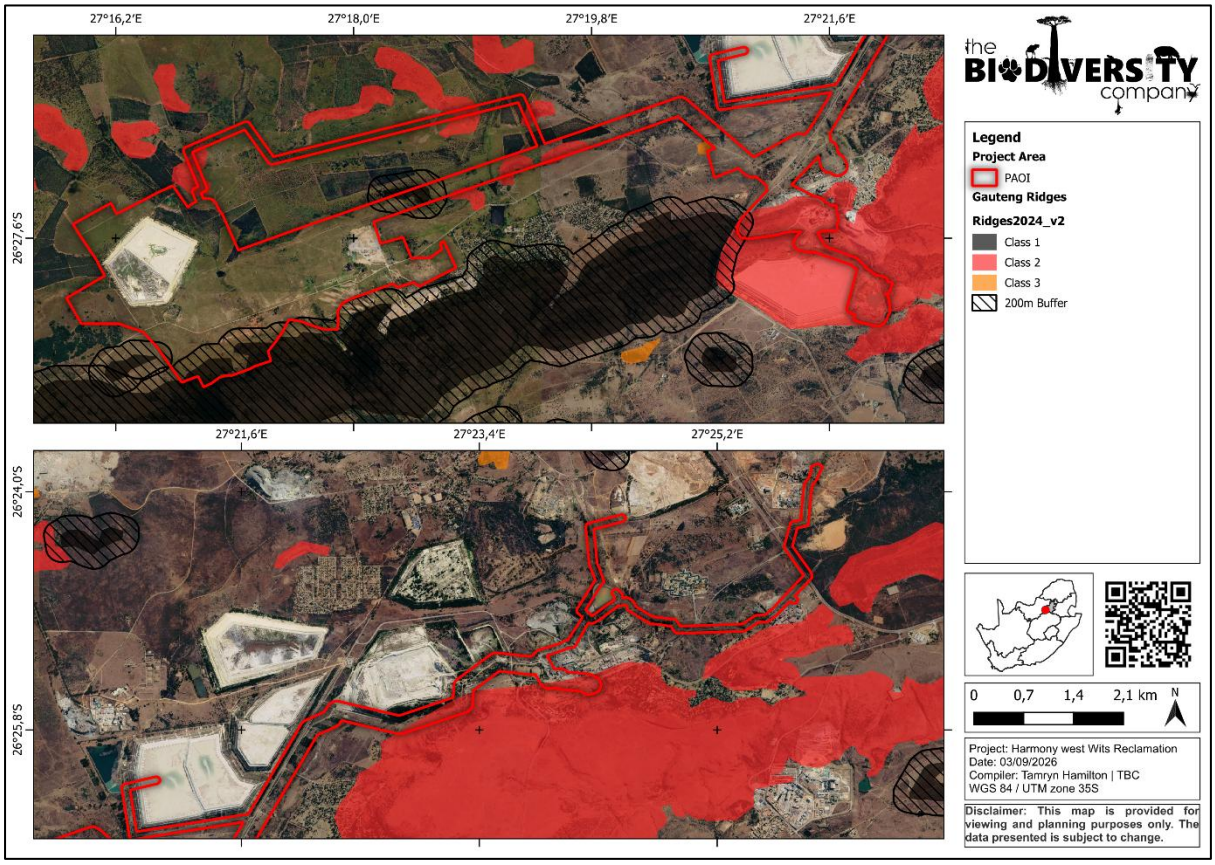


Figure 3-5 The PAOI in relation to the Gauteng Ridges dataset

3.1.1.6 NPAES

The Department of Environmental Affairs (now the Department of Forestry, Fisheries and the Environment) led the development of the National Protected Areas Expansion Strategy (NPAES) in consultation with the protected area agencies and other key private and public sector stakeholders. The need for the development of the NPAES was established in the National Biodiversity Framework in 2009 (DFFE, 2022b).

South Africa's protected area network currently falls far short of representing all ecosystems and maintaining healthy functioning ecological processes. In this context, the goal of the NPAES is to achieve cost effective protected area expansion, thus enabling better ecosystem representation, ecological sustainability, and resilience to climate change. A comprehensive set of priority areas was compiled based on the priorities identified by provincial and other agencies in their respective protected area expansion strategies. These focus areas are generally large, intact and unfragmented and are, therefore, of high importance for biodiversity, climate resilience and freshwater protection (DFFE, 2022b).

The PAOI overlaps Priority Focus Areas (Figure 3-6).

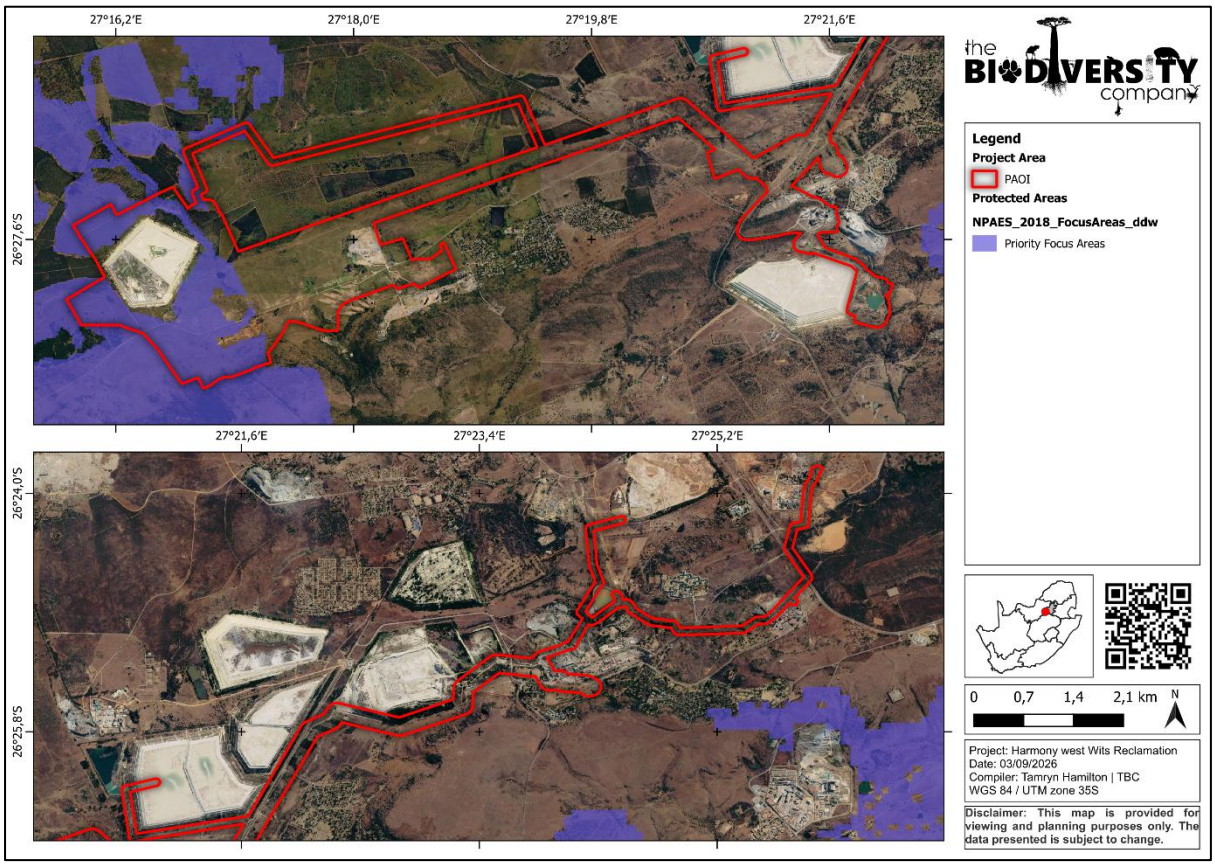


Figure 3-6 Map illustrating the NPAES focus areas and their proximity to the ER32 PAOI

3.1.1.7 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al*., 2019; Skowno *et al*., 2019).

The PAOI overlaps with CR rivers (unnamed) and wetlands (Figure 3-7).

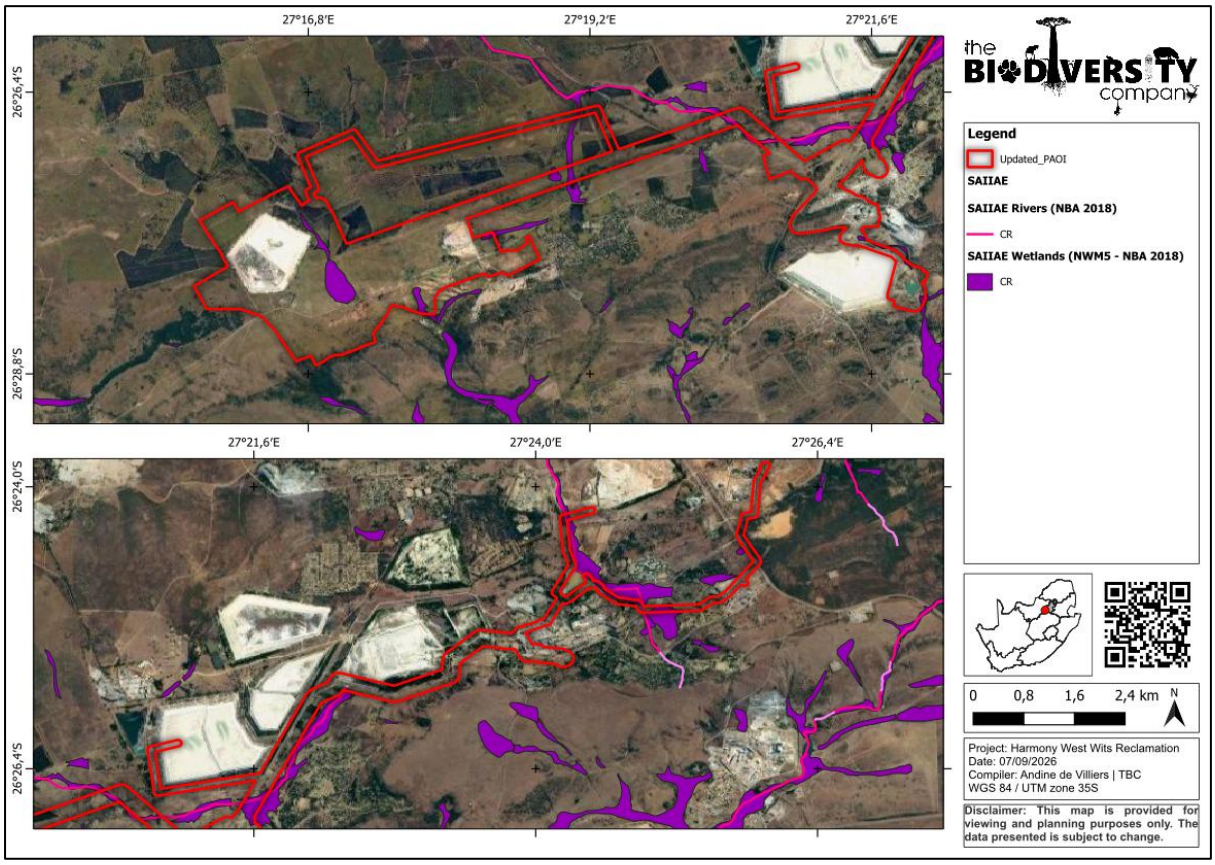


Figure 3-7 Map illustrating the PAOI in relation to the South African Inventory of Inland Aquatic Ecosystems dataset

3.1.1.8 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al*., 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al*., 2011).

The PAOI overlaps with Class D Largely Modified rivers and non-priority wetlands (Figure 3-8).

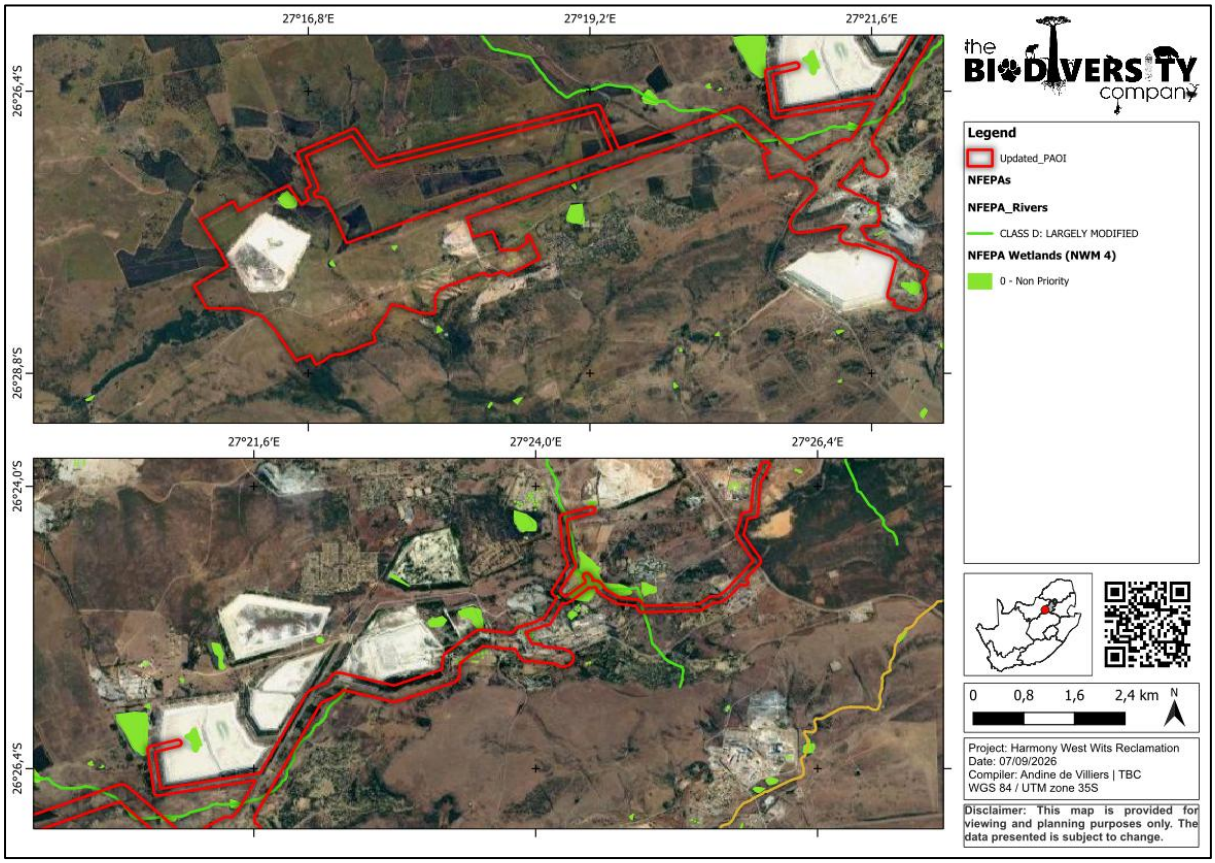


Figure 3-8 Map illustrating the ER32 PAOI in relation to the National Freshwater Ecosystem Priority Area dataset

3.1.1.9 Mining and Biodiversity Guidelines

According to the mining and biodiversity guidelines, the PAOI overlaps with moderate, high and highest biodiversity importance, which correlates to a moderate, high and highest risk for mining (Figure 3-9).

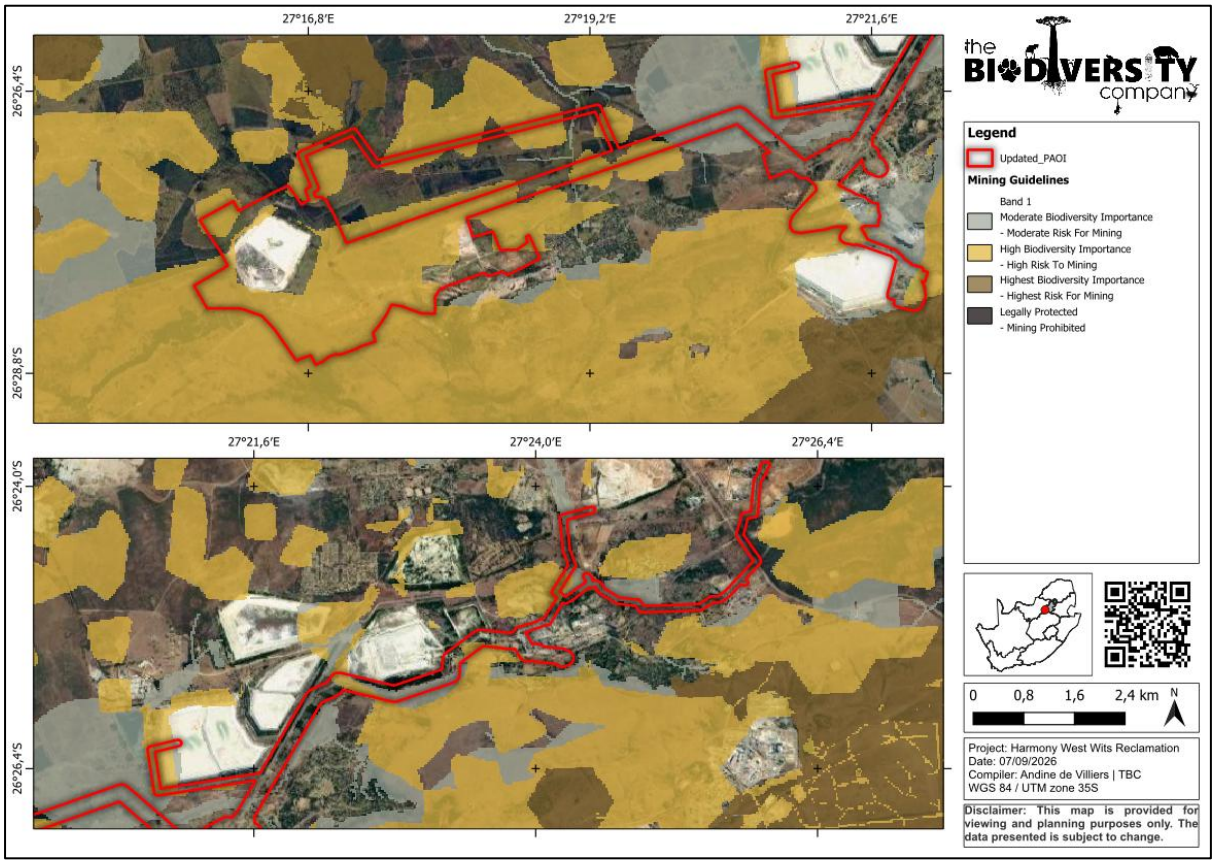


Figure 3-9 The PAOI in relation to the mining and biodiversity guidelines

3.1.1.10 Strategic Transmission Corridor

Seven strategic transmission corridors important for the planning of electricity transmission and distribution infrastructure have been identified across the country. According to the Strategic Transmission Corridors (EGI) dataset, the PAOI falls within the Central Corridor (Figure 3-10).

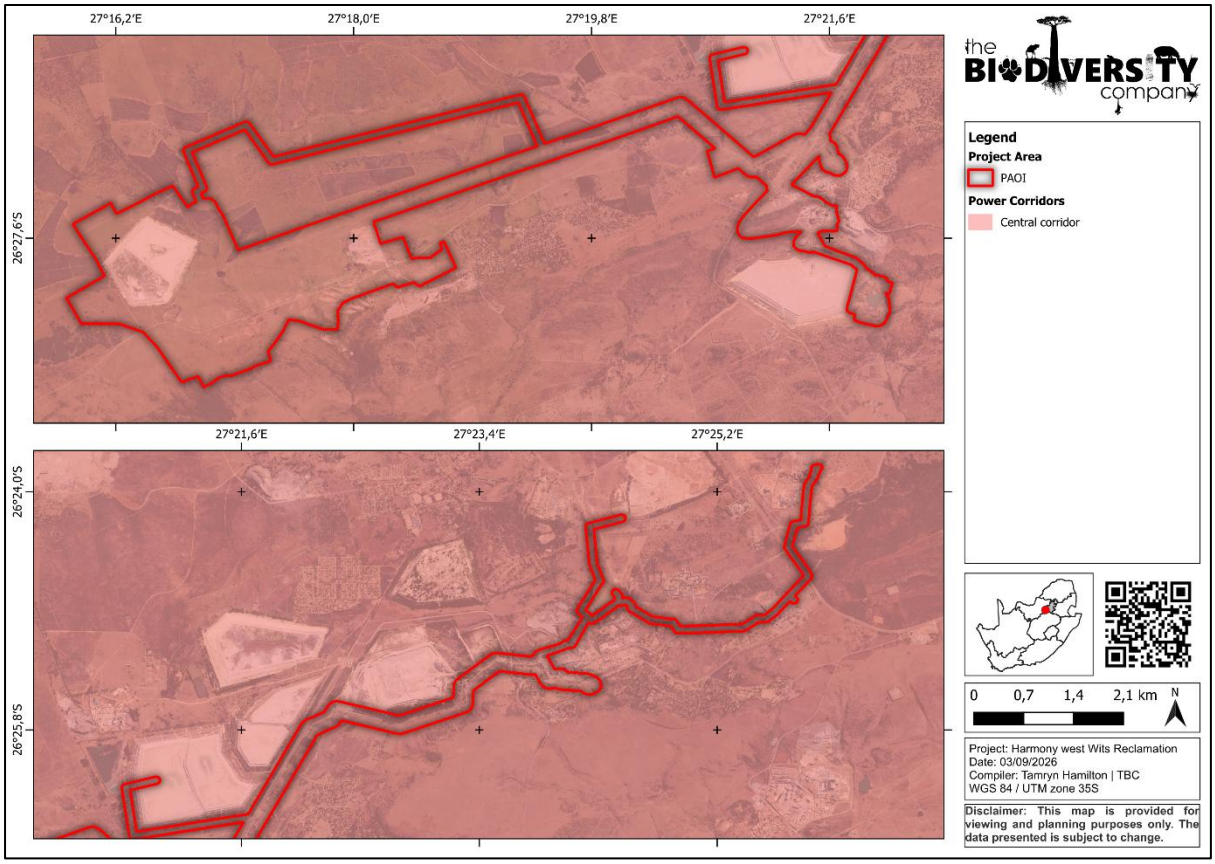


Figure 3-10 The PAOI in relation to the strategic transmission corridors

3.1.2 Flora Assessment

This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

3.1.2.1 Vegetation Type

The PAOI is situated within the savanna biome. The site is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- Seasonal precipitation; and
- (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass-layers, over-topped by

a discontinuous, but distinct woody plant layer. At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include Acacia and Albizia) and a generally dense herbaceous layer (Scholes & Walker, 1993).

According to SANBI (2018) the PAOI overlaps with Gauteng Shale Mountain Bushveld, and marginally with Andesite Mountain Bushveld, and Gold Reef Mountain Bushveld vegetation types (Figure 3-11). It must be noted that although the PAOI is situated in the savanna biome, it is located near the grassland biome, specifically, the Carletonville Dolomite Vegetation Type (to the north).

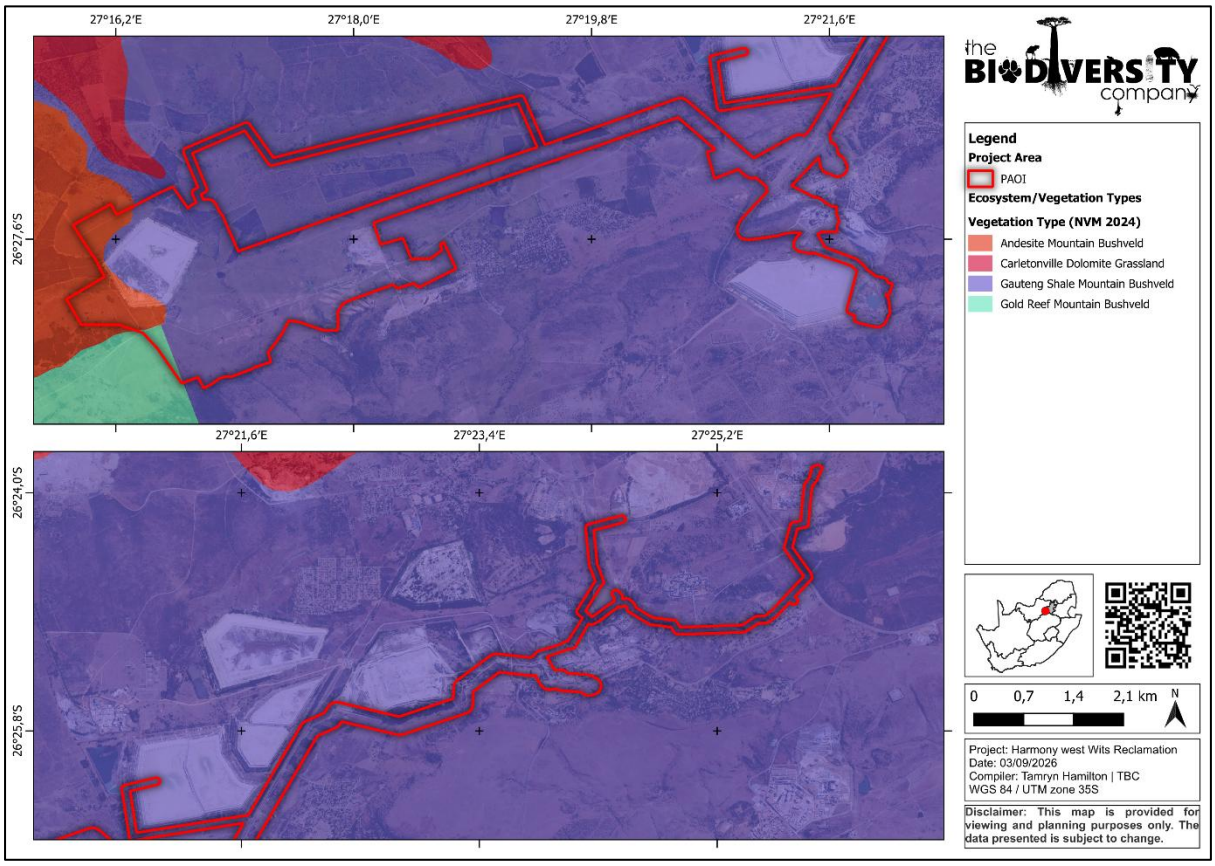


Figure 3-11 Map illustrating the vegetation types associated with the PAOI

3.1.2.1.1 Gauteng Shale Mountain Bushveld

This vegetation unit occurs mainly on the ridge of the Gatsrand south of Carletonville-Westonaria-Lenasia. It also occurs as a narrow band along the ridge that runs form a point between Tarlton and Magaliesberg in the west, through Sterkfontein, Pelindaba, Atteridgeville to Klapperkop and southeastern Pretoria in the east. The altitude ranges between 1300 to 1 750 m. It consists of low, broken ridges varying in steepness and with high surface rock cover. Vegetation is a short, semi-open thicket dominated by a variety of woody species. The understorey is dominated by a variety of grasses. Some of the ridges form plateaus above the northern slopes that carry scrubby grassland with high surface rock cover.

