TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED GLENCORE KROONDAL MINE INFRASTRUCTURE ON PORTION 11 OF THE FARM RIETFONTEIN 338 JQ (WESTERN CHROME MINES)

Rustenburg Municipality, Bojanala Platinum District Municipality, North West Province, South Africa

18 June 2025

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Report Name	**TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED GLENCORE KROONDAL MINE INFRASTRUCTURE ON PORTION 11 OF THE FARM RIETFONTEIN 338 JQ (WESTERN CHROME MINES)**	
Specialist Theme	Terrestrial Biodiversity Theme – Compliance Statement	
Project Reference	Glencore Kroondal Mine Infrastructure	
Report Version	Draft 3 / 18 June 2025	
Environmental Assessment Practitioner	EIMS ENVIRONMENTAL IMPACT MANAGEMENT SERVICES	
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Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017 (as 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.	

List of Acronyms

AIP	Alien and Invasive Plant
BGIS	Biodiversity Geographic Information System
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CI	Conservation Importance
CR	Critically Endangered
DEFF	Department of Environment, Forestry and Fisheries
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered (IUCN)
ESA	Ecological Support Area
FI	Functional Integrity
GIS	Geographic Information System
GPS	Global Positioning System
HGM	Hydrogeomorphic
IBA	Important Bird and Biodiversity Areas
IUCN	International Union for Conservation of Nature
LC	Least Concern
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Area
NPAES	National Protected Areas Expansion Strategy
PAOI	Project Area of Influence
POSA	Plants of Southern Africa
RLE	Red List of Ecosystems
RR	Receptor Resilience
SACAD	South Africa Conservation Areas Database
SANBI	South African National Biodiversity Institute
SAPAD	South Africa Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
SWSA	Strategic Water Source Area
TOPS	Threatened or Protected Species
VU	Vulnerable (IUCN)
BI	Biodiversity Importance
BSP	Biodiversity Spatial Plan
MASL	Metres Above Sea Level
MP	Moderately Protected
NP	Not Protected
NT	Near Threatened

PP	Poorly Protected
SABAP2	Southern African Bird Atlas Project 2
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
WP	Well Protected

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a terrestrial biodiversity assessment for the proposed Glencore Kroondal Mine Infrastructure on Portion 11 of the Farm Rietfontein 338 JQ (Western Chrome Mines) near Rustenburg, North West Province. The project site is located approximately 10 km east of Rustenburg in the North West Province. The site is located within the Rustenburg Local Municipality and the Bojanala Platinum District Municipality. A map presenting the regional context of the PAOI can be seen in Figure 1-1. The Project of Influence (PAOI) has been defined as the Glencore Kroondal Surface Right Boundary and includes powerline infrastructure. The details of the site and the proposed infrastructure are depicted in Figure 1-2 and Figure 1-3.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 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”. The National Web based Environmental Screening Tool has characterised the terrestrial biodiversity theme for the area as ‘Very High’ sensitivity (National Environmental Screening Tool, 2024).

The purpose of conducting the specialist study is to provide relevant input into the Environmental Authorisation application process, with a focus on the proposed activities and their impacts associated with the project. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

