



# **TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED HARMONY GOLD MPONENG LOWER COMPARTMENT TAILINGS STORAGE FACILITY**

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

**2026/01/23**

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| <b>Report Name</b>                           | <b>TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED HARMONY GOLD MPONENG LOWER COMPARTMENT TAILINGS STORAGE FACILITY</b>  |   |
| <b>Specialist Theme</b>                      | Terrestrial Biodiversity, Plant and Animal Theme  |   |
| <b>Project Reference</b>                     | Mponeng TSF Lower Compartment   |   |
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| <b>Declaration</b>                           | <p>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.</p> |   |

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## 1 Introduction

### 1.1 Background

The Biodiversity Company (TBC) was appointed to undertake a terrestrial biodiversity assessment for the proposed Mponeng Lower Compartment Tailings Storage Facility (TSF) project. The proposed project involves recommencing deposition on the Mponeng Lower Compartment TSF (hereafter referred to as Mponeng TSF). The Mponeng TSF is currently not in operation and is used as a holding dam and partially as a landfill facility. The Mponeng TSF is situated in close proximity to Carletonville, Merafong Local Municipality, West Rand District Municipality, Gauteng Province. A 50 meter (m) buffer has been applied to the area provided and is referred to as the Project Area of Influence (PAOI). The regional context of the PAOI can be seen in Figure 1-1. The proposed PAOI can be seen illustrated in Figure 1-2.

To determine the area's baseline ecological state and present a detailed description of the receiving environment, both a desktop assessment and field surveys (3 July 2025 and 20 January 2026) were conducted. Furthermore, the desktop assessment and field survey both involved detecting, identifying and describing any locally relevant sensitive receptors and habitats. The manner in which the proposed development may affect these sensitive features was also investigated.

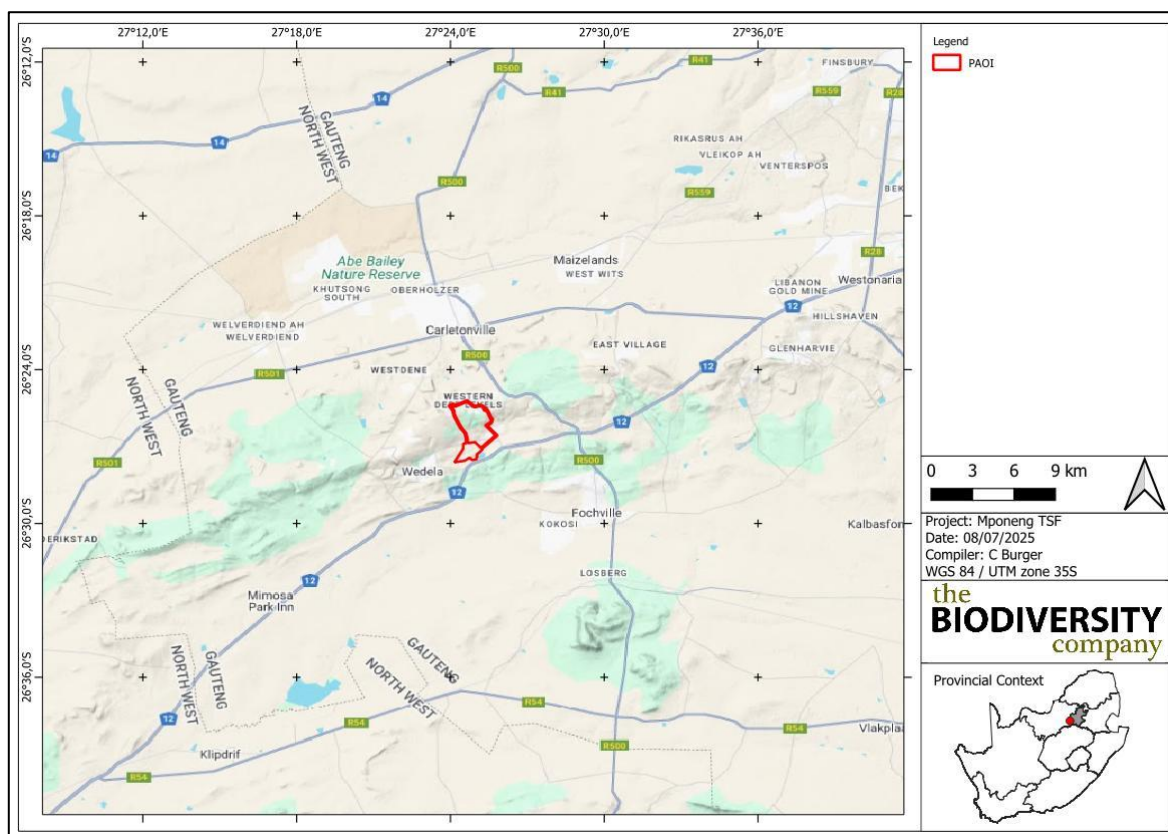
This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020) in terms of NEMA, dated 20 March and 30 October 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" (Reporting Criteria). The National Web-based Environmental Screening Tool has characterised the terrestrial theme sensitivity of the PAOI as:

- Terrestrial Biodiversity Theme sensitivity is Very High;
- Plant Species Theme sensitivity is Medium; and
- Animal Species Theme sensitivity is Medium.

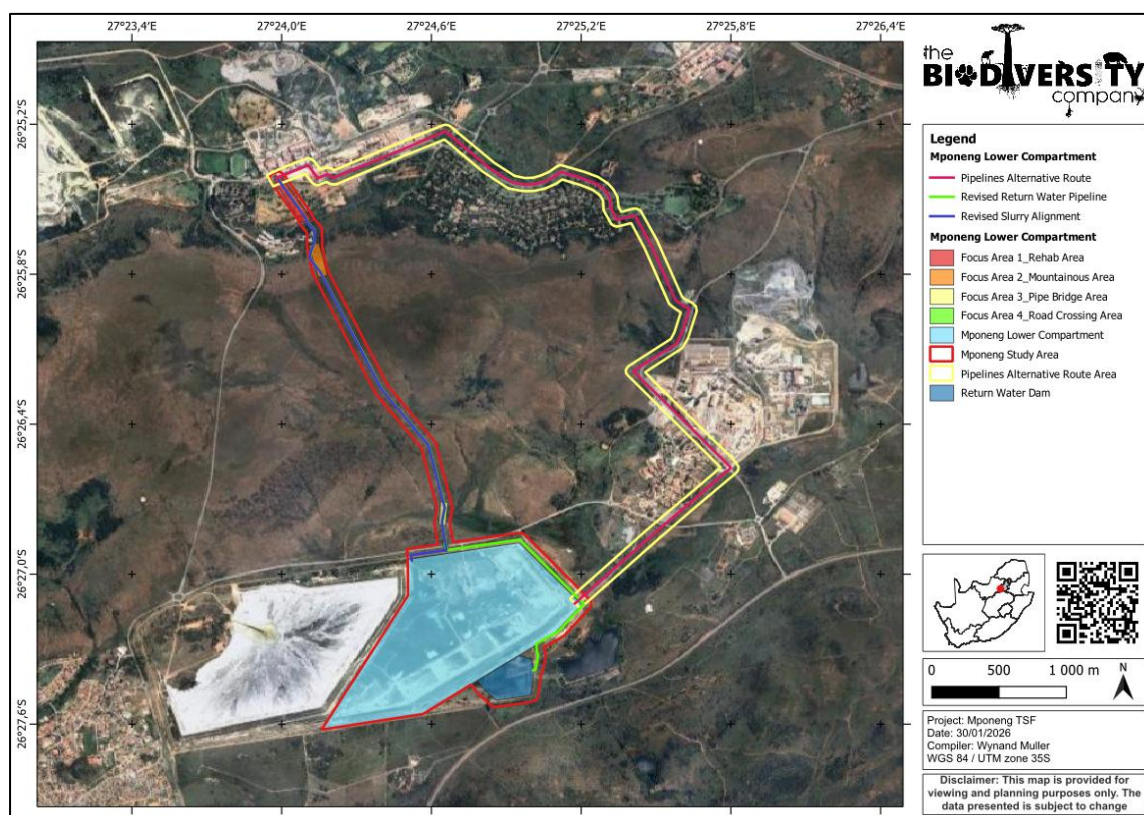
The purpose of the specialist studies is to provide relevant input into the impact assessment process and to provide a report for the proposed activities associated with the development. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should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



## Mponeng TSF Lower Compartment



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



**Figure 1-2** Map illustrating the layout of the project

## 1.2 Project Description

Harmony Gold Mining Company Limited (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to undertake the necessary environmental authorisation and associated consultation processes. EIMS will compile and submit the required documentation in support of applications for:

- Environmental Authorisation (EA) in accordance with the NEMA- Listed activity/ies:
  - GNR983 Listing Notice 1, Activities 10, 12, 19, 21D, and 21F.
  - GNR984 Listing Notice 2, Activities 6 and 15.
  - GNR985 Listing Notice 3, Activities 12, 14, 23, and 26.
- Waste Management Licence in accordance with the requirements of the National Environmental Management: Waste Act- NEM:WA (Act 59 of 2008) - Listed activity/ies:
  - GNR921 Categories A14, B7, B10 and B11.
- Water Use Licence (WUL) in accordance with the National Water Act – NWA (Act 36 of 1998) - Listed activity/ies:
  - Section 21 (c), (g) and (i).

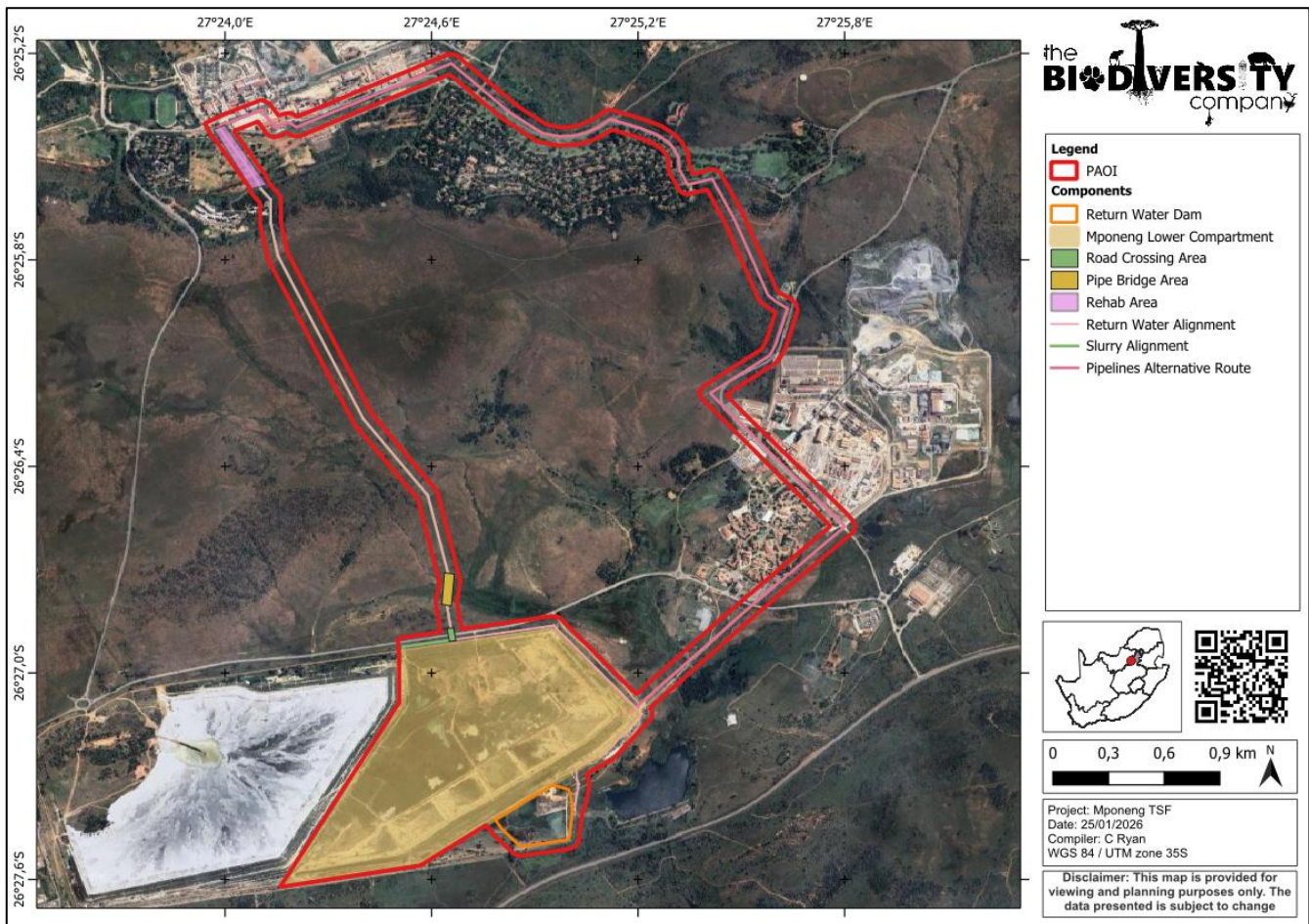
Additional listed activities and/or water uses may be identified during the process.

The applicant owns and operates a number of Gold Mines and Plants in the West Wits region in the Gauteng Province. The Savuka Plant currently deposits tailings onto the Savuka 7a & 7b Tailings Storage Facilities (TSFs). However, these facilities are approaching their final and approved height, and the current planned Life of Mine (LOM) for the West Wits region exceeds the available deposition capacity of these TSFs. Accordingly, the applicant is undertaking a feasibility assessment to recommence deposition on the Mponeng TSF Lower Compartment.

The Mponeng TSF is located at 26°27'11.18"S; 27°24'43.88"E. Mponeng Lower TSF is an existing TSF, however, the Mponeng Lower Compartment TSF is no longer in operation and is currently utilised as a Holding Dam, and a portion of it is used as an authorised Landfill Facility. In order to redeposit on the Mponeng TSF, from the Savuka Plant, slurry pipelines will need to be constructed from the Savuka Plant to the TSF. The proposed slurry and return water pipes extend from the south of Savuka Plant at starting point 26°25'24.95"S; 27°23'58.94"E, extending southwards, parallel to each other until reaching the northern extent of Mponeng TSF where they split. Thereafter, the slurry pipeline extends to west before connecting to Mponeng TSF while the return water pipeline extends east then south around the TSF to the return water dam. There is an alternative slurry and return water pipeline route which extends to the east through Western Deep Levels then south along Mponeng Gold Mine before heading to the west where it connects to Mponeng TSF.

The proposed layout can be seen in Figure 1-3 below.





**Figure 1-3** Proposed layout 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 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;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (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;
- This assessment does not consider temporal trends (note that the data collected is, however, considered sufficient to derive a meaningful baseline);
- The area was surveyed during two site visits, during the dry (3 July 2025) and a wet (20 January 2026) season survey. The data collected is 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.   |
| Provincial | 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. |
|            | Gauteng Provincial Environmental Management Framework, 2014   | To provide for the management and conservation of the Province's biophysical environment and protected areas.  |
|            | Transvaal Nature Conservation Ordinance No. 12 of 1983  | To inform land use planning, environmental assessments,  |

Mponeng TSF Lower Compartment

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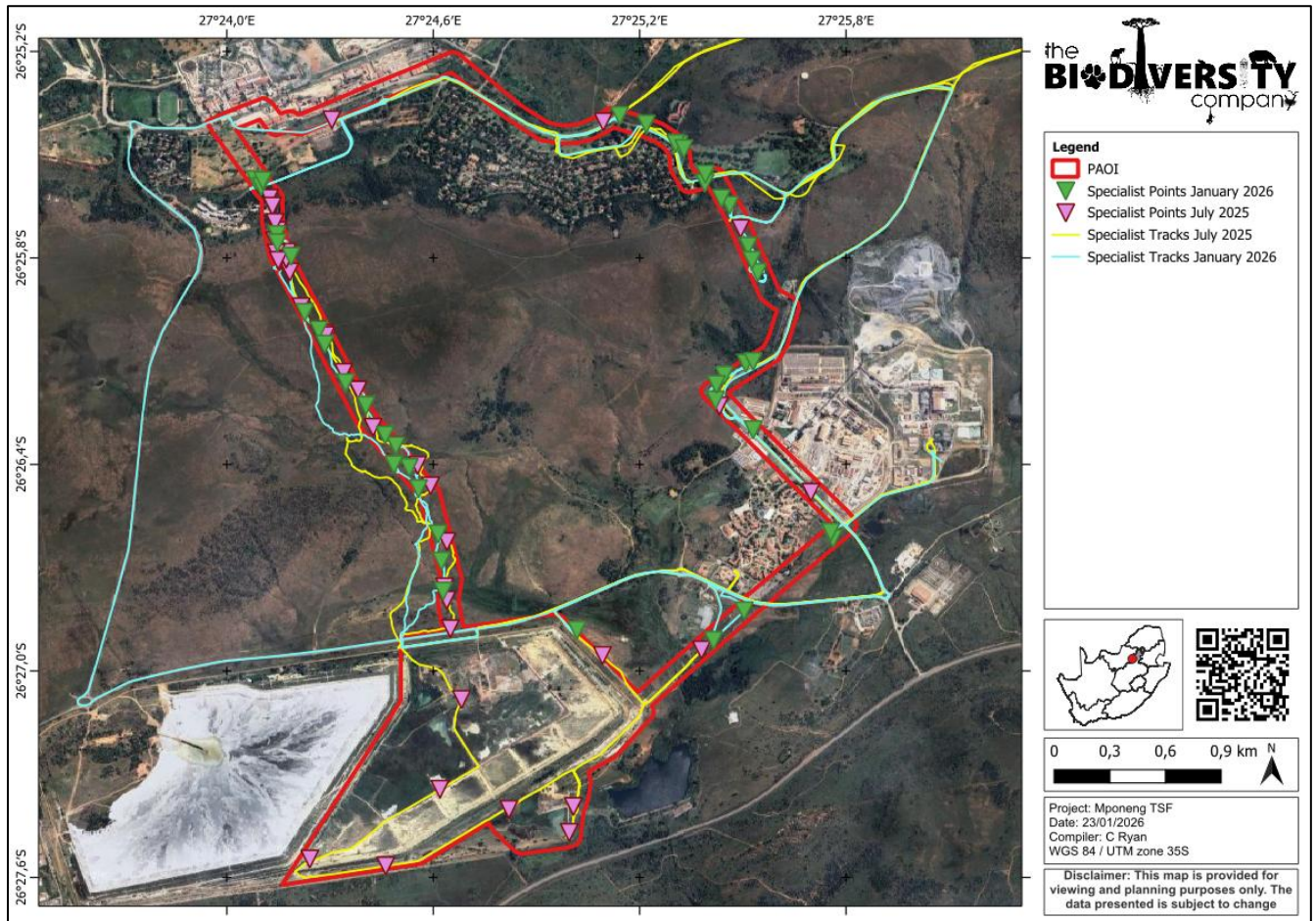
|  |  |
|--|--|
| Gauteng Conservation Plan (2024)   | land and water use authorisations, as well as natural resource management. |
| Gauteng Nature Conservation Bill, 2014 (Draft)                           |  |
| Gauteng Department of Agriculture and Rural Development Ridges Guideline |  |

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## 2 Fieldwork

### 2.1 Biodiversity Field Assessment

A wet (20 January 2026) and a dry (3 July 2025) season field assessment occurred to determine the presence of flora, fauna, and dominant vegetation within the PAOI as well as to determine the likelihood of occurrence within the assessed area. Vegetation and habitat units were also identified. Every 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 field tracks and sample points.

### 3 Results & Discussion

#### 3.1 Desktop Assessment

##### 3.1.1 Ecologically Important Landscape Features

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

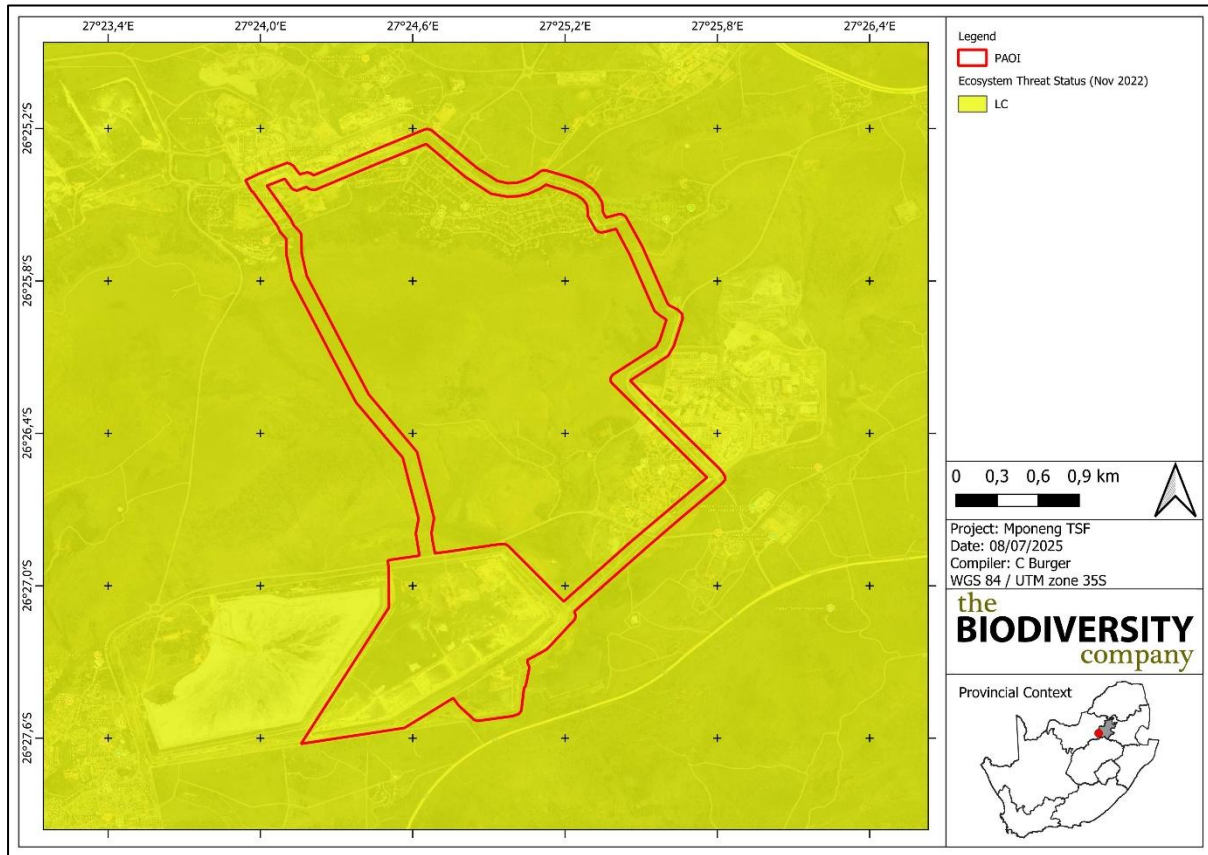
**Table 3-1** *Summary of relevance of the proposed project to ecologically important landscape features*

| Desktop Information Considered  | Relevance  | Reasoning  | Section |
|---|------------|--|---------|
| Ecosystem Threat Status (RLE, 2022)   | Relevant   | Overlaps with a 'Least Concern' (LC) ecosystem.  | 3.1.1.1 |
| Ecosystem Protection Level (NBA, 2018)  | Relevant   | Overlaps with a 'Poorly Protected' (PP) ecosystem.   | 3.1.1.2 |
| Provincial Conservation Plan (2024)   | Relevant   | Overlaps with Critical Biodiversity Area (CBA) 2, and Ecological Support Area (ESA) 1.   | 3.1.1.3 |
| Gauteng Ridges (2019)   | Relevant   | The PAOI overlaps with a Class 2 ridge and is located adjacent to two Class 1 ridges (271m from the southern portion of the PAOI and 1.8 km from the eastern portion of the PAOI). | 3.1.1.4 |
| Key Biodiversity Areas (KBA)  | Irrelevant | Not located within 10 km of any KBA.   | -       |
| South African Protected and Conservation Areas Databases (2025, Q3) (SAPAD and SACAD) | Relevant   | Not within range of any relevant SAPAD or SACAD areas. The Gauteng C-Plan does however show a Protected Area to the east of the PAOI.  | -       |
| National Protected Areas Expansion Strategy (NPAES, 2018)                             | Relevant   | The PAOI overlaps with portions of NPAES Priority Focus Areas.   | 3.1.1.5 |
| Strategic Water Source Areas (SWSA, 2021)   | Irrelevant | Does not overlap with any relevant areas.  | -       |
| South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018)                   | Relevant   | The PAOI overlaps with 'Critically Endangered' (CR) SAIIAE wetlands and a CR/Endangered (EN) River.  | 3.1.1.6 |
| National Freshwater Priority Area (NFEPA, 2011)                                       | Relevant   | The PAOI overlaps with Non Priority FEPA wetlands, and an unclassified Class D: Largely Modified and the Class C: Moderately Modified Elandsfontein spruit River.                  | 3.1.1.7 |
| Mining and Biodiversity Guidelines  | Relevant   | The PAOI overlaps with areas rated as Moderate, High and Highest Biodiversity Importance with the correlating risks for mining.  | 3.1.1.8 |

### 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 & Monyeke, 2021) the proposed PAOI overlaps with a LC ecosystem (Figure 3-1).



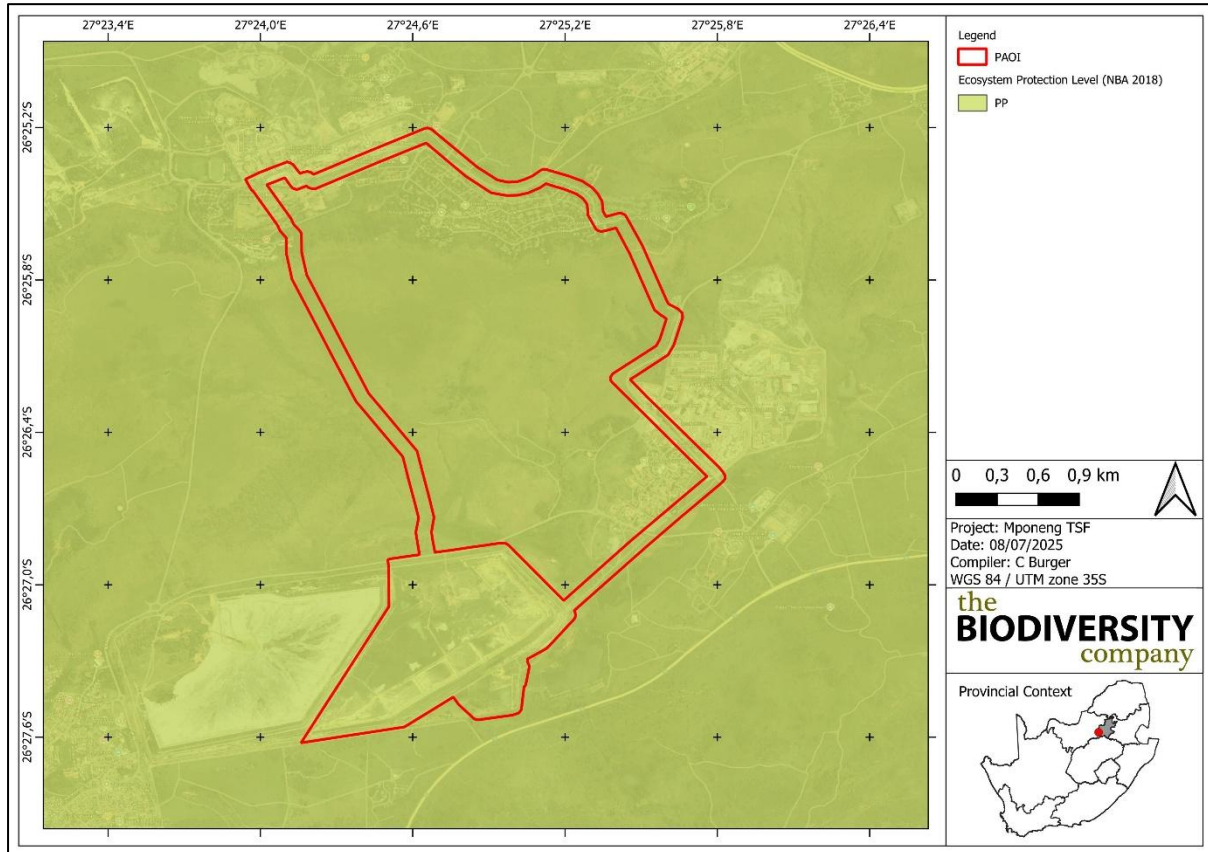
**Figure 3-1** Map illustrating the ecosystem threat status associated with the PAOI.