Important Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

Small Trees: *Senegalia caffra* (d), *Dombeya rotundifolia* (d), *Vachellia karroo, Celtis africana, Combretum molle, Cussonia spicata, Englerophytum magalismontanum, Protea caffra, Searsia leptodictya, Vangueria infausta, Zanthoxylum capense, Ziziphus mucronata.*

Tall Shrubs: *Asparagus laricinus, Canthium gilfillanii, Chrysanthemoides monilifera, Dichrostachys cinerea, Diospyros austro-africana, D. lycioides* subsp. *lycioides, Ehretia rigida* subsp. *rigida, Euclea crispa* subsp. *crispa, Grewia occidentalis, Gymnosporia polyacantha, Olea europaea* subsp. *africana, Tephrosia capensis, T. longipes*.

Low Shrubs: *Acalypha angustata, Asparagus suaveolens, Athrixia elata, Felicia muricata, Indigofera comosa, Rhus magalismontana subsp. magalismontana.*

Geoxylic Suffrutex: *Elephantorrhiza elephantina.*

Succulent Shrub: *Kalanchoe rotundifolia.*

Woody Climber: *Ancylobotrys capensis.*

Graminoids: *Hyparrhenia dregeana* (d), *Cymbopogon caesius, C. pospischilii, Digitaria eriantha subsp. eriantha, Eragrostis curvula.*

Herbs: *Dicoma zeyheri, Helichrysum nudifolium, H. rugulosum, Hermannia lancifolia, Hibiscus pusillus, Selaginella dregei, Senecio venosus, Vernonia natalensis, V. oligocephala.*

Geophytic Herbs: *Cheilanthes hirta, Pellaea calomelanos, Scadoxus puniceus.*

Conservation Status

According to the Red List of Ecosystems (June 2022), this vegetation type is classified as Least Concern. However, according to the NBA 2025, this vegetation type is Endangered. The national target for conservation protection for this vegetation type is 24%. Less than 1% is statutorily conserved, for example, the Skanskop and Hartbeesthoek Nature Reserves, Magaliesberg Nature Area and Groenkloof National Park. Additionally, over 1% conserved in other reserves including the John Nash Nature Reserve, Cheetah Park and Hartbeesthoek Radio Astronomy Observatory. About 21% transformed mainly by urban and built-up areas, mines and quarries, cultivation and plantations. Wattles a common invasive plant in places.

3.1.2.1.2 Andesite Mountain Bushveld

The Andesite Mountain Bushveld vegetation type occurs in several separate patches across Gauteng, North-west, Mpumalanga and the Free State Provinces (Mucina & Rutherford, 2006). Several separate occurrences of which the main are: the Bronberg Ridge in eastern Pretoria extending to Welbekend; from Hartebeesthoek in the west along the valley between the two parallel ranges of hills to Atteridgeville; hills in southern Johannesburg; several hills encompassing Nigel, Willemsdal, Coalbrook and Suikerbosrand (in part); and the outer ring of ridges of the Vredefort Dome and some hills to the northwest around Potchefstroom. This vegetation type occurs at an altitude of about 1 350–1 800m. This vegetation type is characterized by dense, medium-tall thorny bushveld with a well-developed grass layer on hill slopes and some valleys with undulating landscape.

Important Plant Taxa

Mucina and Rutherford (2006) list the following as important species in Andesite Mountain Bushveld:

Small Trees: *Senegalia caffra* (d), *Vachellia karroo* (d), *Celtis africana*, *Protea caffra*, *Zanthoxylum capense*, *Ziziphus mucronata*.

Tall Shrubs: *Asparagus laricinus* (d), *Euclea crispa* subsp. *crispa* (d), *Searsia pyroides* var. *pyroides* (d), *Diospyros lycioides* subsp. *lycioides*, *Gymnosporia polyacantha*, *Lippia javanica*, *Rhamnus prinoides*.

Low Shrubs: *Asparagus suaveolens* (d), *Searsia rigida* var. *margaretae*, *Teucrium trifidum*.

Soft Shrub: *Isoglossa grantii*.

Woody Climber: *Rhoicissus tridentata*.

Graminoids: *Eragrostis curvula* (d), *Hyparrhenia hirta* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Cymbopogon pospischilii*, *Digitaria eriantha* subsp. *eriantha*, *Elionurus muticus*, *Eragrostis racemosa*, *E. superba*, *Panicum maximum*.

Herbs: *Commelina africana, Vernonia galpinii, V. oligocephala.*

Succulent Herb: *Aloe greatheadii* var. davyana.

Conservation Status of the Vegetation Type

According to the Red List of Ecosystems (June 2022), this vegetation type is classified as Least Concern. The national target for conservation protection is 24%. About 7% are statutorily conserved mainly in the Suikerbosrand Nature Reserve and Magaliesberg Nature Area. An additional 1–2% conserved in other reserves mainly in the Hartbeesthoek Radio Astronomy Observatory. Some 15% already transformed, mainly by cultivation and some urban and built-up areas.

3.1.2.1.3 Gold Reef Mountain Bushveld

Gold Reef Mountain Bushveld vegetation type is found in the North-West, Gauteng, Free State and Mpumalanga Provinces. This vegetation type typically comprises of Rocky hills and ridges often west-east trending with more dense woody vegetation often on the south-facing slopes associated with distinct floristic differences (e.g. preponderance of *Senegalia caffra* on the southern slopes). Tree cover elsewhere is variable while the tree and shrub layers are often continuous.

Important Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are important in the Soweto Highveld Grassland.

Small Trees: *Senegalia caffra* (d), *Combretum molle* (d), *Protea caffra* (d), *Celtis africana*, *Dombeya rotundifolia*, *Englerophytum magalismontanum*, *Ochna pretoriensis*, *Searsia leptodictya*, *Vangueria infausta*, *V. parvifolia*, *Ziziphus mucronata*.

Tall Shrubs: *Canthium gilfillanii*, *Ehretia rigida* subsp. *rigida*, *Grewia occidentalis*, *Gymnosporia buxifolia*, *Mystroxylon aethiopicum* subsp. *burkeanum*.

Low Shrubs: *Athrixia elata*, *Pearsonia cajanifolia*, *Rhus magalismontana* subsp. *magalismontana*, *R. rigida* var. *rigida*.

Woody Climber: *Ancylobotrys capensis*.

Graminoids: *Loudetia simplex* (d), *Panicum natalense* (d), *Schizachyrium sanguineum* (d), *Trachypogon spicatus* (d), *Alloteropsis semialata* subsp. *eckloniana*, *Bewsia biflora*, *Digitaria tricholaenoides*, *Diheteropogon amplectens*, *Sporobolus pectinatus*, *Tristachya biseriata*, *T. leucothrix*.

Herbs: *Helichrysum nudifolium*, *H. rugulosum*, *Pentanisia angustifolia*, *Senecio venosus*, *Xerophyta retinervis*.

Geophytic Herbs: *Cheilanthes hirta*, *Hypoxis hemerocallidea*, *Pellaea calomelanos*.

Endemic Taxa

Succulent Shrub: *Aloe peglerae.*

Succulent Herb: *Frithia pulchra*.

Conservation Status

According to the Red List of Ecosystems (June 2022), this vegetation type is classified as Least Concern. The national target for conservation protection for both these vegetation types is 24%, with 22% statutorily conserved mainly in the Magaliesberg Nature Area and much smaller proportions in the Rustenberg, Wonderboom and Suikerbosrand Nature Reserves. At least an additional 1% of this vegetation type is conserved in other reserves which brings the total area conserved very close to target. About 15% has been transformed mainly by cultivation and urban and built-up areas and some areas with dense stands of the alien *Melia azedarach* are embedded within this unit.

3.1.2.2 Expected Flora Species

The Global Biodiversity Information Facility (GBIF) database lists 98 flora species expected to occur within the area (Full list in Appendix C). Three (3) of these species are considered as SCC, with one (1) species also listed as per the DFFE Screening Tool (Table 3-2).

Table 3-2 Expected flora SCC. NE = Not Evaluated, NT = Near Threatened, VU = Vulnerable, and CR = Critically Endangered

Family	Scientific Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Screening Tool Sensitivity	Likelihood of Occurrence	Reason
Aizoaceae	*Khadia beswickii*	VU	CR	Open shallow soil over rocks in grassland.	Medium	High	Suitable habitat, confirmed nearby
Aizoaceae	*Lithops lesliei* subsp. *lesliei*	VU	NE	Occurs primarily in arid grasslands, usually in rocky places, growing under the protection of forbs and grasses	-	Moderate	Some suitable habitat within PAOI
Crassulaceae	*Adromischus umbraticola*	NT	NE	Plants grow on south-facing rock crevices on ridges	-	High	Suitable habitat, confirmed nearby

It is important to note two (2) of the expected flora SCC were observed by TBC (January 2026) less than 500 m from the PAOI, as well as an additional third flora SCC. These species can be seen in Table 3-3.

Table 3-3 Flora SCC observed nearby (TBC, January 2026). NT = Near Threatened, and VU = Vulnerable.

Family	*Species*	Threat Status (SANBI)
Aizoaceae	*Khadia beswickii*	VU
Cleomaceae	*Cleome conrathii*	NT
Crassulaceae	*Adromischus umbraticola subsp. umbraticola*	NT

3.1.3 Fauna Assessment

3.1.3.1 Invertebrates

Three (3) invertebrate species are listed by the Screening Tool (Table 3-4).

Table 3-4 List of Sensitive Species of Conservation Concern that may occur in the PAOI. LC = Least Concern, VU = Vulnerable, and EN = Endangered.

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Lepidochrysops praeterita	Highveld Blue	Medium	EN	EN	Grassy, rocky, typically south-facing slopes, where its host plant (Ocimum obovatum) and, presumably, its host ant occur	Low	Host plant not present in high densities
Lepidochrysops procera	Potchefstroom Blue	Medium	Rare	LC	Rocky areas in grassland (and grassy areas in savanna), where its larval host plant, Ocimum obovatum, occurs.	Low	Host plant not present in high densities
Clonia uvarovi	Uvarov's Clonia	lium	VU	VU	Tall woodland savannah in the highveld region	Low	Limited suitable habitat

3.1.3.2 Mammals

The GBIF database lists twelve (12) mammal species that could occur within the area (Full list in Appendix C). Three (3) of these are SCC, two (2) of which are listed by the DFFE Screening Tool (Table 3-5).

Table 3-5 Expected mammal SCC. LC = Least Concern, NT = Near Threatened, and VU = Vulnerable

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Giraffa camelopardalis	Giraffe	-	LC	VU	Savanna/woodland habitats, but range widely	Low	Restricted to game reserves
Hydrictis maculicollis	Spotted-necked Otter	Medium	VU	NT	Inhabits freshwater habitats where water is unsilted, unpolluted, and rich in small to medium sized fishes	Low	Lack of suitable waterbodies
Crocidura maquassiensis	Maquassie Musk Shrew	Medium	VU	LC	Rocky, mountain habitats	High	Suitable habitat present

3.1.3.3 Herpetofauna

Based on the GBIF database, two (2) amphibian and twenty (20) reptile species are expected to occur within the area, none of which are classified as SCC (Full list in Appendix C). No species are listed by the DFFE Screening Tool.

3.1.3.4 Avifauna

The SABAP2 data indicate that 354 avifauna species are expected for the PAOI and surrounding areas (Full list in Appendix C). Of these, forty-two (42) are SCC (Table 3-6). The likelihood of occurrence within the PAOI are included here. The DFFE Screening Tool lists two (2) high sensitivity species and two (2) medium sensitivity species.

Table 3-6 Expected avifauna SCC. LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, and CR = Critically Endangered.

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Alcedo semitorquata	Half-collared Kingfisher		VU	LC	Wooded and forested streams and rivers, though also occurs in some other wetland habitats including freshwater marshes and coastal lagoons	Moderate	Some suitable habitat
Anas erythrorhyncha	Red-billed Teal		NT	LC	Shallow permanent or temporary eutrophic freshwater wetlands including, dams, sewage ponds and other artificial wetlands, with submerged, floating and peripheral vegetation	High	Suitable habitat
Anas undulata	Yellow-billed Duck		NT	LC	Shallow, calm freshwater wetlands, slow-flowing rivers, floodplains, and artificial impoundments like farm dams and sewage works	High	Suitable habitat
Anhinga rufa	African Darter		NT	LC	Proximity to freshwater and brackish environments of shallow lakes, swamps, lagoons as well as slow-moving rivers bordered by trees, reeds, or mangroves that are suitable for roosting	High	Suitable habitat
Anthropoides paradiseus	Blue Crane		VU	VU	Semi-desert, grassland, and cereal cropland	Low	Lack of suitable habitat

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Aquila verreauxii	Verreaux's Eagle		VU	LC	Rugged mountainous regions, rocky hills, cliffs, and deep gorges	High	Suitable habitat
Ardea alba	Great Egret		NT	LC	Shallow, open aquatic environments	High	Suitable habitat
Ardea brachyrhyncha	Yellow-billed Egret		NT	LC	Diverse wetland environments and shallow, sheltered waters with abundant emergent aquatic vegetation	High	Suitable habitat
Asio capensis	Marsh Owl		NT	LC	Open, moist grasslands, wetlands, marshes, and floodplains	High	Suitable habitat
Calidris ferruginea	Curlew Sandpiper		VU	VU	Temperate and tropical coastal wetlands and mudflats	Low	Lack of suitable habitat
Charadrius pecuarius	Kittlitz's Plover		NT	LC	Open, flat terrains with sparse vegetation near both coastal shores and inland waterbodies, including mudflats, estuaries, and saltpans	Moderate	Some suitable habitat
Ciconia nigra	Black Stork		EN	LC	Undisturbed, wooded wetlands and mountainous regions near freshwater bodies	Low	Lack of suitable habitat
Circus macrourus	Pallid Harrier		NA	NT	Open grasslands, floodplains, scrublands, and agricultural croplands	Low	Lack of suitable habitat
Circus maurus	Black Harrier		EN	EN	Montane fynbos, renosterveld and strandveld habitats; occassionally Karoo and Grassland	Low	Lack of suitable habitat
Circus ranivorus	African Marsh Harrier	High, Medium	VU	LC	Permanent, high-rainfall wetlands	Moderate	Some suitable habitat
Coracias garrulus	European Roller		NT	LC	Broad-leaved, Senegalia and Vachellia woodlands, arid	Low	Lack of suitable habitat

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
					to mesic savannas, and bushy plains		
Dendrocygna bicolor	Fulvous Whistling Duck		NT	LC	Shallow, heavily vegetated freshwater wetlands, marshes, lagoons, and flooded agricultural areas like rice paddies	Low	Lack of suitable habitat
Elanus caeruleus	Black-winged Kite		NT	LC	Grasslands, savannas, agricultural farmlands, and semi-deserts with low tree densities	High	Suitable habitat
Eupodotis senegalensis	White-bellied Bustard	Medium	VU	LC	Grasslands, open savannas, and bushlands with scattered dwarf trees	Moderate	Some suitable habitat
Falco biarmicus	Lanner Falcon		NT	LC	Open landscapes with nearby rocky cliffs or crags	Moderate	Some suitable habitat
Falco naumanni	Lesser Kestrel		VU	LC	Warm, dry, open landscapes with short or sparse vegetation	Moderate	Some suitable habitat
Falco vespertinus	Red-footed Falcon		VU	VU	Open, lowland country with scattered tree cover	Moderate	Some suitable habitat
Glareola nordmanni	Black-winged Pratincole		LC	NT	Expansive open grasslands, edges of seasonal pans, lacustrine grasslands, and recently flooded grassy plains	Low	Lack of suitable habitat
Gyps africanus	White-backed Vulture		CR	CR	Open savannas, woodlands, and steppes	Low	Lack of suitable habitat
Gyps coprotheres	Cape Vulture		VU	VU	Tall cliffs for breeding; forages in open country	Moderate	Some suitable habitat
Hydroprogne caspia	Caspian Tern	High, Medium	VU	LC	Coastal bays, sheltered estuaries, and large inland waterbodies like lakes, rivers, and saltpans	Low	Lack of suitable habitat
Microparra capensis	Lesser Jacana		VU	LC	Shallow, freshwater wetlands, shallow floodplains, and the backwaters of lakes and dams	Low	Lack of suitable habitat

Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Mirafra cheniana	Melodious Lark		NT	LC	Relatively dry, open grasslands	Moderate	Some suitable habitat
Monticola explorator	Sentinel Rock Thrush		LC	NT	Rocky outcrops, boulder-strewn slopes, and alpine grasslands	Low	Lack of suitable habitat
Mycteria ibis	Yellow-billed Stork		VU	LC	Wetlands, swamps, shallow lakes, and floodplains	High	Suitable habitat
Netta erythrophthalma	Southern Pochard		NT	LC	Lakes, vleis, dams, marshes, lagoons, and slow-moving rivers with clear water and abundant submerged or emergent vegetation	High	Suitable habitat
Nycticorax nycticorax	Black-crowned Night Heron		NT	LC	Shallow wetlands, marshes, or rivers for nighttime foraging, and dense trees, reeds, or mangroves to provide shaded roosting cover during the day	Moderate	Some suitable habitat
Oxyura maccoa	Maccoa Duck		VU	EN	Nutrient-rich freshwater, saline, and alkaline wetlands	Moderate	Some suitable habitat
Phoeniconaias minor	Lesser Flamingo		VU	NT	Shallow, highly alkaline soda lakes, saline wetlands, and coastal lagoons	High	Suitable habitat
Phoenicopterus roseus	Greater Flamingo		NT	LC	Shallow, highly saline or alkaline water bodies	High	Suitable habitat
Podiceps cristatus	Great Crested Grebe		VU	LC	Freshwater and brackish aquatic environments globally, including lakes, reservoirs, marshes, and slow-flowing rivers	Moderate	Some suitable habitat
Sagittarius serpentarius	Secretarybird		VU	EN	Open grasslands, savannas, and scrublands with short to moderate grass heights	Moderate	Some suitable habitat

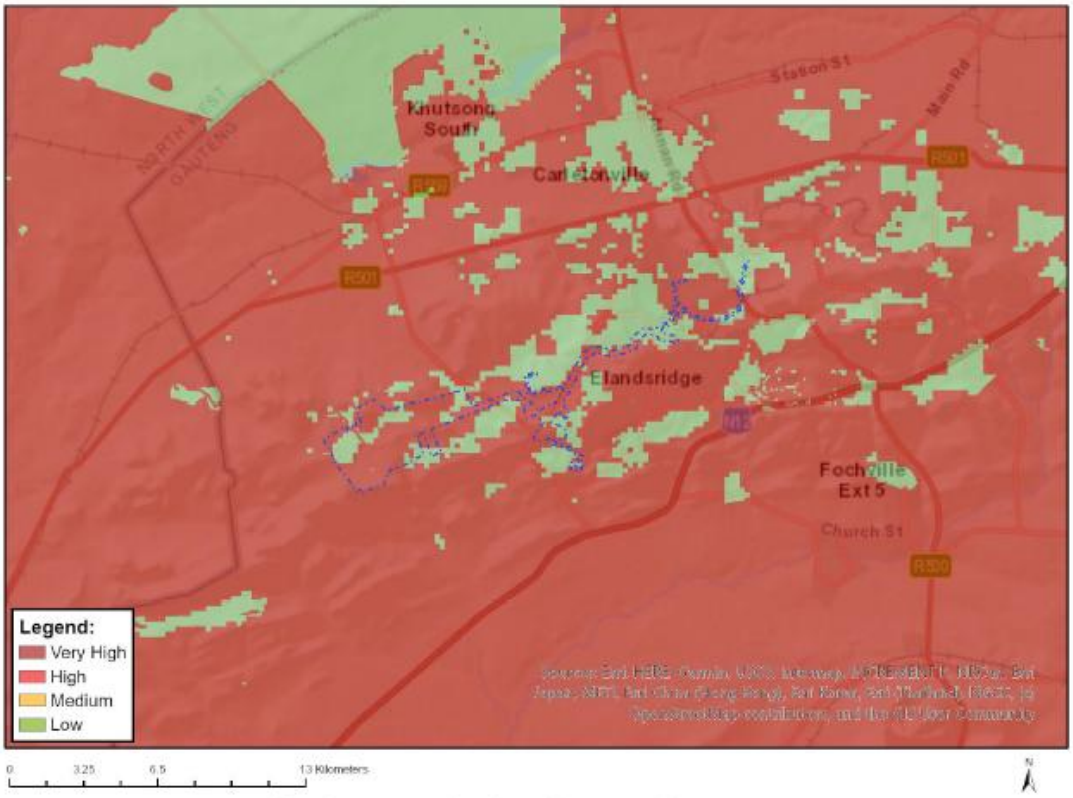
Scientific Name	Common Name	Screening Tool Sensitivity	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Habitat	Likelihood of Occurrence	Reason
Sarkidiornis melanotos	Knob-billed Duck		NT	LC	Freshwater wetlands	Moderate	Some suitable habitat
Scopus umbretta	Hamerkop		NT	LC	Near waterbodies; highly adaptable	High	Suitable habitat
Spatula smithii	Cape Shoveler		NT	LC	Shallow, plankton-rich freshwater and brackish wetlands	Moderate	Some suitable habitat
Thalassornis leuconotus	White-backed Duck		NT	LC	Calm, quiet freshwater bodies	High	Suitable habitat
Tyto capensis	African Grass Owl	Medium	VU	LC	Moist grasslands, marshes, and vleis	Low	Lack of suitable habitat

3.1.4 DFFE Screening Tool

According to the Screening Tool Report generated (Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended), the following sensitivity classifications were gathered from the National Web-based Environmental Screening Tool:

- Terrestrial Biodiversity Theme sensitivity is Very High for the PAOI, due to overlap with CBA 2, ESA 1, ESA 2, and NPAES (Figure 3-12);
- Plant Species Theme sensitivity is Medium for the PAOI, due to the potential presence of one (1) medium sensitivity flora species (Figure 3-13); and
- Animal Species Theme sensitivity is High for the PAOI, due to the possible presence of two (2) high sensitivity avifauna species, two (2) medium sensitivity avifauna species, three (3) medium sensitivity insect species, and two (2) medium sensitivity mammal species (Figure 3-14).