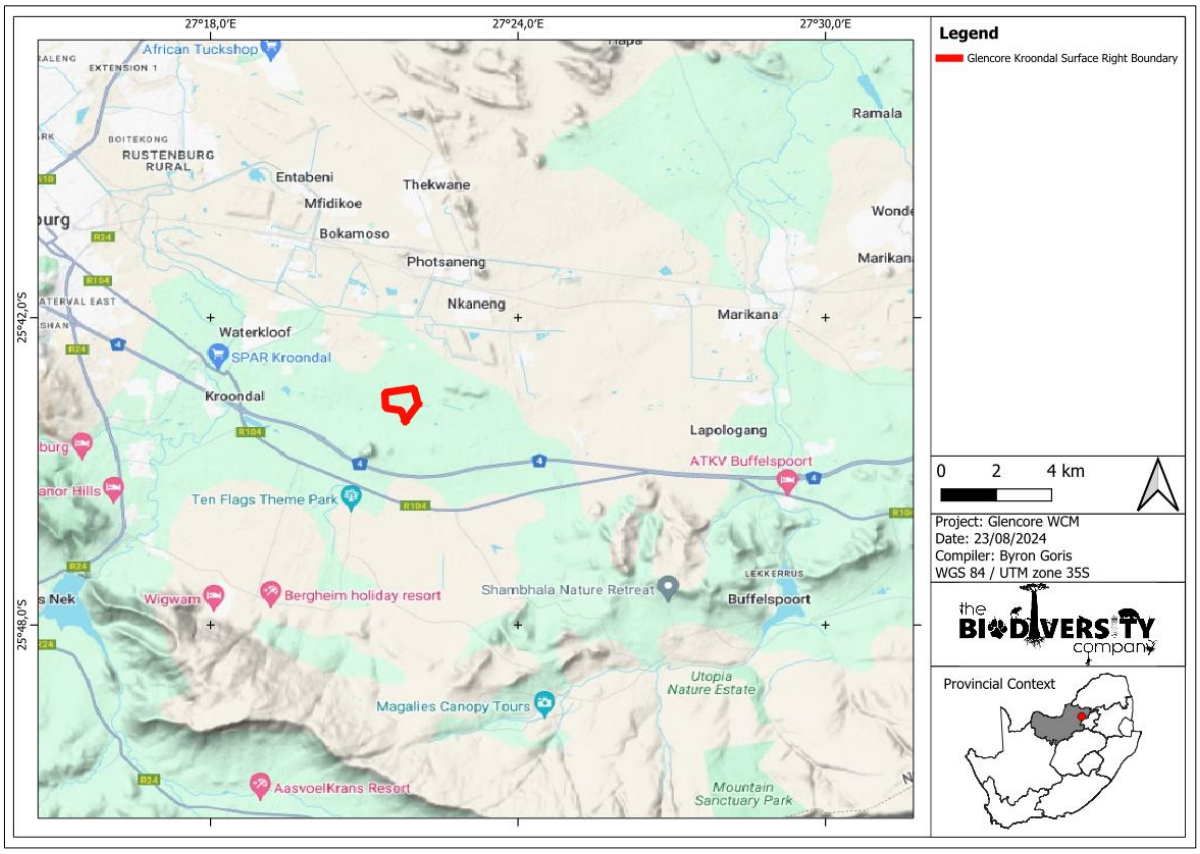


Figure 1-1 Map illustrating the regional context of the PAOI

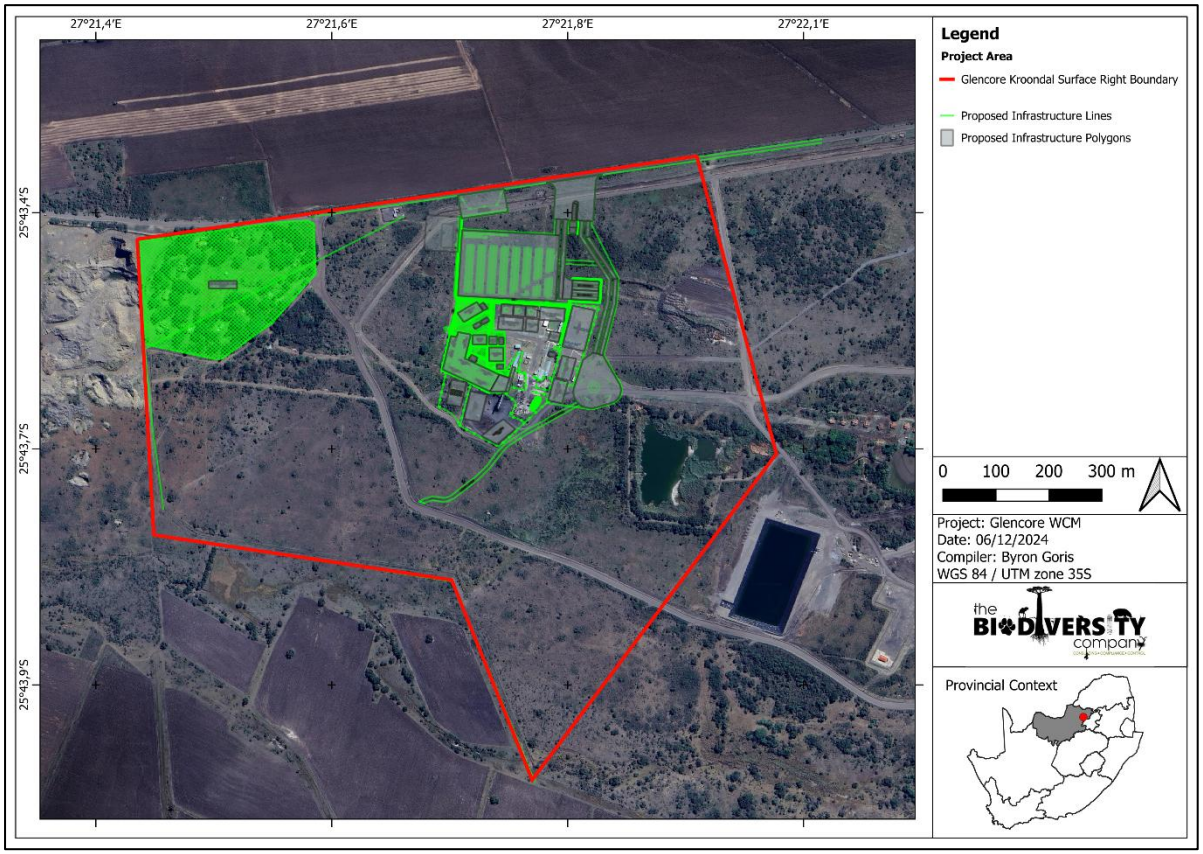


Figure 1-2 Map illustrating the mining boundary and project layout close-up

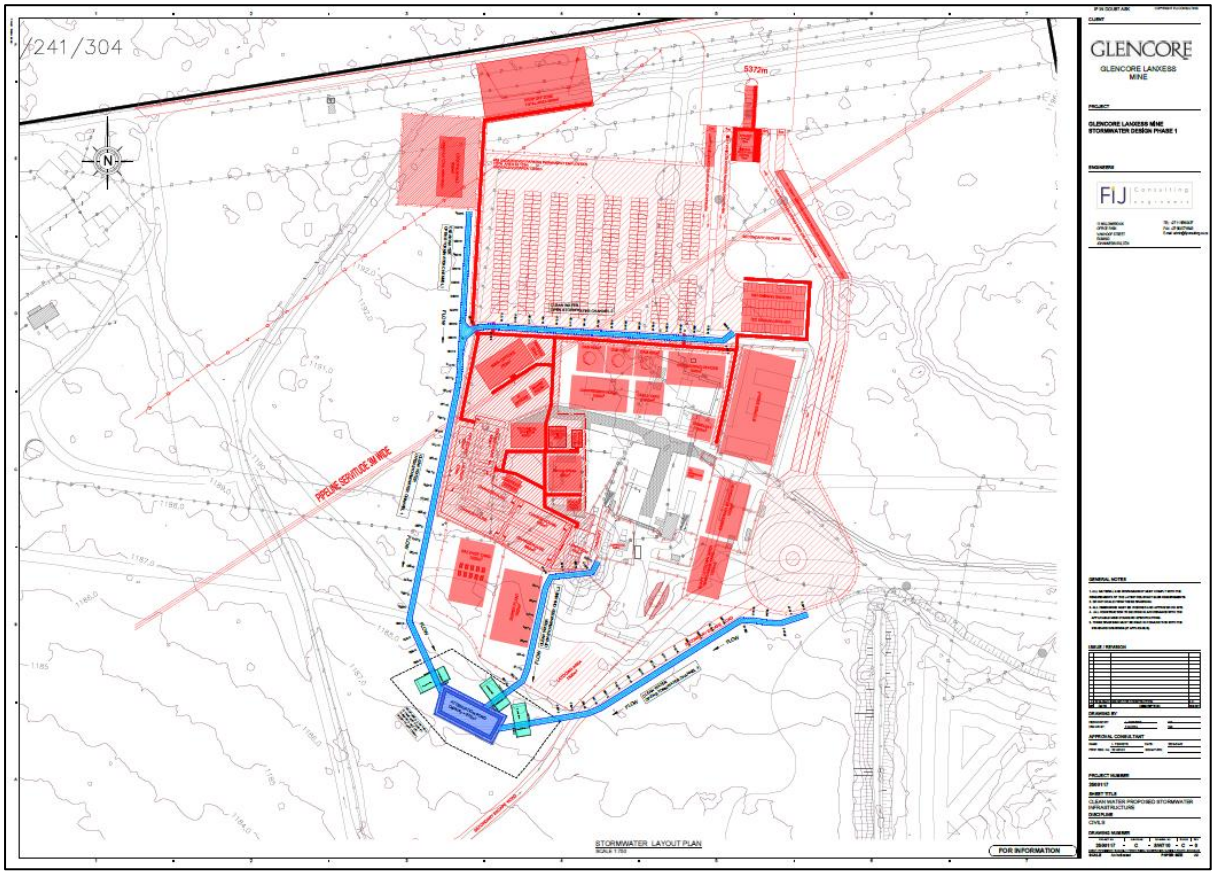


Figure 1-3 Detailed layout for the proposed project (EIMS BID, 2024)

1.2 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 ecologically important features within the landscape comprising of terrestrial features;
- Desktop assessment to identify possible Species of Conservation Concern (SCC) that occur within the landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity; and
- The prescription of mitigation measures for identified risks.

1.3 Project Description

The following information pertaining to the overview and description of the project has been extracted from the Background Information Document (BID) for the Glencore WCM Kroondal Mine Infrastructure.

Location:

The proposed project and related activities will be undertaken at the following location:

- Property Description - Portion 11 of the farm Rietfontein 338 JQ;
- Central Co-ordinates - approximately 25°43'33.74"S, 27°21'41.65"E;
- Regional Description:
    - District Municipality: Bojanala Platinum District Municipality;
    - Local Municipality: Rustenburg Local Municipality;
    - Province: North West Province; and
- Closest town or point of interest: the site is located approximately 5.3 km east of Kroondal.

Glencore Western Chrome Mines (WCM) is in the process of acquiring a portion of the mining and surface rights from the Clover Alloys Rustenburg Chrome Mine (RCM) to reduce the time taken to travel to the face at its Kroondal Mine and increase the mining facetime which will in turn increase productivity. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine. The proposed new developments as well as existing infrastructure include (but are not limited to):

- A parking area for permanent employees;
- A parking area for visitors and contractors;
- Employee drop-off/pick-up zone;
- Salvage yard;
- Sewage plant;
- Shaft Laydown Area / Explosives Delivery Bay;
- Surface laydown area;
- Meeting venue hall (Lekgotla Hall);
- Access and escape roads;
- Two water storage dams;
- Compressor house;
- One 11kV Powerline;
- Administration Offices;
- Change houses;
- Engineering workshop;
- Stores; and
- Temporary laydown area (historic LanXess Chrome Mining village area).