### 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.

The PAOI overlaps with a PP ecosystem (Figure 3-2).

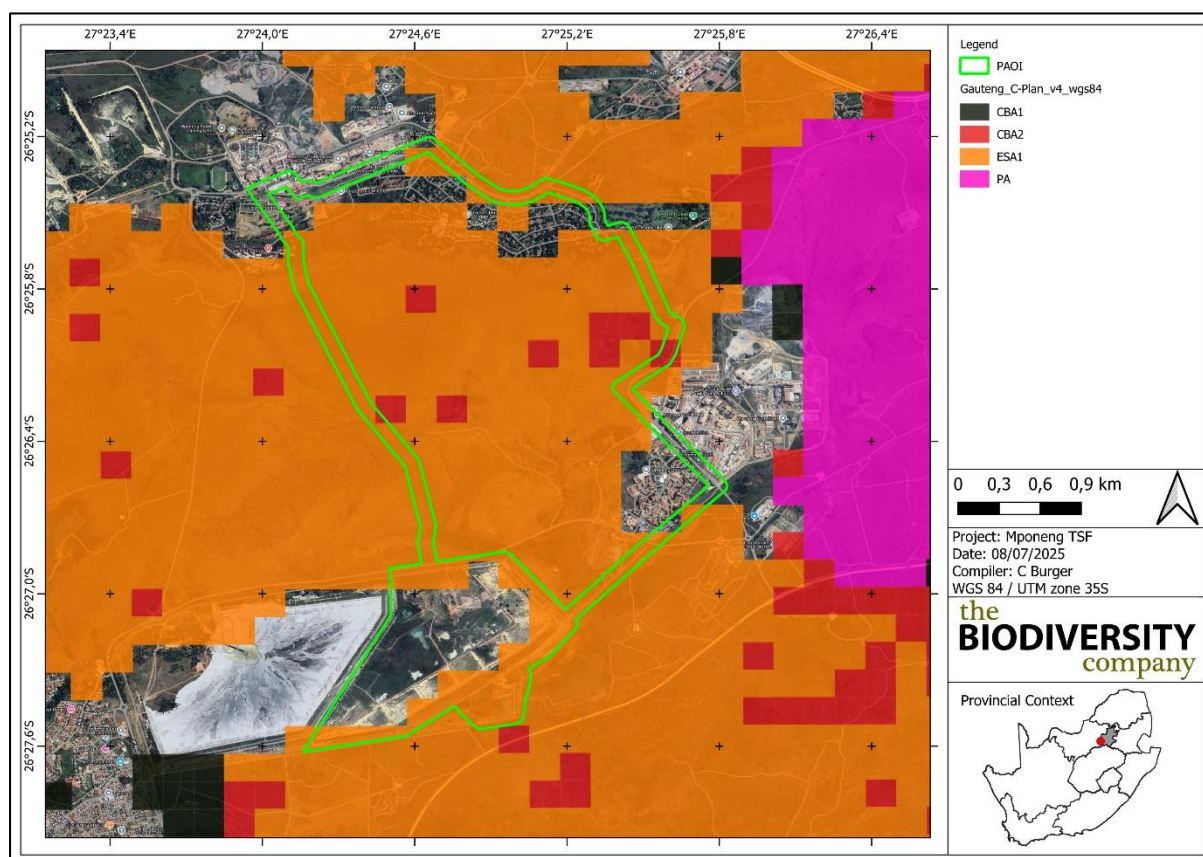


**Figure 3-2** Map illustrating the ecosystem protection level associated with the PAOI.

### 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.

Figure 3-3 shows the PAOI superimposed on the Terrestrial CBA maps. The PAOI overlaps with Critical Biodiversity Area (CBA) 2, and Ecological Support Area (ESA) 1. It also shows that a Protected Area is located to the east of the PAOI.



**Figure 3-3** Map illustrating the PAOI in relation to the Western Cape CBA Map.

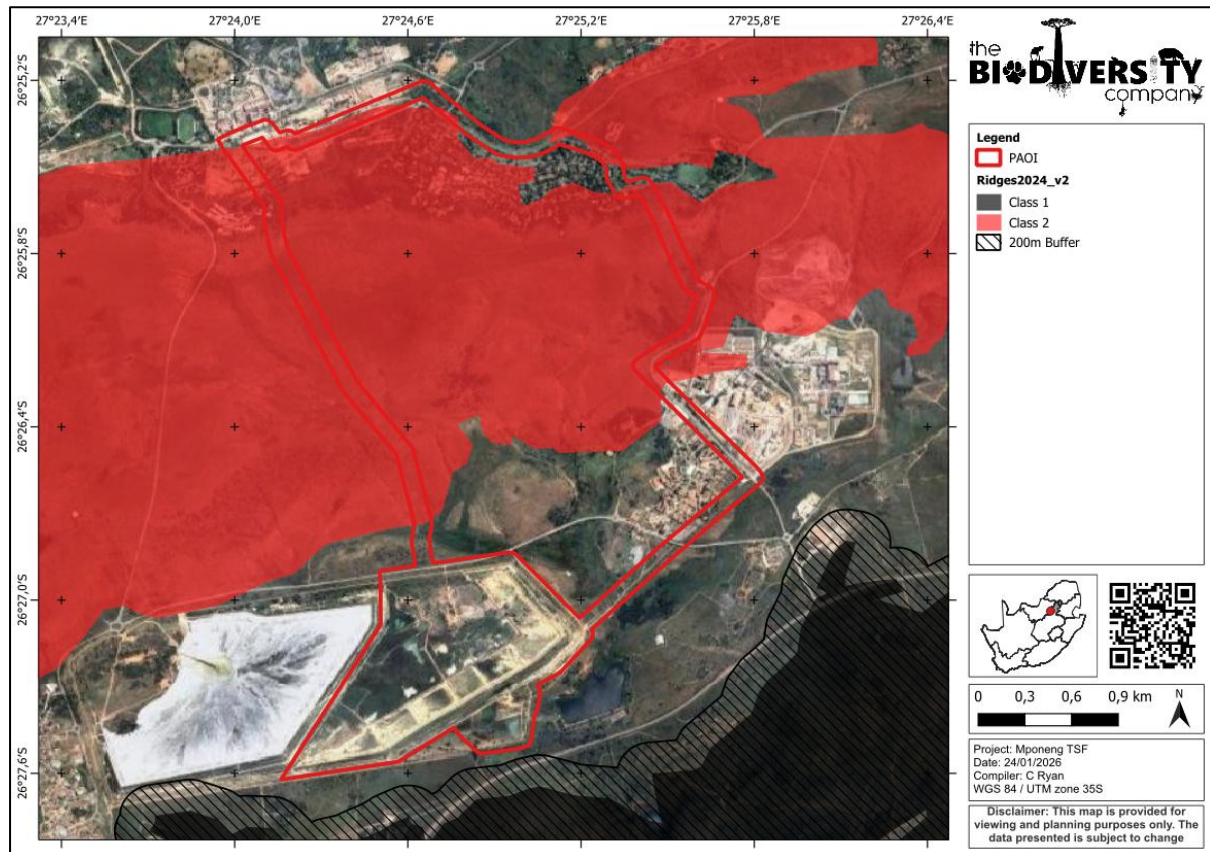
### 3.1.1.4 Gauteng Ridges

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.

According to the Gauteng Ridges spatial dataset, parts of the PAOI overlap with a Class 2 ridge and is located adjacent to two Class 1 ridges. The closest class 1 ridge is located 271 m from the PAOI. The PAOI does not overlap with any Class 1 ridge buffer (Figure 3-4). The Transformed Ridge dataset can be seen in Figure 3-5. This dataset shows the extent to which the ridge overlapping the PAOI has been modified.

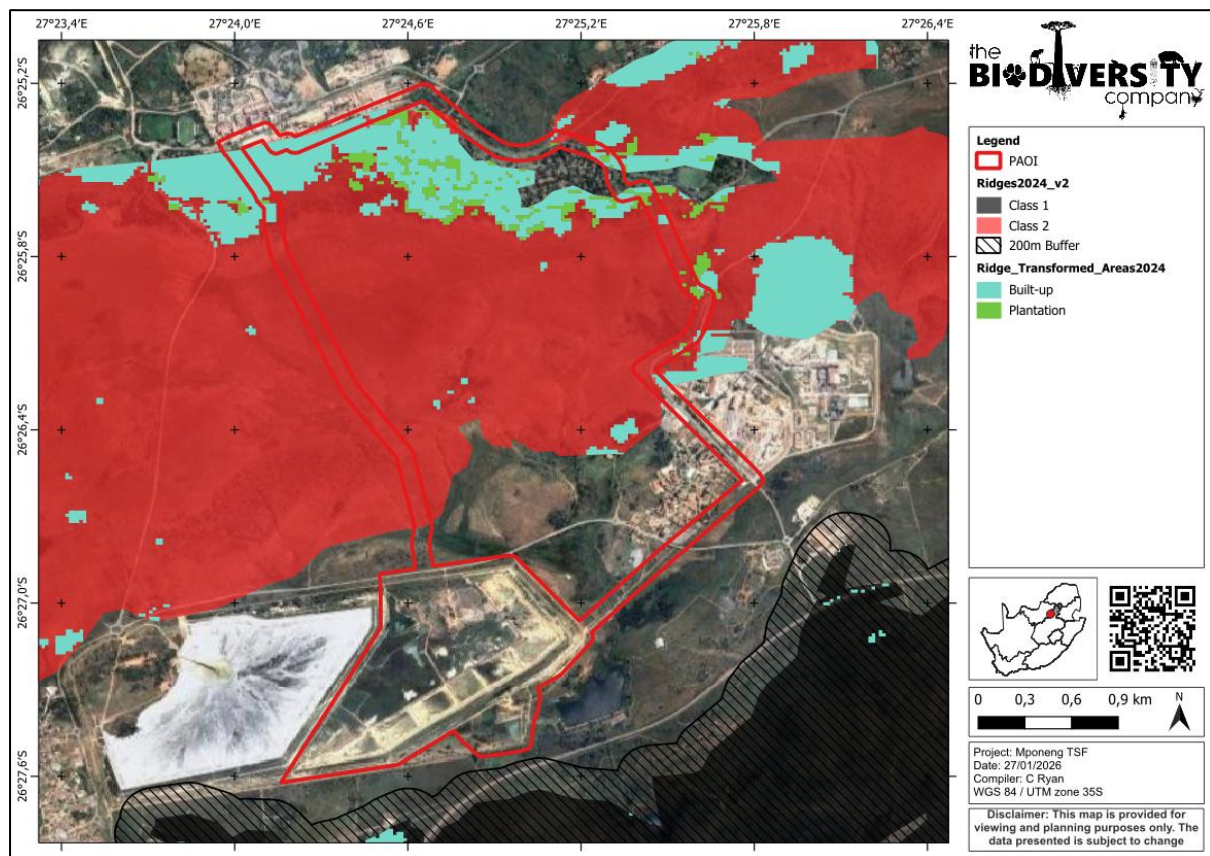
The 2019 Ridges Guideline has defined general guidelines that must be followed with regards to the amount of development that should be permitted on different ridges according to their class.

- Class 1 Ridges: Only low impact activities with an ecological footprint of 5% or less in the 200 m buffer zone of the ridge will be supported and no development will be permitted in the ridge itself;
- Class 2 Ridges: Development activities and uses that have a high environmental impact on a Class 2 ridge will not 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.



**Figure 3-4** Map illustrating the PAOI in relation to the Gauteng Ridges



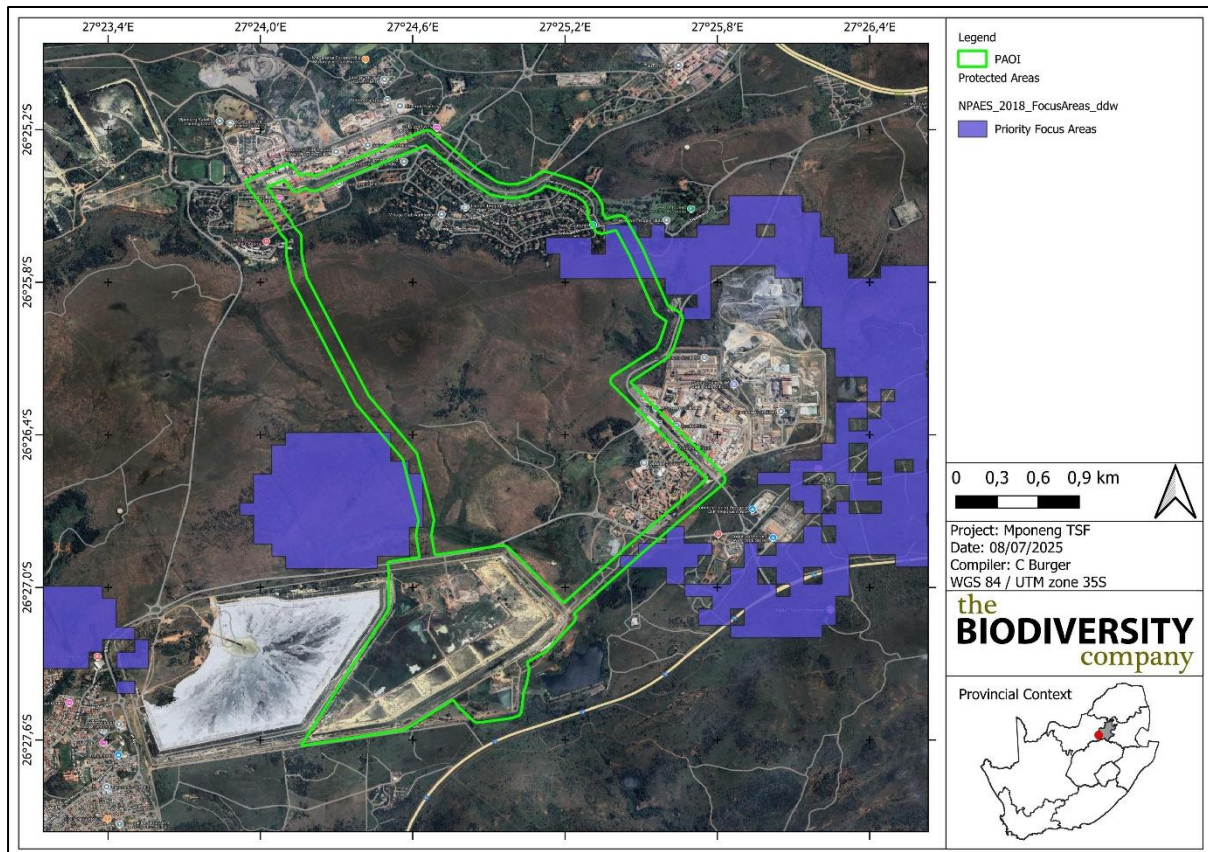


**Figure 3-5** Map illustrating the PAOI in relation to the Gauteng Ridges and Transformed Ridge area dataset.

### 3.1.1.5 National Protected Areas Expansion Strategy

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

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



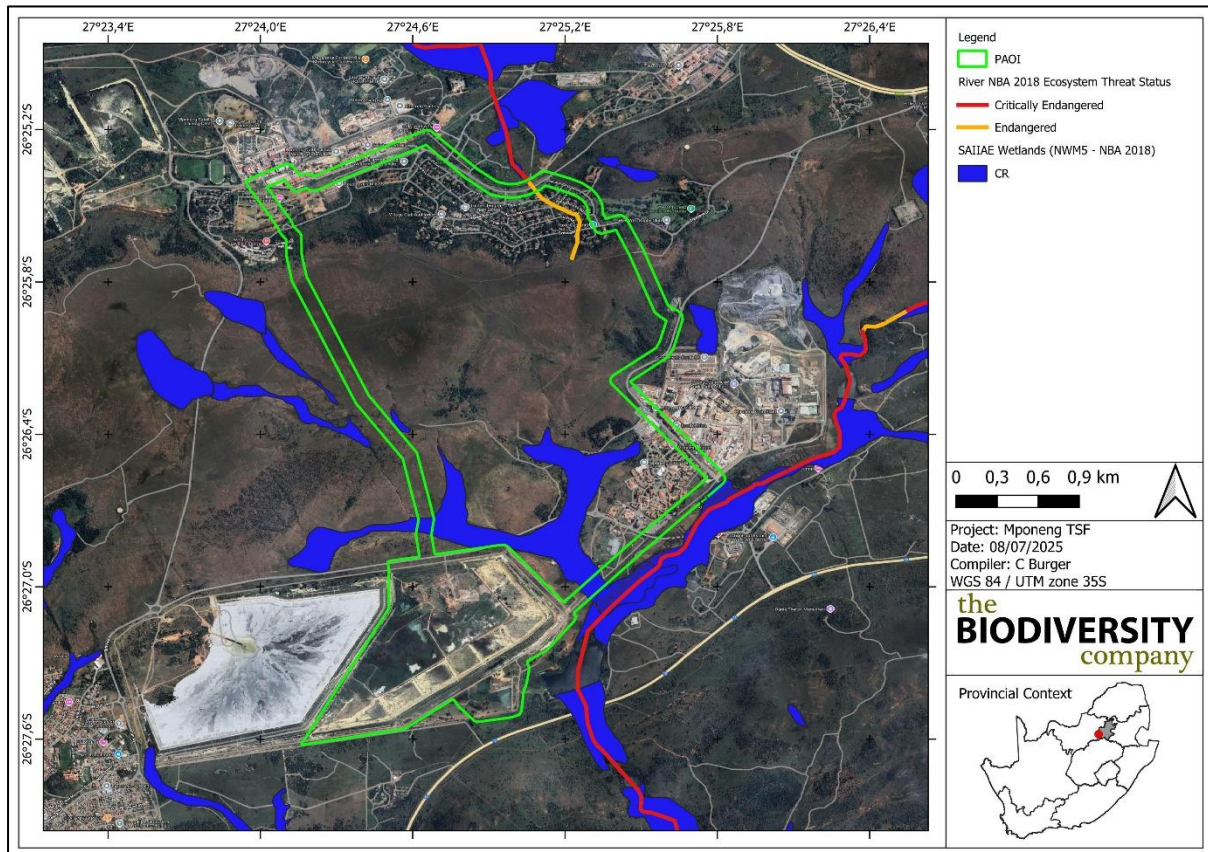
**Figure 3-6** The PAOI in relation to the National Protected Area Expansion Strategy



### 3.1.1.6 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 Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer et al., 2019; Skowno et al., 2019).

The PAOI overlap with CR SAIIE wetlands and a CR/EN River (Figure 3-7).

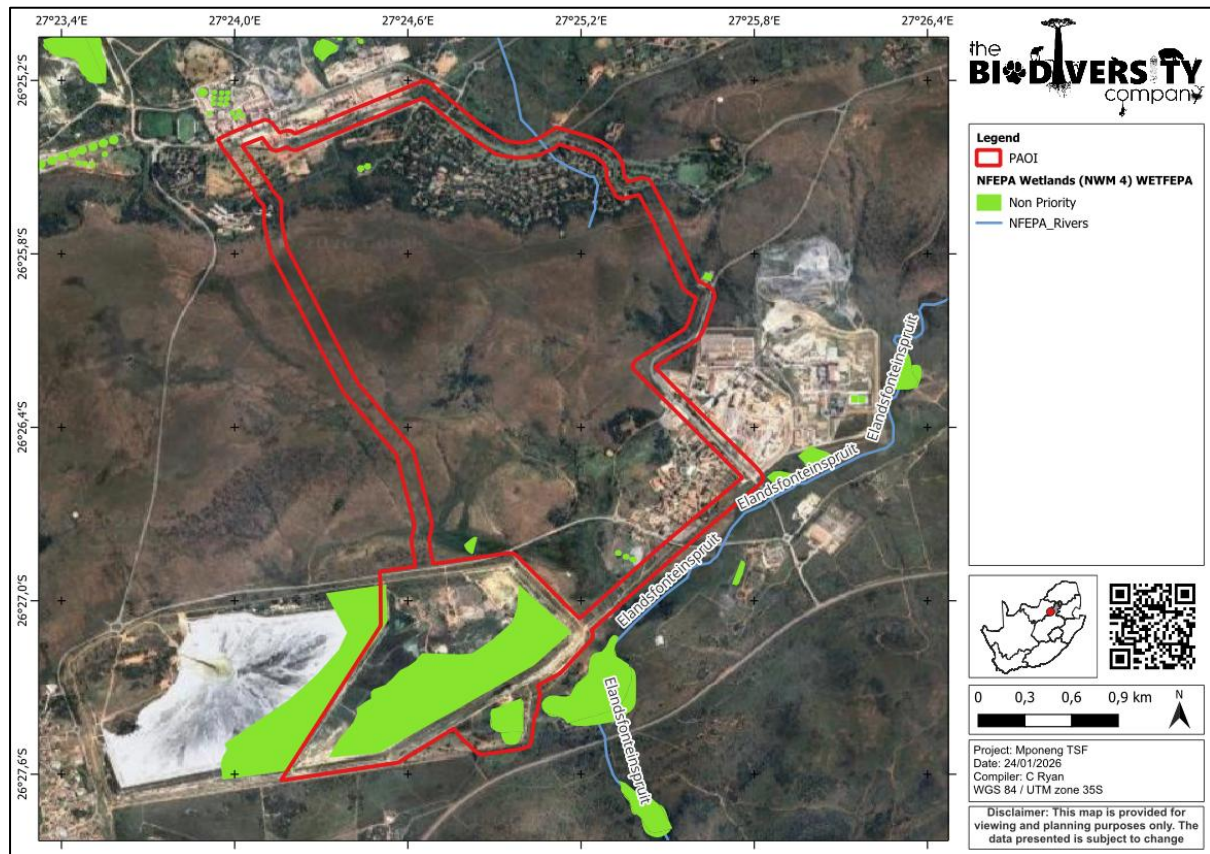


**Figure 3-7** Map illustrating the SAIIE threat status of rivers and wetland systems of the PAOI

### 3.1.1.7 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 Non Priority NFEPA wetlands and an unclassified Class D: Largely Modified and the Class C: Moderately Modified Elandsfonteinpruit River (Figure 3-8).



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

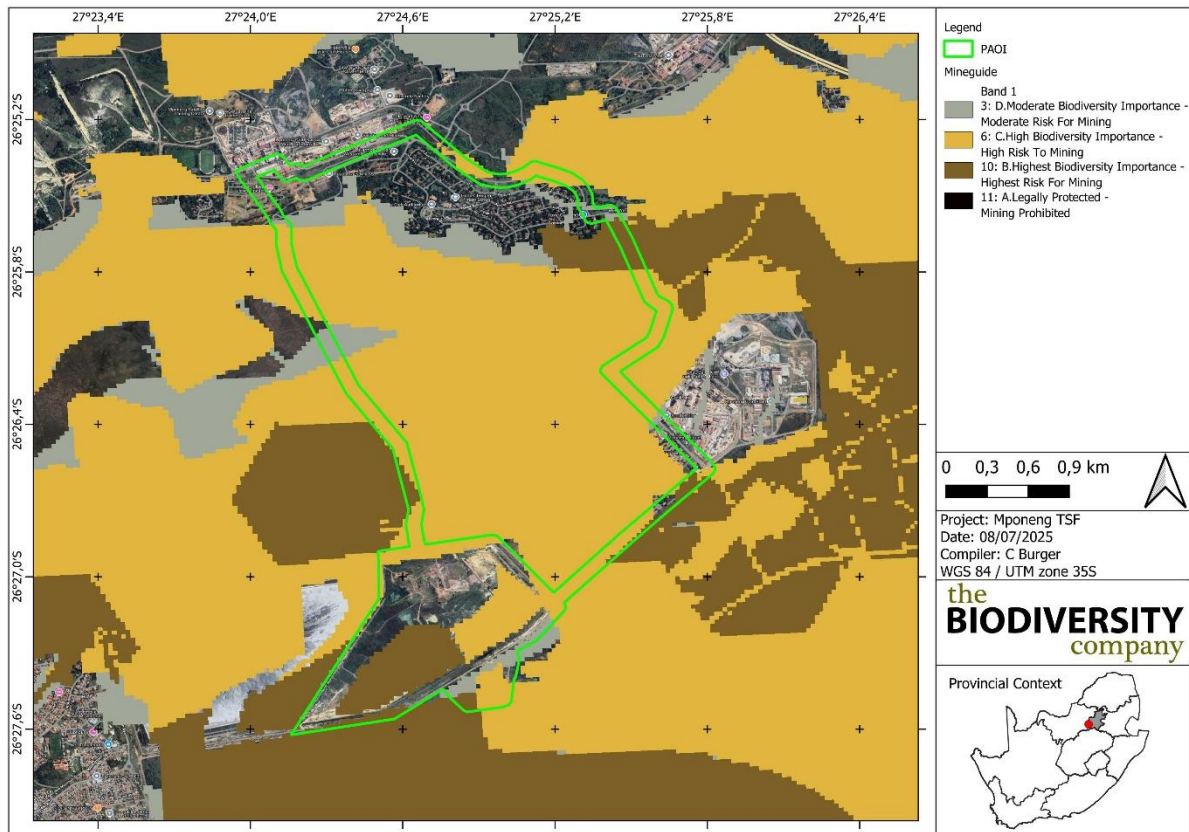


### 3.1.1.8 Mining and Biodiversity Guidelines (2013)

According to the Mining Guide dataset for Biodiversity Risk & Importance (SANBI, 2013), the PAOI is overlapped by the following areas (Figure 3-9):

- Moderate Biodiversity Importance - Classified as Moderate Risk for Mining;
- High Biodiversity Importance - Classified as High risk for Mining; and
- Highest Biodiversity Importance - Classified as 'Highest Risk for Mining'.

See Appendix A, Section 7.1.1.2 for a full breakdown of these guidelines.