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



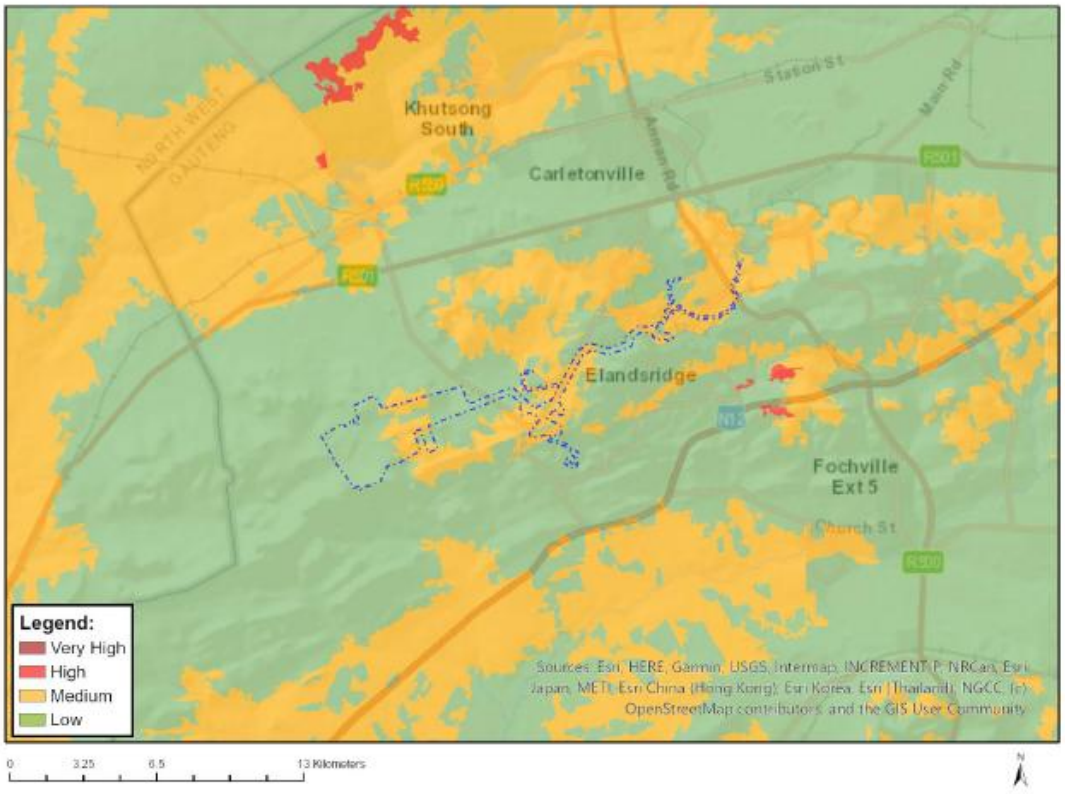
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA 2
Very High	ESA 1
Very High	ESA 2
Very High	National Protected Area Expansion Strategy (NPAES)

Figure 3-12 The Terrestrial Biodiversity Theme sensitivity for the PAOI

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

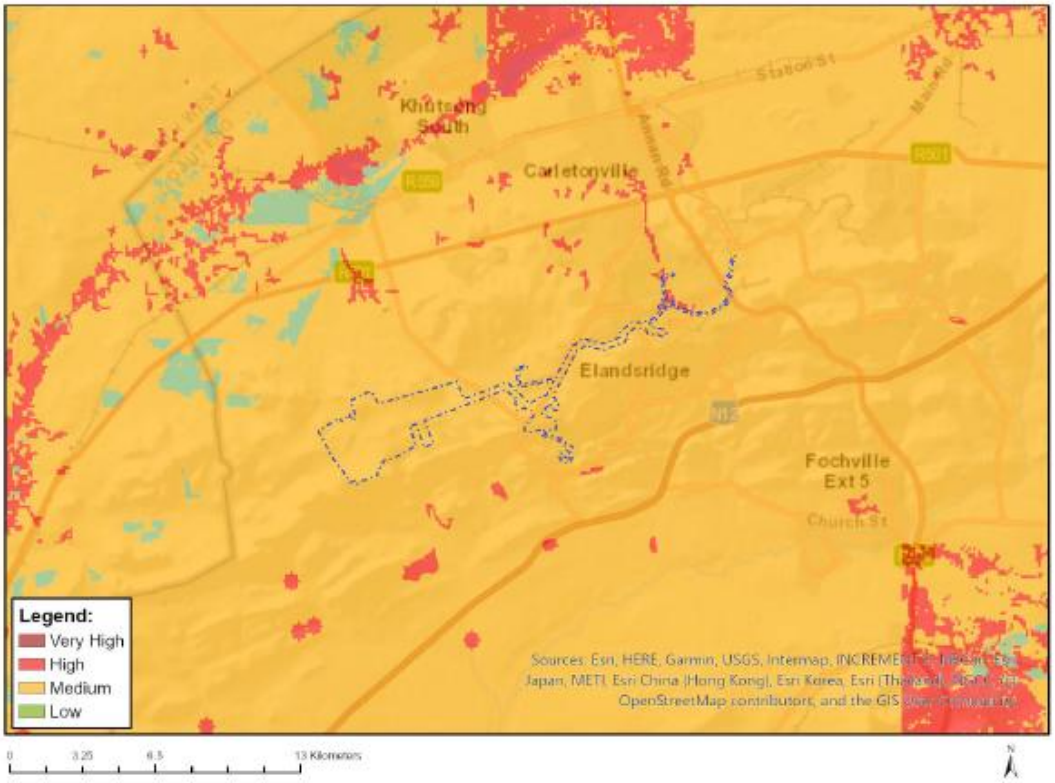
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Khadia beswickii

Figure 3-13 The Plant Theme sensitivity for the PAOI.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Circus ranivorus
High	Aves-Hydroprogne caspia
Medium	Aves-Tyto capensis
Medium	Aves-Circus ranivorus
Medium	Aves-Hydroprogne caspia
Medium	Aves-Eupodotis senegalensis
Medium	Insecta-Lepidochrysops praeterita
Medium	Insecta-Lepidochrysops procera
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Hydrictis maculicollis
Medium	Invertebrate-Clonia uvarovi

Figure 3-14 The Animal Theme sensitivity for the PAOI.

3.2 Fieldwork Findings

3.2.1 Flora Assessment

This section is divided into three sections:

- Indigenous flora;
- Species of Conservation Concern (SCC) and Protected Flora; and
- Alien Invasive Plants (AIPs).

3.2.1.1 Indigenous Flora

The vegetation assessment was conducted throughout the extent of the PAOI. The species composition within the assessment area aligns with what is typically found in the vegetation type, considering some impact, mostly related to the ongoing mining and related activities. The natural habitats were found to be composed predominantly of indigenous species however; some alien and invasive plant (AIP) species were also recorded. Indeed, eighty-six (86) indigenous species, and twenty (2) AIP species were recorded (Table 3-8). Some of the species can be seen in Figure 3-15.

No flora SCC were recorded; however, seven (7) protected species were observed.

It is important to note two (2) of the expected flora SCC were observed by TBC (January 2026) less than 500 m from the PAOI, as well as an additional third flora SCC. These species can be seen inTable 3-7.

Table 3-7 Flora SCC observed nearby (TBC, January 2026). NT = Near Threatened, and VU = Vulnerable.

Family	*Species*	Threat Status (SANBI)
Aizoaceae	*Khadia beswickii*	VU
Cleomaceae	*Cleome conrathii*	NT
Crassulaceae	*Adromischus umbraticola subsp. umbraticola*	NT

The list of plant species recorded is not exhaustive (can be provided upon request), and additional surveys conducted during different phenological periods, those not yet covered, could potentially reveal up to 20% more flora species in the PAOI. Nevertheless, the floristic analysis completed thus far is considered a reliable representation of the local flora for the PAOI.

Table 3-8 The flora species observed within the PAOI

Family	Scientific Name	Ecology	Threat Status (SANBI)	Notes
Amaryllidaceae	*Boophone disticha*	Indigenous	LC	
Amaryllidaceae	*Scadoxus puniceus*	Indigenous	LC	Provincially Protected (Schedule 11)
Anacampserotaceae	*Anacampseros subnuda subsp. subnuda*	Indigenous	LC	
Anacardiaceae	*Searsia leptodactyla*	Indigenous	LC	
Anacardiaceae	*Searsia magalismontana subsp. magalismontana*	Indigenous	LC	
Anacardiaceae	*Searsia pyroides var. pyroides*	Indigenous	LC	
Apocynaceae	*Cryptolepis oblongifolia*	Indigenous	LC	

Family	Scientific Name	Ecology	Threat Status (SANBI)	Notes
Apocynaceae	*Gomphocarpus tomentosus subsp. tomentosus*	Indigenous	LC	
Apocynaceae	*Pentarrhinum insipidum*	Indigenous	LC	
Asparagaceae	*Asparagus angusticladus*	Indigenous	LC	
Asparagaceae	*Asparagus laricinus*	Indigenous	LC	
Asparagaceae	*Asparagus suaveolens*	Indigenous	LC	
Asphodelaceae	*Aloe davyana*	Indigenous; Endemic	LC	
Asteraceae	*Berkheya radula*	Indigenous	LC	
Asteraceae	*Brachylaena rotundata*	Indigenous	LC	
Asteraceae	*Cosmos bipinnatus*	Not indigenous; Naturalised	NE	
Asteraceae	*Felicia muricata subsp. muricata*	Indigenous	LC	
Asteraceae	*Geigeria burkei subsp. burkei*	Indigenous	LC	
Asteraceae	*Gerbera piloselloides*	Indigenous	LC	
Asteraceae	*Helichrysum aureonitens*	Indigenous	LC	
Asteraceae	*Helichrysum chionosphaerum*	Indigenous	LC	
Asteraceae	*Helichrysum kraussii*	Indigenous	LC	
Asteraceae	*Helichrysum nudifolium var. nudifolium*	Indigenous	LC	
Asteraceae	*Helichrysum rugulosum*	Indigenous	LC	
Asteraceae	*Helichrysum setosum*	Indigenous	LC	
Asteraceae	*Hilliardiella aristata*	Indigenous	LC	
Asteraceae	*Hilliardiella elaeagnoides*	Indigenous	LC	
Asteraceae	*Lopholaena coriifolia*	Indigenous	LC	
Asteraceae	*Nidorella resedifolia subsp. resedifolia*	Indigenous	LC	
Asteraceae	*Pseudognaphalium oligandrum*	Indigenous	LC	
Asteraceae	*Senecio anomalochrous*	Indigenous; Endemic	LC	
Asteraceae	*Senecio coronatus*	Indigenous	LC	
Asteraceae	*Senecio venosus*	Indigenous	LC	
Asteraceae	*Ursinia nana subsp. nana*	Indigenous	LC	
Asteraceae	*Zinnia peruviana*	Not indigenous; Naturalised; Invasive	NE	
Bignoniaceae	*Jacaranda mimosifolia*	Not indigenous; Naturalised; Invasive	NE	
Boraginaceae	*Ehretia rigida subsp. nervifolia*	Indigenous	LC	
Cactaceae	*Opuntia ficus-indica*	Not indigenous; Cultivated; Naturalised; Invasive	NE	
Cannabaceae	*Celtis africana*	Indigenous	LC	
Celastraceae	*Gymnosporia buxifolia*	Indigenous	LC	
Chrysobalanaceae	*Parinari capensis subsp. capensis*	Indigenous	LC	
Combretaceae	*Combretum molle*	Indigenous	LC	
Convolvulaceae	*Ipomoea ommanneyi*	Indigenous	LC	

Family	Scientific Name	Ecology	Threat Status (SANBI)	Notes
Convolvulaceae	*Ipomoea purpurea*	Not indigenous; Naturalised; Invasive	NE	
Crassulaceae	*Crassula setulosa*	Indigenous	LC	
Crassulaceae	*Kalanchoe thyrsiflora*	Indigenous	LC	
Dipsacaceae	*Cephalaria zeyheriana*	Indigenous	LC	
Ebenaceae	*Diospyros lycioides subsp. lycioides*	Indigenous	LC	
Euphorbiaceae	*Ricinus communis*	Not indigenous; Naturalised; Invasive	NE	
Fabaceae	*Acacia melanoxylon*	Not indigenous; Naturalised; Invasive	NE	
Fabaceae	*Mundulea sericea subsp. sericea*	Indigenous	LC	
Fabaceae	*Senegalia caffra*	Indigenous	LC	
Fabaceae	*Vachellia karroo*	Indigenous	LC	
Fabaceae	*Vachellia robusta subsp. robusta*	Indigenous	LC	
Fagaceae	*Quercus spp.*	Not indigenous	NE	
Hyacinthaceae	*Ledebouria luteola*	Indigenous	LC	
Hypoxidaceae	*Hypoxis rigidula*	Indigenous	LC	
Iridaceae	*Gladiolus crassifolius*	Indigenous	LC	Provincially Protected (Schedule 11)
Juncaceae	*Juncus rigidus*	Indigenous	LC	
Lamiaceae	*Acrotome hispida*	Indigenous	LC	
Lamiaceae	*Leonotis ocymifolia*	Indigenous	LC	
Lamiaceae	*Salvia tiliifolia*	Not indigenous; Naturalised; Invasive	NE	
Malvaceae	*Pavonia burchellii*	Indigenous	LC	
Malvaceae	*Triumfetta sonderi*	Indigenous; Endemic	LC	
Myrtaceae	*Eucalyptus camaldulensis*	Not indigenous; Cultivated; Naturalised; Invasive	NE	
Oleaceae	*Olea europaea subsp. cuspidata*	Indigenous	LC	
Orobanchaceae	*Alectra sessiliflora*	Indigenous	LC	
Oxalidaceae	*Oxalis corniculata*	Not indigenous; Naturalised; Invasive	NE	
Pittosporaceae	*Pittosporum viridiflorum*	Indigenous	LC	
Poaceae	*Alloteropsis semialata subsp. eckloniana*	Indigenous	LC	
Poaceae	*Arundo donax*	Not indigenous; Naturalised; Invasive	NE	
Poaceae	*Cenchrus setaceus*	Not indigenous; Cultivated; Naturalised; Invasive	NE	
Poaceae	*Cortaderia selloana*	Not indigenous; Naturalised; Invasive	NE	
Poaceae	*Cymbopogon caesius*	Indigenous	LC	
Poaceae	*Cynodon dactylon*	Indigenous	LC	
Poaceae	*Eragrostis gummiflua*	Indigenous	LC	
Poaceae	*Eragrostis racemosa*	Indigenous	LC	
Poaceae	*Hyparrhenia hirta*	Indigenous	LC	

Family	Scientific Name	Ecology	Threat Status (SANBI)	Notes
Poaceae	*Imperata cylindrica*	Indigenous	LC	
Poaceae	*Loudetia simplex*	Indigenous	LC	
Poaceae	*Monocymbium ceresiiforme*	Indigenous	LC	
Poaceae	*Panicum natalense*	Indigenous	LC	
Poaceae	*Perotis patens*	Indigenous	LC	
Poaceae	*Phragmites australis*	Indigenous	LC	
Poaceae	*Pogonarthria squarrosa*	Indigenous	LC	
Poaceae	*Schizachyrium sanguineum*	Indigenous	LC	
Poaceae	*Sporobolus africanus*	Indigenous	LC	
Poaceae	*Sporobolus pectinatus*	Indigenous; Endemic	LC	
Proteaceae	*Protea caffra subsp. caffra*	Indigenous	LC	Provincially Protected (Schedule 11)
Pteridaceae	*Cheilanthes hirta var. hirta*	Indigenous	LC	Provincially Protected (Schedule 11)
Pteridaceae	*Cheilanthes involuta var. obscura*	Indigenous	LC	Provincially Protected (Schedule 11)
Pteridaceae	*Cheilanthes viridis var. viridis*	Indigenous	LC	Provincially Protected (Schedule 11)
Pteridaceae	*Pellaea calomelanos var. calomelanos*	Indigenous	LC	Provincially Protected (Schedule 11)
Ranunculaceae	*Clematis brachiata*	Indigenous	LC	
Rhamnaceae	*Ziziphus mucronata subsp. mucronata*	Indigenous	LC	
Rubiaceae	*Vangueria infausta subsp. infausta*	Indigenous	LC	
Rubiaceae	*Vangueria parvifolia*	Indigenous	LC	
Rutaceae	*Zanthoxylum capense*	Indigenous	LC	
Salicaceae	*Populus alba*	Not indigenous; Naturalised; Invasive	NE	
Salicaceae	*Salix mucronata subsp. mucronata*	Indigenous	LC	
Simaroubaceae	*Ailanthus altissima*	Not indigenous; Naturalised; Invasive	NE	
Solanaceae	*Solanum mauritianum*	Not indigenous; Naturalised; Invasive	NE	
Solanaceae	*Solanum sisymbriifolium*	Not indigenous; Naturalised; Invasive	NE	
Thymelaeaceae	*Lasiosiphon canoargenteus*	Indigenous; Endemic	LC	
Verbenaceae	*Verbena bonariensis*	Not indigenous; Naturalised; Invasive	NE	
Verbenaceae	*Verbena brasiliensis*	Not indigenous; Naturalised; Invasive	NE	



Figure 3-15 Some of the observed indigenous species. A) Anacampseros subnuda, B) Searsia magalismontana, C) Cussonia paniculata, D) Aloe davyana, E) Protea caffra, and F) Crassula setulosa.

3.2.1.2 Protected Flora

Seven (7) species of provincially protected plants were recorded; namely *Scadoxus puniceus, Gladiolus crassifolius, Protea caffra* subsp. *caffra, Cheilanthes hirta* var. *hirta, Cheilanthes involuta* var. *obscura, Cheilanthes viridis* var. *viridis,* and *Pellaea calomelanos* var. *calomelanos.* These species can be seen in Figure 3-16. They are protected under Schedule 11 of the Transvaal Nature Conservation Ordinance No. 12 of 1983.

According to the list of protected species under the Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Gauteng Department of the Environment (GDE). Due to suitable natural habitat present on site, more protected species are expected for the PAOI and a wet season (October to March) flora walkdown of the development footprint must be conducted prior to development activities and any protected species identified on site marked and relocated to a nearby area of similar habitat which will not be impacted by the project activities.



Figure 3-16 The protected flora species. A) – Pellaea calomelanos, B) Protea caffra, C) Scadoxus puniceus, D) Cheilanthes viridis, E) Cheilanthes hirta, F) Cheilanthes involuta, G) Gladiolus crassifolius.

3.2.1.3 Alien Invasive Plants

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

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 metres of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.

- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.

- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.

- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing;

- Take steps to manage the listed invasive species in compliance with:

- Section 75 of the Act;

- The relevant invasive species management programme developed in terms of regulation 4; and

- Any directive issued in terms of section 73(3) of the Act.

Twenty (20) AIP species were recorded for the PAOI, including thirteen (13) NEMBA Category 1b species and three (3) NEMBA Category 2 species (Table 3-9 and Figure 3-17). These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003. NEMBA category 1b AIP species must be controlled by implementing an AIP Management Programme, in compliance with section 75 of NEMBA, as stated above.

Table 3-9 Table presenting the alien and invasive species recorded for the PAOI

Family	Scientific Name	Alien Category
Asteraceae	*Cosmos bipinnatus*	Naturalised
Asteraceae	*Zinnia peruviana*	Naturalised
Bignoniaceae	*Jacaranda mimosifolia*	NEMBA Category 1b in Gauteng (not listed in urban areas)
Cactaceae	*Opuntia ficus-indica*	NEMBA Category 1b
Convolvulaceae	*Ipomoea purpurea*	NEMBA Category 1b
Euphorbiaceae	*Ricinus communis*	NEMBA Category 2
Fabaceae	*Acacia melanoxylon*	NEMBA Category 2
Fagaceae	*Quercus spp.*	Naturalised
Lamiaceae	*Salvia tiliifolia*	NEMBA Category 1b

Family	Scientific Name	Alien Category
Myrtaceae	*Eucalyptus camaldulensis*	NEMBA Category 1b within riparian areas, protected areas or listed ecosystems
Oxalidaceae	*Oxalis corniculata*	Naturalised
Poaceae	*Arundo donax*	NEMBA Category 1b
Poaceae	*Cenchrus setaceus*	NEMBA Category 1b
Poaceae	*Cortaderia selloana*	NEMBA Category 1b
Salicaceae	*Populus alba*	NEMBA Category 2
Simaroubaceae	*Ailanthus altissima*	NEMBA Category 1b
Solanaceae	*Solanum mauritianum*	NEMBA Category 1b
Solanaceae	*Solanum sisymbriifolium*	NEMBA Category 1b
Verbenaceae	*Verbena bonariensis*	NEMBA Category 1b
Verbenaceae	*Verbena brasiliensis*	NEMBA Category 1b



Figure 3-17 Some of the alien and invasive flora species observed. A) Phytolacca octandra, B) Solanum sisymbriifolium, C) Lantana camara, and D) Cenchrus setaceus.

3.2.2 Fauna Assessment

Mammal, herpetofauna and avifauna observations and recordings fall under this section.

3.2.2.1 Mammals

Eight (8) mammal species were recorded within the PAOI during the field survey (Table 3-10 and Figure 3-18). Additional common mammal species are expected for the PAOI. No fauna SCC were recorded.

Table 3-10 Table presenting the mammal species recorded for the PAOI during the field survey

Family	Scientific Name	Common Name	Regional Threat Status (SANBI)	Global Threat Status (IUCN)	Notes
Bathyergidae	*Cryptomys hottentotus pretoriae*	Highveld Mole-Rat	LC	LC	

Family	Scientific Name	Common Name	Regional Threat Status (SANBI)	Global Threat Status (IUCN)	Notes
Bovidae	*Raphicerus campestris*	Steenbok	LC	LC	Provincially Protected (Schedule 2)
Canidae	*Lupulella mesomelas*	Black-backed Jackal	LC	LC	
Cercopithecidae	*Chlorocebus pygerythrus*	Vervet Monkey	LC	LC	
Herpestidae	*Cynictis penicillata*	Yellow Mongoose	LC	LC	
Herpestidae	*Herpestes sanguineus*	Common Slender Mongoose	LC	LC	
Hystricidae	*Hystrix africaeaustralis*	Cape Porcupine	LC	LC	
Sciuridae	*Xerus inauris*	South African Ground Squirrel	LC	LC	

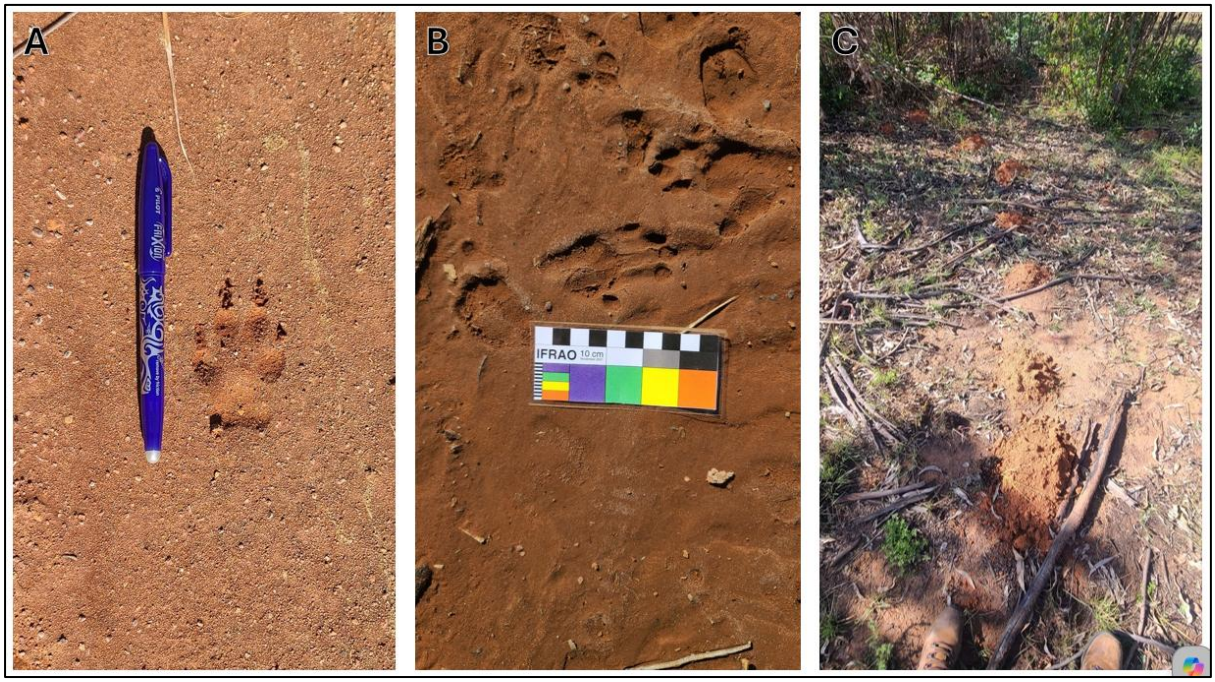


Figure 3-18 Some of the fauna species observed. A) Lupulella mesomelas, B) Chlorocebus pygerythrus, and C) Cryptomys hottentotus pretoriae.

3.2.2.2 Herpetofauna

No reptile or amphibian species were recorded for the PAOI. This is attributed to the secretive nature of these species and common reptile and amphibian species are expected.

3.2.2.3 Avifauna

Thirty (30) species of bird were recorded for the PAOI during the survey based on either direct observation, vocalisations, or the presence of visual tracks and signs (Table 3-11). One (1) SCC was observed, indicated in red text. It should be noted that *Anas undulata* (NT regionally) was observed nearby (TBC, January 2026).

Table 3-11 Table presenting the avifauna species recorded for the PAOI during the field survey

Family	Scientific Name	Common Name	Regional Threat Status (SANBI)	Global Threat Status (IUCN)
Accipitridae	*Elanus caeruleus*	Black-winged Kite	NT	LC

Alaudidae	*Certhilauda semitorquata*	Eastern Long-billed Lark	LC	LC
Anatidae	*Alopochen aegyptiaca*	Egyptian Goose	LC	LC
Apodidae	*Apus barbatus*	African Black Swift	LC	LC
Ardeidae	*Ardea melanocephala*	Black-headed Heron	LC	LC
Charadriidae	*Vanellus armatus*	Blacksmith Lapwing	LC	LC
Coliidae	*Urocolius indicus*	Red-faced Mousebird	LC	LC
Columbidae	*Columba guinea*	Speckled Pigeon	LC	LC
Columbidae	*Spilopelia senegalensis*	Laughing Dove	LC	LC
Columbidae	*Streptopelia capicola*	Ring-necked Dove	LC	LC
Columbidae	*Streptopelia semitorquata*	Red-eyed Dove	LC	LC
Corvidae	*Corvus albus*	Pied Crow	LC	LC
Laniidae	*Lanius collaris*	Southern Fiscal	LC	LC
Lybiidae	*Lybius torquatus*	Black-collared Barbet	LC	LC
Malaconotidae	*Laniarius ferrugineus*	Southern Boubou	LC	LC
Motacillidae	*Macronyx capensis*	Cape Longclaw	LC	LC
Motacillidae	*Motacilla capensis*	Cape Wagtail	LC	LC
Muscicapidae	*Cossypha caffra*	Cape Robin-chat	LC	LC
Muscicapidae	*Oenanthe familiaris*	Familiar Chat	LC	LC
Muscicapidae	*Saxicola torquatus*	African Stonechat	LC	LC
Numididae	*Numida meleagris*	Helmeted Guineafowl	LC	LC
Phoeniculidae	*Phoeniculus purpureus*	Green Wood Hoopoe	LC	LC
Ploceidae	*Plocepasser mahali*	White-browed Sparrow-weaver	LC	LC
Ploceidae	*Ploceus cucullatus*	Village Weaver	LC	LC
Pycnonotidae	*Pycnonotus tricolor*	Dark-capped Bulbul	LC	NE
Rallidae	*Fulica cristata*	Red-knobbed Coot	LC	LC
Rallidae	*Gallinula chloropus*	Common Moorhen	LC	LC
Sturnidae	*Acridotheres tristis*	Common Myna	LC	LC
Sturnidae	*Lamprotornis nitens*	Cape Starling	LC	LC
Threskiornithidae	*Bostrychia hagedash*	Hadada Ibis	LC	LC

3.3 Habitats

The following sections discuss the results from the field survey that was conducted for the proposed project. Habitats observed are described in Table 3-12 and shown in Figure 3-19. Evidence of historical clearing in certain areas can be seen in Figure 3-20.