Kroondal mining operations is situated approximately 10 km east of Rustenburg, North-West Province. Mining at Kroondal has historically consisted of both opencast and underground mining. Currently only underground mining is undertaken, and the old opencast areas have been closed and rehabilitated. The current underground mining is taking place in close proximity to the Clover Alloys RCM mining rights areas. Miners' underground travel time will be reduced by approximately 50% through Glencore WCM acquiring the surface rights on Portion 11 of the farm Rietfontein 338 JQ and mining right (MR336), which will in turn increase production and ensure the long-term survival of the business.

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 and landowner 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;
- Two field surveys were conducted:
    - The first survey took place on the 2nd of August 2024 during the dry season and furthermore, substantial portions of the site were recently burned.
    - The second survey was conducted on the 11th of November 2024, during the late dry season / early wet season. which is the correct season for the biome. The assessment is deemed sufficient;
    - These factors constitute limitations. Due to the modified condition of the PAOI and the limited observable indigenous biodiversity this project only necessitates a compliance statement, and the seasonality would unlikely affect the outcome of this study in a substantial way. Additionally, most of the high-impact construction for the project development is planned for the already 'Modified' areas.
    - A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.
- The area was surveyed during two site visits, but this survey does not consider temporal trends (note that 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, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations; 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 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 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" – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however,
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as field surveys, confirmed that the proposed PAOI is of an overall 'Low' sensitivity. Therefore, this report constitutes a Terrestrial Biodiversity Compliance Statement.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in Table 1-1 below.

Table 1-1 Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Be applicable to the preferred site and proposed development footprint	1
Confirm that the site is of "low" sensitivity for terrestrial biodiversity	3.4.2
Indicate whether or not the proposed development will have any impact on the biodiversity feature	6
The contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae	8.4
A signed statement of independence by the specialist	8.3
Specialist details, including a CV	8.4
A baseline profile description of biodiversity and ecosystems of the site	0
Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used	8.1
In the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase	N/A
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	4
Description of the assumptions and any uncertainties or gaps in knowledge or data	1.4
Any conditions to which this statement is subjected	6.2

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

2 Fieldwork

2.1 Biodiversity Field Assessment

Two field surveys were undertaken, on the 2nd of August 2024 and 11th of November 2024, both of which constitute dry season surveys (refer to 1.4), to determine the presence of any local SCC and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the PAOI, within the limits of time, access and security. This site visit is considered sufficient for the project (Figure 2-1).