**Figure 3-9** Map illustrating the Mining Biodiversity Importance/Risk.

### 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.

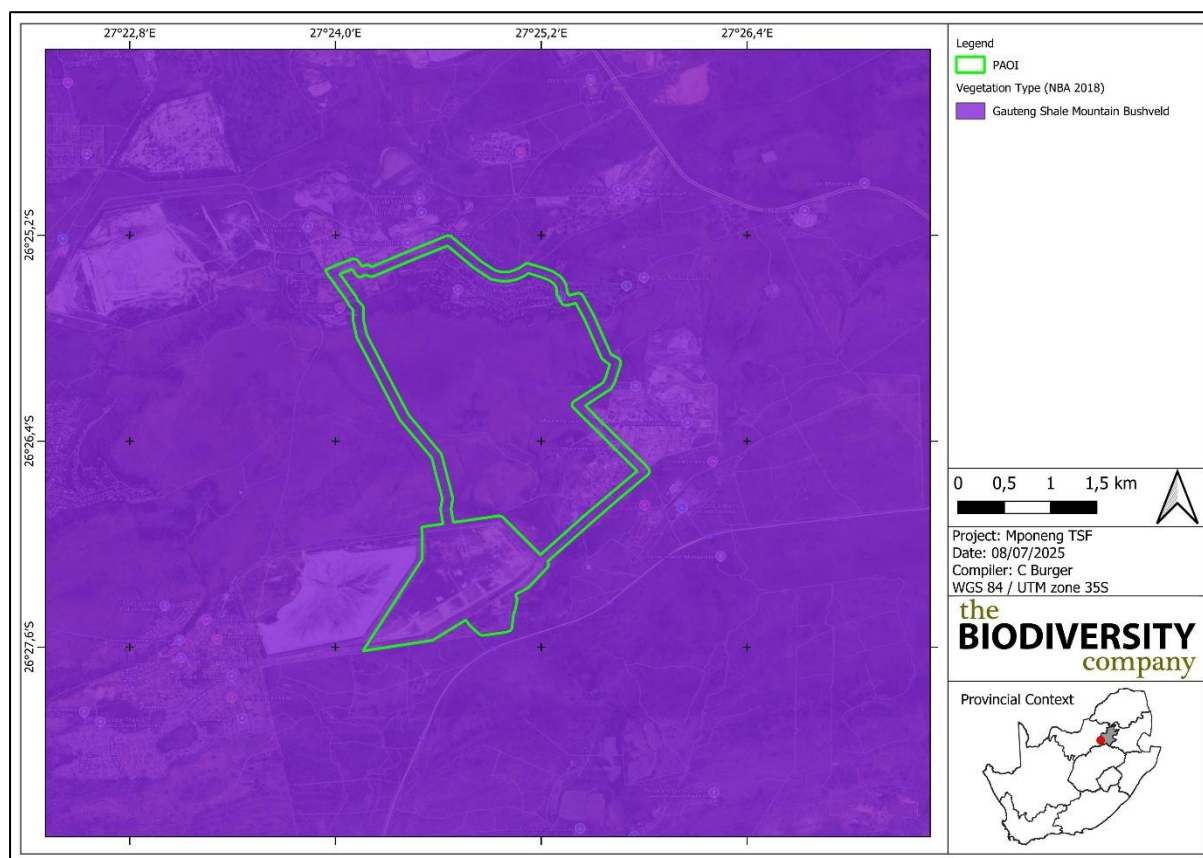
The Savanna biome of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- 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 *Vachellia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

On a fine-scale vegetation type, the PAOI overlaps with Gauteng Shale Mountain Bushveld vegetation types (Figure 3-10).



**Figure 3-10 Map illustrating the vegetation types associated with the PAOI.**

### 3.1.2.2 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 from 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.

The following species are important in the **Gauteng Shale Mountain Bushveld** vegetation type (d = dominant):

**Small Trees:** *Senegalia affra* (d), *Dombeya rotundifolia* (d), *Vachellia karroo*, *Celtis africana*, *Combretum molle*, *Cussonia spicata*, *Englerophytum magalismsontanum*, *Protea affra*, *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 magalismsontana* subsp. *magalismsontana*.

**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

This vegetation type is classified as Least Concern (RLE, 2022). 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.

#### 3.1.2.3 Expected Flora Species

The Global Biodiversity Information Facility (GBIF) database lists 98 flora species expected to occur within the area (Appendix C). Four (4) of these species are considered as SCC. Two (2) species were listed as per the DFFE Screening Tool report (Table 3-2).

Please note that the Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly, and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number / sensitive animal unique number. As per the best practise guideline that accompanies the protocol and screening tool (Species Environmental Assessment Guideline, 2022), the name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as *sensitive plant* or *sensitive animal* and its threat status may be included, e.g. *critically endangered sensitive plant* or *endangered sensitive animal*.

**Table 3-2**      **Threatened flora species that are expected to occur within the PAOI, VU = Vulnerable, CR = Critically Endangered, NT = Near Threatened and NE = Not Evaluated**

| Species Name                                 | Regional | IUCN | Habitat   | Screening Tool Sensitivity | Likelihood of Occurrence | Reason                       |
|--|----------|------|---|----------------------------|--------------------------|------------------------------|
| <i>Adromischus umbraticola</i>               | NT       | NE   | Plants grow on south-facing rock crevices on ridges   | -                          | Confirmed                | Suitable habitat within PAOI |
| <i>Khadia beswickii</i>                      | VU       | CR   | Open shallow soil over rocks in grassland.  | Medium                     | Confirmed                | Suitable habitat within PAOI |
| <i>Lithops lesliei</i> subsp. <i>lesliei</i> | VU       | NE   | Occurs primarily in arid grasslands, usually in rocky places, growing under the protection of forbs and grasses | -                          | Moderate                 | Suitable habitat within PAOI |



| Species Name                  | Regional | IUCN | Habitat | Screening Tool Sensitivity | Likelihood of Occurrence | Reason                       |
|-------------------------------|----------|------|---------|----------------------------|--------------------------|------------------------------|
| <i>Sensitive Species 1248</i> | VU       | NE   | -       | Medium                     | Moderate                 | Suitable habitat within PAOI |

### 3.1.3 Expected Fauna Species

#### 3.1.3.1 Amphibians

Based on the FrogMAP, 22 amphibian species are expected to occur within the PAOI (Appendix C). One (1) amphibian SCC is expected to occur within the PAOI (Table 3-3).

**Table 3-3** *SCC amphibian species that are expected to occur within the PAOI LC = Least Concern and NT = Near Threatened*

| Species                       | Common Name     | Conservation Status |        | Likelihood of Occurrence | Reason                       |
|-------------------------------|-----------------|---------------------|--------|--------------------------|------------------------------|
|                               |                 | Regional            | Global |                          |                              |
| <i>Pyxicephalus adspersus</i> | Giant Bull Frog | NT                  | LC     | Moderate                 | Suitable habitat within PAOI |

#### 3.1.3.2 Reptiles

Based on the ReptileMAP database, 67 reptile species are expected to occur within the area (Appendix C). Three (3) species are regarded as SCC (Table 3-4). No species were listed by the Screening Tool.

**Table 3-4** *SCC reptile species that are expected to occur within the PAOI LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Species                      | Common Name             | Conservation Status |        | Likelihood of Occurrence | Reason                        |
|------------------------------|-------------------------|---------------------|--------|--------------------------|-------------------------------|
|                              |                         | Regional            | Global |                          |                               |
| <i>Chamaesaura aenea</i>     | Coppery Grass Lizard    | LC                  | NT     | Moderate                 | Some suitable habitat present |
| <i>Crocodylus niloticus</i>  | Nile Crocodile          | VU                  | LC     | Low                      | No suitable habitat present   |
| <i>Homoroselaps dorsalis</i> | Striped Harlequin Snake | LC                  | NT     | Moderate                 | Some suitable habitat present |

#### 3.1.3.3 Mammals

The MammalMAP lists 108 mammal species that could be expected to occur within the area (Appendix C). This list excludes large mammal species that are normally restricted to protected areas. Fifteen (15) of these expected species are regarded as SCC (Table 3-5). Of these 15 SCCs, 11 have been assigned a low likelihood of occurrence based on the lack of suitable habitat in the project area. Four (4) species have been assigned a moderate likelihood of occurrence. Two (2) species were listed by the Screening Tool.

**Table 3-5** *SCC mammal species that are expected to occur within the project area EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Species                   | Common Name                        | Conservation Status |      | Screening Tool Sensitivity | Likelihood of occurrence | Reason                        |
|---------------------------|------------------------------------|---------------------|------|----------------------------|--------------------------|-------------------------------|
|                           |                                    | Regional            | IUCN |                            |                          |                               |
| <i>Aonyx capensis</i>     | African Clawless Otter             | NT                  | NT   | -                          | Low                      | No suitable habitat present   |
| <i>Atelerix frontalis</i> | Southern African Hedgehog          | NT                  | LC   | -                          | Moderate                 | Some suitable habitat present |
| <i>Cloeotis percivali</i> | Percival's Short-eared Trident Bat | EN                  | LC   | -                          | Low                      | No suitable habitat present   |

| Species                        | Common Name                                | Conservation Status |      | Screening Tool Sensitivity | Likelihood of occurrence | Reason                        |
|--------------------------------|--|---------------------|------|----------------------------|--------------------------|-------------------------------|
|                                |  | Regional            | IUCN |                            |                          |                               |
| <i>Crocidura maquassiensis</i> | Makwassie Musk Shrew                       | VU                  | LC   | Medium                     | Moderate                 | Some suitable habitat present |
| <i>Crocidura mariquensis</i>   | Swamp Musk Shrew                           | NT                  | LC   | -                          | Low                      | No suitable habitat present   |
| <i>Eidolon helvum</i>          | African Straw-coloured Fruit Bat           | LC                  | NT   | -                          | Low                      | No suitable habitat present   |
| <i>Felis nigripes</i>          | Black-footed Cat                           | VU                  | VU   | -                          | Low                      | No suitable habitat present   |
| <i>Hydricitis maculicollis</i> | Spotted-necked Otter                       | VU                  | NT   | Medium                     | Low                      | No suitable habitat present   |
| <i>Leptailurus serval</i>      | Serval                                     | NT                  | LC   | -                          | Moderate                 | Some suitable habitat present |
| <i>Mystromys albicaudatus</i>  | African White-tailed Rat                   | VU                  | EN   | -                          | Low                      | No suitable habitat present   |
| <i>Otomys auratus</i>          | Southern African Vlei Rat (Grassland type) | NT                  | NT   | -                          | Moderate                 | Some suitable habitat present |
| <i>Panthera pardus</i>         | Leopard                                    | VU                  | VU   | -                          | Low                      | No suitable habitat present   |
| <i>Pipistrellus rusticus</i>   | Rusty Pipistrelle                          | LC                  | NT   | -                          | Low                      | No suitable habitat present   |
| <i>Poecilogale albinucha</i>   | African Striped Weasel                     | NT                  | LC   | -                          | Low                      | No suitable habitat present   |
| <i>Rhinolophus blasii</i>      | Blasius's Horseshoe Bat                    | NT                  | LC   | -                          | Low                      | No suitable habitat present   |

### 3.1.3.4 Avifauna

SABAP2 data indicate that 278 avifauna species are expected for the PAOI and surrounding areas (Appendix C). Of these, 27 are considered SCC (Table 3-6). The likelihood of occurrence within the POAI is included here. The Screening Tool lists three (3) avifauna SCC that could be expected to occur.

**Table 3-6** *Threatened avifauna species that are expected to occur within the PAOI. EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Common Name               | Species                       | Regional * | Global * | Screening Tool Sensitivity | Likelihood of Occurrence | Reason                        |
|---------------------------|-------------------------------|------------|----------|----------------------------|--------------------------|-------------------------------|
| African Darter            | <i>Anhinga rufa</i>           | NT         | LC       | -                          | High                     | Suitable habitat within PAOI  |
| African Grass Owl         | <i>Tyto capensis</i>          | VU         | LC       | Medium                     | Confirmed                | Suitable habitat within PAOI  |
| African Marsh Harrier     | <i>Circus ranivorus</i>       | VU         | LC       | -                          | Moderate                 | Some suitable habitat present |
| Black Harrier             | <i>Circus maurus</i>          | EN         | EN       | -                          | Low                      | No suitable habitat           |
| Black-crowned Night Heron | <i>Nycticorax nycticorax</i>  | NT         | LC       | -                          | Moderate                 | Some suitable habitat present |
| Black-winged Kite         | <i>Elanus caeruleus</i>       | NT         | LC       | -                          | High                     | Suitable habitat within PAOI  |
| Black-winged Pratincole   | <i>Glareola nordmanni</i>     | LC         | NT       | -                          | Moderate                 | Some suitable habitat present |
| Cape Shoveler             | <i>Spatula smithii</i>        | NT         | LC       | -                          | Moderate                 | Some suitable habitat present |
| Cape Vulture              | <i>Gyps coprotheres</i>       | VU         | VU       | -                          | Low                      | No suitable habitat           |
| Curlew Sandpiper          | <i>Calidris ferruginea</i>    | VU         | VU       | -                          | Moderate                 | Some suitable habitat present |
| Caspian Tern              | <i>Hydroprogne caspia</i>     | VU         | LC       | Medium                     | Low                      | No suitable habitat           |
| White-bellied Korhaan     | <i>Eupodotis senegalensis</i> | VU         | LC       | Medium                     | Moderate                 | Some suitable habitat present |
| European Roller           | <i>Coracias garrulus</i>      | NT         | LC       | -                          | Moderate                 | Some suitable habitat present |

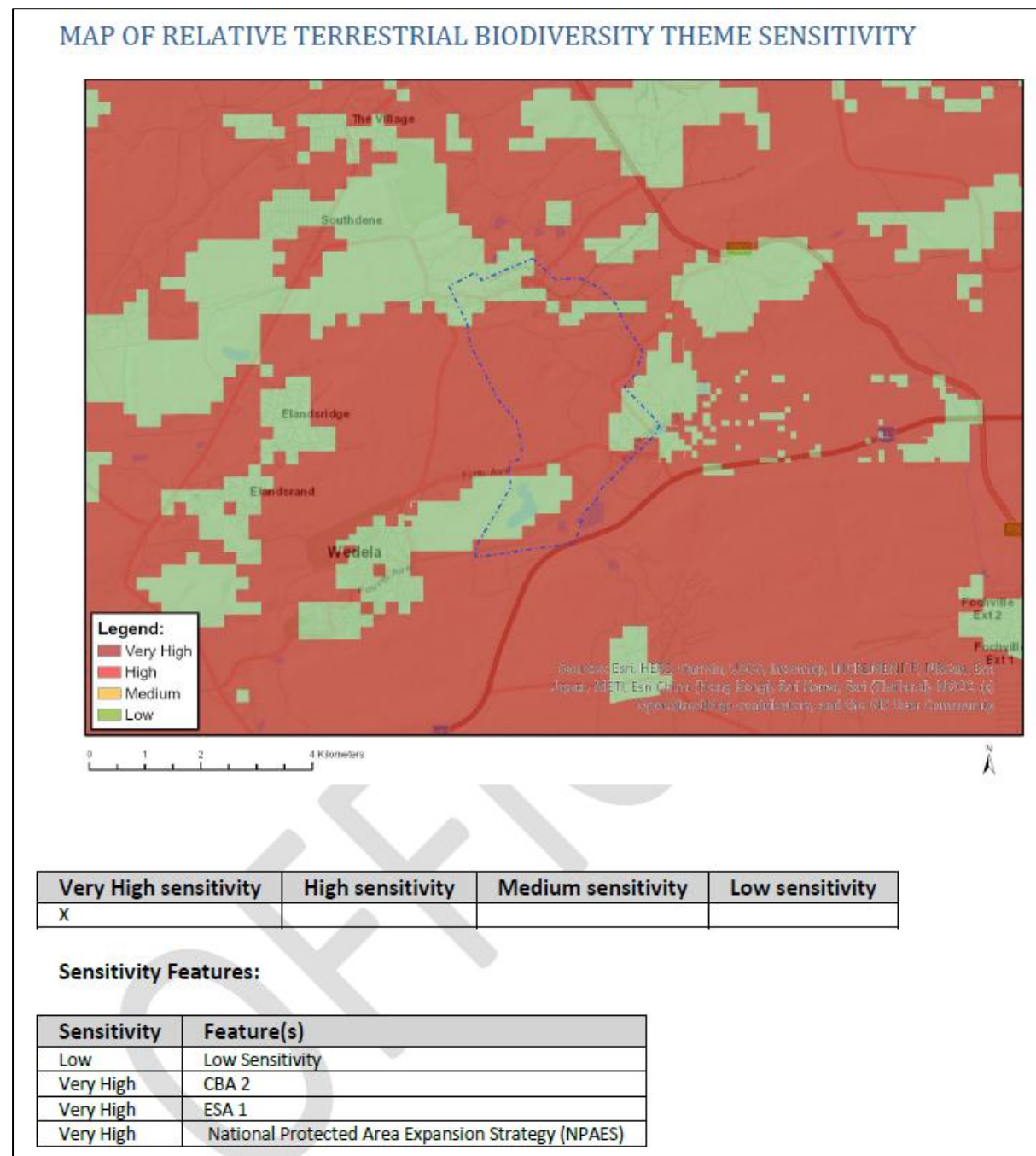
| Common Name            | Species                         | Regional<br>* | Global<br>+ | Screening<br>Tool<br>Sensitivity | Likelihood<br>of<br>Occurrence | Reason                        |
|------------------------|---------------------------------|---------------|-------------|----------------------------------|--------------------------------|-------------------------------|
| Fulvous Whistling Duck | <i>Dendrocygna bicolor</i>      | NT            | LC          | -                                | Low                            | No suitable habitat           |
| Great Crested Grebe    | <i>Podiceps cristatus</i>       | VU            | LC          | -                                | Low                            | No suitable habitat           |
| Great Egret            | <i>Ardea alba</i>               | NT            | LC          | -                                | High                           | Suitable habitat within PAOI  |
| Greater Flamingo       | <i>Phoenicopterus roseus</i>    | NT            | LC          | -                                | Low                            | No suitable habitat           |
| Hamerkop               | <i>Scopus umbretta</i>          | NT            | LC          | -                                | High                           | Suitable habitat within PAOI  |
| Kittlitz's Plover      | <i>Charadrius pecuarius</i>     | NT            | LC          | -                                | Moderate                       | Some suitable habitat present |
| Knob-billed Duck       | <i>Sarkidiornis melanotos</i>   | NT            | LC          | -                                | Moderate                       | Some suitable habitat present |
| Lanner Falcon          | <i>Falco biarmicus</i>          | NT            | LC          | -                                | Moderate                       | Some suitable habitat present |
| Lesser Flamingo        | <i>Phoeniconaias minor</i>      | VU            | NT          | -                                | Low                            | No suitable habitat           |
| Lesser Kestrel         | <i>Falco naumanni</i>           | VU            | LC          | -                                | High                           | Suitable habitat within PAOI  |
| Maccoa Duck            | <i>Oxyura maccoa</i>            | VU            | EN          | -                                | Moderate                       | Some suitable habitat present |
| Marsh Owl              | <i>Asio capensis</i>            | NT            | LC          | -                                | High                           | Suitable habitat within PAOI  |
| Melodious Lark         | <i>Mirafra cheniana</i>         | NT            | LC          | -                                | Moderate                       | Some suitable habitat present |
| Red-billed Teal        | <i>Anas erythrorhyncha</i>      | NT            | LC          | -                                | High                           | Suitable habitat within PAOI  |
| Secretarybird          | <i>Sagittarius serpentarius</i> | VU            | EN          | -                                | High                           | Suitable habitat within PAOI  |
| Southern Pochard       | <i>Netta erythrophthalma</i>    | NT            | LC          | -                                | Moderate                       | Some suitable habitat present |
| Yellow-billed Duck     | <i>Anas undulata</i>            | NT            | LC          | -                                | High                           | Suitable habitat within PAOI  |

\*(Birdlife 2025), + (IUCN 2021).

### 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).

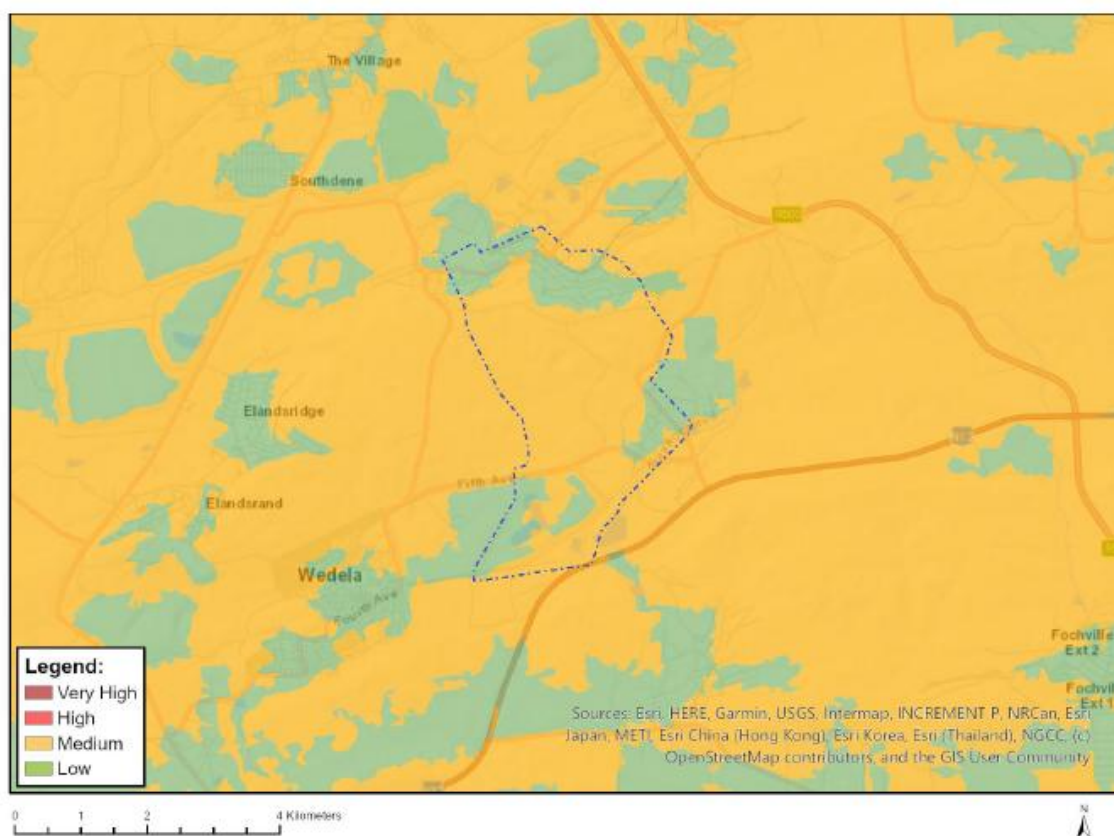
- Terrestrial Biodiversity Theme sensitivity is Very High for the PAOI, with the possibility of a CBA 2, ESA 1 and NPAES areas being present (Figure 3-11);
- Plant Species Theme sensitivity is Medium for the PAOI, with the possibility of two (2) medium sensitivity plant species being present (Figure 3-12); and
- Animal Species Theme sensitivity is Medium for the PAOI, with the possibility of numerous medium sensitivity species being present (Figure 3-13).



**Figure 3-11** *Relative terrestrial biodiversity<sup>1</sup> theme sensitivity for the PAOI*

<sup>1</sup> Note that the screening still uses the previous conservation plan

### 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 [eladatarequests@sanbi.org.za](mailto:eladatarequests@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.

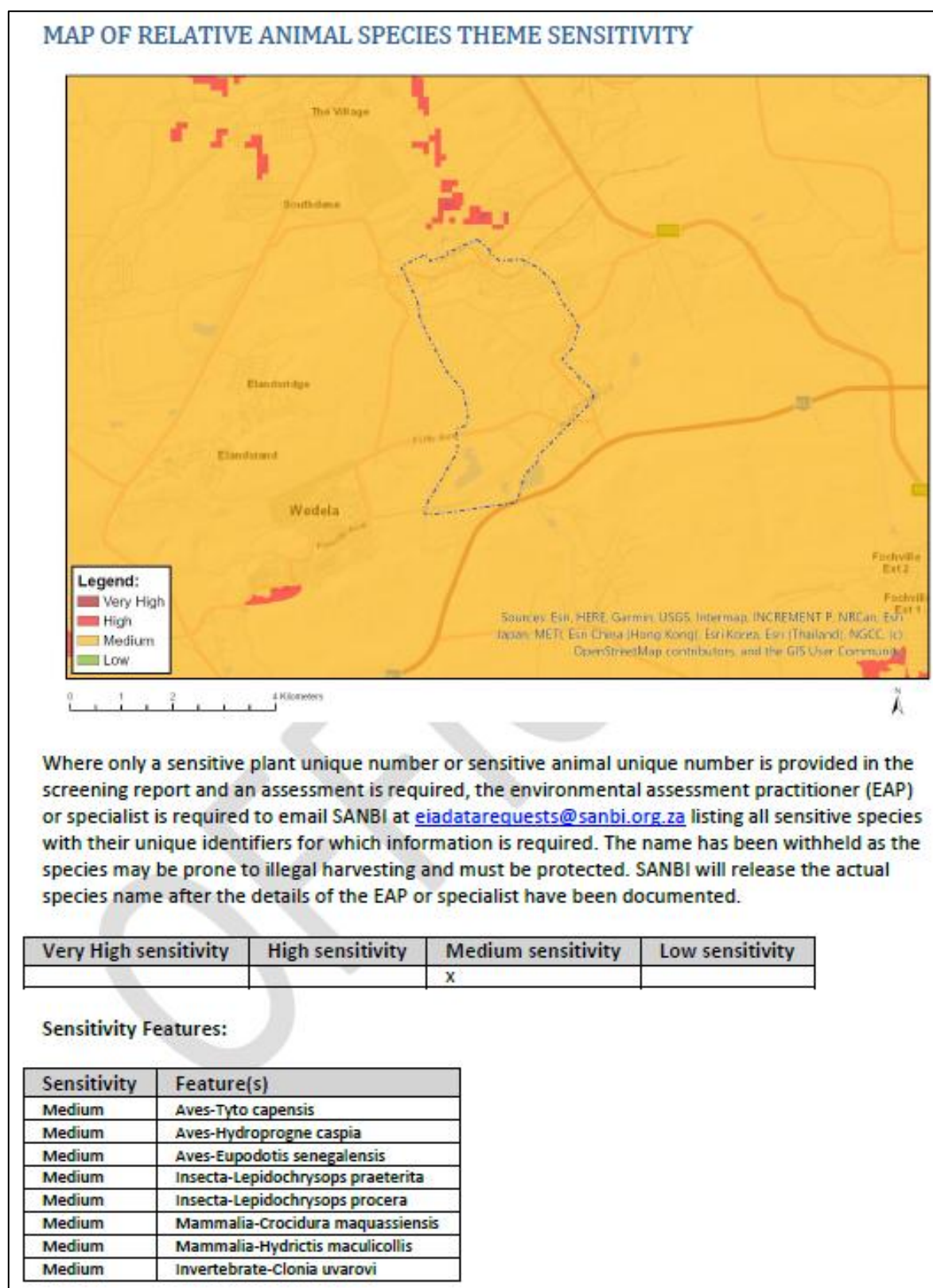
| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
|                       |                  | X                  |                 |

#### Sensitivity Features:

| Sensitivity | Feature(s)              |
|-------------|-------------------------|
| Low         | Low Sensitivity         |
| Medium      | <i>Khadia beswickii</i> |
| Medium      | Sensitive species 1248  |

**Figure 3-12** Relative plant species theme sensitivity for the PAOI





**Figure 3-13** Relative animal species theme sensitivity for the PAOI

## 3.2 Fieldwork Findings

The following results are from the dry (3 July 2025) and wet (20 January 2026) season surveys.