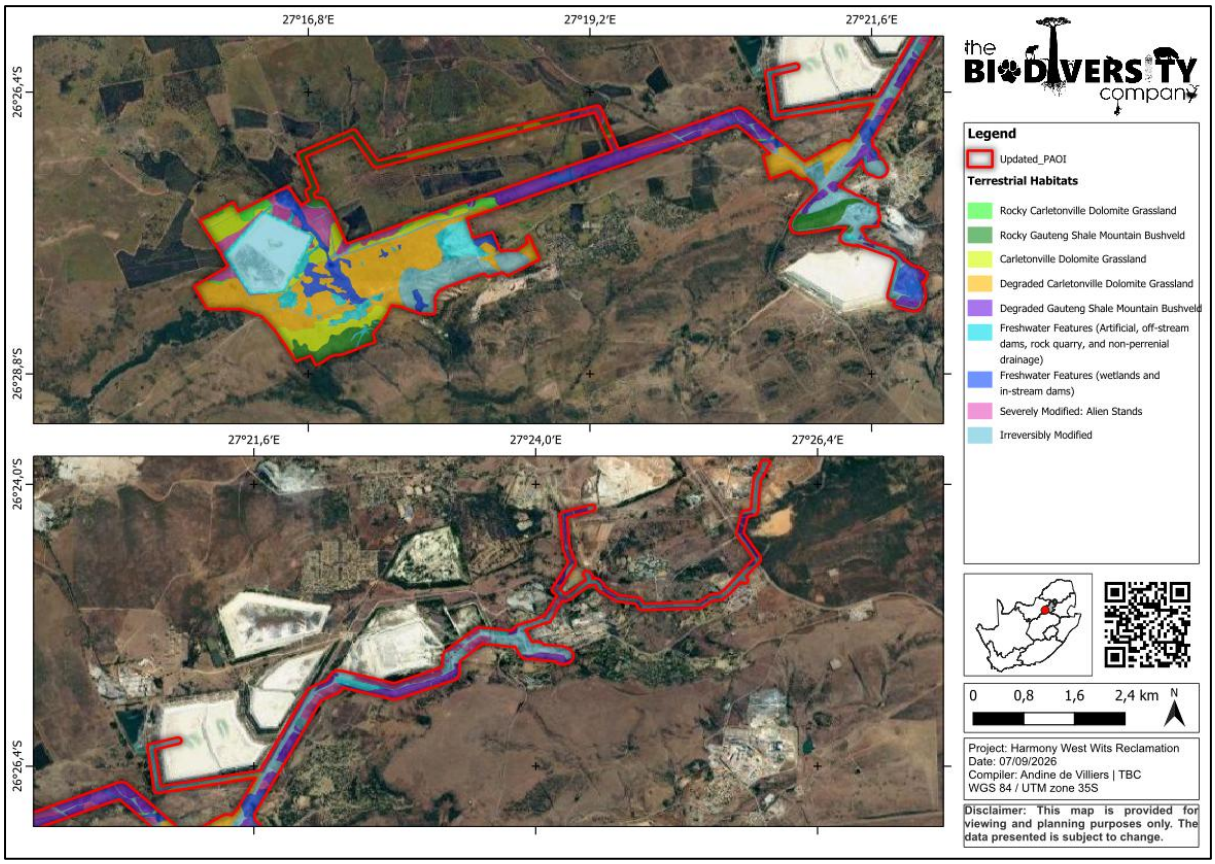


Figure 3-19 Habitats identified within the PAOI.



Figure 3-20 Evidence of historical clearing in certain portions (2013)

Table 3-12 Sensitivity summary of the habitat types delineated within the PAOI.

Habitat	Description and Condition	Ecosystem Processes and Services
Rocky Gauteng Shale Mountain Bushveld **91,5 ha**	This habitat is characterized by a high proportion of exposed surface rock and supports a semi-open thicket, dominated by a variety of woody species including *Senegalia afra, Searsia leptodictya, Searsia magalismontanum, Protea caffra caffra, Vachellia karoo* and *Vangueria infausta*. Other indigenous species observed within this habitat include *Macledium zeyheri, Aloe davyana, Gymnosporia buxifolia,* and *Cussonia paniculata.* No flora SCC were observed, but *Adromischus umbraticola* subsp. u*mbraticola* is expected and was observed nearby. Moreover, fauna SCC, such as *Crocidura maquassiensis,* could occur in this habitat. This habitat is representative of the Gauteng Shale Mountain Bushveld. This habitat overlaps with CBA 2 and ESA 1, and importantly, with a Class 1 Gauteng Ridge. Current impacts are limited but include edge effects from nearby activities and small-scale illegal mining and associated ingress. Fences and historical prospecting evidence are also present. Minimal AIPs exist.	This habitat provides ecological functions by offering structurally diverse habitat and refugia for multiple faunal species, while supporting pollination and seed dispersal through its flowering forbs and shrubs. The extensive rock cover allows for a suitable microclimate to be present for the survival of A. umbraticola subsp. umbraticola, providing neighboring ridge habitat with plant recruitment. This habitat provides erosion control and nutrient cycling. Carbon sequestration and nectar resources for pollinators is also provided.




26°26'57.31"S 27°17'0.81"E




26°28'34.04"S 27°17'9.62"E

Degraded Gauteng Shale Mountain Bushveld **171,0 ha**		This habitat is comprised of areas that have undergone constant degradation, in some cases land clearance. The plant species abundance and structure has changed as a result of this degradation, leaving some areas with an increase grass and decrease in tree cover in comparison to the natural bushveld areas. Indigenous species observed within this habitat include *Vachellia karoo, Hyparrhenia hirta, Ehretia rigida* and *Senegalia afra*. The floral species richness within this habitat type is diminished due to anthropogenic influences. Current impacts include AIP invasion, vehicle ingress, and edge effects from neighbouring ongoing activities. Existing infrastructure, such as pipelines and powerlines, exist here. AIP species observed within this habitat include *Tagetes minuta, Acacia melanoxylon, Lantana camara* and *Solanum mauritianum*. No floral SCC were observed within this habitat and none are expected. Fauna SCC could occur. Overlaps with ESA 1. Some areas overlap with Class 1 and Class 2 Gauteng Ridges.	The ecosystem functioning and services provided by this habitat has been severely diminished due to anthropogenic influences. This habitat still provides areas for faunal species to forage and still acts as a movement corridor for various faunal species.




26°27'54.54"S 27°21'59.31"E




26°24'28.48"S 27°24'14.81"E

Irreversibly Modified **365,6 ha**	Irreversibly Modified habitats, in this instance, include, roads, houses, lawns/gardens, and infrastructure associated with the mining operations (TSF and processing plants). They are largely ecologically dysfunctional and have plant species that are characteristic of disturbance. Moreover, multiple AIPs occur within this habitat. No SCC were observed and none are expected.	The ecosystem functions and services of this habitat have been severely compromised due to modification. However, it still offers some benefits, particularly by supporting the dispersal of wind-borne indigenous plant seeds, which aids in plant recruitment in surrounding areas.


26°25'22.36"S 27°24'0.67"E


26°27'24.28"S 27°21'28.83"E


26°24'6.54"S 27°25'52.49"E


26°27'45.79"S 27°18'7.86"E

Severely Modified: Alien Stand **120,0 ha**	Severely Modified habitats, in this instance, consist of dense AIP stands, especially characterised by *Eucalyptus camaldulensis* stands in the western section of the PAOI, and mixed-species infestations in the eastern section. No SCC were observed. No flora SCC are expected. Fauna SCC (especially avifauna) could forage in the habitat.	The ecosystem functions have been greatly reduced from natural conditions; however, the vegetation that remains in this habitat may provide foraging, movement, and refuge opportunity to fauna species, as well as aiding in ground stabilisation and erosion prevention.


26°27'13.31"S 27°16'40.79"E




26°25'25.52"S 27°23'19.59"E



Degraded Carletonville Dolomite Grassland **248,9 ha**	This habitat is representative of Carletonville Dolomite Grassland, but in a degraded state. Overgrazing and mismanagement have led to the grass layer being reduced to short tufts with sparse vegetation in between. *Seriphium vulgaris* has invaded these areas due to overgrazing. Indigenous species observed within this habitat include *Helichrysum nudifolium, Hyparrhenia hirta, Felicia muricata,* and *Helichrysum setosum.* The floral species richness within this habitat type is diminished due to anthropogenic influences. Current impacts include overgrazing, vehicle ingress and edge effects from the surrounding anthropogenic activities. This habitat is no longer representative of the Carletonville Dolomite Grassland vegetation type. However, it must be noted that this habitat overlaps with CBA 2 and ESA 1 according to the provincial conservation plan. No floral SCC were observed within this habitat, and none are expected. Fauna SCC could occur within the area.	The ecosystem functioning and services of this habitat has been hindered due to the anthropogenic disturbances. This disturbed habitat still however provides important ecosystem services, including soil stabilisation through remaining grass and shrub cover, which helps reduce wind and water erosion. The habitat offers movement corridors for a variety of fauna.
	 26°27'31.05"S 27°17'46.65"E  26°27'55.18"S 27°16'48.66"E	
Carletonville Dolomite Grassland **103,9 ha**	Even though the vegetation map has classed the whole PAOI as Gauteng Shale Mountain Bushveld, certain portions of the PAOI were identified as Carletonville Dolomite Grassland based on plant species characteristic of that vegetation type and landscape features. The vegetation type consists of undulating plains with chert ridges (rocky outcrops), with a species-rich composition. In this habitat, rocky features are absent. Dominant species observed include *Aristida congesta, Cynodon dactylon, Eragrostis racemosa, Heteropogon contortus,* and *Sporobolus pectinatus.* Moreover, *Helichrysum chionosphaerum, Parinari capensis,* and *Hypoxis hemerocallidea* were observed.	This habitat supports primary production, soil stabilization, nutrient cycling, and water regulation, enhanced by its substantial vegetation cover. This habitat provides ecological functions by offering structurally diverse habitat and refugia for multiple faunal species, while supporting pollination and seed dispersal through its flowering forbs and shrubs. The mix of grasses and shrubs provides forage, and plant clumps offer shade and shelter, helping small mammals, reptiles, and ground-dwelling birds survive.

Current impacts to this habitat type include grazing, roads, vehicle ingress and other existing linear infrastructure (powerlines and pipelines).

The main determining factor between the Rocky Carletonville Dolomite Grassland and the Carletonville Dolomite Grassland is the presence of rocky outcrops. Moreover, the Degraded Carletonville Dolomite Grassland differs in the level of grazing pressure and historical (2013) disturbance.

No flora SCC were observed and none are expected. No fauna SCC were observed, but some could use the area for foraging and movement.

This habitat overlaps with CBA 2 and ESA 1.





26°27'36.02"S 27°16'5.34"E

	Even though the vegetation map has classed the whole PAOI as Gauteng Shale Mountain Bushveld, certain portions of the PAOI were identified as Carletonville Dolomite Grassland based on plant species characteristic of that vegetation type and landscape features. The vegetation type consists of undulating plains with chert ridges (rocky outcrops), with a species-rich composition. In this habitat, rocky features are present. Dominant species observed include *Aristida congesta, Cynodon dactylon, Eragrostis racemosa, Heteropogon contortus,* and *Sporobolus pectinatus.* Moreover, *Helichrysum chionosphaerum, Parinari capensis,* and *Hypoxis hemerocallidea* were observed.	This habitat supports primary production, soil stabilization, nutrient cycling, and water regulation, enhanced by its substantial vegetation cover. This habitat provides ecological functions by offering structurally diverse habitat and refugia for multiple faunal species, while supporting pollination and seed dispersal through its flowering forbs and shrubs.
Rocky Carletonville Dolomite Grassland **21,9 ha**	Current impacts to this habitat type include grazing, roads, vehicle ingress and other existing linear infrastructure (powerlines and pipelines). The main determining factor between the Rocky Carletonville Dolomite Grassland and the Carletonville Dolomite Grassland is the presence of rocky outcrops. Moreover, the Degraded Carletonville Dolomite Grassland differs in the level of grazing pressure and historical (2013) disturbance. No flora SCC were observed, however, three are expected (based on desktop data, suitable habitat, and confirmed nearby occurrence), namely *Khadia beswickii, Cleome conrathii* and *Adromischus umbraticola* subsp. *umbraticola*). No fauna SCC were observed, but some could use the area for foraging and movement. This habitat overlaps with ESA 1.	The mix of grasses and shrubs provides forage, and plant clumps offer shade and shelter, helping small mammals, reptiles, and ground-dwelling birds survive. The potential presence of SCC and protected plant species further underscores this habitat's importance in maintaining ecosystem functioning. It also facilitates the recruitment and dispersal of SCC into surrounding areas, supporting the persistence of these species and strengthening their population numbers.



26°27'27.74"S 27°16'19.14"E

Freshwater Features: (Split into)	This habitat type consists of wet portions of land as delineated by the aquatic specialists. Additional information regarding this habitat unit may be found in the accompanying Aquatics Report (TBC, 2026).	
Wetlands and in-stream dams 101,3 ha **and** **Artificial, off-stream dams, rock quarry, and non-perennial drainage 110,3 ha**	These features consist of wetlands, in-stream dams, off-stream dams, a rocky quarry, non-perennial drainage features, and artificial features. The wetlands and in-stream dams are predominantly more natural, and as such, provides potential foraging habitat (and free water) for indigenous fauna and potential SCC. The off-stream dams, rock quarry, non-perennial drainage features and artificial features provide limited potential habitat.	This habitat provides water to faunal species and aids in water purification, flood regulation, groundwater recharge, and erosion control.



26°27'43.48"S 27°18'3.08"E



26°28'1.77"S 27°21'59.60"E

3.4 Site Ecological Importance

The different habitat types within the PAOI were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCCs and their ecosystem processes. As per the terms of reference for the project, GIS sensitivity maps are required in order to identify sensitive features in terms of the relevant specialist discipline/s within the PAOI. Based on the criteria provided in Appendix B of this report, all habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. (Table 3-13). The SEI of the PAOI is illustrated in Figure 3-21.

Table 3-13 Summary of habitat types delineated within field assessment area.

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance[2]	Receptor Resilience	Site Ecological Importance[3]
Degraded Gauteng Shale Mountain Bushveld	**Low**	**Low**	**Low**	**Medium**	**Low**
	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC	Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality,	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Degraded Carletonville Dolomite Grassland	**Low**	**Low**	**Low**	**Medium**	**Low**
	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.	Several minor and major current negative ecological impacts.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Carletonville Dolomite Grassland	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**
	> 50% of receptor contains natural habitat with potential to support SCC.	Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Rocky Gauteng Shale Mountain Bushveld	**Medium**	**Medium**	**Medium**	**Low**	**High**
	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species > 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to

[2] Considered as the 'sensitivity'

[3] Considered as the sensitivity in relation to the project component.

					limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Rocky Carletonville Dolomite Grassland	**High** Confirmed or highly likely occurrence of VU species that has a global EOO of > 10 km^2	**Medium** Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**Low** Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore	**High** Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Freshwater Features: Wetlands and in-stream dams	**Medium** > 50% of receptor contains natural habitat with potential to support SCC.	**Medium** Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**Low** Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore	**High** Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for

					high impact activities.
Freshwater Features: Artificial, off-stream dams, rock quarry, and non-perennial drainage	**Low**	**Medium**	**Low**	**Medium**	**Low**
	< 50% of receptor contains natural habitat with potential to support SCC.	Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Irreversibly Modified	**Low**	**Very Low**	**Very Low**	**High**	**Very Low**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Several major current negative ecological impacts.		Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Severely Modified: Alien Stands	**Low**	**Low**	**Low**	**Medium**	**Low**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Several minor and major current negative ecological impacts.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.

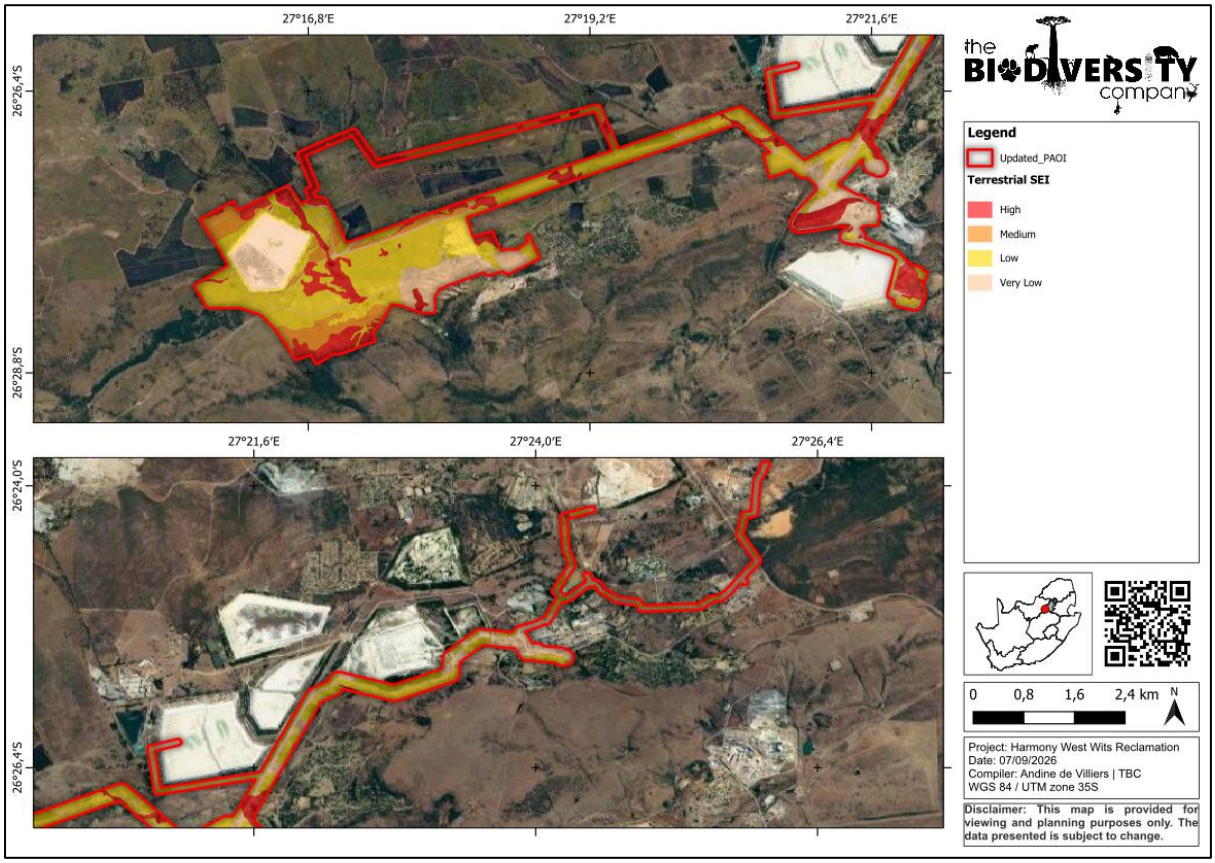


Figure 3-21 Site Ecological Importance of the PAOI

3.4.1 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-12. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

Table 3-14 Summary of the screening tool vs specialist assigned sensitivities

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	Rocky Gauteng Shale Mountain Bushveld; Rocky Carletonville Dolomite Grassland; Carletonville Dolomite Grassland; Freshwater Features: Wetlands and in-stream dams	High	Validated – One (1) avifauna SCC observed. No mammal or herpetofauna SCC observed; however, these habitats provide suitable habitat to support fauna SCC for refuge, foraging or movement.
		Severely Modified; Degraded Gauteng Shale Mountain Bushveld; Degraded Carletonville Dolomite Grassland Freshwater Features: Artificial, off-stream dams, rock quarry, and non-perennial drainage	Low	Disputed – These habitats are degraded and modified. No fauna SCC were observed and none are expected to be resident. Some may occasionally move through the area.
		Irreversibly Modified	Very Low	Disputed – No natural remaining. No fauna SCC were observed or are expected.
Plant Theme	Medium	Rocky Gauteng Shale Mountain Bushveld; Rocky Carletonville Dolomite Grassland	High	Disputed – Multiple flora SCC have a high likelihood of occurrence (confirmed nearby).

		Freshwater Features: Wetlands and in-stream dams; Carletonville Dolomite Grassland	**Medium**	Validated – No SCC were identified, but some suitable habitat is present.
		Freshwater Features: Artificial, off-stream dams, rock quarry, and non-perennial drainage Degraded Carletonville Dolomite Grassland; Degraded Gauteng Shale Mountain Bushveld; Severely Modified: Alein Stands	**Low**	Disputed – No SCC were observed, and none are expected.
		Irreversibly Modified	**Very Low**	Disputed – No flora SCC were observed and none are expected.
Terrestrial Theme	**Very High**	Degraded Gauteng Shale Mountain Bushveld	**Low**	Disputed - Habitat exists in a degraded state, with reduced function. Overlaps with ESA 1 and Gauteng Ridges Class 1 and 2. The ecosystem function has been greatly reduced due to the present disturbances.
		Degraded Carletonville Dolomite Grassland	**Low**	Disputed - Habitat exists in a degraded state, with reduced function. Overlaps with CBA 2 and ESA 1. Still provides some ecosystem functions.
		Carletonville Dolomite Grassland	**Medium**	Disputed – Habitat is largely functional, although fragmented. Overlaps with CBA 2 and ESA 1. Ecosystem provides habitat for indigenous fauna and flora.
		Irreversibly Modified	**Very Low**	Disputed - Habitat exists in a transformed state with little to no function. Habitat will not recover without human intervention and will continue to degrade over time without rehabilitation.
		Severely Modified: Alien Stands	**Low**	Disputed – Habitat is largely modified due to widespread domination by AIPs. Still provided suitable habitat for indigenous fauna.
		Rocky Gauteng Shale Mountain Bushveld	**High**	Disputed – Exists in a natural state, providing important ecological functions. Overlaps with CBA 2, ESA 1, and Class 1 Gauteng Ridges.
		Rocky Carletonville Dolomite Grassland	**High**	Disputed – Exists in a natural state, providing important ecological functions and habitat for potential flora SCC. Overlaps with ESA 1.
		Freshwater Features: Artificial, off-stream dams, rock quarry, and non-perennial drainage	**Low**	Disputed – Artificial and temporary in nature, but provides some habitat and potential free water for indigenous fauna.
		Freshwater Features: Wetlands and in-stream dams	**High**	Disputed – Exists in a natural state, providing important ecological functions.

4 Impact Risk Assessment

4.1 Biodiversity Risk Assessment

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

Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the PAOI. The relevant impacts associated with the proposed construction and operation of the development were then subjected to a prescribed impact assessment method. Impacts were assessed in terms of the construction and operational phases. The operational phase refers to that phase of the project where the construction has been completed. It should be noted that the impacts described are not exhaustive, and more impacts may be identified at a later stage. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis.

Impacts were assessed for the following activities:

- Construction Phase/ Operational Phase; and
- Closure Phase.

4.2 Impact Assessment Methodology

An impact assessment methodology was provided by EIMS to determine the environmental risk associated with various aspects related to the proposed activities. This impact assessment takes the following components into consideration.

- The nature of the associated impact (positive or negative);
- The extent of the proposed activities;
- The duration of the proposed activities;
- The magnitude of the effects caused by the proposed activities;
- The reversibility of associated impacts; and
- The probability of relevant aspects affecting sensitive receptors.

Each one of the above-mentioned components are given a rating, which cumulatively provides the specialist with a pre-mitigation environmental risk rating. These components are then scored again taking into consideration mitigating factors. The cumulative impact and irreplaceable loss to sensitive receptors are then scored to ultimately indicate a “Priority Factor” score.

The purpose of the impact assessment is to:

- Assess impacts of proposed activities on biodiversity of the proposed development area;
- Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically species of conservation concern; and
- Identify practical, implementable mitigation measures to reduce the significance of proposed activities on biodiversity.

It is important to note that the ratings applied within the risk assessment model, considered impacts to open space or natural habitats within the development area and not for areas already transformed.

4.3 Present Impacts to Biodiversity

Considering the anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the PAOI. These include:

- Existing mining and associated infrastructure (including TSF's);
- Edge effects associated with mining activities;
- Human and vehicle ingress;
- Illegal small-scale mining (Zama Zama);
- Invasions by alien and invasive plants;
- Erosion;
- Grazing by livestock; and
- Linear infrastructure (roads, fences, pipelines, and powerlines).



Figure 4-1 ***Some of the current impacts within the PAOI. A, D and E) Mining and associated infrastructure, B) Roads and powerlines, C) Alien and invasive flora species, and F) Pipelines.***

4.4 Terrestrial Impact Assessment

4.4.1 Irreplaceable Loss

The proposed activities will be conducted over the numerous habitats. These areas encompass indigenous vegetation that may be considered largely functional in nature and as such any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- CBA 2 and ESA 1;
- Gauteng Ridges (Class 1 and 2);
- Freshwater Features;
- Potential fauna and flora SCC;
- Potential protected species; and
- Indigenous vegetation.

4.4.2 Identification of Additional Potential Impacts

The following potential activities and potential impacts are expected. A summary of the potential impacts during the construction and operational phases of the proposed activity are presented in Table 4-1.

Table 4-1 Summary of potential impacts to biodiversity associated with the proposed activity

Main Impact	Project activities that can cause loss of habitat	Secondary impacts anticipated
1. Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation	Displacement/loss of flora & fauna (including SCC) Increased potential for soil erosion Habitat fragmentation Increased potential for establishment of alien & invasive vegetation
	Access roads and servitudes	
	Soil dust precipitation	
	Dumping of waste products	
	Random events such as fire (cooking fires or cigarettes)	
Main Impact	**Project activities that can cause the spread and/or establishment of alien and/or invasive species**	**Secondary impacts anticipated**
2. Spread and/or establishment of alien and/or invasive species	Vegetation removal	Habitat loss for native flora & fauna (including SCC) Spreading of potentially dangerous diseases due to invasive and pest species Alteration of fauna assemblages due to habitat modification
	Vehicles potentially spreading seed	
	Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents	
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	
Main Impact	**Project activities that can cause the Direct mortality of fauna**	**Secondary impacts anticipated**
3. Direct mortality of fauna	Clearing of vegetation	Loss of ecosystem services Increase in rodent populations and associated disease risk
	Roadkill due to vehicle collision	
	Pollution of Freshwater Features due to dust effects, chemical spills or sewage leakages	
Main Impact	**Project activities that can cause reduced dispersal/migration of fauna**	**Secondary impacts anticipated**
4.. Reduced dispersal/migration of fauna	Loss of landscape used as corridor	Loss of ecosystem services Reduced plant seed dispersal
	Compacted roads	

	Removal of vegetation	
	Light, noise and dust disturbance	
Main Impact	**Project activities that can cause pollution in water courses and the surrounding environment**	**Secondary impacts anticipated**
5. Environmental pollution due to water/ Acid Mine Drainage (AMD) runoff	Chemical (organic/inorganic) spills	Faunal mortality (direct and indirectly) Groundwater pollution Loss of ecosystem services
	Leaking of pollutants (pipelines)	
	Erosion	
Main Impact	**Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance and dust.**	**Secondary impacts anticipated**
6.Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and light pollution.	Operation of machinery (Large earth moving machinery, generators)	Loss of ecosystem services
	Vehicles	
Main Impact	Project activities that can cause staff to interact directly with potentially dangerous fauna	**Secondary impacts anticipated**
8. Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	All unregulated/supervised activities outdoors	Harm to fauna and/or staff

4.4.3 Unplanned Events

The planned activities will have anticipated impacts as discussed; however, unplanned events may occur on any project and may have potential impacts which will need management.