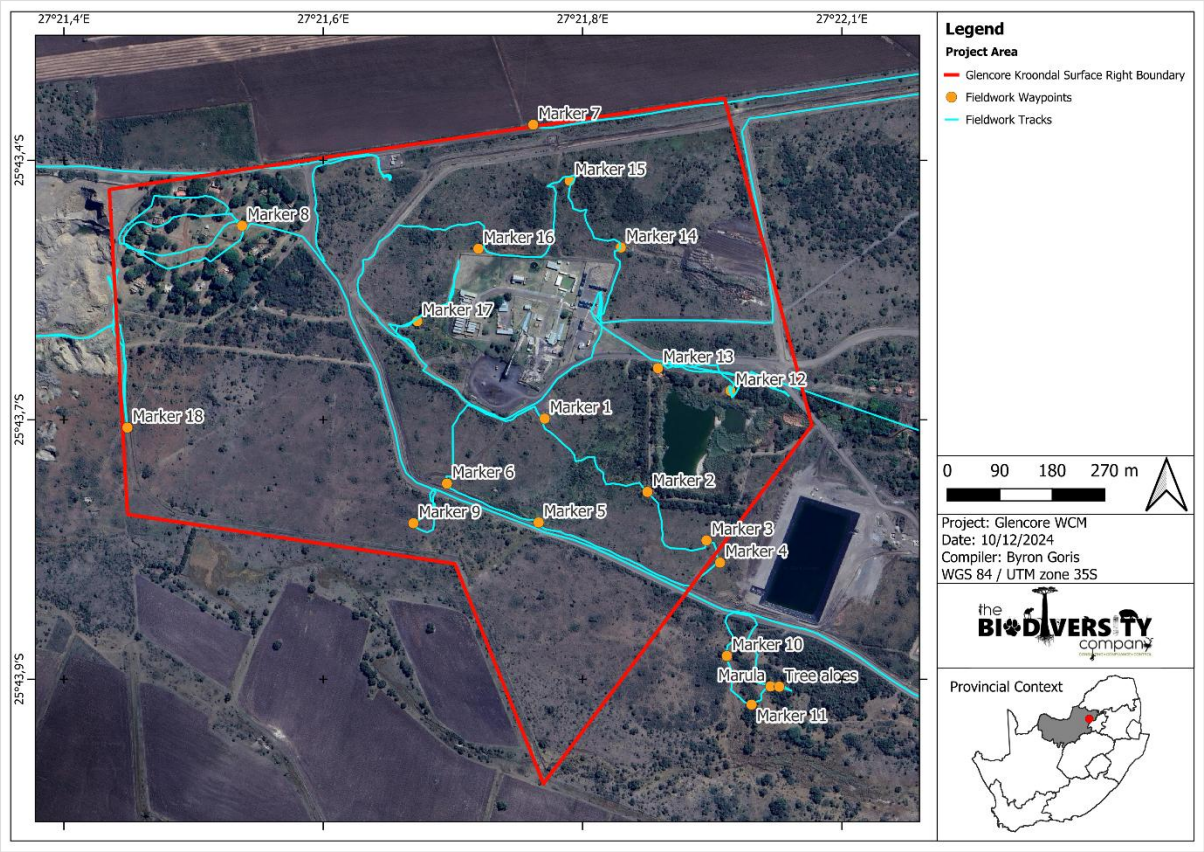


Figure 2-1 Map illustrating the tracks of the field survey

3 Results & Discussion

3.1 Ecologically Important Landscape Features

Table 3-1 below has been produced as a result of the spatial data collected and analysed as provided by relevant sources. It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI.

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

Desktop Information Considered	Relevance	Reasoning
Ecosystem Threat Status	Relevant	Overlaps with a 'Endangered' Ecosystem – Marikana Thornveld (RLE, 2021)
Ecosystem Protection Level	Relevant	Overlaps with a 'Poorly Protected' Ecosystem
Provincial Conservation Plan (Terrestrial)	Relevant	The PAOI overlaps with a 'Critical Biodiversity Area 2' of the North West Conservation Plan, as well as a small section of an 'Ecological Support Area 1', and marginally with an 'Ecological Support Area 2' to the south.
SAPAD & SACAD	Relevant	Located within the Magaliesberg Biosphere Reserve 'Transition' and 'Buffer' zones, and approximately 8.7 km from the Magaliesburg Protected Natural Environment
National Protected Areas Expansion Strategy	Relevant	Overlaps with Priority Focus Area (NPAES, 2018)
Important Bird & Biodiversity Areas (IBA)	Relevant	Overlaps with the Magaliesberg IBA
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	The 500 m regulated area overlaps with NBA water resources – a depression and channelled valley-bottom
National Freshwater Priority Area	Relevant	The 500 m regulated area overlaps with NFEPA wetlands, including one natural non-priority wetland within the project site, and two artificial non-priority wetlands.
Strategic Water Source Areas	Relevant	The PAOI overlaps with a SWSA – Kroondal/Marikana Groundwater SWSA
SANBI 2012 Mine Guide – Biodiversity Priority Areas	Relevant	The PAOI overlaps with 'High Biodiversity Importance – High Risk to Mining' areas

3.2 Biodiversity Field Survey

The following sections discuss the results from the field surveys that were conducted for the proposed project, which were undertaken on the 2nd of August and 11th of November 2024. A selection of key sample points are described in Table 3-2.

Table 3-2 Sensitivity summary of the survey points and habitat types delineated within the PAOI

Survey Point	Description	SEI	Photographs
Marker 1 **Date: 07/06/2024** **GPS Coordinates:** 25°43'40.74"S 27°21'48.30"E	**Modified** High levels of anthropogenic disturbance and transformation can be seen. Based near mining activities. Dumping and recent vegetation burning, with a high number of AIP (Alien and Invasive Plant) species and naturalised exotics is present. Limited ecosystem functionality. Dominant exotics are *Tagetes minuta* and *Bidens pilosa.* Most indigenous vegetation was limited due to clearing and burning but *Aloe davyana, Vachellia karroo* and *Ziziphus mucronata* was noted in the area – other flora cannot be identified to the species level in the current state. No flora or fauna SCC were recorded or are expected.	Very Low	 
Marker 2 **Date: 07/06/2024** **GPS Coordinates:** 25°43'44.80"S 27°21'54.00"E	**Disturbed Thornveld / Water Resource** High levels of anthropogenic disturbance and transformation is present. Based along an artificial dam and near mining activities. Dumping and recent vegetation burning has occurred. Limited vegetation available to assess ecosystem functionality due to burning. Dominant exotics are *Tagetes minuta* and *Bidens pilosa.* Most indigenous vegetation was limited due to clearing and burning, but *Aloe davyana, Vachellia karroo, Hyparrhenia hirta, Vachellia xanthoploea* (fever tree) and *Ziziphus mucronata* was noted in the area – other flora cannot be identified to the species level in the current state. No flora or fauna SCC were recorded or are expected.	Medium/High	 