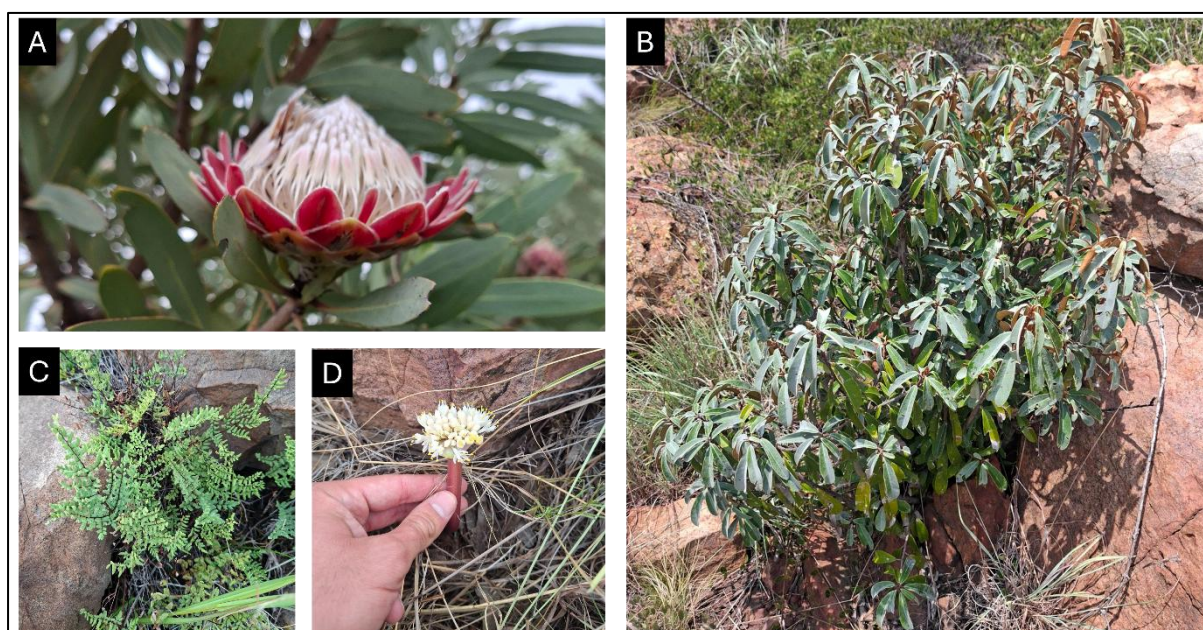
### 3.2.1 Flora Assessment

Numerous indigenous flora species were recorded for the PAOI (a list can be provided upon request), characteristic of the vegetation type for the site. Some of these species can be seen presented in Figure 3-14.

Due to the confirmed protected species and SCC, a search and rescue plan must be developed for relevant flora species (following guidance from the mitigation methods in Section 4.3.5 for SCC located along the alternate pipeline route).

SCC and protected species were recorded in the PAOI and are presented in section 3.2.1.1 below.

Alien invasive plant (AIP) species were recorded for the PAOI and are discussed further in section 3.2.2.1 below.



**Figure 3-14** Photos illustrating indigenous flora species recorded for the PAOI; A) *Protea afra* subsp. *afra* B) *Englerophytum magalismontanum*, C) *Cheilanthes viridis* and D) *Haemanthus humilis* subsp. *humilis*.

### 3.2.1.1 SCC and Protected Species

#### 3.2.1.1.1 SCCs

Three (3) floral SCC were observed in total, *Adromischus umbraticola* subsp. *umbraticola*, *Cleome conrathii* and *Khadia beswickii*. *C. conrathii* was only observed during the wet season survey. Table 3-7 shows the SCCs observed. According to the species guidelines, buffers should be incorporated for all populations of Critically Endangered, Endangered, Vulnerable, Rare and Critically Rare Species (SANBI, 2020). The guidelines stipulate that a 200 m buffer is required. A 200 m buffer was placed on all the *Khadia beswickii* individuals within the PAOI.

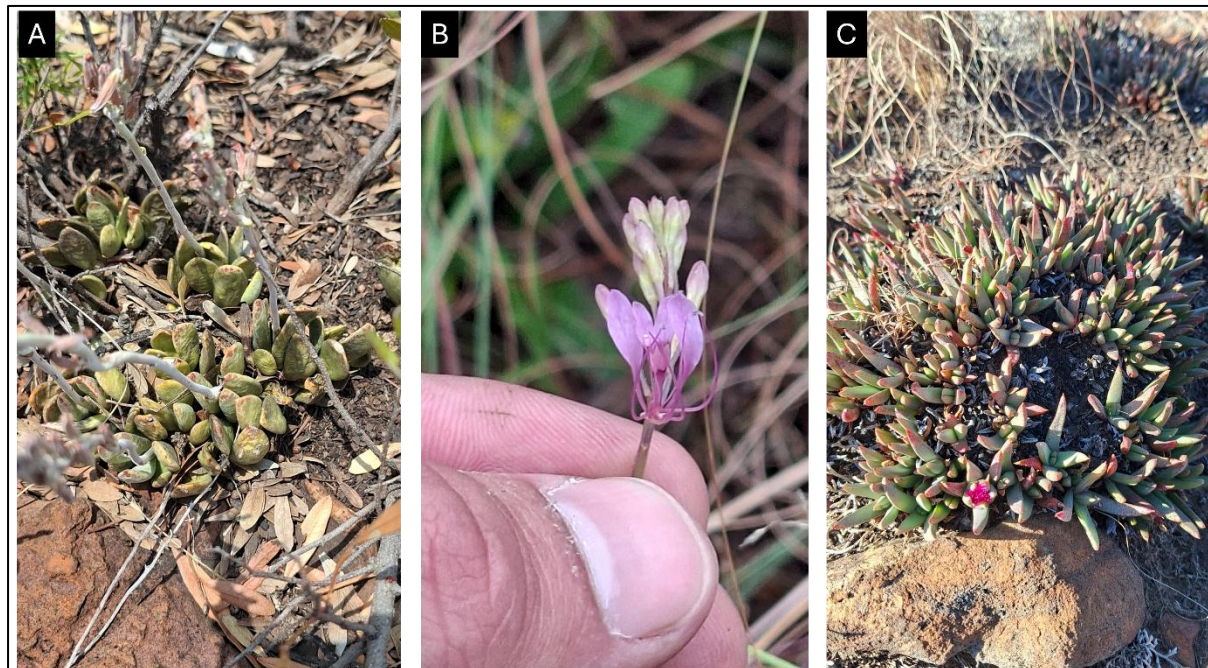
**Table 3-7** Floral SCC identified during both field survey along with their threat status. NT = Near Threatened and VU = Vulnerable.

| Family | Species | Threat Status (SANBI) |
|--------|---------|-----------------------|
|--------|---------|-----------------------|

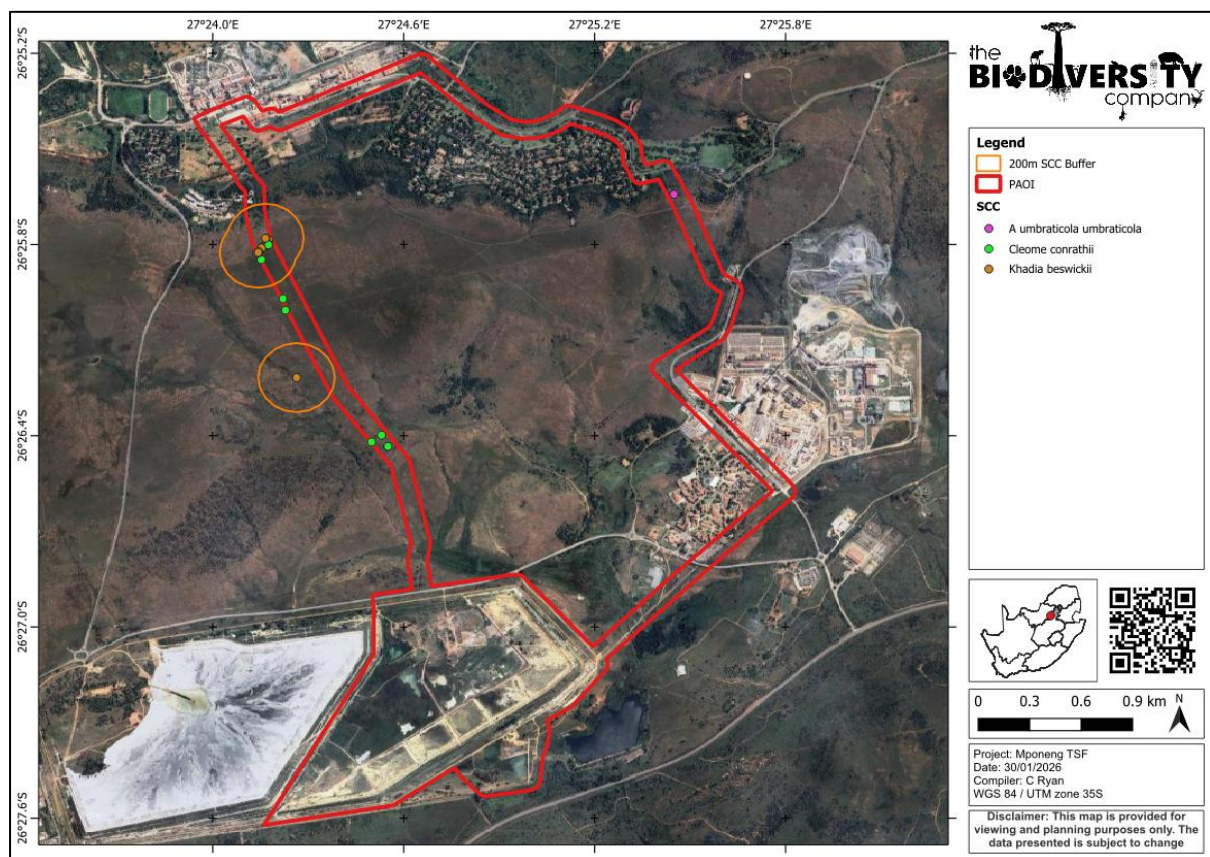


## Mponeng TSF Lower Compartment

|                     |  |    |
|---------------------|--|----|
| <b>Aizoaceae</b>    | <i>Khadia beswickii</i>                                  | VU |
| <b>Cleomaceae</b>   | <i>Cleome conrathii</i>                                  | NT |
| <b>Crassulaceae</b> | <i>Adromischus umbraticola</i> subsp. <i>umbraticola</i> | NT |



**Figure 3-15** Photos illustrating floral SCC recorded for the PAOI; A) *Adromischus umbraticola* subsp. *umbraticola*, B) *Cleome conrathii* and C) *Khadia beswickii*.



**Figure 3-16** SCC locations and buffers within the PAOI



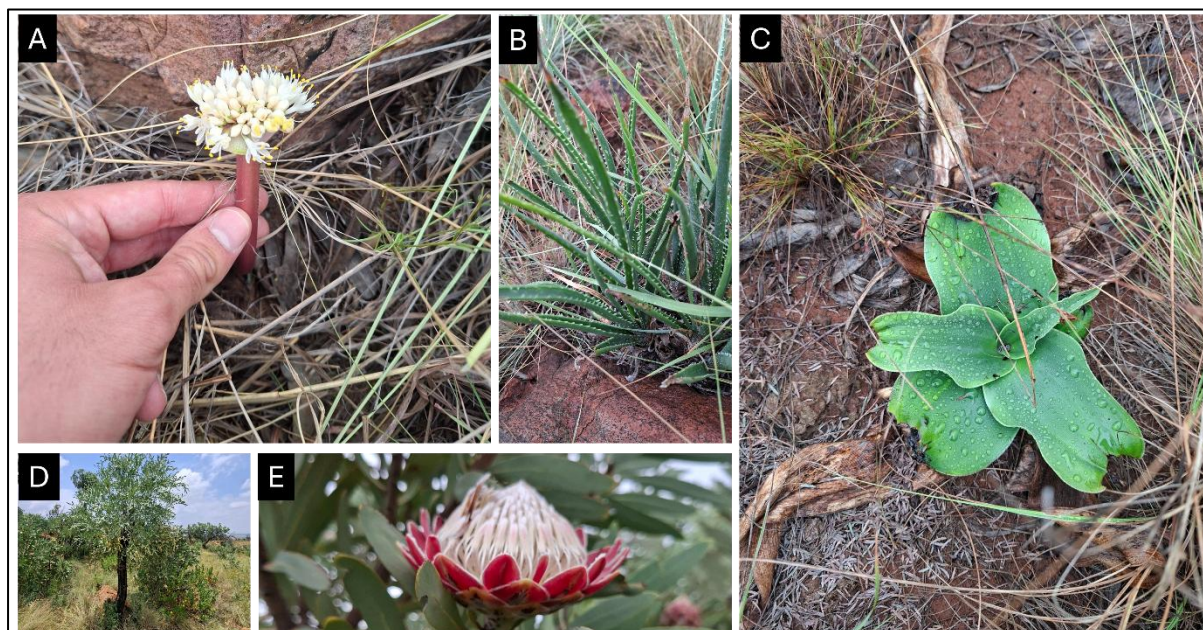
### 3.2.1.1.2 Protected Plants

Five (5) provincially protected plant species were recorded during the site assessment; *Crinum graminicola*, *Haemanthus humilis* subsp. *humilis*, *Cussonia paniculata* subsp. *sinuata*, *Aloe verecunda* and *Protea afra* subsp. *afra*.

All species of the *Crinum*, *Haemanthus* and *Cussonia* genera are provincially protected under Schedule 1 of the Transvaal Nature Conservation Ordinance, No. 12 of 1983. Images of the protected species are seen in Figure 3-17. The protected species found within the PAOI will require a permit, should any of the protected species require removal, damage/destruction, or relocation. A pre construction protected flora species count must be conducted to determine the number of individuals per species.

**Table 3-8 Provincially protected plants recorded within the PAOI. LC = Least Concern.**

| Family         | Species  | Threat Status (SANBI) |
|----------------|--|-----------------------|
| Amaryllidaceae | <i>Crinum graminicola</i>                        | LC                    |
| Amaryllidaceae | <i>Haemanthus humilis</i> subsp. <i>humilis</i>  | LC                    |
| Araliaceae     | <i>Cussonia paniculata</i> subsp. <i>sinuata</i> | LC                    |
| Asphodelaceae  | <i>Aloe verecunda</i>                            | LC                    |
| Proteaceae     | <i>Protea afra</i> subsp. <i>afra</i>            | LC                    |



**Figure 3-17** Photos illustrating some of the protected flora species recorded for the PAOI; A) *Haemanthus humilis* subsp. *humilis* B) *Aloe verecunda*, C) *Crinum graminicola*, D) *Cussonia paniculata* subsp. *sinuata* and E) *Protea afra* subsp. *afra*.

### 3.2.1.2 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 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the 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.

Overall, the study areas showed relatively low levels of alien and invasive plant infestation, which was mostly limited to specific, localized spots—often within modified or degraded areas. The AIP species observed can be seen in Table 3-9.

**Table 3-9 AIP species observed within the PAOI.**

| Family     | Species                             | NEMBA Status       |
|------------|-------------------------------------|--------------------|
| Asteraceae | <i>Campuloclinium macrocephalum</i> | 1b                 |
| Asteraceae | <i>Erigeron bonariensis</i>         | Naturalised exotic |
| Asteraceae | <i>Tagetes minuta</i>               | Naturalised exotic |
| Cactaceae  | <i>Opuntia ficus-indica</i>         | 1b                 |
| Fabaceae   | <i>Acacia decurrens</i>             | 1b                 |
| Fabaceae   | <i>Acacia melanoxylon</i>           | 2                  |
| Solanaceae | <i>Solanum mauritianum</i>          | 1b                 |
| Solanaceae | <i>Solanum sisymbriifolium</i>      | 1b                 |



|             |                            |    |
|-------------|----------------------------|----|
| Verbenaceae | <i>Lantana camara</i>      | 1b |
| Verbenaceae | <i>Verbena bonariensis</i> | 1b |

### 3.2.2 Fauna Assessment

#### 3.2.2.1 Mammals

The overall mammal richness of the PAOI was low, which is attributed to the increased anthropogenic impacts present near mine areas. A total of four (4) mammal species were recorded, none of them being SCC.

**Table 3-10 Mammal species observed within the PAOI.**

| Family       | Species                     | Common Name            | Threat Status (SANBI) |
|--------------|-----------------------------|------------------------|-----------------------|
| Leporidae    | <i>Pronolagus randensis</i> | Jameson's Red Rockhare | LC                    |
| Leporidae    | <i>Lepus spp.</i>           | Hares and Jackrabbits  | -                     |
| Bathyergidae | <i>Cryptomys pretoriae</i>  | Highveld Mole-Rat      | LC                    |
| Canidae      | <i>Lupulella mesomelas</i>  | Black Backed Jackal    | LC                    |



**Figure 3-18 Photos illustrating mammal species recorded within the PAOI; A) *Lupulella mesomelas* (Black Backed Jackal), B) *Cryptomys pretoriae* (Highveld Mole-Rat) and C) *Lepus spp.* and D) *Pronolagus randensis* (Jameson's Red Rockhare).**

#### 3.2.2.2 Herpetofauna

One (1) reptile species was observed during the field surveys. No Amphibian species were observed and furthermore no SCC were observed.

##### 3.2.2.2.1 Reptile species observed within the PAOI.

Table 3-11 summarizes the herpetofauna species identified in the study area, including their most recent conservation status.

**Table 3-11 The herpetofauna Species of Conservation Concern (SCCs) identified in the study area**

| Family Name      | Scientific Name            | Common Name           | Conservation Status |      |
|------------------|----------------------------|-----------------------|---------------------|------|
|                  |                            |                       | SANBI               | IUCN |
| <i>Scincidae</i> | <i>Trachylepis striata</i> | African Striped Skink | LC                  | LC   |

### 3.2.2.3 Avifauna

In total, nineteen (19) avifauna species were observed within the PAOI. One (1) of them is an SCC (*Anas undulata*).

**Table 3-12 The Avifauna species identified in the study area. NT = Near Threatened and LC = Least Concern.**

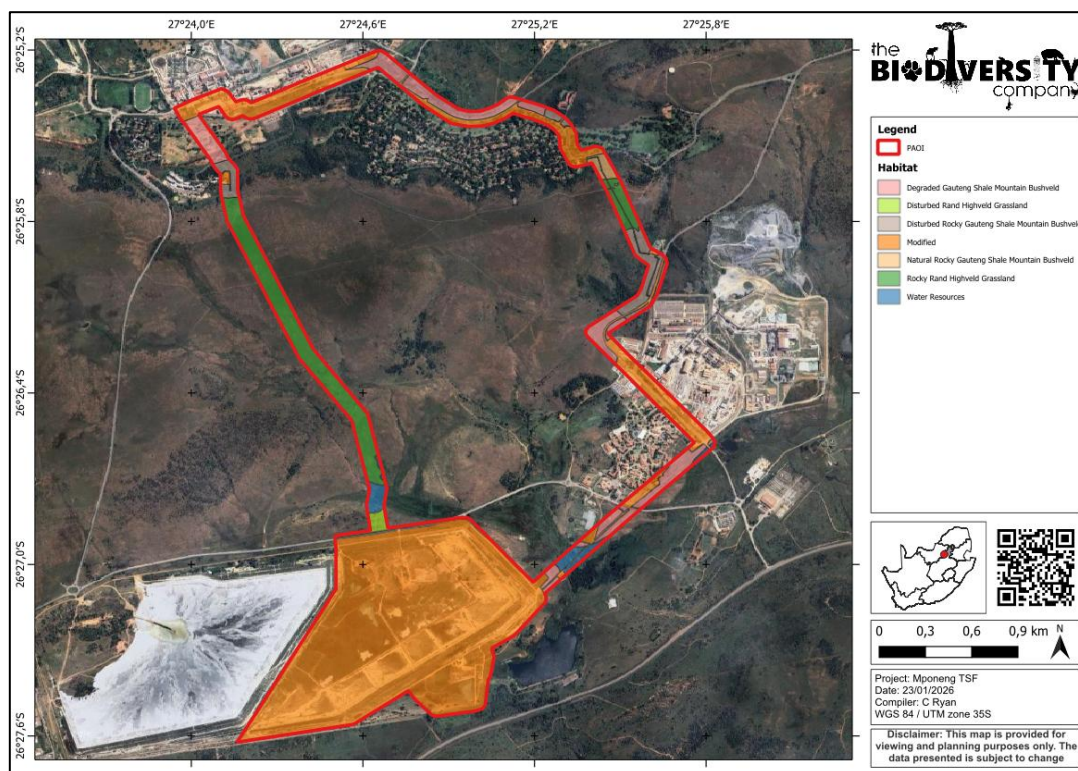
| Family Name       | Scientific Name         | Common Name                 | Conservation Status |        |
|-------------------|-------------------------|-----------------------------|---------------------|--------|
|                   |                         |                             | Regional            | Global |
| Emberizidae       | Emberiza tahapisi       | Cinnamon-breasted Bunting   | LC                  | LC     |
| Anatidae          | Anas undulata           | Yellow-billed Duck          | NT                  | LC     |
| Charadriidae      | Vanellus senegallus     | African Wattled Lapwing     | LC                  | LC     |
| Cisticolidae      | Cisticola juncidis      | Zitting Cisticola           | LC                  | LC     |
| Columbidae        | Spilopelia senegalensis | Laughing Dove               | LC                  | LC     |
| Corvidae          | Corvus albus            | Pied Crow                   | LC                  | LC     |
| Laniidae          | Lanius collaris         | Southern Fiscal             | LC                  | LC     |
| Lybiidae          | Tricholaema leucomelas  | Acacia Pied Barbet          | LC                  | LC     |
| Motacillidae      | Macronyx capensis       | Cape Longclaw               | LC                  | LC     |
| Passeridae        | Passer melanurus        | Cape Sparrow                | LC                  | LC     |
| Ploceidae         | Plocepasser mahali      | White-browed Sparrow-weaver | LC                  | LC     |
| Ploceidae         | Ploceus velatus         | Southern Masked Weaver      | LC                  | LC     |
| Ploceidae         | Ploceus velatus         | Southern Masked Weaver      | LC                  | LC     |
| Pycnonotidae      | Pycnonotus nigricans    | African Red-eyed Bulbul     | LC                  | LC     |
| Sturnidae         | Acridotheres tristis    | Common Myna                 | LC                  | LC     |
| Sturnidae         | Lamprotornis nitens     | Cape Starling               | LC                  | LC     |
| Threskiornithidae | Bostrychia hagedash     | Hadada Ibis                 | LC                  | LC     |
| Turdidae          | Turdus smithi           | Karoo Thrush                | LC                  | LC     |
| Viduidae          | Vidua paradisaea        | Long-tailed Paradise Whydah | LC                  | LC     |

## 3.3 Site Sensitivity Verification

### 3.3.1 Habitat Assessment and Site Ecological Importance

#### 3.3.1.1 Habitats

The following sections discuss the results from the field survey that was conducted for the proposed project, which was undertaken on the 3<sup>rd</sup> of July 2025 and the 20<sup>th</sup> of January 2026. Habitats observed are described in Table 3-13 and shown in Figure 3-19.



**Figure 3-19** Habitats identified within the PAOI.

**Table 3-13** Sensitivity summary of the habitat types delineated within the PAOI.

| Habitat                       | Description and condition  | Ecosystem Services   | Processes and |
|-------------------------------|--|--|---------------|
| Rocky Rand Highveld Grassland | Even though the vegetation map has classed the whole PAOI as Gauteng Shale Mountain Bushveld, certain portions of the PAOI were identified as Rand Highveld Grassland (VU) based on plant species characteristic of that vegetation type.  | This habitat supports primary production, soil stabilization, nutrient cycling, and water regulation, enhanced by its substantial vegetation cover.  |               |
|                               | This habitat is characterised by extensive rocky sloping plains with a high floral richness dominated by grass species such as <i>Themeda triandra</i> , <i>Heteropogon contortus</i> and <i>Elyonurus muticus</i> . This habitat is a viable constituent of the VU Rand Highveld Grassland Vegetation Type. | 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.                               |               |
|                               | Dominant indigenous species characteristic of the vegetation type are present, including <i>Heteropogon contortus</i> , <i>Loudetia simplex</i> , <i>Eragrostis curvula</i> , <i>Senecio coronatus</i> , <i>Cheilanthes hirta</i> and <i>Searsia magalismsontanum</i> .                                      | The mix of grasses and shrubs provides forage, and plant clumps offer shade and shelter, helping small mammals, reptiles, and ground-dwelling birds survive.   |               |
|                               | Fauna observed within this habitat include <i>Cryptomys pretoria</i> (Highveld Mole-Rat) and <i>Lupulella mesomelas</i> (Black Backed Jackal).   | The presence of SCC and protected plant species further underscores this habitat's importance in maintaining ecosystem functioning. It also facilitates the recruitment and dispersal of SCC into surrounding areas, supporting the persistence of |               |
|                               | Current impacts to this habitat type include grazing, roads, vehicle ingress and other existing linear infrastructure (powerlines and pipelines).  |  |               |



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level of grazing pressure from cattle and edge effects from the neighbouring roads and Trailing's Facility.

these species and strengthening their population numbers.

Three (3) plant SCC (*Khadia beswickii*, *Cleome conrathii* and *Adromischus umbraticola* subsp. *umbraticola*) were found within this habitat type.

Overlaps with CBA 2 and ESA 1.

No mammal or herpetofauna SCC were observed within the PAOI, however, suitable habitat for SCC is present and it is expected that they can use the area as a movement corridor and for foraging.

One avifaunal SCC was observed flying over this habitat type (*Anas undulata* [Yellow-billed duck]).

Four (4) provincially protected species were identified within this habitat type (*Crinum graminicola*, *Haemanthus humilis*, *Aloe verecunda* and *Protea afra* subsp. *afra*).

There was an overall low AIP presence within this habitat type and only two (2) species were recorded (*Tagetes minuta* and *Solanum sisymbriifolium*).

Images of the habitat are presented below.







#### Disturbed Rand Highveld Grassland

This habitat is representative of Rand Highveld Grassland, but in a disturbed 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. This habitat is no longer a viable constituent of the VU Rand Highveld Grassland.

Indigenous species observed within this habitat include *Indigofera oxytropis*, *Pogonarthria squarrosa* and *Entada elephantina*.

The floral species richness within this habitat type is diminished due to anthropogenic influences.

Current impacts include overgrazing, vehicle ingress and edge effects from neighbouring modified areas (Roads and Tailings Storage Facility).

No floral SCC were observed within this habitat type and none are expected.

Overlaps with ESA 1.

One (1) provincially protected species was observed within this habitat type (*Protea afra* subsp. *afra*).

Images of the habitat are presented below.

The ecosystem functioning and services of this habitat has been hindered due to the anthropogenic disturbances.