Table 4-2 is a summary of the findings of an unplanned event assessment from a terrestrial ecology perspective. Note, not all potential unplanned events may be captured herein, and this must therefore be managed throughout all phases according to recorded events.

Table 4-2 Summary of unplanned events for terrestrial biodiversity

Unplanned Event	Potential Impact	Mitigation
Hydrocarbon spills into the surrounding environment	Contamination of habitat as well as Freshwater Features associated with spillage.	A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.
Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland and wetlands	Appropriate/Adequate fire management plan need to be implemented.

4.4.4 Construction Phase

The following potential impacts on the biodiversity were considered for the construction/operational phase of the project. Due to the nature of the project, only one phase of impacts is expected, and refers to the period during which the seismic studies are conducted. This phase usually has the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered.

4.4.4.1 Linear Infrastructure Impacts (Pipelines and Powerlines)

- Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC;
- Introduction of invasive and alien species, especially plants;
- Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (noise, dust, vibration), including the reduced dispersal/migration of fauna;

- Destruction of non-resilient habitats (Rocky Outcrops);
- Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials; and
- Clearing of vegetation leading to soil erosion and loss of topsoil.

4.4.4.2 TSF Impacts (TSF, return water dams, and laydown/stockpiles etc.)

- Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community;
- Introduction of invasive and alien species, especially plants;
- Direct loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna;
- Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials; and
- Clearing of vegetation leading to soil erosion and loss of topsoil.
- The disruption of natural faunal movement corridors.

4.4.5 Operational Phase

The operational phase impacts of daily activities are anticipated to result in the further spreading of the AIP, as well as the deterioration of the habitats due to the increase of dust and edge effect impacts. Dust reduces the ability of plants to photosynthesize and thus leads to degradation/retrogression of the veld. Moving maintenance vehicles don't only cause sensory disturbances to fauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions.

4.4.5.1 Pipeline Impacts (Both pipeline routes and Pipe Bridge Area)

- Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community;
- Continued encroachment by alien and invasive plant species;
- Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna; and
- Environmental pollution due to pipe leakage.

4.4.5.2 TSF Impacts (Mponeng Lower Compartment and Return Water Dam).

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

- Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials;
- Continuous stripping of topsoil, leading to ongoing land degradation, including erosion;
- Environmental pollution due to water/ Acid Mine drainage runoff.

4.4.6 Assessment of Significance

Table 4-3 shows the significance of potential impacts associated with the proposed activities, on biodiversity before and after the implementation of mitigation measures.

Table 4-3 Summary assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed linear infrastructure

Impact	Phase	Pre-Mitigation Significance	Post-Mitigation Significance	Final Significance
Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC.	Construction	High -	Medium to Low -	Medium to High-
Mitigation Measures				

- **Linear infrastructure (powerlines and pipelines), with an associated lower impact, are permitted within the high SEI areas, provided that these developments are minimised as far as possible, and that these areas are spanned (powerlines) and avoided as far as feasible.**
- **Class 1 Gauteng Ridges must be avoided as far as possible by pipelines or spanned by powerlines.**
- **The High SEI Freshwater Features must be avoided as far as possible. Ingress may be permitted, as a last resort, in line with recommendations in the associated freshwater assessment (TBC, 2026).**
- **A pre-construction wet season (October to March, following good rains) walkdown of the high SEI areas within development footprint must be conducted to locate and identify any protected flora or flora SCC.**
- The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.
- Areas of indigenous vegetation, even secondary communities outside of the direct pylon and servitude road footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimised and avoided where possible.
- 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 are to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the proposed development area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.
- Any individual of any protected plant species that is present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed, the sensitivity and importance of these species needs to be part of the environmental awareness programme. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.
- Vegetation clearing commences only after the necessary permits have been obtained. Vegetation clearing must be isolated to pylon locations.
- Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- Compilation and implementation of an alien vegetation management plan. An acceptable plan must be in place prior to the commencement of construction activities.
- Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such.
- There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous plants from the area. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.
- Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures, apart from approved structures, must be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated areas.
- It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the PAOI apart from rehabilitation purposes. No plant species whether indigenous or exotic should be brought into/taken from the PAOI, to prevent the spread of exotic or invasive species or the illegal collection of plants.

Destruction of non-resilient habitats (Rocky Outcrops)	**Construction**	**High -**	**Medium to low -**	**Medium to low -**

Mitigation Measures

- **The high SEI Rocky Gauteng Shale Mountain Bushveld and Rocky Carletonville Dolomite Grassland habitats must be avoided as far as possible. Pipeline footprints must be reduced as far as possible.**
- **Pylon placement for powerlines must consider the High SEI areas. Pylons must not be placed within these areas. Powerlines may span these areas.**
- **It is recommended that the routes avoid Class 1 and Class 2 Gauteng Ridges as far as possible. Development within these areas is at the discretion of the relevant authority.**
- **Pipeline Corridor 1 (the southern option) if preferred as this route consolidates with the other proposed infrastructure, and it is located within predominantly very low and low sensitivity areas, with existing roads along parts of the route.**
- Existing access roads must be made use of within the High SEI areas. Construction of new roads must be avoided as far as possible in the High SEI areas (and areas overlapping with ridges). Existing access roads must be used within the Medium and Low SEI areas, as far as practical. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.
-

Direct loss and displacement of faunal community due to habitat loss, mortality and disturbance (noise, dust, vibration), including the reduced dispersal/migration of fauna	Construction	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- A qualified environmental control officer must be appointed before construction begins.
- No trapping, killing, or poisoning of any wildlife is to be permitted. This should be included in Environmental Awareness Training and signs must be put up to enforce this.
- Outside lighting, if used, should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.
- Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. If any excavations are to be dug these must not be left open for more than a few hours without ramps for trapped fauna to leave and must be filled at night. Holes must be subsequently inspected for fauna prior to backfilling.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.
- All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.
- Environmental Awareness Training discussions/training must include (but not limited to): Speed limits, General rules of road use, not limited to Avoiding the widening of the road and Environmental sensitivity of surrounding habitat.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.

Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat.
- Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.
- Only existing access routes and walking paths may be made use of.

Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials.	Construction	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. The Freshwater Features must to be protected and all activities that could result in a spill should occur away from them.
- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- No servicing of equipment on site.
- All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.
- Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.
- All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.
- All construction waste must be removed from site at the closure of the construction phase.
- Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.

Introduction of alien species, especially plants	Construction	Medium to high -	Low -	Medium to low -

Mitigation Measures

- An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual changed in AIP composition.
- It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species.
- A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.

Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.	Operational	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- **Servicing of the pipelines and powerlines should only be done with minimal impact on vegetation to prevent the destruction of potential SCC and indigenous vegetation within the PAOI and to prevent the further fragmentation of habitat.**
- **Only existing access routes and walking paths may be made use of.**
- It must be made an offence for any staff member to remove any indigenous plant species (especially SCC) from the PAOI.
- Restrict all activities to authorised footprint areas only.
- Implement stormwater management plan.
- Address any observed erosion promptly using suitable erosion control structures and revegetation methods.
- Conduct follow-up rehabilitation and re-vegetation of any bare areas with local indigenous grasses, shrubs, and trees.

Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna	Operational	High	Medium to high	Medium to high

Mitigation Measures

- **Pipelines should be raised above the ground to allow for faunal species to pass beneath to reduce the impact on migration.**
- **To mitigate potential impacts on faunal species it is recommended that vehicle movements are avoided at night. If night driving is unavoidable, vehicle speed should be reduced to a maximum of 20 km/h to minimise the risk of harm to wildlife.**
- No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan.

Continued encroachment by alien and invasive plant species	Operational	Medium to High	Low -	Low -

Mitigation Measures

- An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual change in AIP composition.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species.
- It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.

Environmental pollution due to pipe leakage	**Operational**	**Medium to High**	**Medium to low -**	**Medium to low**

Mitigation Measures

- A stormwater management plan must be compiled and implemented.
- An emergency preparedness plan that incorporates a detailed pipe leak spill management plan must be put in place to ensure that should there be any pipe leaks, bursts or overflow that it does not run into the surrounding areas. This includes the installation of leak warning and detection systems. Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks, such as the planting of dense indigenous pioneer grass seeds across all bare earth areas surrounding the pipes. Monitoring of the pipeline must be undertaken to detect leaks and monitoring should be undertaken at least once a week. Water monitoring must also be undertaken to ensure that there has been no runoff into the nearby water sources.

Table 4-4 Summary assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed TSF

Impact	Phase	Pre-Mitigation Significance	Post-Mitigation Significance	Final Significance
Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community.	Construction	High -	Medium to High -	High -

Mitigation Measures

- **Ancillary infrastructure, such as stockpiles and laydown areas must avoid high SEI areas (Rocky Gauteng Shale Mountain Bushveld and Rocky Carletonville Dolomite Grassland). Where avoidance is impossible, the footprint must be minimised.**
- **The TSF must be redesigned to avoid the high SEI Rocky Gauteng Shale Mountain Bushveld (ridges) and Rocky Carletonville Dolomite Grassland. The footprint must avoid the Gauteng Class 1 Ridge and Rocky Gauteng Shale Mountain Bushveld habitat. If complete avoidance is impossible, minimisation must be adhered to. Limited ingress into the 200 m buffer zone may be allowed within the medium and low SEI areas, at the discretion of the relevant authorities.**
- **The High SEI Freshwater Features must be avoided as far as possible. Ingress may be permitted, as a last resort, in line with recommendations in the associated freshwater assessment (TBC, 2026).**
- **A pre-construction wet season (October to March, following good rains) walkdown of the high SEI areas within development footprint must be conducted to locate and identify any protected flora or flora SCC.**
- **The Class 1 Gauteng Ridge, including the 200 m buffer, must be avoided.**
- Existing access roads must be made use of as far as possible, especially within the High SEI areas. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.
- All structure footprints are to be rehabilitated and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the proposed development area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.
- Any individual of any protected plant species that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed, the sensitivity and importance of these species needs to be part of the environmental awareness programme. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.
- Vegetation clearing commences only after the necessary permits have been obtained.
- Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous plants from the area. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.

- Reduce the dust generated by vehicles/machines, creating of 'speed bumps', putting up signs to enforce speed limits to enforce reduced speeds.
- Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures, apart from approved structures, must be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated areas.
- A suitable stormwater plan must be compiled for the development footprint. This plan should include mitigation measures for the construction as well as the operational phase. This plan must attempt to displace and divert stormwater from the road network and construction areas and discharge the water into adjacent areas without eroding the receiving areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses.
- It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the PAOI apart from rehabilitation purposes. No plant species whether indigenous or exotic should be brought into/taken from the PAOI, to prevent the spread of exotic or invasive species or the illegal collection of plants.

Direct loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna	Construction	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- A qualified environmental control officer must be appointed before construction begins.
- No trapping, killing, or poisoning of any wildlife is to be permitted. This should be included in Environmental Awareness Training and signs must be put up to enforce this.
- Outside lighting, if used, should be designed and limited to minimise impacts on fauna. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.
- Vehicle movements must be avoided at night as far as possible. If night driving is unavoidable, vehicle speed should be reduced to a maximum of 20 km/h to minimise the risk of harm to wildlife.
- Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. If any excavations are to be dug these must not be left open for more than a few hours without ramps for trapped fauna to leave and must be filled at night. Holes must be subsequently inspected for fauna prior to backfilling.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.
- All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.
- Environmental Awareness Training discussions/training must include (but not limited to): Speed limits, General rules of road use, not limited to Avoiding the widening of the road and Environmental sensitivity of surrounding habitat.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.

Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat.
- Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.
- Only existing access routes and walking paths may be made use of.

Increased risk of contamination (soil and water resource) from fuel spills and hazardous materials.	Construction	Medium to high	Medium to low	Medium to low

Mitigation Measures

- Construct cut-off berms downslope of working areas.
- Cut-off trenches must be incorporated into the design to decrease contamination of watercourses via runoff.
- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be

complete and available on site. The Freshwater Features must to be protected and all activities that could result in a spill should occur away from them.\

- Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such, although no servicing of equipment on site.
- No non-environmentally friendly suppressants may be used as this could result in pollution of water sources and the ecosystem.
- Compile and implement a Solid Waste Management Plan. Waste management must be a priority, and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum.
- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.
- All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.

Introduction of alien species, especially plants	Construction	Medium to high	Low	Low

Mitigation Measures

- An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual changed in AIP composition.
- It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species.
- A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.

Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.	Operational	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- Vehicles and machinery should only utilise authorized access roads.
- It must be made an offence for any staff member to remove any indigenous plant species (especially SCC) from the PAOI.
- Restrict all activities to authorised footprint areas only.
- Address any observed erosion promptly using suitable erosion control structures and revegetation methods.
- Conduct follow-up rehabilitation and re-vegetation of any bare areas with local indigenous grasses, shrubs, and trees.

Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna	Operational	Medium to high -	Medium to low -	Medium to low -

Mitigation Measures

- No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.
- All maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- All vehicles accessing the site should adhere to a max 40 km/h max to avoid collisions.
- Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan.
- Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction or bare ground. This includes wetting of exposed soft soil surfaces.

Continued encroachment by alien and invasive plant species	Operational	Medium to High	Low -	Low -

Mitigation Measures

- An Alien Invasive Plant Management Plan must be implemented. This should be regularly updated to reflect the annual change in AIP composition.
- It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.

Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials.	Operational	Medium to High	Low -	Low -

Mitigation Measures

- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. The Freshwater Features must be protected. Store fuels, oils and chemicals in bunded areas outside wetland buffers; refuel and service plant only at designated areas on impermeable surfaces; provide drip trays and spill kits on mobile plant; collect sewage in sealed systems; remove waste regularly; and implement a spill response procedure that prevents contaminated water, hydrocarbons, sewage or waste from entering wetlands or drainage lines.
- Compile and implement a Solid Waste Management Plan. Waste management must be a priority, and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum.
- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- No servicing of equipment on site, except in designated areas within the Very Low and Low SEI areas.
- Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.
- All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.

Continuous stripping of topsoil, leading to ongoing land degradation, including erosion	Operational	Medium to High	Medium to low	Medium to low

Mitigation Measures

- All vehicles must utilise the authorized access routes only.
- Environmental awareness training should be conducted, with strict enforcement of a zero-tolerance policy on wildlife poaching, especially for tortoises.
- A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat.
- Only existing access routes and walking paths may be made use of.

Environmental pollution due to water/ Acid Mine drainage runoff.	Operational	Medium to High	Medium to low	Medium to low

Mitigation Measures

- A stormwater management plan must be compiled and implemented.
- An emergency preparedness plan that incorporates a detailed pipe leak spill management plan must be put in place to ensure that should there be any pipe leaks, bursts or overflow that it does not run into the surrounding areas. This includes the installation of leak warning and detection systems. Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks, such as the planting of dense indigenous pioneer grass seeds across all bare earth areas surrounding the pipes. Monitoring of the pipeline must be undertaken to detect leaks and monitoring should be undertaken at least once a week. Water monitoring must also be undertaken to ensure that there has been no runoff into the nearby water sources.
- Keep the surface & sub-surface water and storm water away that may run off from the dumps from the low laying areas, such as wetlands, as well as the surrounding areas, from leaving the project area in an uncontrolled manner.
- Construct cut-off berms downslope of working areas.
    - Construct engineered cut-off berms (compacted earth embankments or similar structures) along the downslope perimeter of all active TSF construction and working areas.
    - Ensure berms are designed to intercept and divert surface water runoff, including potential acid mine drainage, away from undisturbed areas and sensitive receptors (e.g., wetlands, streams, natural drainage lines).
    - Prevent uncontrolled runoff from entering natural watercourses or adjacent land by directing collected runoff to designated containment or treatment facilities (e.g., pollution control dams, sumps, or water treatment plants).
    - Use compacted, low-permeability material (such as clay or suitable soil) for berm construction to minimise seepage.
    - Specify minimum berm height and width based on site hydrology and expected runoff volumes, as determined by a qualified engineer (e.g., typically ≥0.5 m high and ≥1 m wide, but site-specific).
    - Ensure berms are continuous, with no gaps, and maintained throughout the construction phase.
    - Conduct regular inspections (at least weekly and after rainfall events) to check for breaches, erosion, or overtopping.
    - Repair any damaged sections within 24 hours of detection.

    - Remove or rehabilitate berms after construction, unless required for ongoing operational control.
- Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.
- Storm Water run-off & Discharge Water Quality monitoring needs to be implemented.
- Incorporate green /soft engineering stormwater measures. Avoid unnecessary vegetation clearing and preferential surface flow paths.
    - Incorporate green or soft engineering stormwater management measures, such as vegetated swales, bio-retention areas, grassed waterways, and infiltration basins, to slow down, filter, and absorb stormwater runoff.
    - Design stormwater controls to maximise infiltration and natural attenuation of runoff, reducing peak flows and improving water quality.
    - Retain existing vegetation wherever possible, especially in areas that naturally slow or filter runoff, to maintain soil stability and ecological function.
    - Avoid unnecessary clearing of vegetation during site preparation and construction, particularly in buffer zones, riparian areas, and natural drainage lines.
    - Prevent the creation of preferential surface flow paths (e.g., straight, unvegetated channels) that could accelerate runoff and increase erosion or pollution risk.
    - Where vegetation clearing is unavoidable, re-vegetate disturbed areas promptly with indigenous species to restore stormwater attenuation and filtration functions.
    - Regularly inspect and maintain green stormwater infrastructure to ensure continued effectiveness (e.g., remove sediment, repair erosion, replace dead plants).
- Monitoring of adjacent watercourses must be undertaken to assess the impact of runoff to these systems.
- Cut-off trenches must be incorporated into the design to decrease contamination of watercourses via runoff.
- No cleaning of vehicles, machines and equipment in Freshwater Features.
- No servicing of machines, vehicles and equipment on site.
- Storage of potential contaminants in bunded areas.
- All contractors must have spill kits available and be trained in the correct use thereof.
- All released water must be within DWAF (1996) water quality standards for aquatic ecosystems, and discharge must be managed to avoid scouring and erosion of the receiving systems.
- Contain wastewater in a PCD. Contaminated water must not be discharged into the watercourses.
- Clean and dirty water must be separated. This water should be looked at for treatment and then re-introduced, to mitigate losses to the catchment water hydrodynamics.
- To at least minimise impacts to water quality, a treatment strategy is required, and the Groundwater report needs to be considered.
- Aquatic monitoring must be done, this includes ground water and surface water.

4.4.7 Cumulative Impacts

After taking all of the phases into consideration, the cumulative impact rating could be calculated and a final significance produced for each (Table 4-5 and Table 4-6).

Table 4-5 Cumulative impacts for the proposed linear infrastructure

Impact	Phase	Event	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score	Final Significance
Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community, and the loss of floral SCC.	Construction	Normal operations or events	1	2	1,13	-11,81	Medium to high -
Introduction of invasive and alien species, especially plants	Construction	Normal operations or events	1	1	1,13	-4,50	Medium to low -

Direct loss and displacement of faunal community (including SCC) due to habitat loss, mortality and disturbance (noise, dust, vibration), including the reduced dispersal/migration of fauna	Construction	Normal operations or events	2	3	1,25	-5,63	Medium to low -
Destruction of non-resilient habitats (Rocky Outcrops)	Construction	Normal operations or events	1	2	1,13	-14,63	High -
Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials.	Construction	Normal operations or events	1	2	1,13	-8,44	Medium to low -
Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Normal operations or events	1	1	1,00	-8,25	Medium to low -
Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.	Operation	Normal operations or events	1	2	1,13	-8,44	Medium to low -
Continued encroachment by alien and invasive plant species	Operation	Normal operations or events	1	1	1,00	-4,00	Low -
Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance, including the reduced dispersal/migration of fauna	Operation	Normal operations or events	1	2	1,13	-10,13	Medium to high -

Table 4-6 Cumulative impacts for the TSF

Impact	Phase	Event	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score	Final Significance
Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community	Construction	Normal operations or events	2	1	1,13	-6,75	Medium to low -
Introduction of invasive and alien species, especially plants	Construction	Normal operations or events	2	1	1,13	-3,94	Low -
Direct loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna	Construction	Normal operations or events	2	1	1,13	-6,19	Medium to low -
Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials.	Construction	Normal operations or events	2	1	1,13	-8,44	Medium to low -

Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Normal operations or events	1	1	1,00	-8,25	Medium to low -
Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.	Operation	Normal operations or events	2	1	1,13	-7,59	Medium to low -
Continued encroachment by alien and invasive plant species	Operation	Normal operations or events	2	1	1,13	-3,94	Low -
Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including the reduced dispersal/migration of fauna	Operation	Normal operations or events	1	1	1,00	-8,25	Medium to low -
Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials.	Operation	Normal operations or events	1	1	1,00	-4,00	Low -
Continuous stripping of topsoil, leading to ongoing land degradation, including erosion	Operation	Normal operations or events	2	1	1,13	-7,59	Medium to low -
Environmental pollution due to water/ Acid mine drainage runoff.	Operation	Normal operations or events	2	1	1,13	-5,06	Medium to low -

5 Conclusion

The terrestrial biodiversity assessment for the proposed Harmony West Wits Reclamation Project demonstrates that the PAOI encompasses a mosaic of habitat conditions, ranging from natural rocky bushveld and grassland patches to areas that are severely degraded or irreversibly modified by historic and ongoing mining, infrastructure, and alien invasive plant infestations. Notable features include remnants of Gauteng Shale Mountain Bushveld, Carletonville Dolomite Grassland, and Rocky Outcrops, some of which overlap with Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), and Class 1 Gauteng Ridges, which are all features of high conservation value. Moreover, multiple flora SCC and some fauna SCC are expected within the PAOI. Please note, according to the NBA 2025 (not formally gazetted) the Gauteng Shale Mountain Bushveld vegetation type is rated as Endangered.

The Terrestrial Biodiversity Theme sensitivity is assigned Very High by the Screening Tool, while the Plant Species Theme sensitivity is assigned as Medium and the Animal Species Theme sensitivity as High. The sensitivities were disputed or validated as follows (Table 5-1):

Table 5-1 Summary of the screening tool vs specialist assigned sensitivities

Screening Tool Theme	Terrestrial Biodiversity	Animal Theme	Plant Theme
Screening Tool Sensitivity	**Very High**	**High**	**Medium**
Rocky Gauteng Shale Mountain Bushveld	High	High	High
Rocky Carletonville Dolomite Grassland	High	High	High
Carletonville Dolomite Grassland	Medium	High	Medium
Degraded Gauteng Shale Mountain Bushveld	Low	Low	Low
Degraded Carletonville Dolomite Grassland	Low	Low	Low
Severely Modified: Alien Stands	Low	Low	Low
Irreversibly Modified	Very Low	Very Low	Very Low
Water Resources: Wetlands & In-stream Dams	High	High	Medium
Water Resources: Artificial/Off-stream Dams, Rock Quarry, Non-perennial Drainage	Low	Low	Low

5.1 Impact Statement

The impact assessment indicates that, without mitigation, the proposed development would result in medium to high negative impacts on biodiversity, primarily through habitat loss, fragmentation, direct mortality of fauna, spread of alien invasive species, and potential pollution of water resources. However, no fatal flaws were identified that would preclude development, provided that all recommended mitigation measures are strictly implemented. These include avoidance of high ecological importance areas, avoidance of Class 1 Gauteng Ridges and their 200 m buffer zone, pre-construction walkdowns for SCC and protected species, rigorous alien invasive plant management, erosion control, and ongoing ecological monitoring and rehabilitation. With these measures in place, the residual impacts are expected to be reduced to medium to high, medium or low significance. Pipeline Corridor 1 (the southern option) if preferred as this route consolidates with the other proposed infrastructure, and it is located within predominantly very low and low sensitivity areas, with existing roads along parts of the route. Finally, it is important to note that additional conservation actions, such as the management of adjacent natural areas for biodiversity, invasive species control, or ecological restoration, may provide further positive outcomes.

It is the opinion of the specialists that the proposed project may be favourably considered, provided all prescribed mitigation measures and supporting recommendations are implemented. Please see Table 5-2 for details.

Please note, development within CBA 2, ESA 1, Gauteng Ridges (Class 1 and 2) and the associated buffer areas is at the decision of the competent authority.

5.2 Specialist Opinion

It is the opinion of the specialist that the proposed development may be considered environmentally acceptable only if all mitigation and management measures detailed in this and other specialist reports are fully implemented and enforced. Ongoing compliance monitoring and adaptive management will be essential to ensure the long-term persistence of biodiversity and ecosystem services within the PAOI. Importantly, the following is required:

- Avoidance of the High SEI Rocky Gauteng Shale Mountain Bushveld and Rocky Carletonville Dolomite Grassland for high impact developments (TSF, stockpiles, and laydown areas (etc.);
- Avoidance as far as feasible and minimisation of the development footprint of linear infrastructure (powerlines and pipelines) within the High SEI areas. Pylons must not be placed within High SEI areas;
- Avoidance of Class 1 Gauteng Ridges (no-go) and the associated 200 m buffer (as far as feasible, at the discretion of the relevant authority) for high impact developments;
- Implementation of both an alien and invasive plants management plan and a rehabilitation plan; and
- A wet season (October to March, following good rains) walkdown of the High SEI areas within the development footprint to locate and identify potential flora SCC and protected species.