Survey Point	Description	SEI	Photographs
Marker 3 **Date: 07/06/2024** **GPS Coordinates:** 25°43'47.49"S 27°21'57.28"E	**Disturbed Thornveld** High levels of anthropogenic disturbance and transformation is present. Based near mining activities. Some rocky characteristics can be seen which is suspected to be mine rubble derived from adjacent excavations. Recent vegetation burning resulting in limited vegetation available to assess ecosystem functionality. Most indigenous vegetation was limited due to clearing and burning but *Aloe davyana, Vachellia karroo, Themeda triandra* and *Hyparrhenia hirta* was noted in the area – other flora cannot be identified to the species level in current burnt habitat state. No flora or fauna SCC were recorded or are expected.	Medium	 
Marker 5 **Date: 07/06/2024** **GPS Coordinates:** 25°43'46.50"S 27°21'47.96"E	**Water Resource** High levels of anthropogenic disturbance and transformation is present. Based near mining activities, with a road crossing the wetland. Recent vegetation burning resulting in limited vegetation available to assess ecosystem functionality. Evidence of reeds and sedges within the drainage line, but not confirmed to species level as most was dead and/or burnt away. Most indigenous vegetation was limited due to clearing and burning - *Vachellia karroo, Themeda triandra* and *Hyparrhenia hirta* was noted in the area – other flora cannot be identified to the species level in the current burnt habitat state. No flora or fauna SCC were recorded or are expected.	High	 
Marker 7 **Date: 07/06/2024** **GPS Coordinates:** 25°43'24.42"S 27°21'47.66"E	**Modified** High levels of anthropogenic disturbance and transformation is present. This area consists of mining infrastructure, mine road, and adjacent agriculture. Reduced indigenous vegetation from clearing. Exotic species such as *Bidens pilosa* noted and AIP species *Cirsium vulgare* occurs in	Very Low	

Survey Point	Description	SEI	Photographs
	the area. Indigenous vegetation dominated by *Asparagus laricinus, Vachellia karroo,* and *Ziziphus mucronata,* as well as graminoids including *Elionurus muticus, Heteropogon contortus,* and *Themeda triandra*. No flora or fauna SCC were recorded or are expected.		
Marker 8 **Date: 07/06/2024** **GPS Coordinates:** 25°43'30.03"S 27°21'31.50"E	**Modified** High levels of anthropogenic disturbance and transformation is present. The area consists of an abandoned mine residence. Reduced indigenous vegetation from clearing and evidence showing planting of exotic species. AIP, exotic, and indigenous species present – some are likely to have been introduced when the settlement was inhabited. Notable indigenous species include *Erythrina lysistemon* (coral tree) and *Vachellia xanthoploea* (fever tree). Notable AIPs include *Yucca madrensis* (Naturalized exotic) and *Opuntia ficus-indica* (sweet prickly pear - NEMBA Category 1b). No flora or fauna SCC were recorded or are expected.	Very Low	 
Marker 9 **Date: 07/06/2024** **GPS Coordinates:** 25°43'46.54"S 27°21'41.01"E	**Disturbed Thornveld** Anthropogenic disturbances from mining and associated activities are present at this point. Reduced indigenous vegetation from clearing, confirmed with historic satellite imagery (refer to Figure 3-1). Could not fully access this area due to security concerns around nearby informal mining activities (Zama Zama's). Indigenous vegetation, representative of the Marikana thornveld is present, thus the habitat still supports some natural ecosystem functionality. Dominant exotics are *Tagetes minuta* and *Bidens pilosa*, and AIPs such as *Verbena bonariensis* occur in the area. Dominant indigenous species include *Vachellia karroo, Vachellia tortilis* subsp. *heteracantha, Senegalia caffra, Themeda triandra,* and *Heteropogon contortus.* No flora or fauna SCC were recorded or are expected.	Medium	 

Survey Point	Description	SEI	Photographs
Marker 13 **Date: 07/06/2024** **GPS Coordinates:** 25°43'37.94"S 27°21'54.59"E	**Disturbed Thornveld / Water Resource** This sample point consists of an artificial damn. AIP infestation level is high. Impacts include some vegetation clearing, rubble dumping, and edge effects from adjacent road, as well as other mining-related activities. Evidence of *Hystrix cristata* (Porcupine) noted from spoor. Dominant indigenous species include *Vachellia karroo, Themeda triandra,* and *Heteropogon contortus.* Notable AIPs and naturalized exotics are *Melia azedarach, Bidens pilosa,* and *Verbena bonariensis*. *Phragmites australis* (Common Reed) was also noted. No flora or fauna SCC were recorded or are expected.	Medium/High	 
Marker 14 **Date: 07/06/2024** **GPS Coordinates:** 25°43'31.24"S 27°21'52.53"E	**Disturbed Thornveld & Modified** Anthropogenic disturbances from mining and associated activities are present. A large area has been previously excavated, and rubble spread throughout the area. No longer representative of the original ecosystem, and hosts limited ecosystem functionality, due to habitat transformation. Limited indigenous vegetation, with high levels of AIP ingress. Exotic species such as *Tagetes minuta* and *Bidens pilosa*, and AIP species *Ricinus communis* recorded. Dominant indigenous species include *Vachellia karroo, Vachellia tortilis* subsp. *heteracantha, Dichrostachys cinerea, Themeda triandra,* and *Heteropogon contortus.* No flora or fauna SCC were recorded or are expected.	Medium/Very Low	 
Marker 15 **Date: 07/06/2024** **GPS Coordinates:** 25°43'27.53"S 27°21'49.69"E	**Disturbed Thornveld** Patches of increased woody biomass can be seen. Disturbances noted from a servitude, and some impacts from other mining-related anthropogenic activities. Several AIP species present. Increased indigenous species and habitat structure suggests ecological functionality despite disturbances.	Medium	