This disturbed Rand Highveld Grassland habitat still however provides important ecosystem services, including soil stabilization through remaining grass and shrub cover, which helps reduce wind and water erosion.

The habitat offers movement corridors for a variety of fauna such.





**Natural Rocky Gauteng  
Shale Mountain  
Bushveld**

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 magalismontanum*, *Protea afra afra*, *Vachellia karoo* and *Vangueria infausta*.

Other indigenous species observed within this habitat include *Asparagus* sp., *Diospyros lycioides* and *Kalanchoe paniculata*.

One flora SCC was found within this habitat (*Adromischus umbraticola* subsp. *umbraticola*).

This habitat is representative of the Gauteng Shale Mountain Bushveld.

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.



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Current impacts include edge effects from existing infrastructure (roads, pipeline, fencing and neighbouring houses). Disturbance to fauna include collisions with fences. Even though an existing pipeline is passing through this habitat, the bushveld surrounding it is natural with minimal current impacts.

This habitat provides erosion control and nutrient cycling. Carbon sequestration and nectar resources for pollinators is also provided.

Few AIP species were present within this habitat type (*Opuntia ficus-indica*, *Lantana camara* and *Solanum mauritianum*).

Images of the habitat are presented below.



**Disturbed  
Gauteng Shale Mountain  
Bushveld**

**Rocky**

This habitat is representative of the Gauteng Shale Mountain Bushveld albeit in a disturbed manner. This habitat differs from the Natural Rocky Gauteng Shale Mountain Bushveld in that there is an increased AIP invasion and other disturbances (edge effects from neighbouring roads and other infrastructure).

No floral SCC were observed, however, suitable habitat is present.

No fauna SCC were observed; however, it is expected that faunal SCC might use this habitat as a movement corridor.

Images of the habitat are presented below.

Even though this habitat is disturbed, it provides key ecosystem services, microclimate regulation, and nutrient cycling through its unique combination of rock cover and indigenous vegetation.







#### Degraded Gauteng Shale Mountain Bushveld

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, edge effects from neighbouring modified areas, and vegetation clearing.

AIP species observed within this habitat include *Campuloclinium macrocephalum*, *Erigeron bonariensis*, *Tagetes minuta*, *Opuntia ficus-indica*, *Acacia decurrens*, *Verbena bonariensis*, *Acacia melanoxylon*, *Lantana camara* and *Solanum mauritianum*.

No floral SCC were observed within this habitat and none are expected.

Overlaps with ESA 1.

One (1) provincially protected species was observed within this habitat type (*Protea afra* subsp. *afra*).

Images of the habitat are presented below.

The ecosystem functioning and services provided by this habitat has been severely diminished due to anthropogenic influences.

This habitat still however provides areas for faunal species to forage and still acts as a movement corridor for various faunal species.







## Water Resources

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). Please note that the delineations of this habitat were provided by the Aquatic Specialist. All inferences made about the Water Resources should be made with the accompanying Aquatic Report.

Indigenous species observed within this habitat include *Crassula dependens*, *Eragrostis gummiflua* and Cyperaceae species.

No floral SCC were observed, however the habitat is suitable.

Images of this habitat are below

This habitat provides water to faunal species and aids in water purification, flood regulation, groundwater recharge, and erosion control.



## Modified

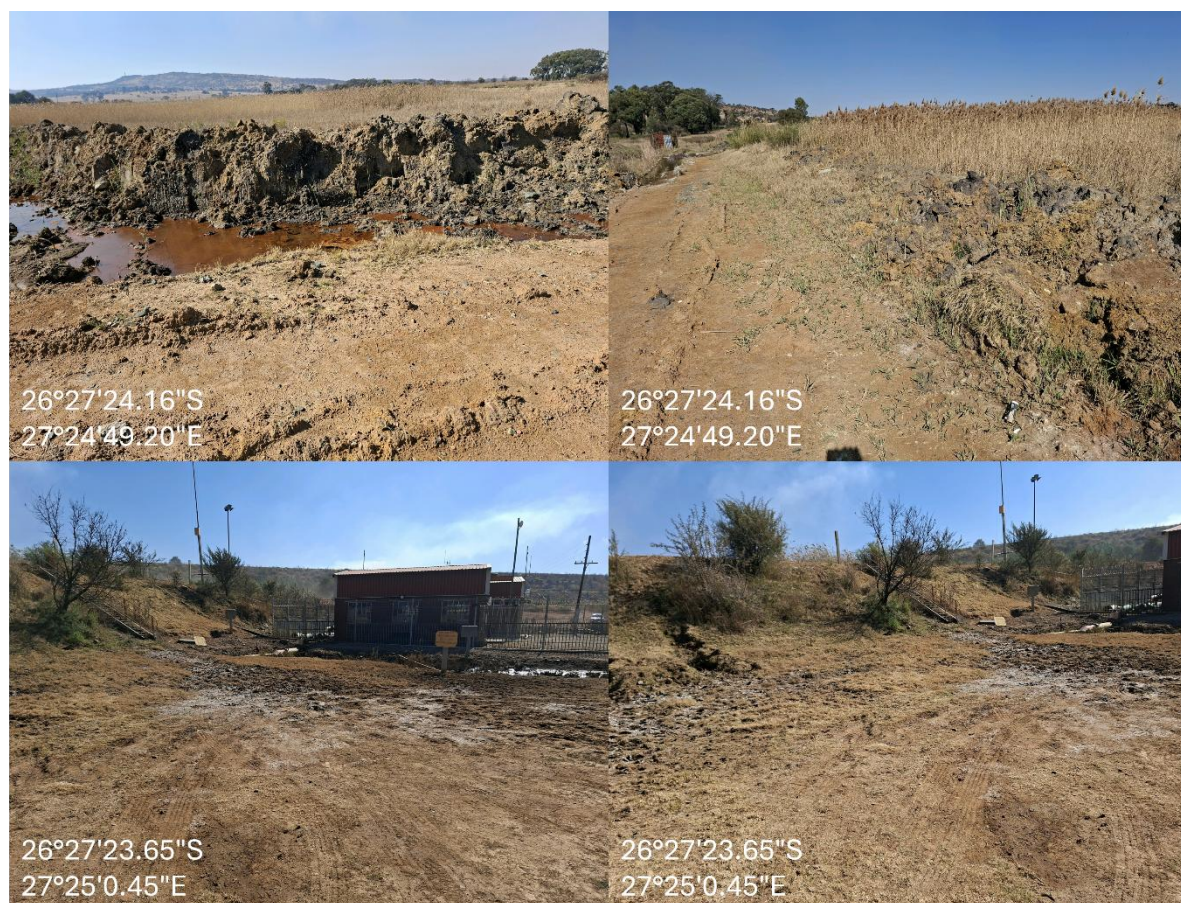
Modified habitats, in this instance, include, roads, houses, lawns and infrastructure associated with the mining operations (TSF and processing plants). They are largely ecologically dysfunctional and have plant species that are characteristic of disturbance.

Images of the habitat are presented below.

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.







### 3.3.2 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 3-14). The SEI of the PAOI is illustrated in Figure 3-20

**Table 3-14 Summary of habitat types delineated within field assessment area.**

| Habitat  | Conservation Importance  | Functional Integrity  | Biodiversity Importance <sup>2</sup> | Receptor Resilience  | Site Ecological Importance <sup>3</sup>  |
|--|--|---|--------------------------------------|--|--|
| <b>Degraded Gauteng Shale Mountain Bushveld</b>        | Low  | Low   | Low                                  | Medium   | Low  |
|  | No confirmed or highly likely populations of SCC.<br>No confirmed or highly likely populations of range-restricted species.<br>< 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.<br>Low rehabilitation potential.<br>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. |
| <b>Disturbed Rand Highveld Grassland</b>               | Low  | Low   | Low                                  | Medium   | Low  |
|  | No confirmed or highly likely populations of SCC.<br>No confirmed or highly likely populations of range-restricted species.<br>< 50% of receptor contains natural habitat with limited potential to support SCC. | Small (> 1 ha but < 5 ha) area.<br>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.<br>Low rehabilitation potential.<br>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. |
| <b>Disturbed Rocky Gauteng Shale Mountain Bushveld</b> | Medium   | Low   | Low                                  | Low  | 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.<br>Low rehabilitation potential.<br>Several minor and major current negative ecological impacts.                                    |                                      | Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore                              | Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.         |
| <b>Natural Rocky Gauteng Shale Mountain Bushveld</b>   | Medium   | Medium  | Medium                               | Low  | High   |
|  | Confirmed or highly likely occurrence of populations of Near Threatened (NT) species<br>> 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  |

<sup>2</sup> Considered as the 'sensitivity'<sup>3</sup> Considered as the sensitivity in relation to the project component.

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|                                      |   |  |        |   |
|--------------------------------------|---|--|--------|---|
|                                      |   |  |        | limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.  |
|                                      | High  | Medium   |        | High  |
| <b>Rocky Rand Highveld Grassland</b> | Confirmed or highly likely occurrence of VU species that has a global EOO of > 10 km <sup>2</sup> | > 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. | Medium | Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore<br><br>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  | Medium   |        | High  |
| <b>Water Resources</b>               | > 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.                                 | Medium | Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore<br><br>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.   |
|                 | Low   | Very Low   |          |   |
| <b>Modified</b> | < 50% of receptor contains natural habitat with limited potential to support SCC. | Several major current negative ecological impacts. | Very Low | <p>Habitat that can recover relatively quickly (~ 5–10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality</p> <p>Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.</p> |

### 3.3.3 Screening Tool Comparison

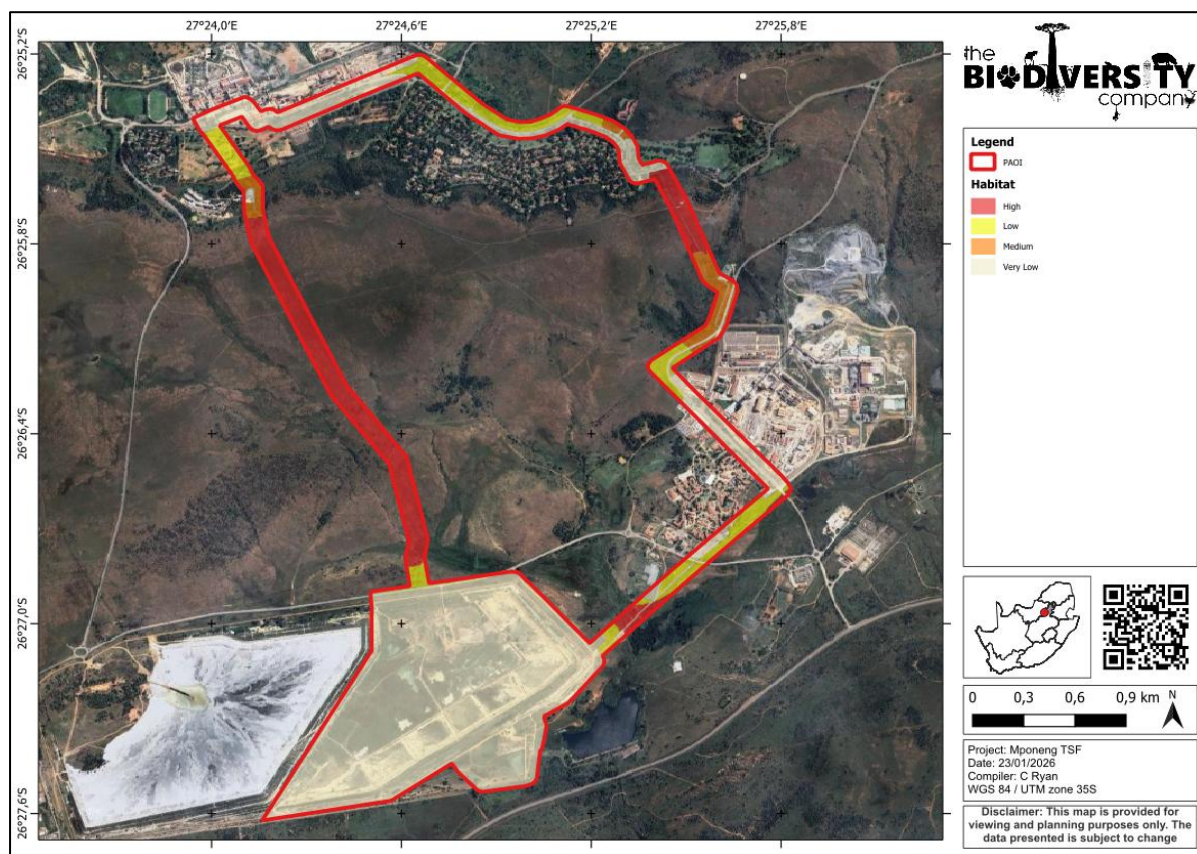
The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-15 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

**Table 3-15 Summary of the screening tool vs specialist assigned sensitivities.**

| Screening Tool Theme | Screening Tool | Habitat   | Specialist    | Tool Validated or Disputed by Specialist - Reasoning   |
|----------------------|----------------|---|---------------|--|
| <b>Animal Theme</b>  | <b>Medium</b>  | Disturbed Rand Highveld Grassland                 | <b>Medium</b> | Validated - No SCC were observed, however, fauna SCC may potentially move through the area sporadically and use the area for foraging and as a migration corridor.   |
|                      |                | Disturbed Rocky Gauteng Shale Mountain Bushveld   |               |  |
|                      |                | Natural Rocky Gauteng Shale Mountain Bushveld     |               |  |
|                      |                | Rocky Rand Highveld Grassland                     |               |  |
|                      |                | Water Resources                                   |               |  |
|                      |                | Modified Degraded Gauteng Shale Mountain Bushveld | <b>Low</b>    | Disputed – Highly degraded habitat. Provides little to no habitat for animals.   |
|                      |                | Natural Rocky Gauteng Shale Mountain Bushveld     |               |  |
|                      | <b>Medium</b>  | Natural Rocky Gauteng Shale Mountain Bushveld     | <b>High</b>   | Disputed – Three floral SCC were observed within the Rocky Rand Highveld Grassland and one (1) was observed within the Natural Rocky Gauteng Shale Mountain Bushveld |
|                      |                | Natural Rocky Gauteng Shale Mountain Bushveld     |               |  |

## Mponeng TSF Lower Compartment

|                   |           |   |          |  |
|-------------------|-----------|---|----------|--|
| Terrestrial Theme | Very High | Rocky Rand Highveld Grassland                   | Medium   | Validated – No SCC were identified but suitable habitat is present.  |
|                   |           | Water Resources                                 |          |  |
|                   |           | Disturbed Rocky Gauteng Shale Mountain Bushveld |          |  |
|                   |           | Disturbed Rand Highveld Grassland               | Low      | Disputed – No SCC were observed, and none are expected.  |
|                   |           | Modified  |          |  |
|                   |           | Degraded Gauteng Shale Mountain Bushveld        |          |  |
|                   |           | Degraded Gauteng Shale Mountain Bushveld        | Low      | Disputed - Habitat exists in a degraded state, with reduced function. ESA 1 areas fall within the boundaries of this habitat type. The ecosystem function has been greatly reduced due to the present disturbances.  |
|                   |           | Disturbed Rand Highveld Grassland               |          |  |
|                   |           | Disturbed Rocky Gauteng Shale Mountain Bushveld | Medium   | Disputed - Habitat exists in a recovering state, however with reduced function. CBA 2 and ESA 1 areas fall within the boundaries of this habitat type. Is a viable constituent of Rocky Gauteng Shale Mountain Bushveld vegetation type, albeit in a disturbed state. Even though these areas are disturbed, it is up to the relevant departmental authorities to decide whether these areas are classified as intact CBA 2. |
|                   |           | 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.  |
|                   |           | Natural Rocky Gauteng Shale Mountain Bushveld   | High     | Disputed – Exists in a natural state, providing important ecological functions. ESA 1 falls within the boundaries of this habitat type.  |
|                   |           | Rocky Rand Highveld Grassland                   | High     | Disputed – Exists in a natural state, providing important ecological functions. CBA 2 and ESA 1 overlap this habitat type. Is a viable constituent of the VU Rand Highveld Grassland vegetation type. It is up to the relevant departmental authorities to decide whether these areas are classified as intact CBA 2.  |
|                   |           | Water Resources                                 | High     | Disputed – Exists in a natural state, providing important ecological functions.  |



**Figure 3-20** Map illustrating Site Ecological Importance (SEI) of the habitat types within the PAOI.



## **4 Impact Assessment**

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the PAOI, specifically the proposed development footprint area. The relevant impacts were then subjected to a prescribed impact assessment methodology. The details of this methodology can be provided on request.

Impacts were assessed in terms of the construction/operational phases. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis and can be seen in section 6.

### **4.1 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.

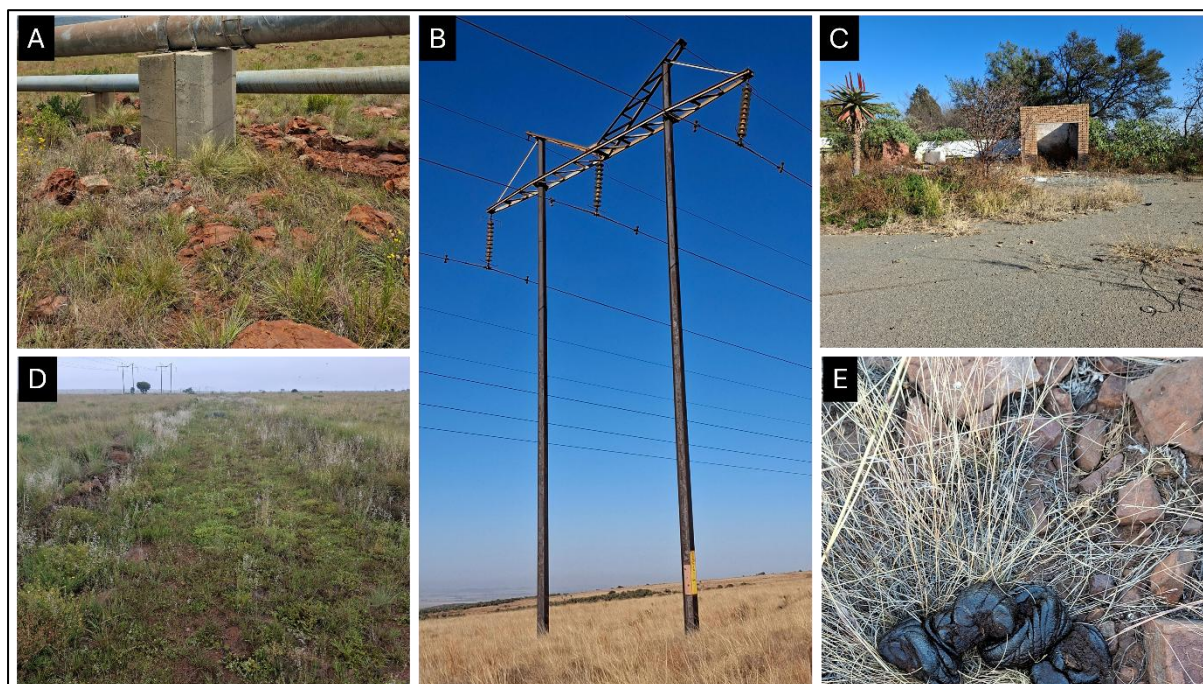
- The nature of the associated impact (positive or negative);
- The extent of the proposed activities;
- The duration of the proposed activities;
- The magnitude of the effects caused by the proposed activities;
- The reversibility of associated impacts; and
- The probability of relevant aspects affecting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

### **4.2 Current Impacts**

The current impacts observed during surveys are listed below. Photographic evidence of a selection of these impacts is shown in Figure 4-1.

- Overgrazing and trampling of natural vegetation and wetlands by livestock;
- Secondary Roads (and associated traffic and wildlife road mortalities);
- Unregulated burning
- Alien and/or Invasive Plants (AIP);
- Existing mine infrastructure;
- Servitudes and infrastructure (powerlines);
- Water contamination and sewage;
- Vegetation removal.



**Figure 4-1** Some of the identified impacts within the PAOI; A) Existing Pipelines, B) Powerline infrastructure, C) Old Infrastructure, D) Roads and associated edge effects and E) Grazing

### 4.3 Terrestrial Impact Assessment

The impacts regarding the proposed development were assessed for construction and the operational stages, no decommission/rehabilitation phases were considered.

#### 4.3.1 Anticipated Impacts

In the impacts anticipated for the proposed activities are considered in order to predict and quantify these impacts and assess & evaluate the magnitude on the identified terrestrial biodiversity.

**Table 4-1** Anticipated impacts for the proposed activities on terrestrial biodiversity

| Main Impact   | Project activities that can cause loss of habitat   | Secondary impacts anticipated  |
|---|---|--|
| <b>1. Destruction, fragmentation and degradation of habitats and ecosystems</b> | Physical removal of vegetation  | Displacement/loss of flora & fauna (including SCC)                           |
|   | Access roads and servitudes   | Increased potential for soil erosion   |
|   | Soil dust precipitation   | Habitat fragmentation  |
|   | Dumping of waste products   | Increased potential for establishment of alien & invasive vegetation         |
|   | 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  |
| <b>2. Spread and/or establishment of alien and/or invasive species</b>          | Vegetation removal  | Habitat loss for native flora & fauna (including SCC)                        |
|   | Vehicles potentially spreading seed   | Spreading of potentially dangerous diseases due to invasive and pest species |
|   | Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents | Alteration of fauna assemblages due to habitat modification                  |
|   | 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  |

|  |   |   |
|--|---|---|
| <b>3. Direct mortality of fauna</b>  | Clearing of vegetation  | Loss of ecosystem services<br>Increase in rodent populations and associated disease risk        |
|  | Roadkill due to vehicle collision   |   |
|  | Pollution of water resources due to dust effects, chemical spills or sewage leakages  |   |
| <b>Main Impact</b>   | <b>Project activities that can cause reduced dispersal/migration of fauna</b>   | <b>Secondary impacts anticipated</b>  |
| <b>4.. Reduced dispersal/migration of fauna</b>  | Loss of landscape used as corridor  | Loss of ecosystem services<br>Reduced plant seed dispersal                                      |
|  | Compacted roads   |   |
|  | Removal of vegetation   |   |
|  | Light, noise and dust disturbance   |   |
| <b>Main Impact</b>   | <b>Project activities that can cause pollution in water courses and the surrounding environment</b>                           | <b>Secondary impacts anticipated</b>  |
| <b>5. Environmental pollution due to water/ Acid Mine Drainage (AMD) runoff</b>  | Chemical (organic/inorganic) spills   | Faunal mortality (direct and indirectly)<br>Groundwater pollution<br>Loss of ecosystem services |
|  | Erosion   |   |
| <b>Main Impact</b>   | <b>Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance and dust.</b> | <b>Secondary impacts anticipated</b>  |
| <b>6. Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and light pollution.</b> | Operation of machinery (Large earth moving machinery, generators)   | Loss of ecosystem services  |
|  | Vehicles  |   |
| <b>Main Impact</b>   | <b>Project activities that can cause staff to interact directly with potentially dangerous fauna</b>                          | <b>Secondary impacts anticipated</b>  |
| <b>8. Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals</b>                        | All unregulated/supervised activities outdoors  | Harm to fauna and/or staff  |

### 4.3.2 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  |
|--|--|---|
| <b>Hydrocarbon spills into the surrounding environment</b> | Contamination of habitat as well as water resources 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. |
| <b>Fire</b>  | Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland and wetlands | Appropriate/Adequate fire management plan need to be implemented.   |

### 4.3.3 Construction Phase

The following potential impacts on the biodiversity were considered for the construction phase of the project. This phase refers to the period during construction when the proposed infrastructure is constructed. This phase usually has the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered.

#### 4.3.3.1.1 Pipeline impacts (Both pipeline routes and Pipe Bridge Area)



- 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.

#### **4.3.3.1.2 TSF Impacts (Mponeng Lower Compartment and Return Water Dam).**

- 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.

#### **4.3.4 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.

##### **4.3.4.1.1 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.

##### **4.3.4.1.2 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.

#### 4.3.5 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 (Slurry alignment and Return Water Pipes and Pipe Bridge Area)*

| 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 High-              | Medium to High-    |

#### Mitigation Measures

- **Areas of high SEI must be avoided.**
- **All plant SCC along this route must be avoided, and the 200 m buffers be strictly adhered to, if these buffers cannot be avoided then more consideration of pursuing the alternative pipeline route must occur.**
- 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 minimized 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 program. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.
- 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.

## Mponeng TSF Lower Compartment

- 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 high - | High |
|--|--------------|--------|------------------|------|

## Mitigation Measures

- All terrestrial areas along this route designated as High SEI must be avoided.**
- Existing access roads must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.

|  |              |                  |                 |                 |
|--|--------------|------------------|-----------------|-----------------|
| 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 water resources must be protected and all activities that could result in a spill should occur away from them.



## Mponeng TSF Lower Compartment

- 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 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.
- 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 should only be done with minimal impact on vegetation to prevent the destruction of SCC 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 minimize 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.

## Mponeng TSF Lower Compartment

- 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 linear infrastructure (Alternative pipeline route)**

| 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 High-              | Medium to High-    |

## Mitigation Measures

- Construction of pipelines within High SEI areas along this route is permissible as long as the existing pipeline infrastructure, or modified areas within the High SEI areas or additional mitigation measures, are utilised.
- One SCC (*Adromischus umbraticola umbraticola*) was found along this route within the high SEI area. One individual was located next to the existing pipeline and therefore will be destroyed if the existing infrastructure is used. It is recommended that a plant search and rescue should take place, relocating individuals to suitable undisturbed habitat nearby.
- A protected plant and SCC search and rescue plan should take place occur to record locations of all SCC and protected species.
- Areas of indigenous vegetation, even secondary communities outside of the direct pylon and servitude road footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible.
- No unnecessary further loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.
- 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 program. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.
- 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 construction 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.

## Mponeng TSF Lower Compartment

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.

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

## Mitigation Measures

- **Construction of pipelines within High SEI areas along this route is permissible as long as the existing pipeline infrastructure, or modified areas, are utilised.**
- Existing access roads must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.
- Proposed new servitude roads should be constructed on existing roads, where possible, to limit clearance of vegetation and impacts. Existing roads and servitudes need to be used before new areas are considered. All new roads must be authorised.

|  |              |                  |                 |                 |
|--|--------------|------------------|-----------------|-----------------|
| 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

- **Pipelines should be raised above the ground to allow for faunal species to pass beneath to reduce the impact on migration.**
- 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.
- Considering that many of the mammal fauna recorded within the PAOI are nocturnal, **no road activity** is to occur at night.
- 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.



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- 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 water resources must be protected and all activities that could result in a spill should occur away from them.
- 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.
- 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 should be done in a manner that no further disturbance to the vegetation occurs.**
- Maintenance of pipelines within High SEI areas should be done by foot as to reduce the impact on vegetation.**
- 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 | Medium to high | Medium to low | Medium to low |
|--|-------------|----------------|---------------|---------------|

## Mitigation Measures

- All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions with animals. Appropriate speed control measures and signs must be erected.
- To mitigate potential impacts on faunal species it is recommended that vehicle movements are avoided at night. If night driving is unavoidable, vehicle speed should be reduced to a maximum of 20 km/h to minimize the risk of harm to wildlife.**

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- 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.
- Waste management must be a priority and a Solid Waste Management Plan must be developed and implemented. All waste must be collected and stored effectively. All solid waste collected shall be disposed of at a licensed disposal facility.
- 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 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 4-5** *Summary assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed TSF [Mponeng Lower Compartment and Return Water Dam].*

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

**Mitigation Measures**

- Existing access roads must be made use of as far as possible. 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 program. Infrastructure, development areas and routes where protected plants cannot be avoided should be removed from the soil and relocated/ re-planted in similar habitats.
- 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.