The most sensitive and relevant terrestrial features can be seen below in Figure 5-1. These features relevant to the current layout can be seen in Figure 5-2 and Figure 5-3.

Table 5-2 Habitats within the PAOI and Their Respective Sensitivities

Biodiversity Plan Category	Habitat	Condition	SEI	Specialist Opinion	Impact Statement
CBA 2, ESA 1, Class 1 Ridge[4]	Rocky Gauteng Shale Mountain Bushveld	Largely Natural	High	Confirmed/high likelihood of NT species; >50% natural habitat; overlaps with CBA 2, ESA 1, Class 1 Ridge.	Avoidance mitigation wherever possible; limited low-impact development; offset may be required.
ESA 1, Class 1/2 Ridge	Degraded Gauteng Shale Mountain Bushveld	Degraded	Low	No SCC confirmed/likely; <50% natural habitat; several negative impacts; slow recovery.	Minimisation and restoration; medium-high impact development acceptable with restoration.
CBA 2, ESA 1	Carletonville Dolomite Grassland	Semi-intact	Medium	>50% natural habitat; potential to support SCC; fragmented but functional; overlaps with CBA 2, ESA 1.	Minimisation and restoration; medium-impact development acceptable with restoration.
ESA 1	Rocky Carletonville Dolomite Grassland	Largely Natural	High	Confirmed/high likelihood of VU species; >50% natural habitat;	Avoidance mitigation wherever possible; limited low-impact development; offset may be required.

[4] Please note, the Gauteng Shale Mountain Bushveld is listed as Endangered according to the NBA 2025. The majority of the PAOI overlaps with this vegetation type according to desktop data. High residual impacts in EN ecosystems may require offsets.

				moderate impacts; moderate rehab potential.	
CBA 2, ESA 1	Degraded Carletonville Dolomite Grassland	Degraded	Low	No SCC confirmed/likely; <50% natural habitat; several negative impacts; slow recovery.	Minimisation and restoration; medium-high impact development acceptable with restoration.
-	Severely Modified: Alien Stands	Severely Modified	Low	<50% natural habitat; dominated by AIPs; several negative impacts; slow recovery.	Minimisation and restoration; medium-high impact development acceptable with restoration.
-	Irreversibly Modified	Transformed	Very Low	No natural habitat; several major negative impacts; rapid recovery unlikely without intervention.	Minimisation; medium-high impact development acceptable; restoration may not be required.
CBA 2, ESA 1	Water Resources: Wetlands & In-stream Dams	Semi-natural	High	>50% natural habitat; potential to support SCC; moderate impacts; moderate rehab potential.	Avoidance wherever possible; limited low-impact development; offset may be required.
-	Water Resources: Artificial/Off-stream Dams, Rock Quarry, Non-perennial Drainage	Artificial/Modified	Low	<50% natural habitat; moderate impacts; moderate rehab potential.	Minimisation and restoration; medium-high impact development acceptable with restoration.

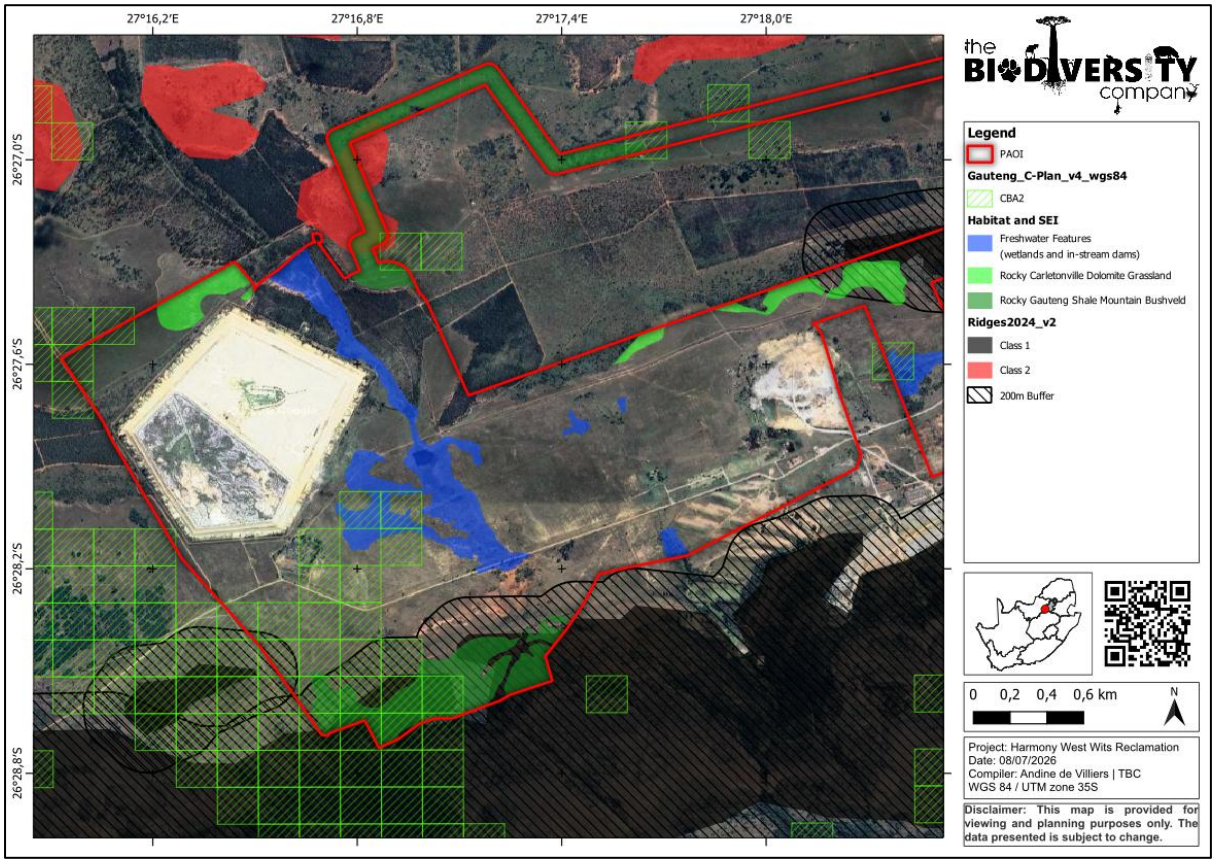


Figure 5-1 Most sensitive and relevant terrestrial features

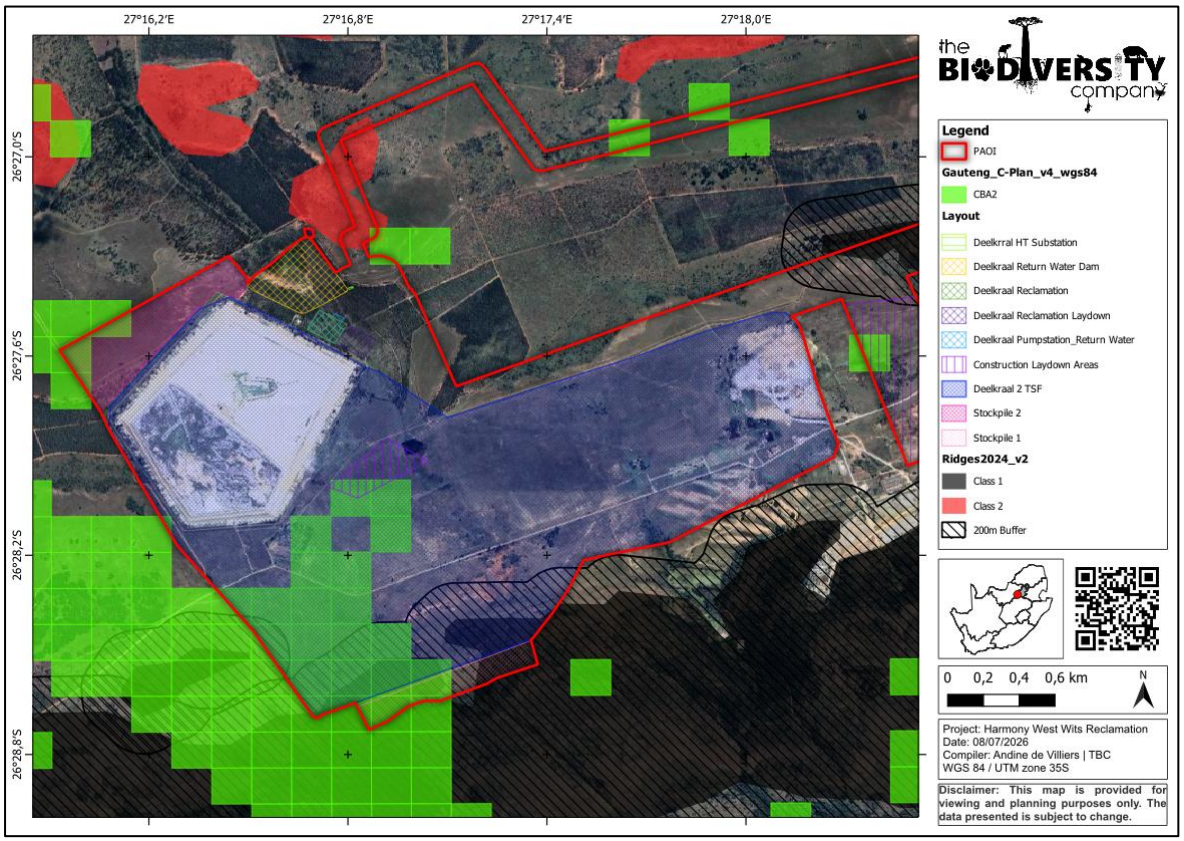


Figure 5-2 The high impact developments overlaid on the Gauteng Ridges and CBA 2 layers

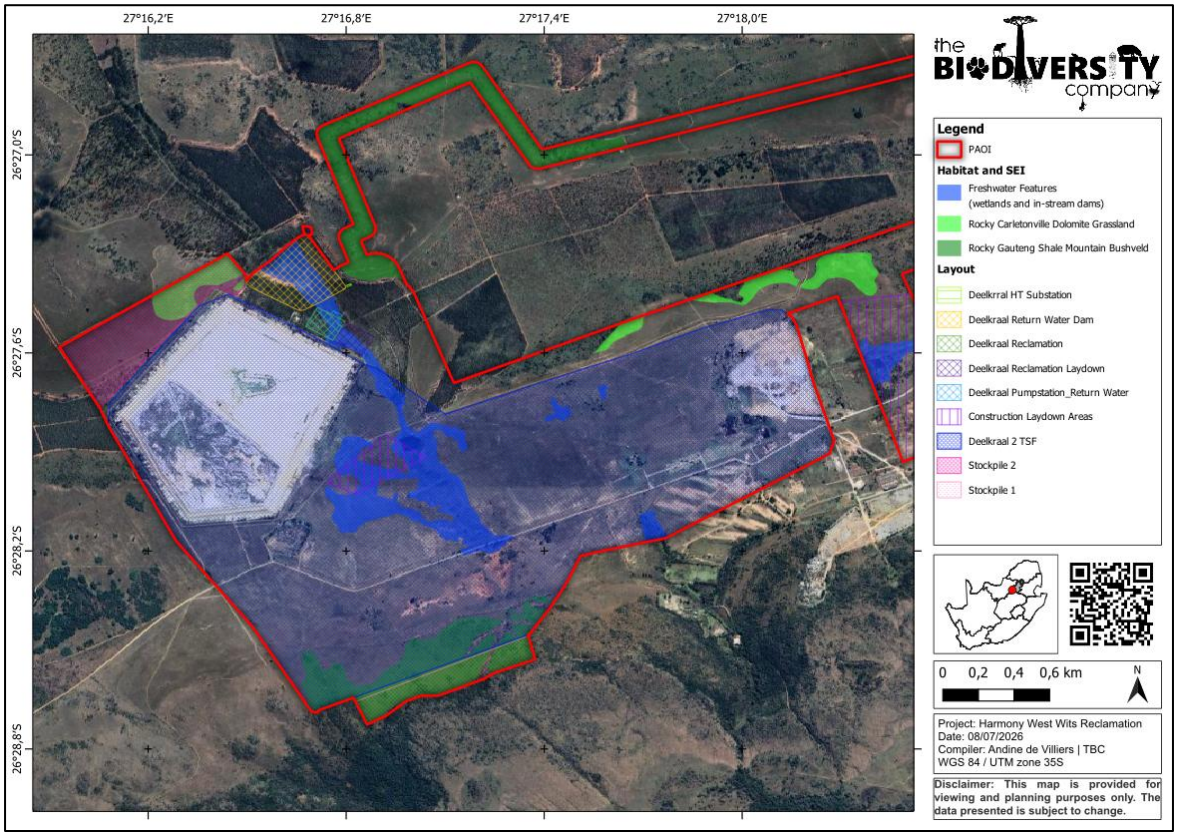


Figure 5-3 The high impact developments overlaid on the High SEI habitats

5.3 Layout Approval

The initial proposed layout can be seen in Figure 5-4. An updated project layout has been received (Figure 5-5 and Figure 5-6). It is the opinion of the terrestrial specialist that the provided layout is acceptable and can be considered for authorisation provided that the mitigation measures of the EMPr are implemented. It must be noted that an offset is required for the overlap of the proposed high impact developments and the intact ridges. The offset process is underway. Moreover, the majority of the PAOI overlaps with an EN ecosystem according to the NBA 2025 (not gazetted), while this ecosystem was previously rated as LC. Additional offsets may be required.

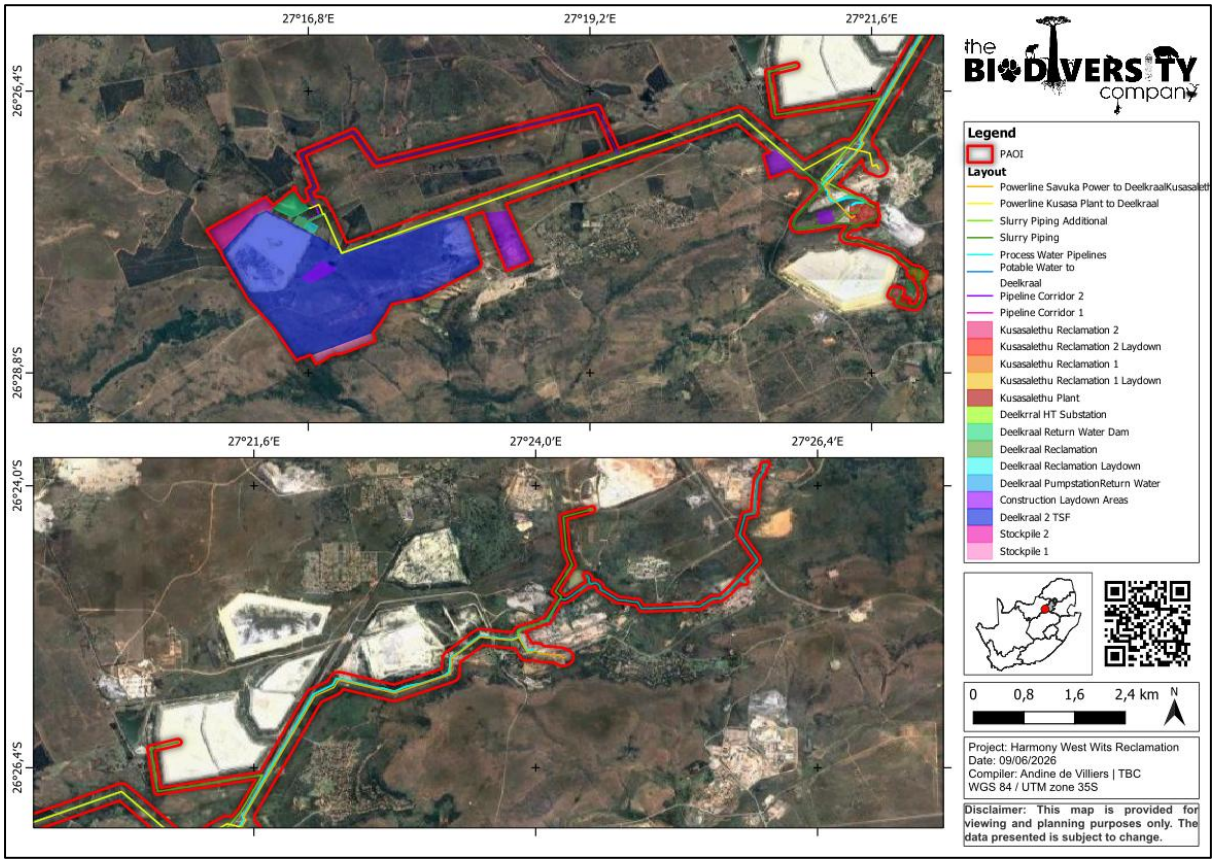


Figure 5-4 The original proposed layout

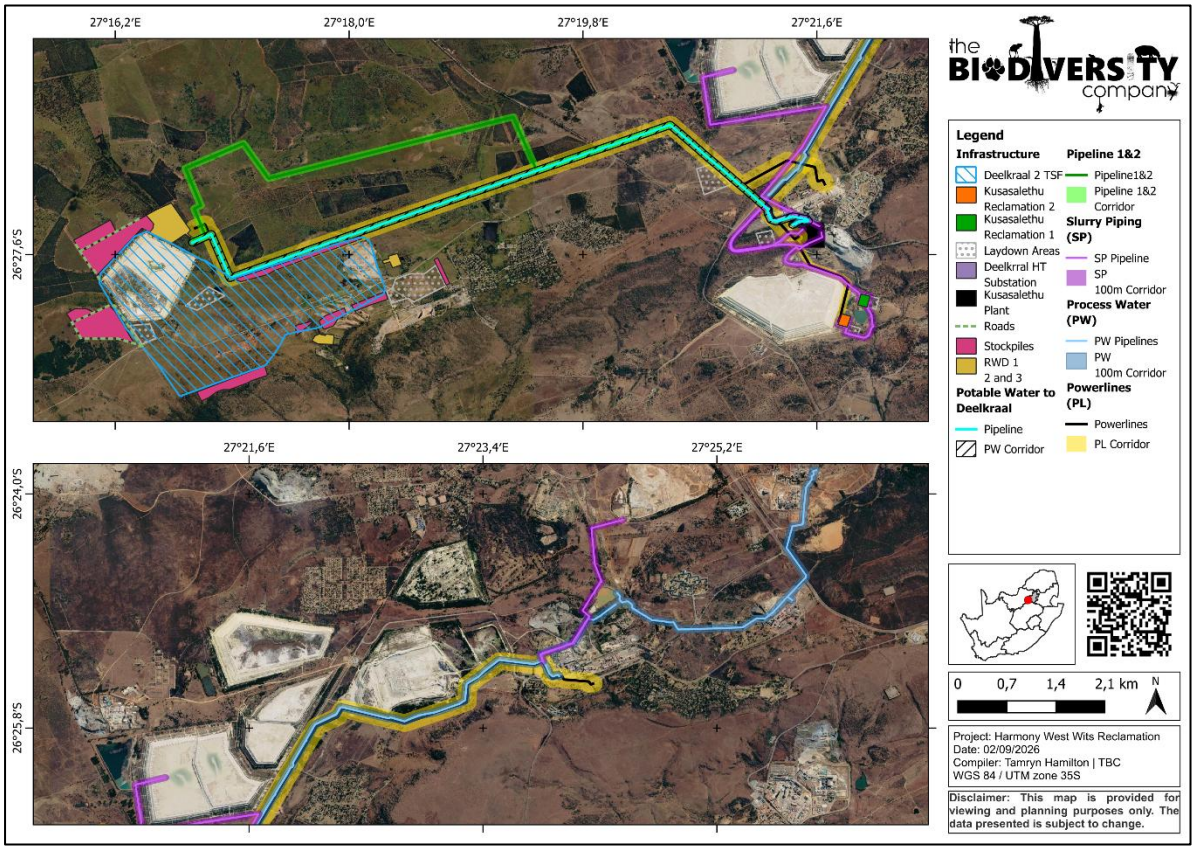


Figure 5-5 Updated layout for the proposed project (1)

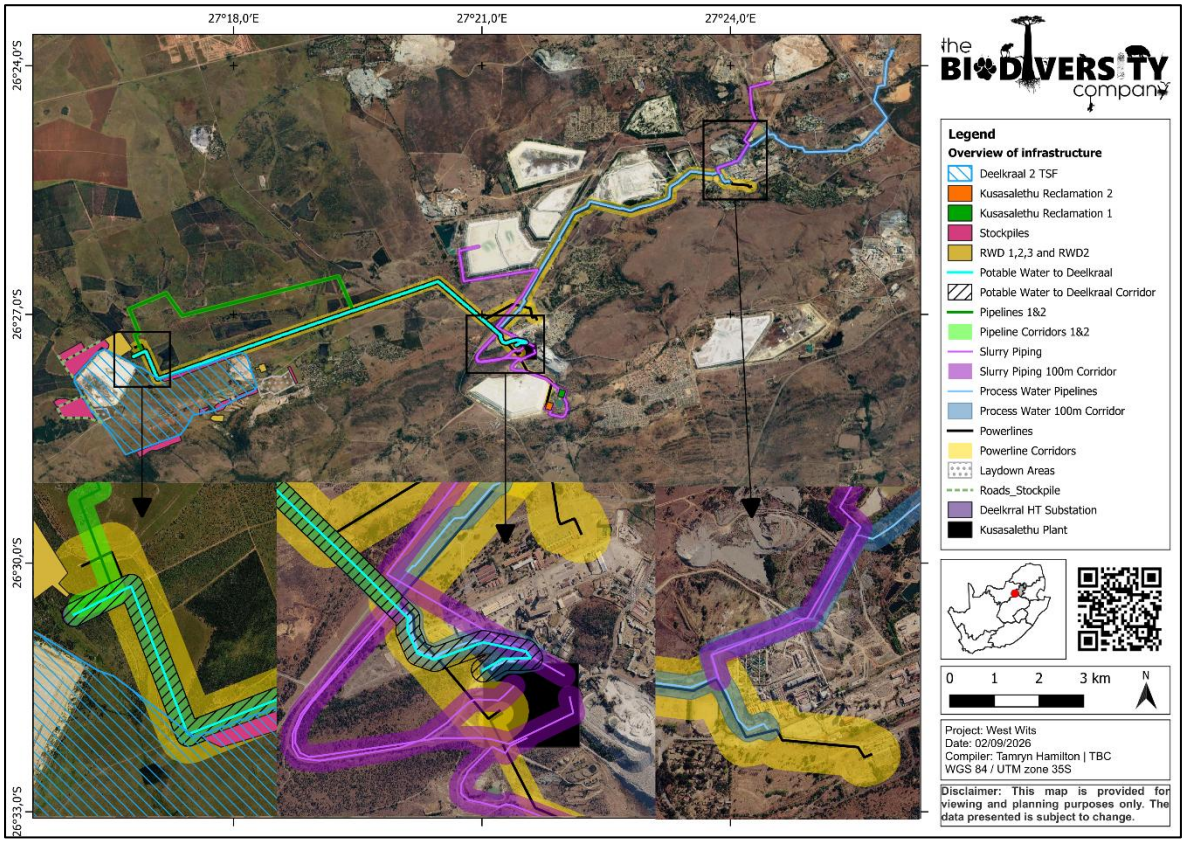


Figure 5-6 Updated layout for the proposed project (2)

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7 Appendix Items

7.1 Appendix A: Methods

7.1.1 Desktop Dataset Assessment

7.1.1.1 Spatially Relevant Legislative Boundaries

Two aspects of legislation apply with regards to the development of certain project types within South Africa, and these have important implications for the EA processes for these project types. These two aspects are briefly discussed below. Where relevant the spatial orientation of the proposed project is referenced with respect to these important legislative boundaries, as the applicable legislation may be relevant to not only the overall EIA process, but also the specialist assessment process that is to be followed.

- Strategic Transmission Corridors (EGI):

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

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

  In June 2022 the Standard for the Development and Expansion of Power Lines and Substations within Identified Geographical Areas Revision 2, Prepared by the CSIR and SANBI, was published. This standard was then adopted as per Government Notice No. 2313 of Government Gazette No. 47095 of 27 July 2022. The Standard was prepared to allow a proponent to achieve planning, routing, siting and remediation objectives that will ensure the acceptability of the impacts of the development of EGI (including substations) on the environment, independently from the need for an assessment by the competent authority. The standard enforces the following key environmental principles as part of its application with regards to the planning of powerline routes and substation positions (Note: several additional principles apply as relevant to avifauna assessments, however these are not included below):

    - There must be no removal of threatened plant species;
    - There must be no impact on Tier 1 plant species (i.e. threatened species reliant on critical habitat) identified through the screening process and site verification process;
    - Clear-cutting during construction must be kept to a maximum of 8 m; and
    - Wetlands must be avoided or, where wetland crossing is unavoidable, the power line should be routed over the narrowest part of the wetland. For the most part, wetlands and rivers can be traversed by the power line with little to no impact by placing the pylons outside of the wetland.

7.1.1.2 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al,* 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
    - Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
    - Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- The National Biodiversity Assessment 2025 (NBA 2025)
    - The National Biodiversity Assessment 2025 (NBA 2025) is a SANBI-coordinated collaborative national scientific assessment that synthesises the best available evidence on the status of South Africa's biodiversity to inform policy, planning and decision-making across sectors. The purpose of the NBA is to assess the state of biodiversity, identify patterns and trends over time, and provide a national evidence base for environmental management and spatial planning. For the terrestrial realm, the two headline indicators are Ecosystem Threat Status and Ecosystem Protection Level.
    - Ecosystem Threat Status (ETS) is a headline indicator of the risk of ecosystem collapse, reflecting the degree to which an ecosystem type has lost key aspects of its structure, function or composition. For NBA 2025, the International Union for Conservation of Nature (IUCN) Red List of Ecosystems (RLE) framework was applied systematically across all nationally recognised terrestrial ecosystem types. In the terrestrial realm, 463 ecosystem types were assessed and assigned to one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Least Concern (LC). The threatened categories comprise CR, EN and VU. The current assessment indicates that 141 of the 463 terrestrial ecosystem types are threatened, comprising 63 Critically Endangered, 68 Endangered and 10 Vulnerable ecosystem

types. These figures reflect refinements to the National Vegetation Map since NBA 2018, which increased the number of nationally recognised terrestrial ecosystem types from 456 to 463 (Monyeki & Skowno, 2026).