Survey Point	Description	SEI	Photographs
	Dominant indigenous species include *Vachellia karroo, Vachellia tortilis* subsp. *heteracantha, Senegalia caffra, Themeda triandra,* and *Heteropogon contortus.* Notable AIP species include *Opuntia ficus-indica* (sweet prickly pear) and *Cereus jamacaru* (Queen-of-the-night) – both NEMBA category 1b species. No flora or fauna SCC were recorded or are expected.		
Marker 17 **Date: 07/06/2024** **GPS Coordinates:** 25°43'35.33"S 27°21'41.22"E	**Disturbed Thornveld** Heavy disturbances from mining-related anthropogenic activities are present. Several AIP species present. Some indigenous species present, and habitat still hosts some ecological functionality but experiences high levels of disturbance due to the close proximity to a mine road and other mining operations. AIPs including *Melia azedarach* (syringa) and *Verbena bonariensis* are present. Dominant indigenous species include *Vachellia karroo, Vachellia tortilis* subsp. *heteracantha, Vachellia robusta, Themeda triandra,* and *Heteropogon contortus.* No flora or fauna SCC were recorded or are expected.	Medium	 
Marker 18 **Date: 11/11/2024** **GPS Coordinates:** 25°43'41.24"S 27°21'25.13"E	**Disturbed Thornveld** Significant disturbances from mining-related human activities are evident, as well as cattle grazing. Several alien invasive plant (AIP) species are present, alongside some indigenous species. The habitat retains some ecological functionality but is heavily impacted by dirt roads and ongoing mining operations. Dominant exotics included *Tagetes minuta* and *Bidens pilosa*. Indigenous vegetation was dominated by *Vachellia karroo,* Narrow-leaf Cotton Bush *(Gomphocarpus fruticosus),* and *Searsia lancea,* with *Aloe davyana* noted nearby. No flora or fauna SCC were recorded or are expected.	Medium	 

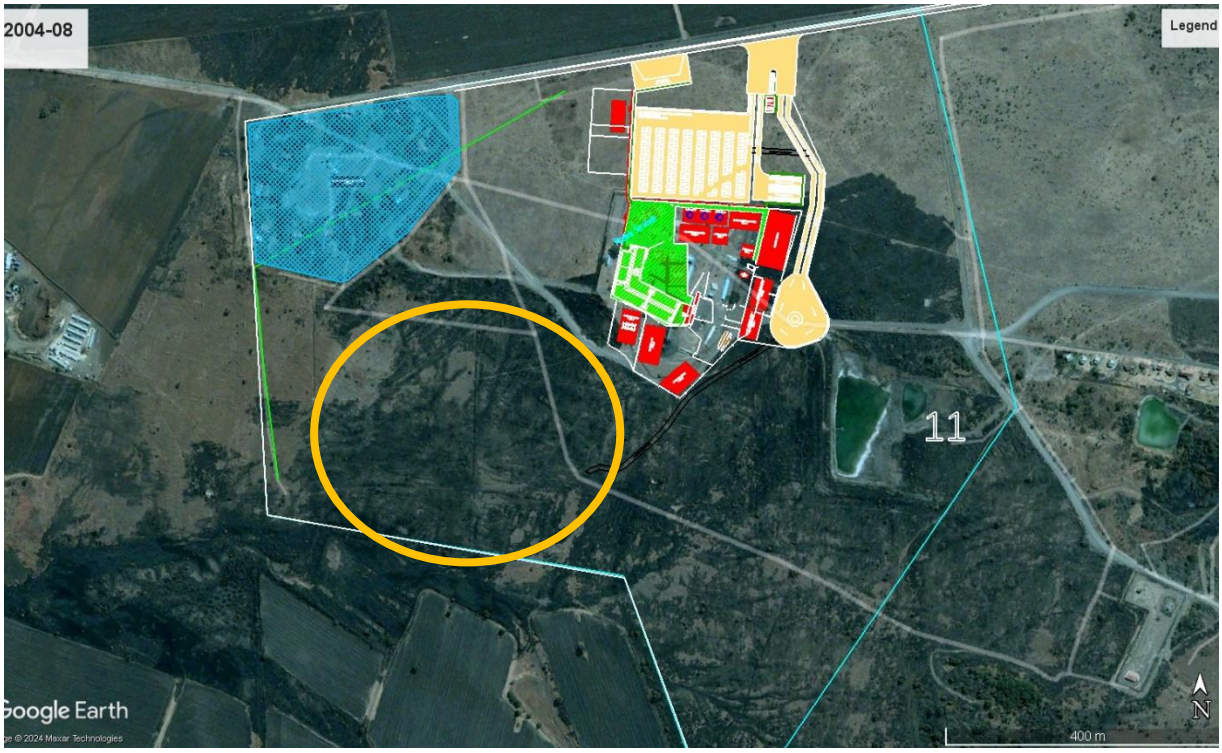


Figure 3-1 Historical Imagery overlayed with project infrastructure showing evidence of previous impacts to Thornveld habitat in the south-western section of the PAOI (circled orange).