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- 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.
- Considering that many of the mammal fauna recorded within the PAOI are nocturnal, **no road activity** is to occur at night.
- 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



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complete and available on site. The water resources must be protected and all activities that could result in a spill should occur away from them.)

- 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 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.
- 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.

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|   |             |                |       |       |
|---|-------------|----------------|-------|-------|
| 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 water resources must be protected and all activities that could result in a spill should occur away from them.
- 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.
- 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 utilize 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/<br>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.
- 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.
- 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 water resources.
- 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.

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- 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.
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#### 4.4 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 4-6 to Table 4-8).

**Table 4-6 Cumulative impacts for the proposed linear infrastructure (Slurry alignment, Return Water Pipes and Pipe Bridge Area)**

| 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 events or | 1                 | 2                  | 1,13            | -11,81      | Medium high - to   |
| Introduction of invasive and alien species, especially plants  | Construction | Normal operations events or | 1                 | 1                  | 1,13            | -4,50       | Medium low - to    |
| 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 events or | 2                 | 3                  | 1,25            | -5,63       | Medium low - to    |
| Destruction of non-resilient habitats (Rocky Outcrops)   | Construction | Normal operations events or | 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 events or | 1                 | 2                  | 1,13            | -8,44       | Medium low - to    |
| Clearing of vegetation leading to soil erosion and loss of topsoil.  | Construction | Normal operations events or | 1                 | 1                  | 1,00            | -8,25       | Medium low - to    |
| Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.  | Operation    | Normal operations events or | 1                 | 2                  | 1,13            | -8,44       | Medium low - to    |
| Continued encroachment by alien and invasive plant species   | Operation    | Normal operations events or | 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 events or | 1                 | 2                  | 1,13            | -10,13      | Medium high - to   |

**Table 4-7 Cumulative impacts for the proposed linear infrastructure (Alternative Pipeline).**

| 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                 | 1                  | 1,00            | -9,00       | 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                 | 1                  | 1,00            | -8,25       | Medium to low -    |
| 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 (noise, dust, vibration), including the reduced dispersal/migration of fauna                | Operation    | Normal operations or events | 1                 | 2                  | 1,13            | -6,75       | Medium to low -    |
| Environmental pollution due to pipe leakage  | Operation    | Normal operations or events | 1                 | 2                  | 1,13            | -6,75       | Medium to low -    |

**Table 4-8 Cumulative impacts for the TSF (Mponeng Lower Compartment and Return Water Dam).**

| 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

Given the fact that the proposed development is largely composed of linear infrastructure, which refers to pipelines, the actual footprint of the infrastructure has a small, localised impact on the terrestrial biodiversity. In comparison, the creation of the TSF is a more important aspect to note. By minimising impacts in these areas and implementing strict mitigation measures, they will continue to support and sustain biodiversity. Both pipelines overlap with CBA 2, according to the provincial conservation plan, and 'High' SEI areas. It is therefore important to follow the mitigations outlined in this report to reduce the overall impacts. The preferred pipeline route has an overall higher impact on the terrestrial biodiversity as full clearance is to occur and no existing infrastructure exists, in comparison to the alternative pipeline route.

The PAOI has been impacted both historically and currently, primarily due to mining activities and current livestock grazing. These activities have impacted both the fauna and flora, with notable disturbances to the bushveld and grassland characteristics. Even the disturbed habitats are important within the local and regional landscape. They serve as fauna habitat, foraging grounds, and movement corridors in a landscape fragmented by anthropogenic influence.

The terrestrial biodiversity assessment confirms the varied sensitivity of the PAOI but disputes the screening report's findings. The habitat sensitivity of these areas varies, with the Natural Rocky Gauteng Shale Mountain Bushveld, Rocky Rand Highveld Grassland and Water Resources habitat being of a 'High' SEI due:

- Having a lower resilience to development; and
- Supporting various organisms, including flora SCC and protected species.

The ecological integrity, importance, and functioning of these areas are crucial for various fauna and flora. Preservation and enhancement of these systems are vital, especially given their sensitivity and limited availability. The other habitat types identified in the PAOI are of lower ecological functionality and value, and with the correct impact mitigation implementation, are more viable localities for this development to take place. The Screening Tool theme sensitivities for the associated habitats are seen in Table 5-1.

**Table 5-1** *Habitats and their associated specialist assignment sensitivities for the Screening Tool Themes (the sensitivities are either disputed or validated).*

| Habitat   | Specialist Assignment           |                         |                          |
|---|---------------------------------|-------------------------|--------------------------|
|   | Terrestrial Biodiversity        | Animal Theme            | Plant Theme              |
| Degraded Gauteng Shale Mountain Bushveld        | Low (Disputed – Very High)      | Low (Disputed - Medium) | Low (Disputed - Medium)  |
| Disturbed Rand Highveld Grassland               | Low (Disputed – Very High)      | Medium (Validated)      | Low (Disputed - Medium)  |
| Disturbed Rocky Gauteng Shale Mountain Bushveld | Medium (Disputed – Very High)   | Medium (Validated)      | Medium (Validated)       |
| Modified  | Very Low (Disputed – Very High) | Low (Disputed - Medium) | Low (Disputed - Medium)  |
| Natural Rocky Gauteng Shale Mountain Bushveld   | High (Disputed – Very High)     | Medium (Validated)      | High (Disputed - Medium) |
| Rocky Rand Highveld Grassland                   | High (Disputed – Very High)     | Medium (Validated)      | High (Disputed – Medium) |

**Water Resources** (Disputed – Very High)

Medium (Validated)

Medium (Validated)

### 5.1 Impact Statement

It is the opinion of the specialists that the proposed project may be favourably considered, provided all prescribed mitigation measures and supporting recommendations are implemented (including all protected species and SCC mitigations). Particularly, the alternative pipeline route should be the chosen route as this route is overall less sensitive in terms of terrestrial ecology. Construction of the alternative pipeline route will aid in avoiding large impacts on High SEI areas, as well as the 200 m flora SCC buffers, that don't have existing infrastructure passing through. However, the proposed pipeline route is equally favourable provided that the necessary mitigation measures are adhered to.

### 5.2 Specialist Opinion

The specialist proposes that the development can proceed only under the following conditions:

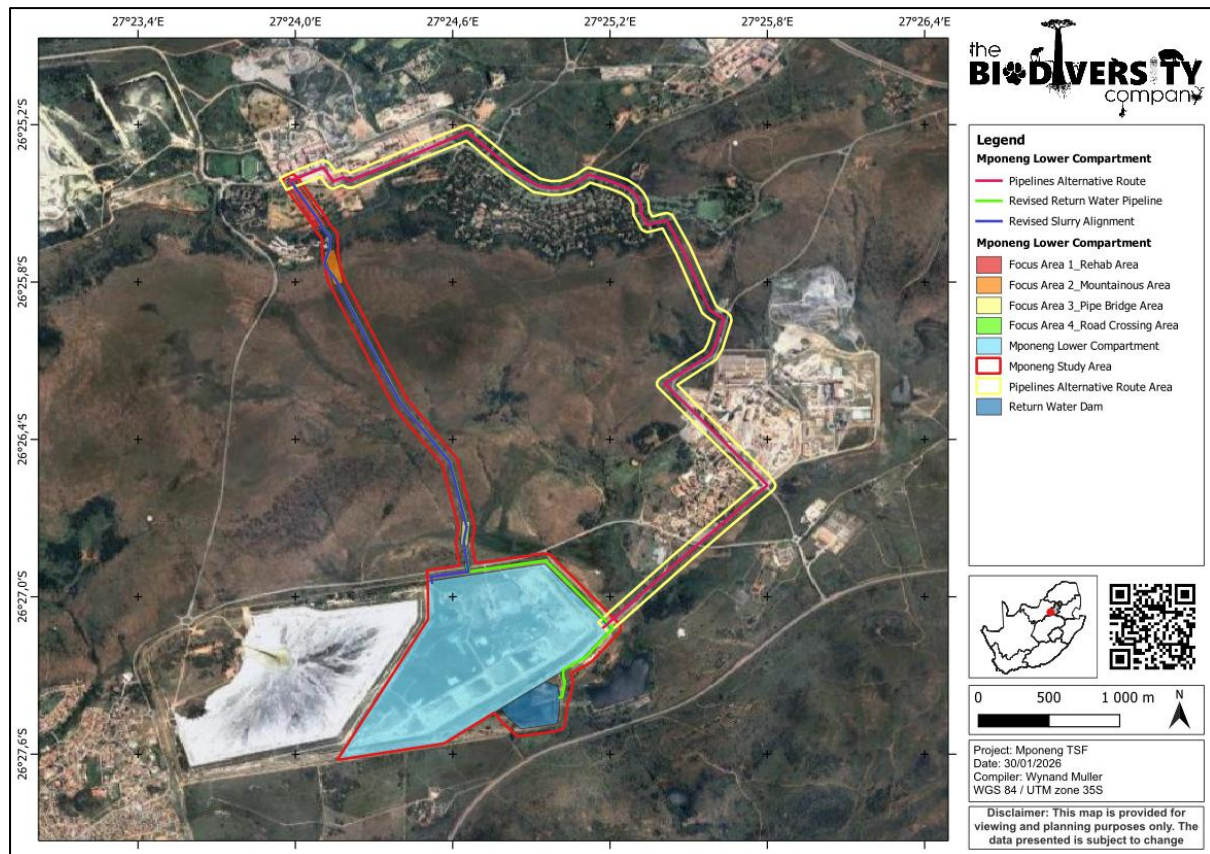
- The development adheres to all mitigation measures outlined in this and other specialist reports
  - It is recommended that the pipeline should follow the alternative route.
- All 'High' SEI habitats without existing pipeline infrastructure or modified areas within them are to be avoided.
- All SCC (and associated buffers) are avoided by development infrastructure in the preferred pipeline route and set-aside as a no-go area. A search and rescue operation must take place for the SCC that will be impacted by construction of the alternative pipeline route.
- Permits are acquired for all protected species that cannot be avoided by infrastructure, a protected plant species count must occur as to inform the relevant permits.
- The following environmental management and compliance frameworks/plans should be developed and implemented:
  - Biodiversity Monitoring Plan: A plan to monitor biodiversity, including flora and fauna, to assess the effectiveness of mitigation measures and adapt them as necessary.
  - Alien and Invasive Species Management Plan: A plan to identify, control, and manage AIP species, including monitoring and removal strategies.
  - Erosion and Sedimentation Control Plan: A plan to implement erosion control measures and prevent sedimentation in nearby water resources.
  - Fire Management Plan: A plan developed in consultation with a fire expert to minimize the risk of veld fires and manage fire-related risks around the project site.
  - Rehabilitation and Revegetation Plan: A plan for the rehabilitation of disturbed areas, including the use of indigenous vegetation for revegetation and stabilization.
  - Environmental Awareness Training Program: A program to provide training to all personnel and contractors on environmental management practices, sensitive receptors, and mitigation measures.

### 5.3 Layout Approval

An updated project layout has been received (Figure 5-1 **Error! Reference source not found.**). It is the opinion of the specialists that the proposed project may be favourably considered, provided all prescribed mitigation measures and supporting recommendations are implemented (including all protected species and SCC mitigations). Particularly, the alternative pipeline route should be the chosen route as this route is overall less sensitive in terms of terrestrial ecology. Construction of the alternative pipeline route will aid in avoiding large impacts on High SEI areas, as well as the 200 m flora SCC

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buffers, that don't have existing infrastructure passing through. No new risks are associated with the layout change.



**Figure 5-1** Updated layout for the proposed project



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## 7 Appendix Items

### 7.1 Appendix A: Methods

#### 7.1.1.1 Desktop Dataset Baseline

#### 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) 2022 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeke (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 & Monyeke, 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.
- Protected areas:
  - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2025a) – 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:



- Gauteng Conservation Plan (C-Plan) version 4 (GDE, 2024) – 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.
- 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

- **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 Environment (GDE) (previously 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 (2019), the ridges within Gauteng may be classified as follows:

- Class 1 Ridges: 5% or less of the ridge area has been transformed by human activity (Approx. 58% of ridges fall within this category);
- Class 2 Ridges: Between 6 and 34% of the ridge area has been transformed by human activity (Approx. 23% of ridges fall within this category);
- Class 3 Ridges: Between 35 and 64% of the ridge area has been transformed by human activity (Approx. 8% of ridges fall within this category); and
- Class 4 Ridges: Over 65% of the ridge area has been transformed by human activity (Approx. 11% of ridges fall within this category).

The 2019 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. GDE (2019) 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 (GDE, 2019):

- Class 1 Ridges: Only low impact activities with an ecological footprint of 5% or less in the 200 m buffer zone of the ridge will be supported and no development will be permitted in the ridge itself;
  - Class 2 Ridges: Development activities and uses that have a high environmental impact on a Class 2 ridge will not 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 on by human activity. The guidelines for Class 3 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.
- 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.
- Mining and Biodiversity Guidelines:
  - The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the SANBI and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining, which will eventually translate into best practice within the mining sector. It provides a tool to facilitate the sustainable development of South Africa's mineral resources, in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. It provides the mining sector with a practical, user- friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where: mining-related impacts are legally prohibited; biodiversity priority areas may present high risks for mining projects; and biodiversity may limit the potential for mining.
  - In identifying biodiversity priority areas, which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:
    - A) Legally protected areas, where mining is prohibited;
    - B) Areas of highest biodiversity importance, which are at the highest risk for mining;
    - C) Areas of high biodiversity importance, which are at a high risk for mining; and
    - D) Areas of moderate biodiversity importance, which are at a moderate risk for mining.

Table 7-1 presents the four different categories and the implications for mining within each of these categories.



**Table 7-1 Summary of the Mining and Biodiversity Guidelines**

| Category                                  | Biodiversity priority areas  | Risk for mining                | Implications for mining  |
|---|--|--------------------------------|--|
| <b>A. Legally protected</b>               | <ul style="list-style-type: none"> <li>Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves)</li> <li>Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)</li> </ul>  | <b>Mining prohibited</b>       | <p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>   |
| <b>B. Highest biodiversity importance</b> | <ul style="list-style-type: none"> <li>CE and EN</li> <li>CBAs (or equivalent areas) from provincial spatial biodiversity plans</li> <li>River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1 km buffer around these FEPAs</li> <li>Ramsar Sites</li> </ul>   | <b>Highest risk for mining</b> | <p>Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and EAs.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.</p> |
| <b>C. High biodiversity importance</b>    | <ul style="list-style-type: none"> <li>Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves)</li> <li>Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas)</li> <li>Other identified priorities from provincial spatial biodiversity plans</li> <li>High water yield areas</li> <li>Coastal Protection Zone</li> <li>Estuarine functional zone</li> </ul> | <b>High risk for mining</b>    | <p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and maintaining important ecosystem services for particular communities or the country as a whole.</p> <p>An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>   |

| Category                                   | Biodiversity priority areas  | Risk for mining                 | Implications for mining  |
|--|--|---------------------------------|--|
| <b>D. Moderate biodiversity importance</b> | <ul style="list-style-type: none"> <li>• Ecological support areas</li> <li>• Vulnerable ecosystems</li> <li>• Focus areas for protected area expansion (land-based and offshore protection)</li> </ul> | <b>Moderate risk for mining</b> | <p>These areas are of moderate biodiversity value. EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p> |

### 7.1.2 Baseline 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 GBIF database ([www.GBIF.org](http://www.GBIF.org)) was accessed to compile a list of expected flora species within the PAOI. 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 (Transvaal Nature Conservation Ordinance No. 12 of 1983);
- Gauteng Nature Conservation Bill, 2014 (Draft);
- 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 (DEFF, 2022).

### 7.1.3 Baseline Fauna Assessment

The faunal desktop assessment comprised of the following:

- Compiling an expected amphibian list generated from the FrogMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024a) using the 2627 quarter degree square;
- Compiling an expected reptile list generated from the ReptileMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024b) using the 2627 quarter degree square;
- Compiling an expected mammal list generated from the MammalMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024c) using the 2627 quarter degree square; and

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 (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).

#### 7.1.4 Field Assessment

##### 7.1.4.1 Vegetation & Flora Survey

The 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);
- iNaturalist;
- Flowering Plants of the Southern Kalahari (Van Rooyen and Van Rooyen, 2019);
- Problem Plants and Alien Weeds of South Africa (Bromilow, 2010);
- Field Guide to Succulents in Southern Africa (Smith *et al.*, 2017);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Medicinal Plants of South Africa (Van Wyk *et al.*, 2013).



#### 7.1.4.2 Fauna Survey

The faunal component of this report pertains only to mammals and herpetofauna (reptiles and amphibians), as a separate avifauna assessment was conducted. 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.);
- The identification of tracks and signs, and listening to species calls; and
- Utilization of local knowledge;

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 7-2 and Table 7-3 respectively.

**Table 7-2 Summary of Conservation Importance (CI) criteria**

| Conservation Importance | Fulfilling Criteria   |
|-------------------------|---|
| <b>Very High</b>        | 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 <sup>2</sup> .<br>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.<br>Globally significant populations of congregatory species (> 10% of global population). |
| <b>High</b>             | Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km <sup>2</sup> . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.  |

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|                 |  |
|-----------------|--|
|                 | <p>If listed as threatened only under Criterion A, include if there are less than 10 locations or &lt; 10 000 mature individuals remaining.</p> <p>Small area (&gt; 0.01% but &lt; 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (&gt; 0.1%) of natural habitat of VU ecosystem type.</p> <p>Presence of Rare species.</p> <p>Globally significant populations of congregatory species (&gt; 1% but &lt; 10% of global population).</p> |
| <b>Medium</b>   | <p>Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.</p> <p>Any area of natural habitat of threatened ecosystem type with status of VU.</p> <p>Presence of range-restricted species.</p> <p>&gt; 50% of receptor contains natural habitat with potential to support SCC.</p>                             |
| <b>Low</b>      | <p>No confirmed or highly likely populations of SCC.</p> <p>No confirmed or highly likely populations of range-restricted species.</p> <p>&lt; 50% of receptor contains natural habitat with limited potential to support SCC.</p>   |
| <b>Very Low</b> | <p>No confirmed and highly unlikely populations of SCC.</p> <p>No confirmed and highly unlikely populations of range-restricted species.</p> <p>No natural habitat remaining.</p>  |

**Table 7-3 Summary of Functional Integrity (FI) criteria**

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

BI can be derived from a simple matrix of CI and FI as provided in Table 7-4.

**Table 7-4 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 |
| <b>Functional Integrity</b> | <b>Very High</b> | Very High               | Very High | High   | Medium | Low      |
|                             | <b>High</b>      | Very High               | High      | Medium | Medium | Low      |
|                             | <b>Medium</b>    | High                    | Medium    | Medium | Low    | Very Low |
|                             | <b>Low</b>       | 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 7-5.

**Table 7-5 Summary of Receptor Resilience (RR) criteria**

| Resilience       | Fulfilling Criteria   |
|------------------|---|
| <b>Very High</b> | 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.   |
| <b>High</b>      | 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.  |
| <b>Medium</b>    | 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.  |
| <b>Low</b>       | 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. |
| <b>Very Low</b>  | 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 7-6.

**Table 7-6 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 7-7.

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

| Site Ecological Importance | Interpretation in relation to proposed development activities  |
|----------------------------|--|
| <b>Very High</b>           | 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. |
| <b>High</b>                | 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.   |



|                 |  |
|-----------------|--|
| <b>Medium</b>   | Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.         |
| <b>Low</b>      | Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities. |
| <b>Very Low</b> | 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.



### 7.2.1 Impact Assessment Considerations and Procedure

**Table 7-8** *Assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed linear infrastructure (Slurry alignment and Return Water Pipes and Pipe Bridge Area)*

| Impact  | Phase        | Pre-Nature | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance | Post-Nature | Post-Extent | Post-Duration | Post-Magnitude | Post-Reversibility | Consequence2 | Post-Probability | Post-mitigation Significance Score | Post-Mitigation Significance | Confidence | 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 | -1         | 3          | 4            | 5             | 4                 | -4          | 5               | -20                               | High -                      | -1          | 3           | 3             | 4              | 4                  | -3,5         | 3                | -10,5                              | Medium to high -             | High       | 1                 | 2                  | 1,13            | -11,81      | Medium to high -   |
| Introduction of invasive and alien species, especially plants   | Construction | -1         | 4          | 3            | 2             | 2                 | -2,75       | 4               | -11                               | Medium to high -            | -1          | 3           | 2             | 2              | 1                  | -2           | 2                | -4                                 | Low -                        | Medium     | 1                 | 1                  | 1,13            | -4,50       | Medium to low -    |



| Operation   | Construction     | Construction     | Construction     | Construction     |
|---|------------------|------------------|------------------|------------------|
| Continued destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community. | -1               | -1               | -1               | -1               |
|   | 3                | 2                | 2                | 4                |
|   | 3                | 4                | 3                | 4                |
|   | 3                | 4                | 3                | 3                |
|   | 4                | 3                | 3                | 2                |
| -3,25   | -3,25            | -2,75            | -3,75            | -3,25            |
| 3   | 3                | 4                | 4                | 4                |
| -9,75   | -9,75            | -11              | -15              | -13              |
| Medium to high -  | Medium to high - | Medium to high - | High -           | Medium to high - |
| -1  | -1               | -1               | -1               | -1               |
| 2   | 2                | 2                | 2                | 3                |
| 3   | 3                | 3                | 3                | 2                |
| 3   | 3                | 2                | 3                | 3                |
| 2   | 3                | 3                | 5                | 1                |
| -2,5  | -2,75            | -2,5             | -3,25            | -2,25            |
| 3   | 3                | 3                | 4                | 2                |
| -7,5  | -8,25            | -7,5             | -13              | -4,5             |
| Medium to low -   | Medium to low -  | Medium to low -  | Medium to high - | Medium to low -  |
| High  | High             | High             | High             | High             |
| 1   | 1                | 1                | 1                | 2                |
| 2   | 1                | 2                | 2                | 3                |
| 1,13  | 1,00             | 1,13             | 1,13             | 1,25             |
| -8,44   | -8,25            | -8,44            | -14,63           | -5,63            |
| Medium to low -   | Medium to low -  | Medium to low -  | High -           | Medium to low -  |

|  |           |    |   |   |   |   |      |   |     |                  |    |   |   |   |   |      |   |      |                  |        |   |   |      |        |                  |
|--|-----------|----|---|---|---|---|------|---|-----|------------------|----|---|---|---|---|------|---|------|------------------|--------|---|---|------|--------|------------------|
| Continued encroachment by alien and invasive plant species   | Operation | -1 | 3 | 3 | 2 | 2 | -2,5 | 4 | -10 | Medium to high - | -1 | 2 | 3 | 1 | 2 | -2   | 2 | -4   | Low -            | Medium | 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 | -1 | 4 | 4 | 3 | 3 | -3,5 | 4 | -14 | High -           | -1 | 3 | 3 | 3 | 3 | -3   | 3 | -9   | Medium to high - | High   | 1 | 2 | 1,13 | -10,13 | Medium to high - |
| Environmental pollution due to pipe leakage  | Operation | -1 | 3 | 3 | 3 | 3 | -3   | 4 | -12 | Medium to high - | -1 | 3 | 2 | 2 | 3 | -2,5 | 3 | -7,5 | Medium to low -  | High   | 1 | 2 | 1,13 | -8,44  | Medium to low -  |

**Table 7-9** *Assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed linear infrastructure (Alternate Pipeline Route).*

| Impact   | Phase        | Pre-Nature | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance | Post-Nature | Post-Extent | Post-Duration | Post-Magnitude | Post-Reversibility | Consequence2 | Post-Probability | Post-mitigation Significance Score | Post-Mitigation Significance | Confidence | 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 | -1         | 3          | 4            | 4             | 3                 | -3,5        | 4               | -14                               | High -                      | -1          | 3           | 3             | 3              | 3                  | -3           | 3                | -9                                 | Medium to high -             | High       | 1                 | 1                  | 1,00            | -9,00       | Medium to high -   |
| Introduction of invasive and alien species, especially plants  | Construction | -1         | 4          | 3            | 2             | 2                 | -2,75       | 4               | -11                               | Medium to high -            | -1          | 3           | 2             | 2              | 1                  | -2           | 2                | -4                                 | Low -                        | Medium     | 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 | -1         | 4          | 4            | 3             | 2                 | -3,25       | 4               | -13                               | Medium to high -            | -1          | 3           | 2             | 3              | 1                  | -2,25        | 2                | -4,5                               | Medium to low -              | High       | 2                 | 3                  | 1,25            | -5,63       | Medium to low -    |



|   |                  |                  |                  |                  |  |
|---|------------------|------------------|------------------|------------------|--|
| <b>Continued encroachment by alien and invasive plant species</b> | Operation        | Operation        | Construction     | Construction     | Destruction of non-resilient habitats (Rocky Outcrops) |
|   | -1               | -1               | -1               | -1               | -1   |
|   | 3                | 3                | 2                | 2                | 2  |
|   | 3                | 3                | 4                | 3                | 4  |
|   | 2                | 3                | 4                | 3                | 4  |
|   | 2                | 4                | 3                | 3                | 4  |
|   | -2,5             | -3,25            | -3,25            | -2,75            | -3,5   |
|   | 4                | 3                | 3                | 4                | 4  |
|   | -10              | -9,75            | -9,75            | -11              | -14  |
| Medium to high -  | Medium to high - | Medium to high - | Medium to high - | Medium to high - | High -   |
|   | -1               | -1               | -1               | -1               | -1   |
|   | 2                | 2                | 2                | 2                | 2  |
|   | 3                | 3                | 3                | 3                | 3  |
|   | 1                | 3                | 3                | 2                | 3  |
|   | 2                | 2                | 3                | 3                | 3  |
|   | -2               | -2,5             | -2,75            | -2,5             | -2,75  |
|   | 2                | 3                | 3                | 3                | 3  |
|   | -4               | -7,5             | -8,25            | -7,5             | -8,25  |
| Low -   | Medium to low -  | Medium to low -  | Medium to low -  | Medium to low -  | Medium to low -  |
| Medium  | High             | High             | High             | High             | High   |
| 1   | 1                | 1                | 1                | 1                | 1  |
| 1   | 2                | 1                | 2                | 2                | 1  |
| 1,00  | 1,13             | 1,00             | 1,13             | 1,00             | 1,00   |
| -4,00   | -8,44            | -8,25            | -8,44            | -8,44            | -8,25  |
| Low -   | Medium to low -  | Medium to low -  | Medium to low -  | Medium to low -  | Medium to low -  |

| Ongoing loss and displacement of faunal community due to habitat loss, mortality and disturbance (noise, dust, vibration), including the reduced dispersal/migration of fauna | Operation        |                  |
|---|------------------|------------------|
|   | Operation        | Operation        |
| Environmental pollution due to pipe leakage   | -1               | -1               |
|   | 4                | 4                |
|   | 3                | 3                |
|   | 2                | 2                |
|   | 2                | 2                |
|   | -2,75            | -2,75            |
|   | 4                | 4                |
|   | -11              | -11              |
|   | Medium to high - | Medium to high - |
|   | -1               | -1               |
|   | 3                | 3                |
|   | 2                | 2                |
|   | 1                | 1                |
|   | 2                | 2                |
|   | -2               | -2               |
|   | 3                | 3                |
|   | -6               | -6               |
|   | Medium to low -  | Medium to low -  |
|   | High             | High             |
|   | 1                | 1                |
|   | 2                | 2                |
|   | 1,13             | 1,13             |
|   | -6,75            | -6,75            |
|   | Medium to low -  | Medium to low -  |