- Ecosystem Protection Level (EPL) is an indicator of the extent to which ecosystem types are represented within South Africa's protected area network relative to ecosystem-specific conservation targets. In NBA 2025, terrestrial ecosystem types were classified as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP) or Not Protected (NP), according to the proportion of the ecosystem target achieved within the protected area network. A total of 463 terrestrial ecosystem types were assessed, of which 121 (26.1%) are Well Protected, 67 (14.5%) are Moderately Protected, 163 (35.2%) are Poorly Protected, and 112 (24.2%) are Not Protected. At the start of 2025, approximately 9.9% of South Africa's landmass was formally protected (Skowno, Monyeki & Khatieb, 2026).

- Protected areas:

  - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

  - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:

- The Gauteng C-Plan has been developed using a systematic conservation planning approach. Systematic conservation planning has become the standard approach to conservation planning in South Africa, due to its robust scientific approach and internationally recognized principles and methodologies. The map is designed to be used at approximately 1:50 000 scale as the integrated biodiversity input into land use planning and decision making. Gauteng C-Plan v4 should be used as the key biodiversity informant in the compilation of bioregional plans, Environmental Management Frameworks and Municipal Spatial Development Frameworks, and should be a primary biodiversity consideration in Environmental Impact Assessments. The Gauteng C-Plan v4 delineates biodiversity priority areas called Critical Biodiversity Areas and Ecological Support Areas.

  - Critical Biodiversity Areas (CBAs) – Critical Biodiversity Areas (CBAs) include irreplaceable sites where no other options exist for meeting targets for biodiversity features, as well as best-design sites which represent an efficient configuration of sites to meet targets in an ecologically sustainable way that is least conflicting with other land uses and activities. CBAs include both terrestrial and aquatic habitats, including threatened species and their habitat requirements, as well as important ecological process that ensure the persistence of biodiversity.

- Ecological Support Areas (ESAs) - Areas are required to support and sustain the ecological functioning of Critical Biodiversity Areas (CBAs). For terrestrial and aquatic environments, these areas are functional but are not necessarily pristine natural areas. They are however required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the CBAs, and which also contributes significantly to the maintenance of Ecological Infrastructure.

- A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024); and

- Freshwater Ecology:

  - Strategic Water Source Areas (SWSAs) (Le Maitre *et al,* 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.

  - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.

  - National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.,* 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

- Gauteng Ridges:

  The quartzite ridges of Gauteng are one of the most important natural assets in this northern province of South Africa. This is because these ridges, and the areas immediately surrounding them, provide unique habitat for a wide variety of fauna and flora, some of which are Red-Listed, rare or endemic species, or in the case of certain plant species, are found nowhere else in South Africa or around the world.

  In order to give practical effect to this policy, the Gauteng Department of Agriculture and Rural Development (GDARD) has classified all ridges in Gauteng into one of four classes, based on the existing extent and percentage of area converted by urban development or disturbed by

other human activities. According to GDARD (2025), the ridges within Gauteng may be classified as follows:

- Class 1 Ridges: Class 1 ridges are those in respect of which 5% or less of the area has been transformed by human activity. (Approximately 58% of ridges currently fall within Class 1, including the Suikerbosrand and parts of the Magaliesberg).;

- Class 2 Ridges: Class 2 ridges are those in respect of which 5-34% of the ridge area has been irreversibly transformed by human activity. (Approximately 23% of ridges currently fall within Class 2, including parts of the Magaliesberg, ridges falling within the Cradle of Humankind World Heritage Site, the Klipriviersberg, the Bronberg and the Skurweberg).;

- Class 3 Ridges: Class 3 ridges are those that have been transformed by 35-65%, as a result of human activity (Approximately 8% of ridges currently fall within Class 3, including the Northcliff, Roodepoort and Krugersdorp ridges); and

- Class 4 Ridges: Class 4 ridges are those that have been transformed as a result of human activity by 65% or more. (Approximately 11% of ridges currently fall within Class 4, including the Melville Koppies and the Linksfield Ridge).

The 2015 Ridges Guideline has defined general guidelines that must be followed with regard to the amount of development that should be permitted on different ridges according to their class. GDARD (2015) stipulates that no development is to be permitted on any class 1 ridge, and varying levels of development may be permissible with regards to the higher ridge classes – depending on the impact level of the proposed activity and the corresponding spatial scale. Buffers and permitted developments are as follows (GDARD, 2015):

- Class 1 Ridges: No development within the 200m buffer zone is preferred by the Department, although, low impact activities with an ecological footprint of 5% or less in the 200 m buffer zone of the ridge may be considered to deter edge-effect. No development will be permitted on the ridge itself;

- Class 2 Ridges: Development activities and uses that have significant environmental impact on a Class 2 ridge will not be permitted. Only low impact activities might be permitted.

    - Low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the property may be supported. (The ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision).

    - Low impact development activities on a ridge will not be supported where it is feasible to undertake the development on a portion of the property abutting the ridge;

- Class 3 Ridges: The guidelines for Class 2 ridges will be applied to areas of the ridge that have not been significantly impacted (non-significant impact) on by human activity. The guidelines for Class 4 ridges will be applied to areas of the ridge that have been significantly impacted on by human activity; and

- Class 4 Ridges: Further development activities will not be supported in areas of the ridge where the remaining contiguous extent of natural habitat is 4 ha or more.

7.1.2 Desktop Flora Assessment

The desktop flora assessment encompassed an assessment of all the vegetation units and habitat types within the PAOI, as well as the identification of expected plant species and any locally occurring flora SCC.

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and the 2018 Terrestrial & Freshwater Assessment by SANBI (2018) was used to identify the vegetation types that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Global Biodiversity Information Facility (GBIF) database was accessed to compile a list of expected flora species within the PAOI (Figure 7-1). The Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.

The latest information regarding provincially, and nationally protected flora was obtained from the following published legislative sources:

- Provincially Protected Plant Species (Schedule 11 of the Transvaal Nature Conservation Ordinance No. 12 of 1983);
- Nationally Protected plant species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004); and
- List of Nationally Protected Tree Species (DFFE, 2022).

7.1.3 Desktop Fauna Assessment

The non-volant faunal desktop assessment comprised of the following:

- The mammal, reptile and amphibian species list was extracted from the GBIF database (Figure 7-1); and
- The Avifauna list was generated from the Southern African Bird Atlas Project 2 (SABAP2) dataset by looking at pentads 2620_2720, 2620_2725, 2625_2715, 2625_2720, 2625_2725, 2615_2715, 2620_2715, 2615_2720, 2615_2725, 2615_2730, 2620_2730, 2625_2730, 2620_2710, 2625_2710, 2630_2710, 2630_2715, 2630_2720, 2630_2725, and 2630_2730.

South Africa's official site for Species Information and National Red Lists (SANBI, 2022) was used to provide the most current national Red-List status of fauna. The latest information regarding provincially, and nationally protected fauna was obtained from the following published legislative lists:

- Provincially Protected Wildlife Species (Schedule 2 and 4 of the Transvaal Nature Conservation Ordinance No. 12 of 1983); and
- Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004).

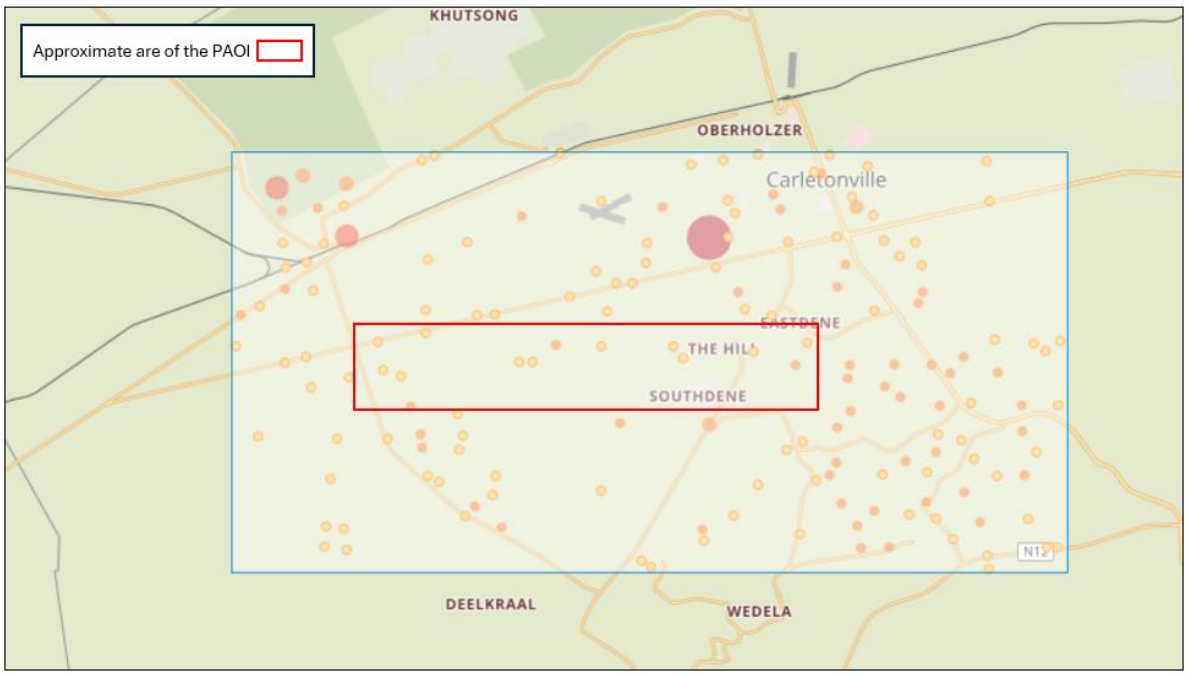


Figure 7-1 Map illustrating extent of area used to obtain the expected flora species list from the GBIF database.

7.1.4 Vegetation & Flora Survey

The late dry season fieldwork and sample sites were placed within targeted areas (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was, therefore, to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps (confirmed during the field survey). The floristic diversity and search for protected plants and flora SCC were conducted through timed meanders within representative habitat units delineated during the desktop assessment. Emphasis was placed on sensitive habitats, especially those overlapping with the PAOI.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting protected plants and flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling observed flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff et al. (1982). Suitable habitat for SCC were identified according to Raimondo et al. (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g., roads, erosion etc.), and this included the subjective recording of dominant vegetation species and any sensitive features (e.g., wetlands, rock outcrops etc.). In addition, opportunistic observations were made while navigating through the area.

Species were identified in field wherever possible. If they could not be identified in the field, field guides and texts were used. Relevant field guides and texts consulted for identification purposes included, but was not limited, to the following:

- Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions (Fish *et al.*, 2015);
- A Field Guide to Wild Flowers (Pooley, 1998);
- Problem Plants and Alien Weeds of South Africa (Bromilow, 2018);
- Field Guide to Succulents in Southern Africa (Smith *et al.*, 2017);
- Field Guide to Wildflowers of South Africa (Manning, 2009); and
- iNaturalist. Available at https://www.inaturalist.org/home

7.1.4.1 Fauna Survey

The faunal component of this report pertains only to mammals and herpetofauna (reptiles and amphibians), as a separate avifauna assessment was conducted and can be found in the accompanying avifauna assessment report (TBC, 2024). The faunal field survey utilised a variety of sampling techniques, including but not limited to:

- Visual and auditory searches: This involves strategic meandering and the use of binoculars and specialist camera equipment to view species from a distance without them being disturbed;
- Active hand-searches: Used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.); and
- The identification of tracks and signs, and listening to species calls.

Relevant field guides and texts consulted for identification purposes included the following:

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates et al, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi (Stuart and Stuart, 2015); and
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the PAOI) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 7-1 and

Table 7-2 respectively.

Table 7-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km^2. Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 7-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 7-3.

Table 7-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance		Conservation Importance				
		Very High	**High**	**Medium**	**Low**	**Very Low**
Functional Integrity	**Very High**	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 7-4.

Table 7-4 Summary of Receptor Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-5.

Table 7-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance				
		Very High	**High**	**Medium**	**Low**	**Very Low**
Receptor Resilience	**Very Low**	Very High	Very High	High	Medium	Low
	Low	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	High	High	Medium	Low	Very Low	Very Low
	Very High	Medium	Low	Very Low	Very Low	Very Low

Interpretation of the SEI in the context of the proposed project is provided in Table 7-6.

Table 7-6 Guideline for interpreting Site Ecological Importance in the context of proposed activities

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

7.3 Appendix C: Expected Species Lists

7.3.1 Expected Flora Species

Family Name	Species Name	Ecology	Conservation Status	
			Regional	Global
Acanthaceae	*Justicia anagalloides*	Indigenous	LC	NE
Acanthaceae	*Barleria macrostegia*	Indigenous	LC	LC
Aizoaceae	*Khadia acutipetala*	Indigenous; Endemic	LC	NE
Aizoaceae	*Delosperma herbeum*	Indigenous	LC	NE
Aizoaceae	*Lithops leslie subsp. lesliei*	Indigenous	VU	NE
Amaryllidaceae	*Crinum graminicola*	Indigenous	LC	NE
Anacardiaceae	*Searsia pyroides*	Indigenous	LC	LC
Anacardiaceae	*Searsia rigida*	Indigenous; Endemic	LC	LC
Anacardiaceae	*Harpephyllum caffrum*	Indigenous	LC	LC
Apiaceae	*Deverra burchellii*	Indigenous	LC	NE
Apocynaceae	*Nerium oleander*	Not indigenous; Naturalised; Invasive	NE	LC
Araliaceae	*Cussonia paniculata*	Indigenous; Endemic	LC	LC
Arecaceae	*Washingtonia robusta*	Not indigenous; Cultivated; Naturalised; Invasive	NE	LC
Asparagaceae	*Ledebouria ovatifolia*	Indigenous	LC	NE
Asphodelaceae	*Bulbine narcissifolia*	Indigenous	LC	NE
Asteraceae	*Nidorella podocephala*	Indigenous	LC	NE
Asteraceae	*Berkheya pinnatifida*	Indigenous	LC	NE
Asteraceae	*Macledium zeyheri*	Indigenous	LC	NE
Asteraceae	*Hilliardiella oligocephala*	Indigenous	LC	NE
Asteraceae	*Athrixia elata*	Indigenous	LC	NE
Asteraceae	*Brachylaena discolor*	Indigenous	LC	NE
Asteraceae	*Schkuhria pinnata*	Not indigenous; Naturalised	NE	NE
Asteraceae	*Zinnia peruviana*	Not indigenous; Naturalised; Invasive	NE	NE
Asteraceae	*Nidorella resedifolia*	Indigenous	LC	NE
Asteraceae	*Geigeria burkei*	Indigenous	LC	NE
Asteraceae	*Bidens pilosa*	Not indigenous; Naturalised	NE	NE
Asteraceae	*Helichrysum setosum*	Indigenous	LC	NE
Asteraceae	*Berkheya radula*	Indigenous	LC	NE
Asteraceae	*Helichrysum rugulosum*	Indigenous	LC	NE
Asteraceae	*Helichrysum nudifolium*	Indigenous	LC	NE
Asteraceae	*Tagetes minuta*	Not indigenous; Naturalised; Invasive	NE	NE
Cactaceae	*Echinopsis spachiana*	Not indigenous; Naturalised; Invasive	NE	NE
Cactaceae	*Opuntia ficus-indica*	Not indigenous; Cultivated; Naturalised; Invasive	NE	DD
Campanulaceae	*Lobelia thermalis*	Indigenous	LC	NE
Celastraceae	*Gymnosporia polyacantha*	Indigenous; Endemic	LC	LC
Celastraceae	*Elaeodendron croceum*	Indigenous	LC	LC
Cleomaceae	*Sieruela maculata*	Indigenous	LC	NE
Cleomaceae	*Sieruela monophylla*	Indigenous	LC	NE
Crassulaceae	*Adromischus umbraticola*	Indigenous; Endemic	NT	NE
Cucurbitaceae	*Cucumis zeyheri*	Indigenous	LC	NE
Cyperaceae	*Cyperus niveus*	Indigenous	LC	NE

Cyperaceae	*Cyperus marginatus*	Indigenous	LC	NE
Cyperaceae	*Cyperus congestus*	Indigenous	LC	NE
Ebenaceae	*Diospyros lycioides*	Indigenous	LC	LC
Ehretiaceae	*Ehretia rigida*	Indigenous	LC	LC
Fabaceae	*Elephantorrhiza elephantina*	Indigenous	LC	NE
Fabaceae	*Tephrosia elongata*	Indigenous	LC	NE
Fabaceae	*Sesbania punicea*	Not indigenous; Naturalised; Invasive	NE	LC
Fabaceae	*Gleditsia triacanthos*	Not indigenous; Naturalised; Invasive	NE	LC
Fabaceae	*Vigna vexillata*	Indigenous	LC	NE
Fabaceae	*Vachellia robusta*	Indigenous	LC	LC
Fabaceae	*Zornia linearis*	Indigenous	LC	NE
Fabaceae	*Eriosema salignum*	Indigenous	LC	NE
Geraniaceae	*Pelargonium luridum*	Indigenous	LC	LC
Geraniaceae	*Monsonia angustifolia*	Indigenous	LC	NE
Gesneriaceae	*Streptocarpus vandeleurii*	Indigenous; Endemic	LC	NE
Haloragaceae	*Myriophyllum aquaticum*	Not indigenous; Cultivated; Naturalised; Invasive	NE	NE
Iridaceae	*Tritonia nelsonii*	Indigenous	LC	NE
Lamiaceae	*Leonotis ocymifolia*	Indigenous	LC	LC
Lamiaceae	*Teucrium trifidum*	Indigenous	LC	NE
Lamiaceae	*Stachys spathulata*	Indigenous	LC	NE
Lamiaceae	*Ajuga ophrydis*	Indigenous	LC	NE
Lamiaceae	*Salvia runcinata*	Indigenous	LC	NE
Lamiaceae	*Ocimum angustifolium*	Indigenous	LC	NE
Malpighiaceae	*Sphedamnocarpus pruriens*	Indigenous	LC	NE
Malvaceae	*Grewia occidentalis*	Indigenous	LC	LC
Malvaceae	*Hibiscus pusillus*	Indigenous	LC	NE
Malvaceae	*Hibiscus trionum*	Not indigenous; Naturalised	NE	NE
Malvaceae	*Hibiscus malacospermus*	Indigenous	LC	NE
Malvaceae	*Hermannia lancifolia*	Indigenous; Endemic	LC	NE
Myrtaceae	*Callistemon viminalis*	Not indigenous; Naturalised; Invasive	NE	LC
Myrtaceae	*Syzygium australe*	Not indigenous; Cultivated; Naturalised; Invasive	NE	NE
Oxalidaceae	*Oxalis obliquifolia*	Indigenous	LC	NE
Poaceae	*Elionurus muticus*	Indigenous	LC	NE
Poaceae	*Cenchrus clandestinus*	Not indigenous; Cultivated; Naturalised; Invasive	NE	LC
Poaceae	*Andropogon eucomus*	Indigenous	LC	NE
Poaceae	*Cenchrus geniculatus*	Indigenous	LC	LC
Polygalaceae	*Polygala hottentotta*	Indigenous	LC	NE
Polygonaceae	*Oxygonum dregeanum*	Indigenous	LC	NE
Polygonaceae	*Rumex usambarensis*	Not indigenous; Naturalised; Invasive	NE	NE
Pteridaceae	*Pellaea calomelanos*	Indigenous	LC	NE
Ranunculaceae	*Clematis villosa*	Indigenous	LC	NE
Rosaceae	*Agrimonia bracteata*	Indigenous	LC	NE
Rosaceae	*Pyracantha angustifolia*	Not indigenous; Cultivated; Naturalised; Invasive	NE	LC
Rubiaceae	*Richardia humistrata*	Not indigenous; Naturalised	NE	NE
Rubiaceae	*Pygmaeothamnus zeyheri*	Indigenous	LC	NE
Rubiaceae	*Vangueria infausta*	Indigenous	LC	LC

Rubiaceae	*Pentanisia angustifolia*	Indigenous	LC	NE
Scrophulariaceae	*Buddleja salviifolia*	Indigenous	LC	LC
Scrophulariaceae	*Jamesbrittenia aurantiaca*	Indigenous	LC	NE
Scrophulariaceae	*Selago densiflora*	Indigenous	LC	NE
Scrophulariaceae	*Jamesbrittenia burkeana*	Indigenous	LC	NE
Solanaceae	*Solanum campylacanthum*	Indigenous	LC	LC
Solanaceae	*Datura stramonium*	Not indigenous; Naturalised; Invasive	NE	NE
Thymelaeaceae	*Gnidia capitata*	Indigenous	LC	NE
Verbenaceae	*Lantana rugosa*	Indigenous	LC	NE
Verbenaceae	*Duranta erecta*	Not indigenous; Naturalised; Invasive	NE	LC
Verbenaceae	*Chascanum hederaceum*	Indigenous	LC	NE

7.3.2 Expected Mammal Species

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
Bathyergidae	*Cryptomys hottentotus*	Highveld Mole-rat	LC	LC
Bovidae	*Connochaetes gnou*	Black Wildebeest	LC	LC
Bovidae	*Sylvicapra grimmia*	Common Duiker	LC	LC
Bovidae	*Tragelaphus angasii*	Nyala	LC	LC
Bovidae	*Tragelaphus oryx*	Common Eland	LC	LC
Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	LC	LC
Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	LC	LC
Cercopithecidae	*Chlorocebus pygerythrus*	Vervet	LC	LC
Giraffidae	*Giraffa camelopardalis*	Giraffe	LC	VU
Mustelidae	*Hydrictis maculicollis*	Spotted-necked Otter	VU	NT
Procaviidae	*Procavia capensis*	Rock Hyrax	LC	LC
Soricidae	*Crocidura maquassiensis*	Maquassie Musk Shrew	VU	LC

7.3.3 Expected Herpetofauna Species

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
		Amphibians		
Bufonidae	*Sclerophrys gutturalis*	African Common Toad	LC	LC
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	LC	LC
		Reptiles		
Agamidae	*Agama aculeata*	Ground Agama	LC	LC
Agamidae	*Agama atra*	Southern Rock Agama	LC	LC
Atractaspididae	*Aparallactus capensis*	Black-headed Centipede-eater	LC	LC
Chamaeleonidae	*Chamaeleo dilepis*	Common Flap-neck Chameleon	LC	LC
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater	LC	LC
Cordylidae	*Cordylus vittifer*	Common Girdled Lizard	LC	LC
Elapidae	*Hemachatus haemachatus*	Rinkhals	LC	LC
Gekkonidae	*Lygodactylus capensis*	Common Dwarf Gecko	LC	LC
Gekkonidae	*Pachydactylus affinis*	Transvaal Gecko	LC	LC
Gekkonidae	*Pachydactylus capensis*	Cape Gecko	LC	LC
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	LC	LC
Lacertidae	*Nucras holubi*	Holub's Sandveld Lizard	LC	LC
Lamprophiidae	*Boaedon capensis*	Brown House Snake	LC	LC
Prosymnidae	*Prosymna sundevalli*	Sundevall's Shovel-snout	LC	LC
Psammophiidae	*Psammophis trinasalis*	Cape Sand Snake	LC	LC

Psammophiidae	*Psammophylax rhombeatus*	Spotted Grass Snake	LC	LC
Psammophiidae	*Pseudaspis cana*	Mole Snake	LC	LC
Scincidae	*Trachylepis varia*	Variable Skink	LC	LC
Typhlopidae	*Ramphotyphlops multilineatus*	Hook-Nosed Blindsnake	NE	LC
Viperidae	*Causus rhombeatus*	Rhombic Night Adder	LC	LC

7.3.4 Expected Avifauna Species

Family Name	Common Name	Scientific Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
Accipitridae	Shikra	*Accipiter badius*		
Accipitridae	Black Sparrowhawk	*Accipiter melanoleucus*		
Accipitridae	Little Sparrowhawk	*Accipiter minullus*		
Accipitridae	Ovambo Sparrowhawk	*Accipiter ovampensis*		
Accipitridae	African Hawk-eagle	*Aquila spilogaster*		
Accipitridae	Verreaux's Eagle	*Aquila verreauxii*	VU	LC
Accipitridae	African Cuckoo-hawk	*Aviceda cuculoides*		
Accipitridae	Common Buzzard	*Buteo buteo*		
Accipitridae	Jackal Buzzard	*Buteo rufofuscus*		
Accipitridae	Brown Snake Eagle	*Circaetus cinereus*		
Accipitridae	Black-chested Snake Eagle	*Circaetus pectoralis*		
Accipitridae	Western Marsh Harrier	*Circus aeruginosus*		
Accipitridae	Pallid Harrier	*Circus macrourus*	NA	NT
Accipitridae	Black Harrier	*Circus maurus*	EN	EN
Accipitridae	Montagu's Harrier	*Circus pygargus*		
Accipitridae	African Marsh Harrier	*Circus ranivorus*	VU	LC
Accipitridae	Black-winged Kite	*Elanus caeruleus*	NT	LC
Accipitridae	White-backed Vulture	*Gyps africanus*	CR	CR
Accipitridae	Cape Vulture	*Gyps coprotheres*	VU	VU
Accipitridae	African Fish Eagle	*Haliaeetus vocifer*		
Accipitridae	Booted Eagle	*Hieraaetus pennatus*		
Accipitridae	Long-crested Eagle	*Lophaetus occipitalis*		
Accipitridae	Pale Chanting Goshawk	*Melierax canorus*		
Accipitridae	Gabar Goshawk	*Micronisus gabar*		
Accipitridae	Yellow-billed Kite	*Milvus aegyptius*		
Accipitridae	Black Kite	*Milvus migrans*		
Accipitridae	European Honey Buzzard	*Pernis apivorus*		
Accipitridae	African Harrier-hawk	*Polyboroides typus*		
Acrocephalidae	Great Reed Warbler	*Acrocephalus arundinaceus*		