**Table 7-10** *Assessment of significance of potential impacts on terrestrial biodiversity associated with the project for the proposed TSF (Mponeng Lower Compartment and Return Water Dam).*

| Impact  | Phase        | Pre-Nature                         | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance |
|---|--------------|------------------------------------|------------|--------------|---------------|-------------------|-------------|-----------------|-----------------------------------|-----------------------------|
|   |              |                                    |            |              |               |                   |             |                 |                                   |                             |
| Destruction, further loss and fragmentation of the habitats, ecosystems vegetation community  | Construction | -1                                 | 3          | 3            | 2             | 3                 | -2,75       | 3               | -8,25                             | Medium to low -             |
|   |              |                                    |            |              |               |                   |             |                 |                                   |                             |
| Introduction of invasive and alien species, especially plants   | Construction | -1                                 | 2          | 3            | 4             | 3                 | -3          | 4               | -12                               | Medium to high -            |
|   |              |                                    |            |              |               |                   |             |                 |                                   |                             |
| 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 | -1                                 | 3          | 3            | 3             | 2                 | -2,75       | 4               | -11                               | Medium to high -            |
|   |              |                                    |            |              |               |                   |             |                 |                                   |                             |
|   |              | -1                                 |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 2                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | -2,75                              |            |              |               |                   |             |                 |                                   |                             |
|   |              | 4                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | -11                                |            |              |               |                   |             |                 |                                   |                             |
|   |              | Medium to high -                   |            |              |               |                   |             |                 |                                   |                             |
|   |              | -1                                 |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 2                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 3                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | -2,75                              |            |              |               |                   |             |                 |                                   |                             |
|   |              | 2                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | -5,5                               |            |              |               |                   |             |                 |                                   |                             |
|   |              | Medium to low -                    |            |              |               |                   |             |                 |                                   |                             |
|   |              | High                               |            |              |               |                   |             |                 |                                   |                             |
|   |              | 2                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 1                                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | 1,13                               |            |              |               |                   |             |                 |                                   |                             |
|   |              | -6,19                              |            |              |               |                   |             |                 |                                   |                             |
|   |              | Medium to low -                    |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Nature                        |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Extent                        |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Duration                      |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Magnitude                     |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Reversibility                 |            |              |               |                   |             |                 |                                   |                             |
|   |              | Consequence2                       |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Probability                   |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-mitigation Significance Score |            |              |               |                   |             |                 |                                   |                             |
|   |              | Post-Mitigation Significance       |            |              |               |                   |             |                 |                                   |                             |
|   |              | Confidence                         |            |              |               |                   |             |                 |                                   |                             |
|   |              | Cumulative Impact                  |            |              |               |                   |             |                 |                                   |                             |
|   |              | Irreplaceable loss                 |            |              |               |                   |             |                 |                                   |                             |
|   |              | Priority Factor                    |            |              |               |                   |             |                 |                                   |                             |
|   |              | Final score                        |            |              |               |                   |             |                 |                                   |                             |
|   |              | Final Significance                 |            |              |               |                   |             |                 |                                   |                             |



Mponeng TSF Lower Compartment

## Mponeng TSF Lower Compartment

|   |           |    |   |   |   |   |       |   |     |                  |    |   |   |   |   |       |   |       |                 |      |   |   |      |       |                 |
|---|-----------|----|---|---|---|---|-------|---|-----|------------------|----|---|---|---|---|-------|---|-------|-----------------|------|---|---|------|-------|-----------------|
| Continued risk of contamination (soil and water resource) from fuel spills and hazardous materials. | Operation | -1 | 2 | 2 | 3 | 3 | -2,5  | 4 | -10 | Medium to high - | -1 | 2 | 2 | 2 | 2 | -2    | 2 | -4    | Low -           | High | 1 | 1 | 1,00 | -4,00 | Low -           |
| Continuous stripping of topsoil, leading to ongoing land degradation, including erosion             | Operation | -1 | 2 | 2 | 4 | 3 | -2,75 | 4 | -11 | Medium to high - | -1 | 2 | 2 | 3 | 2 | -2,25 | 3 | -6,75 | Medium to low - | High | 2 | 1 | 1,13 | -7,59 | Medium to low - |
| Environmental pollution due to water/ Acid Mine drainage runoff.                                    | Operation | -1 | 3 | 2 | 3 | 4 | -3    | 3 | -9  | Medium to high - | -1 | 3 | 2 | 2 | 2 | -2,25 | 2 | -4,5  | Medium to low - | High | 2 | 1 | 1,13 | -5,06 | Medium to low - |





### 7.3 Appendix C: Expected Species Lists

#### 7.3.1 Expected Flora Species

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

## Mponeng TSF Lower Compartment

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

## Mponeng TSF Lower Compartment

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

### 7.3.2 Expected Mammal Species

| Family                  | Taxon   | Conservation Status |          |
|-------------------------|---|---------------------|----------|
|                         |   | Local               | Global   |
| <b>Muridae</b>          | <i>Aethomys namaquensis</i>                   | LC                  | LC       |
| <b>Bovidae</b>          | <i>Antidorcas marsupialis</i>                 | LC                  | LC       |
| <b>Canidae</b>          | <i>Canis mesomelas</i>                        | LC                  | LC       |
| <b>Felidae</b>          | <i>Caracal caracal</i>                        | LC                  | LC       |
| <b>Chrysochloridae</b>  | <i>Chrysochloris (Chrysochloris) asiatica</i> | LC                  | LC       |
| <b>Chrysochloridae</b>  | <i>Chrysochloris sp.</i>                      | LC                  | LC       |
| <b>Vespertilionidae</b> | <i>Cistugo seabrae</i>                        | LC                  | NT       |
| <b>Soricidae</b>        | <i>Crocidura cyanea</i>                       | LC                  | LC       |
| <b>Bathyergidae</b>     | <i>Cryptomys hottentotus</i>                  | LC                  | LC       |
| <b>Herpestidae</b>      | <i>Cynictis penicillata</i>                   | LC                  | LC       |
| <b>Muridae</b>          | <i>Desmodillus auricularis</i>                | LC                  | LC       |
| <b>Pteropodidae</b>     | <i>Eidolon helvum</i>                         | LC                  | NT       |
| <b>Macroscelididae</b>  | <i>Elephantulus edwardii</i>                  | LC                  | LC       |
| <b>Macroscelididae</b>  | <i>Elephantulus rupestris</i>                 | LC                  | LC       |
| <b>Vespertilionidae</b> | <i>Eptesicus hottentotus</i>                  | LC                  | LC       |
| <b>Felidae</b>          | <i>Felis nigripes</i>                         | VU                  | VU       |
| <b>Felidae</b>          | <i>Felis silvestris</i>                       | LC                  | LC       |
| <b>Viverridae</b>       | <i>Genetta genetta</i>                        | LC                  | LC       |
| <b>Muridae</b>          | <i>Gerbilliscus brantsii</i>                  | LC                  | LC       |
| <b>Muridae</b>          | <i>Gerbilliscus paeba</i>                     | LC                  | LC       |
| <b>Muridae</b>          | <i>Gerbillurus paeba</i>                      | LC                  | Unlisted |
| <b>Muridae</b>          | <i>Gerbillurus vullinus</i>                   | LC                  | Unlisted |
| <b>Gliridae</b>         | <i>Graphiurus (Graphiurus) oculus</i>         | LC                  | LC       |
| <b>Gliridae</b>         | <i>Graphiurus rupicola</i>                    | NT                  | LC       |
| <b>Herpestidae</b>      | <i>Herpestes pulverulentus</i>                | LC                  | LC       |
| <b>Hystriidae</b>       | <i>Hystrix africae australis</i>              | LC                  | LC       |
| <b>Mustelidae</b>       | <i>Ictonyx striatus</i>                       | LC                  | LC       |
| <b>Leporidae</b>        | <i>Lepus capensis</i>                         | LC                  | LC       |
| <b>Leporidae</b>        | <i>Lepus saxatilis</i>                        | LC                  | LC       |
| <b>Macroscelididae</b>  | <i>Macroscelides proboscideus</i>             | LC                  | LC       |
| <b>Nesomyidae</b>       | <i>Malacothrix typica</i>                     | LC                  | LC       |
| <b>Mustelidae</b>       | <i>Mellivora capensis</i>                     | LC                  | LC       |
| <b>Muridae</b>          | <i>Mus (Nannomys) minutoides</i>              | LC                  | LC       |
| <b>Muridae</b>          | <i>Mus musculus</i>                           | Unlisted            | LC       |
| <b>Muridae</b>          | <i>Mus musculus musculus</i>                  | Unlisted            | LC       |
| <b>Soricidae</b>        | <i>Myosorex varius</i>                        | LC                  | LC       |



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|                         |                                   |    |    |
|-------------------------|-----------------------------------|----|----|
| <b>Vespertilionidae</b> | <i>Neoromicia capensis</i>        | LC | LC |
| <b>Nycteridae</b>       | <i>Nycteris thebaica</i>          | LC | LC |
| <b>Bovidae</b>          | <i>Oreotragus oreotragus</i>      | LC | LC |
| <b>Orycteropodidae</b>  | <i>Orycteropus afer</i>           | LC | LC |
| <b>Canidae</b>          | <i>Otocyon megalotis</i>          | LC | LC |
| <b>Muridae</b>          | <i>Otomys unisulcatus</i>         | LC | LC |
| <b>Felidae</b>          | <i>Panthera pardus</i>            | VU | VU |
| <b>Cercopithecidae</b>  | <i>Papio ursinus</i>              | LC | LC |
| <b>Muridae</b>          | <i>Parotomys brantsii</i>         | LC | LC |
| <b>Muridae</b>          | <i>Parotomys littledalei</i>      | NT | LC |
| <b>Pedetidae</b>        | <i>Pedetes capensis</i>           | LC | LC |
| <b>Petromuridae</b>     | <i>Petromus typicus</i>           | LC | LC |
| <b>Nesomyidae</b>       | <i>Petromyscus barbouri</i>       | LC | LC |
| <b>Nesomyidae</b>       | <i>Petromyscus collinus</i>       | LC | LC |
| <b>Nesomyidae</b>       | <i>Petromyscus monticularis</i>   | LC | LC |
| <b>Procaviidae</b>      | <i>Procavia capensis</i>          | LC | LC |
| <b>Procaviidae</b>      | <i>Procavia capensis capensis</i> | LC | LC |
| <b>Leporidae</b>        | <i>Pronolagus crassicaudatus</i>  | LC | LC |
| <b>Leporidae</b>        | <i>Pronolagus rupestris</i>       | LC | LC |
| <b>Hyaenidae</b>        | <i>Proteles cristata</i>          | LC | LC |
| <b>Muridae</b>          | <i>Rhabdomys pumilio</i>          | LC | LC |
| <b>Rhinolophidae</b>    | <i>Rhinolophus capensis</i>       | LC | LC |
| <b>Rhinolophidae</b>    | <i>Rhinolophus clivosus</i>       | LC | LC |
| <b>Rhinolophidae</b>    | <i>Rhinolophus damarensis</i>     | LC | LC |
| <b>Rhinolophidae</b>    | <i>Rhinolophus darlingi</i>       | LC | LC |
| <b>Molossidae</b>       | <i>Sauromys petrophilus</i>       | LC | LC |
| <b>Soricidae</b>        | <i>Suncus varilla</i>             | LC | LC |
| <b>Herpestidae</b>      | <i>Suricata suricatta</i>         | LC | LC |
| <b>Bovidae</b>          | <i>Sylvicapra grimmia</i>         | LC | LC |
| <b>Molossidae</b>       | <i>Tadarida aegyptiaca</i>        | LC | LC |
| <b>Muridae</b>          | <i>Thallomys paedulcus</i>        | LC | LC |
| <b>Muridae</b>          | <i>Thallomys shortridgei</i>      | DD | DD |
| <b>Canidae</b>          | <i>Vulpes chama</i>               | LC | LC |
| <b>Sciuridae</b>        | <i>Xerus inauris</i>              | LC | LC |

### 7.3.3 Expected Reptile Species

| Family         | Taxon                               | Conservation Status |          |
|----------------|-------------------------------------|---------------------|----------|
|                |                                     | Local               | Global   |
| Scincidae      | <i>Acontias lineatus</i>            | LC                  | LC       |
| Scincidae      | <i>Acontias namaquensis</i>         | LC                  | LC       |
| Scincidae      | <i>Acontias tristis</i>             | LC                  | LC       |
| Agamidae       | <i>Agama aculeata aculeata</i>      | LC                  | Unlisted |
| Agamidae       | <i>Agama atra</i>                   | LC                  | LC       |
| Agamidae       | <i>Agama hispida</i>                | LC                  | LC       |
| Agamidae       | <i>Agama knobeli</i>                | LC                  | LC       |
| Elapidae       | <i>Aspidelaps lubricus lubricus</i> | LC                  | Unlisted |
| Viperidae      | <i>Bitis arietans arietans</i>      | LC                  | Unlisted |
| Lamprophiidae  | <i>Boaedon capensis</i>             | LC                  | LC       |
| Lamprophiidae  | <i>Boaedon mentalis</i>             | LC                  | Unlisted |
| Chamaeleonidae | <i>Chamaeleo namaquensis</i>        | LC                  | LC       |
| Testudinidae   | <i>Chersina angulata</i>            | LC                  | LC       |
| Testudinidae   | <i>Chersobius signatus</i>          | EN                  | EN       |
| Gekkonidae     | <i>Chondrodactylus angulifer</i>    | LC                  | LC       |
| Gekkonidae     | <i>Chondrodactylus bibronii</i>     | LC                  | Unlisted |
| Gekkonidae     | <i>Chondrodactylus laevigatus</i>   | Unlisted            | LC       |
| Gerrhosauridae | <i>Cordylus subcaeruleus</i>        | LC                  | LC       |
| Colubridae     | <i>Dasypeltis scabra</i>            | LC                  | LC       |
| Colubridae     | <i>Dipsosaaurus multimaculatus</i>  | LC                  | Unlisted |
| Gekkonidae     | <i>Goggia lineata</i>               | LC                  | LC       |
| Gekkonidae     | <i>Goggia rupicola</i>              | LC                  | LC       |
| Cordylidae     | <i>Karusasaurus polyzonus</i>       | LC                  | LC       |
| Lamprophiidae  | <i>Lamprophis fiskii</i>            | Unlisted            | LC       |
| Lamprophiidae  | <i>Lamprophis guttatus</i>          | LC                  | LC       |
| Lacertidae     | <i>Meroles knoxii</i>               | LC                  | LC       |
| Lacertidae     | <i>Meroles suborbitalis</i>         | LC                  | Unlisted |
| Elapidae       | <i>Naja nigricincta woodi</i>       | LC                  | Unlisted |
| Elapidae       | <i>Naja nivea</i>                   | LC                  | Unlisted |
| Cordylidae     | <i>Namazonurus peersi</i>           | LC                  | LC       |
| Lacertidae     | <i>Nucras tessellata</i>            | LC                  | Unlisted |
| Gekkonidae     | <i>Pachydactylus atorquatus</i>     | Unlisted            | LC       |
| Gekkonidae     | <i>Pachydactylus capensis</i>       | LC                  | Unlisted |
| Gekkonidae     | <i>Pachydactylus latirostris</i>    | LC                  | Unlisted |
| Gekkonidae     | <i>Pachydactylus montanus</i>       | LC                  | LC       |
| Gekkonidae     | <i>Pachydactylus namaquensis</i>    | LC                  | LC       |

## Mponeng TSF Lower Compartment

|                      |  |    |          |
|----------------------|--|----|----------|
| <b>Gekkonidae</b>    | <i>Pachydactylus rugosus</i>                   | LC | Unlisted |
| <b>Gekkonidae</b>    | <i>Pachydactylus weberi</i>                    | LC | LC       |
| <b>Lacertidae</b>    | <i>Pedioplanis inornata</i>                    | LC | Unlisted |
| <b>Lacertidae</b>    | <i>Pedioplanis lineoocellata lineoocellata</i> | LC | Unlisted |
| <b>Lacertidae</b>    | <i>Pedioplanis lineoocellata pulchella</i>     | LC | LC       |
| <b>Lacertidae</b>    | <i>Pedioplanis namaquensis</i>                 | LC | Unlisted |
| <b>Colubridae</b>    | <i>Philothamnus semivariegatus</i>             | LC | Unlisted |
| <b>Cordylidae</b>    | <i>Platysaurus capensis</i>                    | LC | LC       |
| <b>Lamprophiidae</b> | <i>Prosymna bivittata</i>                      | LC | Unlisted |
| <b>Lamprophiidae</b> | <i>Prosymna frontalis</i>                      | LC | Unlisted |
| <b>Testudinidae</b>  | <i>Psammobates tentorius verroxii</i>          | NT | LC       |
| <b>Lamprophiidae</b> | <i>Psammophis leightoni</i>                    | LC | LC       |
| <b>Lamprophiidae</b> | <i>Psammophis notostictus</i>                  | LC | Unlisted |
| <b>Lamprophiidae</b> | <i>Pseudaspis cana</i>                         | LC | Unlisted |
| <b>Gekkonidae</b>    | <i>Ptenopus garrulus maculatus</i>             | LC | Unlisted |
| <b>Typhlopidae</b>   | <i>Rhinotyphlops lalandei</i>                  | LC | Unlisted |
| <b>Typhlopidae</b>   | <i>Rhinotyphlops schinzi</i>                   | LC | Unlisted |
| <b>Colubridae</b>    | <i>Telescopus beetzi</i>                       | LC | LC       |
| <b>Colubridae</b>    | <i>Telescopus semiannulatus polystictus</i>    | LC | Unlisted |
| <b>Scincidae</b>     | <i>Trachylepis occidentalis</i>                | LC | Unlisted |
| <b>Scincidae</b>     | <i>Trachylepis sulcata</i>                     | LC | Unlisted |
| <b>Scincidae</b>     | <i>Trachylepis sulcata sulcata</i>             | LC | Unlisted |
| <b>Scincidae</b>     | <i>Trachylepis variegata</i>                   | LC | Unlisted |

### 7.3.4 Expected Amphibian Species

| Family                | Taxon                                      | Conservation Status |            |
|-----------------------|--|---------------------|------------|
|                       |  | Local               | Global     |
| <b>Pyxicephalidae</b> | <i>Amietia fuscigula</i>                   | LC                  | Unlisted   |
| <b>Pyxicephalidae</b> | <i>Cacosternum namaquense</i>              | LC                  | LC         |
| <b>Microhylidae</b>   | <i>Phrynomantis annectens</i>              | LC                  | LC         |
| <b>Pyxicephalidae</b> | <i>Strongylopus grayii</i>                 | LC                  | LC         |
| <b>Pyxicephalidae</b> | <i>Tomopterna delalandii</i>               | LC                  | LC         |
| <b>Bufonidae</b>      | <i>Vandijkophrynus gariensis gariensis</i> | Not listed          | Not listed |
| <b>Bufonidae</b>      | <i>Vandijkophrynus robinsoni</i>           | LC                  | LC         |
| <b>Pipidae</b>        | <i>Xenopus laevis</i>                      | LC                  | LC         |



### 7.3.5 Expected Avifauna Species

| Common Name                 | Scientific Name                   | Family Name       | Endemism in South Africa (E) | Regional | Global |
|-----------------------------|-----------------------------------|-------------------|------------------------------|----------|--------|
| Abdim's Stork               | <i>Ciconia abdimii</i>            | Ciconiidae        |                              |          |        |
| Acacia Pied Barbet          | <i>Tricholaema leucomelas</i>     | Lybiidae          |                              |          |        |
| African Crake               | <i>Crecopsis egregia</i>          | Rallidae          |                              |          |        |
| African Darter              | <i>Anhinga rufa</i>               | Anhingidae        |                              | NT       | LC     |
| African Firefinch           | <i>Lagonosticta rubricata</i>     | Estrididae        |                              |          |        |
| African Harrier-Hawk        | <i>Polyboroides typus</i>         | Accipitridae      |                              |          |        |
| African Hawk Eagle          | <i>Aquila spilogaster</i>         | Accipitridae      |                              |          |        |
| African Hoopoe              | <i>Upupa africana</i>             | Upupidae          |                              |          |        |
| African Jacana              | <i>Actophilornis africanus</i>    | Jacanidae         |                              |          |        |
| African Pipit               | <i>Anthus cinnamomeus</i>         | Motacillidae      |                              |          |        |
| African Rail                | <i>Rallus caerulescens</i>        | Rallidae          |                              |          |        |
| African Snipe               | <i>Gallinago nigripennis</i>      | Scolopacidae      |                              |          |        |
| African Spoonbill           | <i>Platalea alba</i>              | Threskiornithidae |                              |          |        |
| African Stonechat           | <i>Saxicola torquatus</i>         | Muscicapidae      |                              |          |        |
| African Swamphen            | <i>Porphyrio madagascariensis</i> | Rallidae          |                              |          |        |
| African Black Duck          | <i>Anas sparsa</i>                | Anatidae          |                              |          |        |
| African Black Swift         | <i>Apus barbatus</i>              | Apodidae          |                              |          |        |
| African Fish Eagle          | <i>Haliaeetus vocifer</i>         | Accipitridae      |                              |          |        |
| African Grass Owl           | <i>Tyto capensis</i>              | Strigidae         |                              | VU       | LC     |
| African Green Pigeon        | <i>Treron calvus</i>              | Columbidae        |                              |          |        |
| African Grey Hornbill       | <i>Lophoceros nasutus</i>         | Bucerotidae       |                              |          |        |
| African Marsh Harrier       | <i>Circus ranivorus</i>           | Accipitridae      |                              | VU       | LC     |
| African Olive Pigeon        | <i>Columba arquatrix</i>          | Columbidae        |                              |          |        |
| African Palm Swift          | <i>Cypsiurus parvus</i>           | Apodidae          |                              |          |        |
| African Paradise Flycatcher | <i>Terpsiphone viridis</i>        | Monarchidae       |                              |          |        |
| African Red-eyed Bulbul     | <i>Pycnonotus nigricans</i>       | Pycnonotidae      |                              |          |        |
| African Sacred Ibis         | <i>Threskiornis aethiopicus</i>   | Threskiornithidae |                              |          |        |
| African Wattled Lapwing     | <i>Vanellus senegallus</i>        | Charadriidae      |                              |          |        |
| Alpine Swift                | <i>Tachymarptis melba</i>         | Apodidae          |                              |          |        |
| Amethyst Sunbird            | <i>Chalcomitra amethystina</i>    | Nectariniidae     |                              |          |        |
| Amur Falcon                 | <i>Falco amurensis</i>            | Falconidae        |                              |          |        |
| Ant-eating Chat             | <i>Myrmecocichla formicivora</i>  | Muscicapidae      |                              |          |        |
| Arrow-marked Babbler        | <i>Turdoides jardineii</i>        | Leiothrichidae    |                              |          |        |
| Ashy Tit                    | <i>Melaniparus cinerascens</i>    | Paridae           |                              |          |        |
| Banded Martin               | <i>Riparia cincta</i>             | Hirundinidae      |                              |          |        |
| Barn Swallow                | <i>Hirundo rustica</i>            | Hirundinidae      |                              |          |        |

## Mponeng TSF Lower Compartment

|                           |                               |                  |    |    |    |
|---------------------------|-------------------------------|------------------|----|----|----|
| Bar-throated Apalis       | <i>Apalis thoracica</i>       | Cisticolidae     |    |    |    |
| Black Crane               | <i>Zapornia flavirostra</i>   | Rallidae         |    |    |    |
| Black Cuckoo              | <i>Cuculus clamosus</i>       | Cuculidae        |    |    |    |
| Black Cuckooshrike        | <i>Campephaga flava</i>       | Campephagidae    |    |    |    |
| Black Harrier             | <i>Circus maurus</i>          | Accipitridae     | NE | EN | EN |
| Black Heron               | <i>Egretta ardesiaca</i>      | Ardeidae         |    |    |    |
| Black Sparrowhawk         | <i>Accipiter melanoleucus</i> | Accipitridae     |    |    |    |
| Black-backed Puffback     | <i>Dryoscopus cubla</i>       | Malaconotidae    |    |    |    |
| Black-chested Prinia      | <i>Prinia flavicans</i>       | Cisticolidae     |    |    |    |
| Black-chested Snake Eagle | <i>Circaetus pectoralis</i>   | Accipitridae     |    |    |    |
| Black-collared Barbet     | <i>Lybius torquatus</i>       | Lybiidae         |    |    |    |
| Black-crowned Tchagra     | <i>Tchagra senegalus</i>      | Malaconotidae    |    |    |    |
| Black-crowned Night Heron | <i>Nycticorax nycticorax</i>  | Ardeidae         |    | NT | LC |
| Black-faced Waxbill       | <i>Brunhilda erythronotos</i> | Estrildidae      |    |    |    |
| Black-headed Heron        | <i>Ardea melanocephala</i>    | Ardeidae         |    |    |    |
| Black-headed Oriole       | <i>Oriolus larvatus</i>       | Oriolidae        |    |    |    |
| Blacksmith Lapwing        | <i>Vanellus armatus</i>       | Charadriidae     |    |    |    |
| Black-throated Canary     | <i>Crithagra atrogularis</i>  | Fringillidae     |    |    |    |
| Black-winged Kite         | <i>Elanus caeruleus</i>       | Accipitridae     |    | NT | LC |
| Black-winged Pratincole   | <i>Glareola nordmanni</i>     | Glareolidae      |    | LC | NT |
| Black-winged Stilt        | <i>Himantopus himantopus</i>  | Recurvirostridae |    |    |    |
| Blue Waxbill              | <i>Uraeginthus angolensis</i> | Estrildidae      |    |    |    |
| Blue-billed Teal          | <i>Spatula hottentota</i>     | Anatidae         |    |    |    |
| Bokmakierie               | <i>Telophorus zeylonus</i>    | Malaconotidae    |    |    |    |
| Booted Eagle              | <i>Hieraaetus pennatus</i>    | Accipitridae     |    |    |    |
| Bronze Mannikin           | <i>Spermestes cucullata</i>   | Estrildidae      |    |    |    |
| Brown Snake Eagle         | <i>Circaetus cinereus</i>     | Accipitridae     |    |    |    |
| Brown-backed Honeybird    | <i>Prodotiscus regulus</i>    | Indicatoridae    |    |    |    |
| Brown-crowned Tchagra     | <i>Tchagra australis</i>      | Malaconotidae    |    |    |    |
| Brown-hooded Kingfisher   | <i>Halcyon albiventris</i>    | Alcedinidae      |    |    |    |
| Brown-throated Martin     | <i>Riparia paludicola</i>     | Hirundinidae     |    |    |    |
| Brubru                    | <i>Nilaus afer</i>            | Malaconotidae    |    |    |    |
| Buffy Pipit               | <i>Anthus vaalensis</i>       | Motacillidae     |    |    |    |
| Burchell's Coucal         | <i>Centropus burchellii</i>   | Cuculidae        |    |    |    |
| Cape Bunting              | <i>Emberiza capensis</i>      | Emberizidae      |    |    |    |
| Cape Grassbird            | <i>Sphenoeacus afer</i>       | Macrosphenidae   | NE |    |    |
| Cape Longclaw             | <i>Macronyx capensis</i>      | Motacillidae     |    |    |    |
| Cape Robin-Chat           | <i>Cossypha caffra</i>        | Muscicapidae     |    |    |    |
| Cape Shoveler             | <i>Spatula smithii</i>        | Anatidae         |    | NT | LC |

## Mponeng TSF Lower Compartment

|                                     |                                 |                |    |    |
|-------------------------------------|---------------------------------|----------------|----|----|
| <b>Cape Sparrow</b>                 | <i>Passer melanurus</i>         | Passeridae     |    |    |
| <b>Cape Starling</b>                | <i>Lamprotornis nitens</i>      | Sturnidae      |    |    |
| <b>Cape Teal</b>                    | <i>Anas capensis</i>            | Anatidae       |    |    |
| <b>Cape Vulture</b>                 | <i>Gyps coprotheres</i>         | Accipitridae   | VU | VU |
| <b>Cape Wagtail</b>                 | <i>Motacilla capensis</i>       | Motacillidae   |    |    |
| <b>Cape Weaver</b>                  | <i>Ploceus capensis</i>         | Ploceidae      | NE |    |
| <b>Cape White-eye</b>               | <i>Zosterops virens</i>         | Zosteropidae   | NE |    |
| <b>Cape Penduline Tit</b>           | <i>Anthoscopus minutus</i>      | Remizidae      |    |    |
| <b>Capped Wheatear</b>              | <i>Oenanthe pileata</i>         | Muscicapidae   |    |    |
| <b>Cardinal Woodpecker</b>          | <i>Dendropicos fuscescens</i>   | Picidae        |    |    |
| <b>Chestnut-backed Sparrow-Lark</b> | <i>Eremopterix leucotis</i>     | Alaudidae      |    |    |
| <b>Chestnut-vented Warbler</b>      | <i>Curruca subcoerulea</i>      | Sylviidae      |    |    |
| <b>Chinspot Batis</b>               | <i>Batis molitor</i>            | Platysteiridae |    |    |
| <b>Cinnamon-breasted Bunting</b>    | <i>Emberiza tahapisi</i>        | Emberizidae    |    |    |
| <b>Cloud Cisticola</b>              | <i>Cisticola textrix</i>        | Cisticolidae   | NE |    |
| <b>Common Buzzard</b>               | <i>Buteo buteo</i>              | Accipitridae   |    |    |
| <b>Common Greenshank</b>            | <i>Tringa nebularia</i>         | Pycnonotidae   |    |    |
| <b>Common Moorhen</b>               | <i>Gallinula chloropus</i>      | Rallidae       |    |    |
| <b>Common Myna</b>                  | <i>Acridotheres tristis</i>     | Sturnidae      |    |    |
| <b>Common Ostrich</b>               | <i>Struthio camelus</i>         | Struthionidae  |    |    |
| <b>Common Quail</b>                 | <i>Coturnix coturnix</i>        | Phasianidae    |    |    |
| <b>Common Sandpiper</b>             | <i>Actitis hypoleucos</i>       | Scolopacidae   |    |    |
| <b>Common Scimitarbill</b>          | <i>Rhinopomastus cyanomelas</i> | Phoeniculidae  |    |    |
| <b>Common Swift</b>                 | <i>Apus apus</i>                | Apodidae       |    |    |
| <b>Common Waxbill</b>               | <i>Estrilda astrild</i>         | Estrildidae    |    |    |
| <b>Common Whitethroat</b>           | <i>Curruca communis</i>         | Sylviidae      |    |    |
| <b>Common House Martin</b>          | <i>Delichon urbicum</i>         | Hirundinidae   |    |    |
| <b>Common Reed Warbler</b>          | <i>Acrocephalus baeticatus</i>  | Acrocephalidae |    |    |
| <b>Common Reed Warbler</b>          | <i>Acrocephalus baeticatus</i>  | Acrocephalidae |    |    |
| <b>Coqui Francolin</b>              | <i>Peliperdix coqui</i>         | Phasianidae    |    |    |
| <b>Crested Barbet</b>               | <i>Trachyphonus vaillantii</i>  | Lybiidae       |    |    |
| <b>Crimson-breasted Shrike</b>      | <i>Laniarius atrococcineus</i>  | Malaconotidae  |    |    |
| <b>Crowned Lapwing</b>              | <i>Vanellus coronatus</i>       | Charadriidae   |    |    |
| <b>Cuckoo Finch</b>                 | <i>Anomalospiza imberbis</i>    | Viduidae       |    |    |
| <b>Curlew Sandpiper</b>             | <i>Calidris ferruginea</i>      | Scolopacidae   | VU | VU |
| <b>Cut-throat Finch</b>             | <i>Amadina fasciata</i>         | Estrildidae    |    |    |
| <b>Dark-capped Bulbul</b>           | <i>Pycnonotus tricolor</i>      | Pycnonotidae   |    |    |
| <b>Dark-capped Yellow Warbler</b>   | <i>Iduna natalensis</i>         | Acrocephalidae |    |    |
| <b>Desert Cisticola</b>             | <i>Cisticola aridulus</i>       | Cisticolidae   |    |    |

## Mponeng TSF Lower Compartment

|                                 |                                      |                   |     |    |
|---------------------------------|--------------------------------------|-------------------|-----|----|
| Diederik Cuckoo                 | <i>Chrysococcyx caprius</i>          | Cuculidae         |     |    |
| Dusky Indigobird                | <i>Vidua funerea</i>                 | Viduidae          |     |    |
| Eastern Clapper Lark            | <i>Mirafrasciolata</i>               | Alaudidae         |     |    |
| Eastern Long-billed Lark        | <i>Certhilauda semitorquata</i>      | Alaudidae         | SLS |    |
| Egyptian Goose                  | <i>Alopochen aegyptiaca</i>          | Anatidae          |     |    |
| European Bee-eater              | <i>Merops apiaster</i>               | Meropidae         |     |    |
| European Honey Buzzard          | <i>Pernis apivorus</i>               | Accipitridae      |     |    |
| European Roller                 | <i>Coracias garrulus</i>             | Coraciidae        | NT  | LC |
| Fairy Flycatcher                | <i>Stenostira scita</i>              | Muscicapidae      | NE  |    |
| Familiar Chat                   | <i>Oenanthe familiaris</i>           | Muscicapidae      |     |    |
| Fiery-necked Nightjar           | <i>Caprimulgus pectoralis</i>        | Caprimulgidae     |     |    |
| Fiscal Flycatcher               | <i>Melaenornis silens</i>            | Muscicapidae      | NE  |    |
| Fulvous Whistling Duck          | <i>Dendrocygna bicolor</i>           | Anatidae          | NT  | LC |
| Gabar Goshawk                   | <i>Micronisus gabar</i>              | Accipitridae      |     |    |
| Garden Warbler                  | <i>Sylvia borin</i>                  | Sylviidae         |     |    |
| Giant Kingfisher                | <i>Megaceryle maxima</i>             | Alcedinidae       |     |    |
| Glossy Ibis                     | <i>Plegadis falcinellus</i>          | Threskiornithidae |     |    |
| Golden-breasted Bunting         | <i>Emberiza flaviventris</i>         | Emberizidae       |     |    |
| Golden-tailed Woodpecker        | <i>Campethera abingoni</i>           | Picidae           |     |    |
| Goliath Heron                   | <i>Ardea goliath</i>                 | Ardeidae          |     |    |
| Great Egret                     | <i>Ardea alba</i>                    | Ardeidae          | NT  | LC |
| Great Crested Grebe             | <i>Podiceps cristatus</i>            | Podicipedidae     | VU  | LC |
| Great Reed Warbler              | <i>Acrocephalus arundinaceus</i>     | Acrocephalidae    |     |    |
| Great Spotted Cuckoo            | <i>Clamator glandarius</i>           | Cuculidae         |     |    |
| Greater Flamingo                | <i>Phoenicopterus roseus</i>         | Phoenicopteridae  | NT  | LC |
| Greater Honeyguide              | <i>Indicator indicator</i>           | Indicatoridae     |     |    |
| Greater Kestrel                 | <i>Falco rupicoloides</i>            | Falconidae        |     |    |
| Greater Painted-snipe           | <i>Rostratula benghalensis</i>       | Rostratulidae     |     |    |
| Greater Double-collared Sunbird | <i>Cinnyris afer</i>                 | Nectariniidae     | SLS |    |
| Greater Striped Swallow         | <i>Cecropis cucullata</i>            | Hirundinidae      |     |    |
| Green Wood Hoopoe               | <i>Phoeniculus purpureus</i>         | Phoeniculidae     |     |    |
| Green-winged Pytilia            | <i>Pytilia melba</i>                 | Estrildidae       |     |    |
| Grey Go-away-bird               | <i>Corythaixoides concolor</i>       | Musophagidae      |     |    |
| Grey Heron                      | <i>Ardea cinerea</i>                 | Ardeidae          |     |    |
| Grey-headed Bush-Shrike         | <i>Malaconotus blanchoti</i>         | Malaconotidae     |     |    |
| Grey-headed Gull                | <i>Chroicocephalus cirrocephalus</i> | Laridae           |     |    |
| Groundscraper Thrush            | <i>Turdus litsitsirupa</i>           | Turdidae          |     |    |
| Hadada Ibis                     | <i>Bostrychia hagedash</i>           | Threskiornithidae |     |    |
| Hamerkop                        | <i>Scopus umbretta</i>               | Scopidae          | NT  | LC |



## Mponeng TSF Lower Compartment

|                             |                                    |                  |    |    |
|-----------------------------|------------------------------------|------------------|----|----|
| Helmeted Guineafowl         | <i>Numida meleagris</i>            | Numididae        |    |    |
| Horus Swift                 | <i>Apus horus</i>                  | Apodidae         |    |    |
| House Sparrow               | <i>Passer domesticus</i>           | Passeridae       |    |    |
| Icterine Warbler            | <i>Hippolais icterina</i>          | Acrocephalidae   |    |    |
| Indian Peafowl              | <i>Pavo cristatus</i>              | Phasianidae      |    |    |
| Jackal Buzzard              | <i>Buteo rufofuscus</i>            | Accipitridae     | NE |    |
| Jacobin Cuckoo              | <i>Clamator jacobinus</i>          | Cuculidae        |    |    |
| Jameson's Firefinch         | <i>Lagonosticta rhodopareia</i>    | Estrididae       |    |    |
| Kalahari Scrub Robin        | <i>Cercotrichas paena</i>          | Muscicapidae     |    |    |
| Karoo Thrush                | <i>Turdus smithi</i>               | Turdidae         | NE |    |
| Kittlitz's Plover           | <i>Charadrius pecuarius</i>        | Charadriidae     | NT | LC |
| Klaas's Cuckoo              | <i>Chrysococcyx klaas</i>          | Cuculidae        |    |    |
| Knob-billed Duck            | <i>Sarkidiornis melanotos</i>      | Anatidae         | NT | LC |
| Kurrichane Buttonquail      | <i>Turnix sylvaticus</i>           | Turnicidae       |    |    |
| Kurrichane Thrush           | <i>Turdus libonyana</i>            | Turdidae         |    |    |
| Lanner Falcon               | <i>Falco biarmicus</i>             | Falconidae       | NT | LC |
| Lark-like Bunting           | <i>Emberiza impetuanii</i>         | Emberizidae      |    |    |
| Laughing Dove               | <i>Spilopelia senegalensis</i>     | Columbidae       |    |    |
| Lazy Cisticola              | <i>Cisticola aberrans</i>          | Cisticolidae     |    |    |
| Lesser Flamingo             | <i>Phoeniconaias minor</i>         | Phoenicopteridae | VU | NT |
| Lesser Honeyguide           | <i>Indicator minor</i>             | Indicatoridae    |    |    |
| Lesser Kestrel              | <i>Falco naumanni</i>              | Falconidae       | VU | LC |
| Lesser Grey Shrike          | <i>Lanius minor</i>                | Laniidae         |    |    |
| Lesser Striped Swallow      | <i>Cecropis abyssinica</i>         | Hirundinidae     |    |    |
| Lesser Swamp Warbler        | <i>Acrocephalus gracilirostris</i> | Acrocephalidae   |    |    |
| Levaillant's Cisticola      | <i>Cisticola tinniens</i>          | Cisticolidae     |    |    |
| Lilac-breasted Roller       | <i>Coracias caudatus</i>           | Coraciidae       |    |    |
| Little Bee-eater            | <i>Merops pusillus</i>             | Meropidae        |    |    |
| Little Bittern              | <i>Ixobrychus minutus</i>          | Ardeidae         |    |    |
| Little Egret                | <i>Egretta garzetta</i>            | Ardeidae         |    |    |
| Little Grebe                | <i>Tachybaptus ruficollis</i>      | Podicipedidae    |    |    |
| Little Sparrowhawk          | <i>Accipiter minullus</i>          | Accipitridae     |    |    |
| Little Stint                | <i>Calidris minuta</i>             | Scolopacidae     |    |    |
| Little Swift                | <i>Apus affinis</i>                | Apodidae         |    |    |
| Little Rush Warbler         | <i>Bradypterus baboecala</i>       | Locustellidae    |    |    |
| Long-billed Crombec         | <i>Sylvietta rufescens</i>         | Macrosphenidae   |    |    |
| Long-crested Eagle          | <i>Lophaetus occipitalis</i>       | Accipitridae     |    |    |
| Long-tailed Widowbird       | <i>Euplectes progne</i>            | Ploceidae        |    |    |
| Long-tailed Paradise Whydah | <i>Vidua paradisaea</i>            | Viduidae         |    |    |

## Mponeng TSF Lower Compartment

|                                    |                                     |                  |     |    |
|------------------------------------|-------------------------------------|------------------|-----|----|
| <b>Maccoa Duck</b>                 | <i>Oxyura maccoa</i>                | Anatidae         | VU  | EN |
| <b>Malachite Kingfisher</b>        | <i>Corythornis cristatus</i>        | Alcedinidae      |     |    |
| <b>Malachite Sunbird</b>           | <i>Nectarinia famosa</i>            | Nectariniidae    |     |    |
| <b>Mallard</b>                     | <i>Anas platyrhynchos</i>           | Anatidae         |     |    |
| <b>Marico Flycatcher</b>           | <i>Melaenornis mariquensis</i>      | Muscicapidae     |     |    |
| <b>Marsh Owl</b>                   | <i>Asio capensis</i>                | Strigidae        | NT  | LC |
| <b>Marsh Sandpiper</b>             | <i>Tringa stagnatilis</i>           | Scolopacidae     |     |    |
| <b>Marsh Warbler</b>               | <i>Acrocephalus palustris</i>       | Acrocephalidae   |     |    |
| <b>Melodious Lark</b>              | <i>Mirafraga cheniana</i>           | Alaudidae        | NE  | NT |
| <b>Mocking Cliff Chat</b>          | <i>Thamnolaea cinnamomeiventris</i> | Muscicapidae     |     | LC |
| <b>Mountain Wheatear</b>           | <i>Myrmecocichla monticola</i>      | Muscicapidae     |     |    |
| <b>Namaqua Dove</b>                | <i>Oena capensis</i>                | Columbidae       |     |    |
| <b>Natal Spurfowl</b>              | <i>Pternistis natalensis</i>        | Phasianidae      |     |    |
| <b>Neddicky</b>                    | <i>Cisticola fulvicapilla</i>       | Cisticolidae     |     |    |
| <b>Nicholson's Pipit</b>           | <i>Anthus nicholsoni</i>            | Motacillidae     |     |    |
| <b>Northern Black Korhaan</b>      | <i>Afrotis afraoides</i>            | Otididae         |     |    |
| <b>Orange River Francolin</b>      | <i>Scleroptila gutturalis</i>       | Phasianidae      |     |    |
| <b>Orange River White-eye</b>      | <i>Zosterops pallidus</i>           | Zosteropidae     |     |    |
| <b>Orange-breasted Bush-Shrike</b> | <i>Chlorophoneus sulfureopectus</i> | Malaconotidae    |     |    |
| <b>Orange-breasted Waxbill</b>     | <i>Amandava subflava</i>            | Estrildidae      |     |    |
| <b>Ovambo Sparrowhawk</b>          | <i>Accipiter ovampensis</i>         | Accipitridae     |     |    |
| <b>Pale Chanting Goshawk</b>       | <i>Melierax canorus</i>             | Accipitridae     |     |    |
| <b>Pearl-breasted Swallow</b>      | <i>Hirundo dimidiata</i>            | Hirundinidae     |     |    |
| <b>Peregrine Falcon</b>            | <i>Falco peregrinus</i>             | Falconidae       |     |    |
| <b>Pied Avocet</b>                 | <i>Recurvirostra avosetta</i>       | Recurvirostridae |     |    |
| <b>Pied Crow</b>                   | <i>Corvus albus</i>                 | Corvidae         |     |    |
| <b>Pied Kingfisher</b>             | <i>Ceryle rudis</i>                 | Alcedinidae      |     |    |
| <b>Pied Starling</b>               | <i>Lamprolaima bicolor</i>          | Sturnidae        | SLS |    |
| <b>Pink-billed Lark</b>            | <i>Spizocorys conirostris</i>       | Alaudidae        |     |    |
| <b>Pin-tailed Whydah</b>           | <i>Vidua macroura</i>               | Viduidae         |     |    |
| <b>Plain-backed Pipit</b>          | <i>Anthus leucophrys</i>            | Motacillidae     |     |    |
| <b>Pirit Batis</b>                 | <i>Batis pririt</i>                 | Platysteiridae   |     |    |
| <b>Purple Heron</b>                | <i>Ardea purpurea</i>               | Ardeidae         |     |    |
| <b>Purple Indigobird</b>           | <i>Vidua purpurascens</i>           | Viduidae         |     |    |
| <b>Quailfinch</b>                  | <i>Ortygospiza atricollis</i>       | Estrildidae      |     |    |
| <b>Rattling Cisticola</b>          | <i>Cisticola chiniana</i>           | Cisticolidae     |     |    |
| <b>Red-backed Shrike</b>           | <i>Lanius collurio</i>              | Laniidae         |     |    |
| <b>Red-billed Firefinch</b>        | <i>Lagonosticta senegala</i>        | Estrildidae      |     |    |
| <b>Red-billed Quelea</b>           | <i>Quelea quelea</i>                | Ploceidae        |     |    |

## Mponeng TSF Lower Compartment

|                              |                                   |                   |     |    |
|------------------------------|-----------------------------------|-------------------|-----|----|
| Red-billed Teal              | <i>Anas erythrorhyncha</i>        | Anatidae          | NT  | LC |
| Red-breasted Swallow         | <i>Cecropis semirufa</i>          | Hirundinidae      |     |    |
| Red-capped Lark              | <i>Calandrella cinerea</i>        | Alaudidae         |     |    |
| Red-chested Cuckoo           | <i>Cuculus solitarius</i>         | Cuculidae         |     |    |
| Red-chested Flufftail        | <i>Sarothrura rufa</i>            | Sarothruridae     |     |    |
| Red-collared Widowbird       | <i>Euplectes ardens</i>           | Ploceidae         |     |    |
| Red-eyed Dove                | <i>Streptopelia semitorquata</i>  | Columbidae        |     |    |
| Red-faced Mousebird          | <i>Urocolius indicus</i>          | Coliidae          |     |    |
| Red-headed Finch             | <i>Amadina erythrocephala</i>     | Estrididae        |     |    |
| Red-knobbed Coot             | <i>Fulica cristata</i>            | Rallidae          |     |    |
| Red-throated Wryneck         | <i>Jynx ruficollis</i>            | Picidae           |     |    |
| Red-winged Starling          | <i>Onychognathus morio</i>        | Sturnidae         |     |    |
| Reed Cormorant               | <i>Microcarbo africanus</i>       | Phalacrocoracidae |     |    |
| Ring-necked Dove             | <i>Streptopelia capicola</i>      | Columbidae        |     |    |
| Rock Dove                    | <i>Columba livia</i>              | Columbidae        |     |    |
| Rock Kestrel                 | <i>Falco rupicolus</i>            | Falconidae        |     |    |
| Rock Martin                  | <i>Ptyonoprogne fuligula</i>      | Hirundinidae      |     |    |
| Rose-ringed Parakeet         | <i>Psittacula krameri</i>         | Psittaculidae     |     |    |
| Ruff                         | <i>Calidris pugnax</i>            | Scolopacidae      |     |    |
| Rufous-cheeked Nightjar      | <i>Caprimulgus rufigena</i>       | Caprimulgidae     |     |    |
| Rufous-naped Lark            | <i>Mirafra africana</i>           | Alaudidae         |     |    |
| Sabota Lark                  | <i>Calendulauda sabota</i>        | Alaudidae         |     |    |
| Scaly-feathered Weaver       | <i>Sporopipes squamifrons</i>     | Ploceidae         |     |    |
| Secretarybird                | <i>Sagittarius serpentarius</i>   | Sagittariidae     | VU  | EN |
| Sedge Warbler                | <i>Acrocephalus schoenobaenus</i> | Acrocephalidae    |     |    |
| Shaft-tailed Whydah          | <i>Vidua regia</i>                | Viduidae          |     |    |
| Shikra                       | <i>Accipiter badius</i>           | Accipitridae      |     |    |
| Short-toed Rock Thrush       | <i>Monticola brevipes</i>         | Muscicapidae      |     |    |
| Sickle-winged Chat           | <i>Emarginata sinuata</i>         | Muscicapidae      | NE  |    |
| South African Shelduck       | <i>Tadorna cana</i>               | Anatidae          |     |    |
| South African Cliff Swallow  | <i>Petrochelidon spilodera</i>    | Hirundinidae      | BNE |    |
| Southern Boubou              | <i>Laniarius ferrugineus</i>      | Malaconotidae     |     |    |
| Southern Fiscal              | <i>Lanius collaris</i>            | Laniidae          |     |    |
| Southern Pochard             | <i>Netta erythrophthalma</i>      | Anatidae          | NT  | LC |
| Southern Grey-headed Sparrow | <i>Passer diffusus</i>            | Passeridae        |     |    |
| Southern Masked Weaver       | <i>Ploceus velatus</i>            | Ploceidae         |     |    |
| Southern Pied Babbler        | <i>Turdoides bicolor</i>          | Leiiothrichidae   |     |    |
| Southern Red Bishop          | <i>Euplectes orix</i>             | Ploceidae         |     |    |
| Speckled Mousebird           | <i>Colius striatus</i>            | Coliidae          |     |    |

## Mponeng TSF Lower Compartment

|                                 |                                 |              |
|---------------------------------|---------------------------------|--------------|
| <b>Speckled Pigeon</b>          | <i>Columba guinea</i>           | Columbidae   |
| <b>Spike-heeled Lark</b>        | <i>Chersomanes albofasciata</i> | Alaudidae    |
| <b>Spotted Eagle-Owl</b>        | <i>Bubo africanus</i>           | Strigidae    |
| <b>Spotted Flycatcher</b>       | <i>Muscicapa striata</i>        | Muscicapidae |
| <b>Spotted Thick-knee</b>       | <i>Burhinus capensis</i>        | Burhinidae   |
| <b>Spur-winged Goose</b>        | <i>Plectropterus gambensis</i>  | Anatidae     |
| <b>Squacco Heron</b>            | <i>Ardeola ralloides</i>        | Ardeidae     |
| <b>Streaky-headed Seedeater</b> | <i>Crithagra gularis</i>        | Fringillidae |





#### 7.4 Appendix D: Specialist Declaration of Independence

I, Connor Ryan , 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.



Terrestrial Ecologist

The Biodiversity Company

January 2026

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

Terrestrial Ecologist

The Biodiversity Company

January 2026

## 7.5 Appendix E: Specialist CVs

|   |  |
|---|--|
| <div><div><h1>Andine<br/>DE VILLIERS</h1><p>Pr Sci Nat 164894    +27 64 417 6320    andine@thebiodiversitycompany.com</p></div><div></div></div>   |  |
| <h3>PROFILE SUMMARY</h3> <p>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.</p> |  |
| <h3>PERSONAL INFO</h3> <p>Nationality: South African<br/>Date of birth: 8 April 1995</p>  | <h3>ACADEMIC QUALIFICATIONS</h3> <p><b>University of Pretoria (2020): MAGISTER SCIENTIAE (MSc) – Zoology with distinction:</b><br/><i>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.</i></p> <p><b>University of Pretoria (2018): BACCALAREUS SCIENTIAE CUM HONORIBUS (BSc Hons) – Zoology:</b><br/><i>Research project title: Research project: Locomotor activity of individual Damaraland mole-rats (Fukomys damarensis) in intact colonies.</i></p> <p><b>University of Pretoria (2017): BACCALAREUS SCIENTIAE (BSc) – Zoology:</b><br/><b>Majors: Zoology</b></p> |
| <h3>EXPERIENCE</h3> <p>Environmental Impact Assessments (EIA)<br/>Environmental Management Programmes (EMP)<br/>Project Management<br/>Mammal Assessments</p>   | <h3>PROFESSIONAL EXPERIENCE</h3> <p>June 2023 – Present    <b>The Biodiversity Company</b><br/>Terrestrial Ecologist</p>   |
| <h3>SKILLS</h3> <ul style="list-style-type: none"><li>✓ Terrestrial Biodiversity, Fauna and Flora (Ecology) Assessments</li><li>✓ GIS</li><li>✓ Golden Mole and Riverine Rabbit Assessment</li><li>✓ Rehabilitation</li><li>✓ Monitoring &amp; Management Plans</li></ul>   | <h3>INTERNATIONAL EXPERIENCE</h3> <p>South Africa, Mauritius, Zambia</p>   |
| <h3>LANGUAGES</h3> <p>English – Proficient<br/>Afrikaans – Proficient</p> <div><p>Signed: Andine de Villiers</p></div>   |  |



# Connor Ryan

B.Sc.Hons. – Plant sciences  
 (Candidate Natural Scientist)

Cell: +27 713823005

Email: [connor@thebiodiversitycompany.com](mailto:connor@thebiodiversitycompany.com)

Identity Number: 0010275154085

Date of birth: 27 October 2000



## Profile Summary

Ecologist with experience in sampling grassland and savanna plants. Passionate about protecting South African flora and fauna

## Areas of Interest

Sustainability & Conservation  
 Plant Ecology  
 Plant species identification  
 Invasive plant species management  
 Terrestrial habitat delineation

## Key Experience

- Terrestrial Ecological Assessments
- Environmental Impact Assessments (EIA)
- Plant Ecological Assessments
- Plant identification
- Field work and research
- Data Analysis
- Plant collection and herbarium curation
- Fire Management Plans

## Countries worked in

South Africa  
 Botswana  
 Lesotho

## Nationality

South African

## Languages

English – Proficient  
 Afrikaans - Basic

## Qualifications and Courses

- BSc Hons Plant Sciences (Cum Laude), University of Pretoria
- BSc Ecology, University of Pretoria
- Cand Sci Nat (174067)