Acrocephalidae	Common Reed Warbler	*Acrocephalus baeticatus*		
Acrocephalidae	Lesser Swamp Warbler	*Acrocephalus gracilirostris*		
Acrocephalidae	Marsh Warbler	*Acrocephalus palustris*		
Acrocephalidae	Sedge Warbler	*Acrocephalus schoenobaenus*		
Acrocephalidae	Icterine Warbler	*Hippolais icterina*		
Acrocephalidae	African Yellow Warbler	*Iduna natalensis*		
Alaudidae	Red-capped Lark	*Calandrella cinerea*		
Alaudidae	Sabota Lark	*Calendulauda sabota*		
Alaudidae	Eastern Long-billed Lark	*Certhilauda semitorquata*		
Alaudidae	Spike-heeled Lark	*Chersomanes albofasciata*		
Alaudidae	Chestnut-backed Sparrow-lark	*Eremopterix leucotis*		
Alaudidae	Grey-backed Sparrow-lark	*Eremopterix verticalis*		
Alaudidae	Rufous-naped Lark	*Mirafra africana*		
Alaudidae	Melodious Lark	*Mirafra cheniana*	NT	LC
Alaudidae	Eastern Clapper Lark	*Mirafra fasciolata*		
Alaudidae	Pink-billed Lark	*Spizocorys conirostris*		
Alcedinidae	Half-collared Kingfisher	*Alcedo semitorquata*	VU	LC
Alcedinidae	Pied Kingfisher	*Ceryle rudis*		
Alcedinidae	Malachite Kingfisher	*Corythornis cristatus*		
Alcedinidae	Brown-hooded Kingfisher	*Halcyon albiventris*		
Alcedinidae	Woodland Kingfisher	*Halcyon senegalensis*		
Alcedinidae	Giant Kingfisher	*Megaceryle maxima*		
Anatidae	Egyptian Goose	*Alopochen aegyptiaca*		
Anatidae	Cape Teal	*Anas capensis*		
Anatidae	Red-billed Teal	*Anas erythrorhyncha*	NT	LC
Anatidae	Mallard	*Anas platyrhynchos*		
Anatidae	African Black Duck	*Anas sparsa*		
Anatidae	Yellow-billed Duck	*Anas undulata*	NT	LC
Anatidae	Fulvous Whistling Duck	*Dendrocygna bicolor*	NT	LC
Anatidae	White-faced Whistling Duck	*Dendrocygna viduata*		
Anatidae	Southern Pochard	*Netta erythrophthalma*	NT	LC
Anatidae	Maccoa Duck	*Oxyura maccoa*	VU	EN
Anatidae	Spur-winged Goose	*Plectropterus gambensis*		
Anatidae	Knob-billed Duck	*Sarkidiornis melanotos*	NT	LC
Anatidae	Blue-billed Teal	*Spatula hottentota*		
Anatidae	Cape Shoveler	*Spatula smithii*	NT	LC
Anatidae	South African Shelduck	*Tadorna cana*		
Anatidae	Ruddy Shelduck	*Tadorna ferruginea*		
Anatidae	White-backed Duck	*Thalassornis leuconotus*	NT	LC

Anhingidae	African Darter	*Anhinga rufa*	NT	LC
Apodidae	Little Swift	*Apus affinis*		
Apodidae	Common Swift	*Apus apus*		
Apodidae	African Black Swift	*Apus barbatus*		
Apodidae	White-rumped Swift	*Apus caffer*		
Apodidae	Horus Swift	*Apus horus*		
Apodidae	African Palm Swift	*Cypsiurus parvus*		
Apodidae	Alpine Swift	*Tachymarptis melba*		
Ardeidae	Great Egret	*Ardea alba*	NT	LC
Ardeidae	Yellow-billed Egret	*Ardea brachyrhyncha*	NT	LC
Ardeidae	Grey Heron	*Ardea cinerea*		
Ardeidae	Goliath Heron	*Ardea goliath*		
Ardeidae	Black-headed Heron	*Ardea melanocephala*		
Ardeidae	Purple Heron	*Ardea purpurea*		
Ardeidae	Squacco Heron	*Ardeola ralloides*		
Ardeidae	Western Cattle Egret	*Bubulcus ibis*		
Ardeidae	Striated Heron	*Butorides striata*		
Ardeidae	Black Heron	*Egretta ardesiaca*		
Ardeidae	Little Egret	*Egretta garzetta*		
Ardeidae	Little Bittern	*Ixobrychus minutus*		
Ardeidae	Black-crowned Night Heron	*Nycticorax nycticorax*	NT	LC
Bucerotidae	African Grey Hornbill	*Lophoceros nasutus*		
Burhinidae	Spotted Thick-knee	*Burhinus capensis*		
Campephagidae	Black Cuckooshrike	*Campephaga flava*		
Caprimulgidae	Fiery-necked Nightjar	*Caprimulgus pectoralis*		
Caprimulgidae	Rufous-cheeked Nightjar	*Caprimulgus rufigena*		
Charadriidae	Common Ringed Plover	*Charadrius hiaticula*		
Charadriidae	Kittlitz's Plover	*Charadrius pecuarius*	NT	LC
Charadriidae	Three-banded Plover	*Charadrius tricollaris*		
Charadriidae	Blacksmith Lapwing	*Vanellus armatus*		
Charadriidae	Crowned Lapwing	*Vanellus coronatus*		
Charadriidae	African Wattled Lapwing	*Vanellus senegallus*		
Ciconiidae	Abdim's Stork	*Ciconia abdimii*		
Ciconiidae	White Stork	*Ciconia ciconia*		
Ciconiidae	Black Stork	*Ciconia nigra*	EN	LC
Ciconiidae	Yellow-billed Stork	*Mycteria ibis*	VU	LC
Cisticolidae	Bar-throated Apalis	*Apalis thoracica*		
Cisticolidae	Lazy Cisticola	*Cisticola aberrans*		
Cisticolidae	Desert Cisticola	*Cisticola aridulus*		

Cisticolidae	Wing-snapping Cisticola	*Cisticola ayresii*		
Cisticolidae	Rattling Cisticola	*Cisticola chiniana*		
Cisticolidae	Neddicky	*Cisticola fulvicapilla*		
Cisticolidae	Zitting Cisticola	*Cisticola juncidis*		
Cisticolidae	Wailing Cisticola	*Cisticola lais*		
Cisticolidae	Cloud Cisticola	*Cisticola textrix*		
Cisticolidae	Levaillant's Cisticola	*Cisticola tinniens*		
Cisticolidae	Yellow-bellied Eremomela	*Eremomela icteropygialis*		
Cisticolidae	Black-chested Prinia	*Prinia flavicans*		
Cisticolidae	Tawny-flanked Prinia	*Prinia subflava*		
Coliidae	White-backed Mousebird	*Colius colius*		
Coliidae	Speckled Mousebird	*Colius striatus*		
Coliidae	Red-faced Mousebird	*Urocolius indicus*		
Columbidae	African Olive Pigeon	*Columba arquatrix*		
Columbidae	Speckled Pigeon	*Columba guinea*		
Columbidae	Rock Dove	*Columba livia*		
Columbidae	Namaqua Dove	*Oena capensis*		
Columbidae	Laughing Dove	*Spilopelia senegalensis*		
Columbidae	Ring-necked Dove	*Streptopelia capicola*		
Columbidae	Red-eyed Dove	*Streptopelia semitorquata*		
Columbidae	African Green Pigeon	*Treron calvus*		
Coraciidae	Lilac-breasted Roller	*Coracias caudatus*		
Coraciidae	European Roller	*Coracias garrulus*	NT	LC
Coraciidae	Purple Roller	*Coracias naevius*		
Corvidae	Pied Crow	*Corvus albus*		
Cuculidae	Burchell's Coucal	*Centropus burchellii*		
Cuculidae	Diederik Cuckoo	*Chrysococcyx caprius*		
Cuculidae	Klaas's Cuckoo	*Chrysococcyx klaas*		
Cuculidae	Great Spotted Cuckoo	*Clamator glandarius*		
Cuculidae	Jacobin Cuckoo	*Clamator jacobinus*		
Cuculidae	Black Cuckoo	*Cuculus clamosus*		
Cuculidae	African Cuckoo	*Cuculus gularis*		
Cuculidae	Red-chested Cuckoo	*Cuculus solitarius*		
Dicruridae	Fork-tailed Drongo	*Dicrurus adsimilis*		
Emberizidae	Cape Bunting	*Emberiza capensis*		
Emberizidae	Golden-breasted Bunting	*Emberiza flaviventris*		
Emberizidae	Lark-like Bunting	*Emberiza impetuani*		
Emberizidae	Cinnamon-breasted Bunting	*Emberiza tahapisi*		
Estriididae	Red-headed Finch	*Amadina erythrocephala*		

Estriididae	Cut-throat Finch	*Amadina fasciata*		
Estriididae	Jameson's Firefinch	*Lagonosticta rhodopareia*		
Estriididae	African Firefinch	*Lagonosticta rubricata*		
Estriididae	Red-billed Firefinch	*Lagonosticta senegala*		
Estrildidae	Orange-breasted Waxbill	*Amandava subflava*		
Estrildidae	Black-faced Waxbill	*Brunhilda erythronotos*		
Estrildidae	Common Waxbill	*Estrilda astrild*		
Estrildidae	Violet-eared Waxbill	*Granatina granatina*		
Estrildidae	Quailfinch	*Ortygospiza atricollis*		
Estrildidae	Green-winged Pytilia	*Pytilia melba*		
Estrildidae	Bronze Mannikin	*Spermestes cucullata*		
Estrildidae	Blue Waxbill	*Uraeginthus angolensis*		
Falconidae	Amur Falcon	*Falco amurensis*		
Falconidae	Lanner Falcon	*Falco biarmicus*	NT	LC
Falconidae	Lesser Kestrel	*Falco naumanni*	VU	LC
Falconidae	Peregrine Falcon	*Falco peregrinus*		
Falconidae	Greater Kestrel	*Falco rupicoloides*		
Falconidae	Rock Kestrel	*Falco rupicolus*		
Falconidae	Red-footed Falcon	*Falco vespertinus*	VU	VU
Fringillidae	Black-throated Canary	*Crithagra atrogularis*		
Fringillidae	Yellow Canary	*Crithagra flaviventris*		
Fringillidae	Streaky-headed Seedeater	*Crithagra gularis*		
Fringillidae	Yellow-fronted Canary	*Crithagra mozambica*		
Glareolidae	Temminck's Courser	*Cursorius temminckii*		
Glareolidae	Black-winged Pratincole	*Glareola nordmanni*	LC	NT
Glareolidae	Double-banded Courser	*Rhinoptilus africanus*		
Gruidae	Blue Crane	*Anthropoides paradiseus*	VU	VU
Hirundinidae	Lesser Striped Swallow	*Cecropis abyssinica*		
Hirundinidae	Greater Striped Swallow	*Cecropis cucullata*		
Hirundinidae	Red-breasted Swallow	*Cecropis semirufa*		
Hirundinidae	Common House Martin	*Delichon urbicum*		
Hirundinidae	White-throated Swallow	*Hirundo albigularis*		
Hirundinidae	Pearl-breasted Swallow	*Hirundo dimidiata*		
Hirundinidae	Barn Swallow	*Hirundo rustica*		
Hirundinidae	Banded Martin	*Neophedina cincta*		
Hirundinidae	South African Cliff Swallow	*Petrochelidon spilodera*		
Hirundinidae	Large Rock Martin	*Ptyonoprogne fuligula*		
Hirundinidae	Brown-throated Martin	*Riparia paludicola*		
Hirundinidae	Sand Martin	*Riparia riparia*		

Indicatoridae	Greater Honeyguide	*Indicator indicator*		
Indicatoridae	Lesser Honeyguide	*Indicator minor*		
Indicatoridae	Brown-backed Honeybird	*Prodotiscus regulus*		
Jacanidae	African Jacana	*Actophilornis africanus*		
Jacanidae	Lesser Jacana	*Microparra capensis*	NA	LC
Laniidae	Southern Fiscal	*Lanius collaris*		
Laniidae	Red-backed Shrike	*Lanius collurio*		
Laniidae	Lesser Grey Shrike	*Lanius minor*		
Laridae	Whiskered Tern	*Chlidonias hybrida*		
Laridae	White-winged Tern	*Chlidonias leucopterus*		
Laridae	Grey-headed Gull	*Chroicocephalus cirrocephalus*		
Laridae	Caspian Tern	*Hydropogne caspia*	VU	LC
Leiothrichidae	Southern Pied Babbler	*Turdoides bicolor*		
Leiothrichidae	Arrow-marked Babbler	*Turdoides jardineii*		
Locustellidae	Little Rush Warbler	*Bradypterus baboecala*		
Lybiidae	Black-collared Barbet	*Lybius torquatus*		
Lybiidae	Crested Barbet	*Trachyphonus vaillantii*		
Lybiidae	Acacia Pied Barbet	*Tricholaema leucomelas*		
Macrosphenidae	Cape Grassbird	*Sphenoeacus afer*		
Macrosphenidae	Long-billed Crombec	*Sylvietta rufescens*		
Malaconotidae	Orange-breasted Bushshrike	*Chlorophoneus sulfureopectus*		
Malaconotidae	Black-backed Puffback	*Dryoscopus cubla*		
Malaconotidae	Crimson-breasted Shrike	*Laniarius atrococcineus*		
Malaconotidae	Southern Boubou	*Laniarius ferrugineus*		
Malaconotidae	Grey-headed Bushshrike	*Malaconotus blanchoti*		
Malaconotidae	Brubru	*Nilaus afer*		
Malaconotidae	Brown-crowned Tchagra	*Tchagra australis*		
Malaconotidae	Black-crowned Tchagra	*Tchagra senegalus*		
Malaconotidae	Bokmakierie	*Telophorus zeylonus*		
Meropidae	European Bee-eater	*Merops apiaster*		
Meropidae	White-fronted Bee-eater	*Merops bullockoides*		
Meropidae	Swallow-tailed Bee-eater	*Merops hirundineus*		
Meropidae	Blue-cheeked Bee-eater	*Merops persicus*		
Meropidae	Little Bee-eater	*Merops pusillus*		
Monarchidae	African Paradise Flycatcher	*Terpsiphone viridis*		
Motacillidae	African Pipit	*Anthus cinnamomeus*		
Motacillidae	Plain-backed Pipit	*Anthus leucophrys*		
Motacillidae	Striped Pipit	*Anthus lineiventris*		
Motacillidae	Nicholson's Pipit	*Anthus nicholsoni*		

Motacillidae	Buffy Pipit	*Anthus vaalensis*		
Motacillidae	Cape Longclaw	*Macronyx capensis*		
Motacillidae	African Pied Wagtail	*Motacilla aguimp*		
Motacillidae	Cape Wagtail	*Motacilla capensis*		
Motacillidae	Western Yellow Wagtail	*Motacilla flava*		
Muscicapidae	White-browed Scrub Robin	*Cercotrichas leucophrys*		
Muscicapidae	Kalahari Scrub Robin	*Cercotrichas paena*		
Muscicapidae	Cape Robin-chat	*Cossypha caffra*		
Muscicapidae	White-throated Robin-chat	*Cossypha humeralis*		
Muscicapidae	Sickle-winged Chat	*Emarginata sinuata*		
Muscicapidae	Marico Flycatcher	*Melaenornis mariquensis*		
Muscicapidae	Fiscal Flycatcher	*Melaenornis silens*		
Muscicapidae	Short-toed Rock Thrush	*Monticola brevipes*		
Muscicapidae	Sentinel Rock Thrush	*Monticola explorator*	LC	NT
Muscicapidae	Spotted Flycatcher	*Muscicapa striata*		
Muscicapidae	Ant-eating Chat	*Myrmecocichla formicivora*		
Muscicapidae	Mountain Wheatear	*Myrmecocichla monticola*		
Muscicapidae	Familiar Chat	*Oenanthe familiaris*		
Muscicapidae	Capped Wheatear	*Oenanthe pileata*		
Muscicapidae	African Stonechat	*Saxicola torquatus*		
Muscicapidae	Fairy Flycatcher	*Stenostira scita*		
Muscicapidae	Mocking Cliff Chat	*Thamnolaea cinnamomeiventris*		
Musophagidae	Grey Go-away-bird	*Corythaixoides concolor*		
Nectariniidae	Amethyst Sunbird	*Chalcomitra amethystina*		
Nectariniidae	Greater Double-collared Sunbird	*Cinnyris afer*		
Nectariniidae	Marico Sunbird	*Cinnyris mariquensis*		
Nectariniidae	White-bellied Sunbird	*Cinnyris talatala*		
Nectariniidae	Malachite Sunbird	*Nectarinia famosa*		
Numididae	Helmeted Guineafowl	*Numida meleagris*		
Oriolidae	Black-headed Oriole	*Oriolus larvatus*		
Otididae	Northern Black Korhaan	*Afrotis afraoides*		
Pandionidae	Western Osprey	*Pandion haliaetus*		
Paridae	Ashy Tit	*Melaniparus cinerascens*		
Passeridae	Yellow-throated Bush Sparrow	*Gymnoris superciliaris*		
Passeridae	Southern Grey-headed Sparrow	*Passer diffusus*		
Passeridae	House Sparrow	*Passer domesticus*		
Passeridae	Cape Sparrow	*Passer melanurus*		
Phalacrocoracidae	Reed Cormorant	*Microcarbo africanus*		
Phalacrocoracidae	White-breasted Cormorant	*Phalacrocorax lucidus*		

Phasianidae	Common Quail	*Coturnix coturnix*		
Phasianidae	Crested Francolin	*Dendroperdix sephaena*		
Phasianidae	Indian Peafowl	*Pavo cristatus*		
Phasianidae	Coqui Francolin	*Peliperdix coqui*		
Phasianidae	Natal Spurfowl	*Pternistis natalensis*		
Phasianidae	Swainson's Spurfowl	*Pternistis swainsonii*		
Phasianidae	Orange River Francolin	*Scleroptila gutturalis*		
Phoenicopteridae	Lesser Flamingo	*Phoeniconaias minor*	VU	NT
Phoenicopteridae	Greater Flamingo	*Phoenicopterus roseus*	NT	LC
Phoeniculidae	Green Wood Hoopoe	*Phoeniculus purpureus*		
Phoeniculidae	Common Scimitarbill	*Rhinopomastus cyanomelas*		
Phylloscopidae	Willow Warbler	*Phylloscopus trochilus*		
Picidae	Golden-tailed Woodpecker	*Campethera abingoni*		
Picidae	Bearded Woodpecker	*Chloropicus namaquus*		
Picidae	Cardinal Woodpecker	*Dendropicos fuscescens*		
Picidae	Red-throated Wryneck	*Jynx ruficollis*		
Platysteiridae	Chinspot Batis	*Batis molitor*		
Platysteiridae	Pririt Batis	*Batis pririt*		
Ploceidae	Thick-billed Weaver	*Amblyospiza albifrons*		
Ploceidae	Yellow-crowned Bishop	*Euplectes afer*		
Ploceidae	White-winged Widowbird	*Euplectes albonotatus*		
Ploceidae	Red-collared Widowbird	*Euplectes ardens*		
Ploceidae	Southern Red Bishop	*Euplectes orix*		
Ploceidae	Long-tailed Widowbird	*Euplectes progne*		
Ploceidae	White-browed Sparrow-weaver	*Plocepasser mahali*		
Ploceidae	Cape Weaver	*Ploceus capensis*		
Ploceidae	Village Weaver	*Ploceus cucullatus*		
Ploceidae	Southern Masked Weaver	*Ploceus velatus*		
Ploceidae	Red-billed Quelea	*Quelea quelea*		
Ploceidae	Scaly-feathered Weaver	*Sporopipes squamifrons*		
Podicipedidae	Great Crested Grebe	*Podiceps cristatus*	VU	LC
Podicipedidae	Little Grebe	*Tachybaptus ruficollis*		
Psittaculidae	Rose-ringed Parakeet	*Psittacula krameri*		
Pteroclidae	Namaqua Sandgrouse	*Pterocles namaqua*		
Pycnonotidae	African Red-eyed Bulbul	*Pycnonotus nigricans*		
Pycnonotidae	Dark-capped Bulbul	*Pycnonotus tricolor*		
Pycnonotidae	Common Greenshank	*Tringa nebularia*		
Rallidae	African Crake	*Crecopsis egregia*		
Rallidae	Corn Crake	*Crex crex*		

Rallidae	Red-knobbed Coot	*Fulica cristata*		
Rallidae	Common Moorhen	*Gallinula chloropus*		
Rallidae	Lesser Moorhen	*Paragallinula angulata*		
Rallidae	African Swamphen	*Porphyrio madagascariensis*		
Rallidae	African Rail	*Rallus caerulescens*		
Rallidae	Black Crake	*Zapornia flavirostra*		
Recurvirostridae	Black-winged Stilt	*Himantopus himantopus*		
Recurvirostridae	Pied Avocet	*Recurvirostra avosetta*		
Remizidae	Cape Penduline Tit	*Anthoscopus minutus*		
Rostratulidae	Greater Painted-snipe	*Rostratula benghalensis*		
Sagittariidae	Secretarybird	*Sagittarius serpentarius*	VU	EN
Sarothruridae	Red-chested Flufftail	*Sarothrura rufa*		
Scolopacidae	Common Sandpiper	*Actitis hypoleucos*		
Scolopacidae	Curlew Sandpiper	*Calidris ferruginea*	VU	VU
Scolopacidae	Little Stint	*Calidris minuta*		
Scolopacidae	Ruff	*Calidris pugnax*		
Scolopacidae	African Snipe	*Gallinago nigripennis*		
Scolopacidae	Wood Sandpiper	*Tringa glareola*		
Scolopacidae	Marsh Sandpiper	*Tringa stagnatilis*		
Scopidae	Hamerkop	*Scopus umbretta*	NT	LC
Strigidae	Marsh Owl	*Asio capensis*	NT	LC
Strigidae	Spotted Eagle Owl	*Bubo africanus*		
Strigidae	Western Barn Owl	*Tyto alba*		
Strigidae	African Grass Owl	*Tyto capensis*	VU	LC
Struthionidae	Common Ostrich	*Struthio camelus*		
Sturnidae	Common Myna	*Acridotheres tristis*		
Sturnidae	Violet-backed Starling	*Cinnyricinclus leucogaster*		
Sturnidae	Wattled Starling	*Creatophora cinerea*		
Sturnidae	Pied Starling	*Lamprotornis bicolor*		
Sturnidae	Cape Starling	*Lamprotornis nitens*		
Sturnidae	Red-winged Starling	*Onychognathus morio*		
Sylviidae	Common Whitethroat	*Curruca communis*		
Sylviidae	Chestnut-vented Warbler	*Curruca subcoerulea*		
Sylviidae	Garden Warbler	*Sylvia borin*		
Threskiornithidae	Hadada Ibis	*Bostrychia hagedash*		
Threskiornithidae	African Spoonbill	*Platalea alba*		
Threskiornithidae	Glossy Ibis	*Plegadis falcinellus*		
Threskiornithidae	African Sacred Ibis	*Threskiornis aethiopicus*		
Turdidae	Kurrichane Thrush	*Turdus libonyana*		

Turdidae	Groundscraper Thrush	*Turdus litsitsirupa*
Turdidae	Karoo Thrush	*Turdus smithi*
Turnicidae	Common Buttonquail	*Turnix sylvaticus*
Upupidae	African Hoopoe	*Upupa africana*
Viduidae	Cuckoo Finch	*Anomalospiza imberbis*
Viduidae	Village Indigobird	*Vidua chalybeata*
Viduidae	Dusky Indigobird	*Vidua funerea*
Viduidae	Pin-tailed Whydah	*Vidua macroura*
Viduidae	Long-tailed Paradise Whydah	*Vidua paradisaea*
Viduidae	Purple Indigobird	*Vidua purpurascens*
Viduidae	Shaft-tailed Whydah	*Vidua regia*
Zosteropidae	Orange River White-eye	*Zosterops pallidus*
Zosteropidae	Cape White-eye	*Zosterops virens*

7.4 Appendix D: Specialist Declaration of Independence

I, Andine de Villiers, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Andine de Villiers

Ecologist

The Biodiversity Company

June 2026

7.5 Appendix E: Specialist CVs

Andine DE VILLIERS



Pr Sci Nat 164894 +27 64 417 6320 andine@thebiodiversitycompany.com

PROFILE SUMMARY

Environmental and ecological specialist with more than two years of consulting experience within South Africa and internationally. Specialist expertise as a terrestrial ecologist and project manager in various sectors including mining, engineering, renewable energy, and private sector developments. Experienced in delivering field surveys, technical reports and specialist guidance for compliance with in-country legislative requirements and international lender standards. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 8 April 1995

EXPERIENCE

Environmental Impact Assessments (EIA)

Environmental Management Programmes (EMP)

Project Management

Mammal Assessments

SKILLS

- ✓ Terrestrial Biodiversity, Fauna and Flora (Ecology) Assessments
- ✓ GIS
- ✓ Golden Mole and Riverine Rabbit Assessment
- ✓ Rehabilitation
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient

Afrikaans – Proficient

Signed: Andine de Villiers

ACADEMIC QUALIFICATIONS

University of Pretoria (2020): MAGISTER SCIENTIAE (MSc) – Zoology *with distinction*:
Thesis title: *Playing with rats: The effect of a social companion, environmental enrichment and human interactions on the plasma oxytocin and faecal corticosterone metabolite concentration of Sprague Dawley rats.*

University of Pretoria (2018): BACCALAREUS SCIENTIAE CUM HONORIBUS (BSc Hons) – Zoology:
Research project title: Research project: Locomotor activity of individual Damaraland mole-rats (*Fukomys damarensis*) in intact colonies.

University of Pretoria (2017): BACCALAREUS SCIENTIAE (BSc) – Zoology:
Majors: Zoology

PROFESSIONAL EXPERIENCE

June 2023 – Present **The Biodiversity Company**
Terrestrial Ecologist

INTERNATIONAL EXPERIENCE

South Africa, Mauritius, Zambia