3.3 Habitat Assessment

Three (3) main habitats were identified across the PAOI and include:

- Modified;
- Disturbed thornveld; and
- Water Resources.

The habitat for the PAOI can be seen delineated in Figure 3-2 and descriptions of the habitats are presented in Table 3-3.

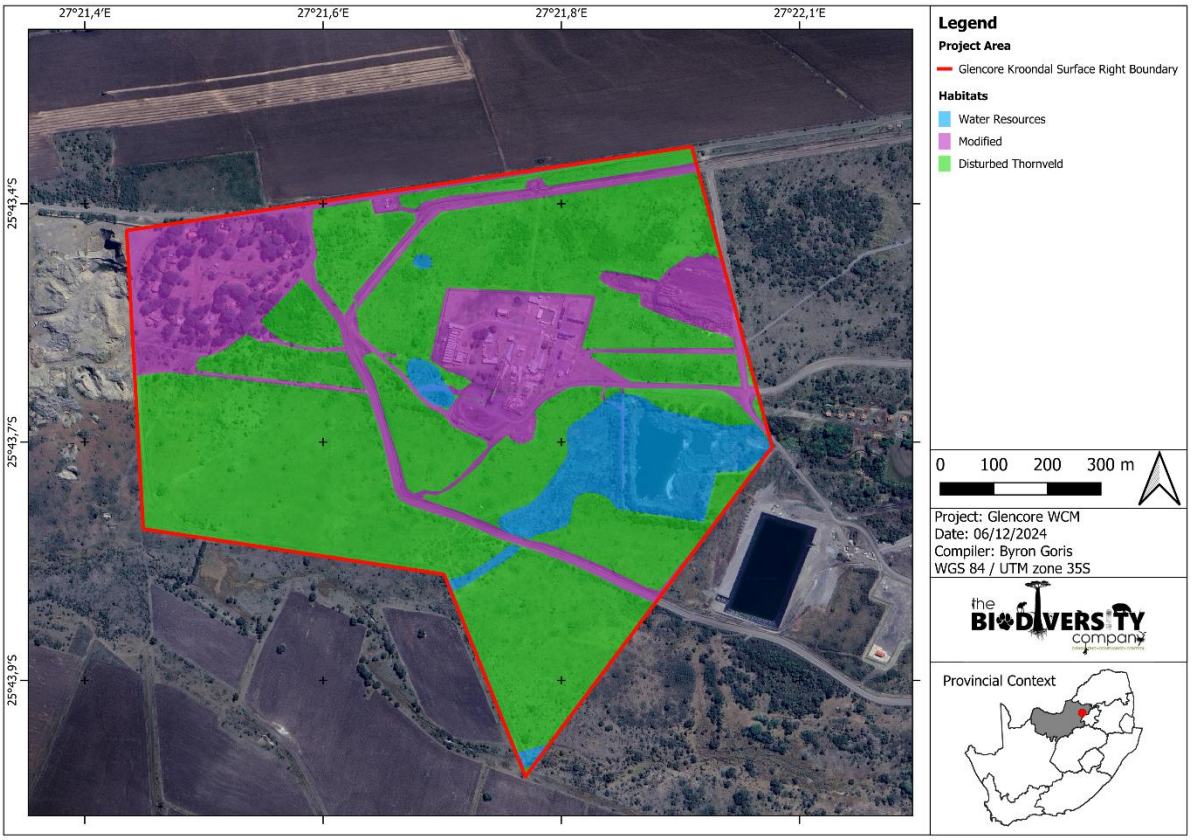


Figure 3-2 Habitats identified within the PAOI.

Table 3-3 Table providing descriptions of the habitat types delineated for the PAOI

Habitat	Description and Condition
Modified	This habitat includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified an area's primary ecological functions and species composition. These areas include few, if any, indigenous species and are associated with alien and invasive plant species. No fauna or flora SCC were observed, and none are expected for the habitat.
Disturbed Thornveld	This habitat regarded as thornveld with some ecological functionality, including refuge and foraging opportunity, and a movement corridor between areas of anthropogenic land use, as well as also hosting some indigenous flora. However, high levels of anthropogenic disturbances have resulted in negative impacts and associated habitat degradation. Impacts mostly result from mining-related activities within the PAOI, and includes alien species infestations, old diggings, rubble, grazing, roads and vehicles, and edge effects from adjacent agriculture. No fauna or flora SCC were observed, and none are expected for the habitat.
Water Resource	Various wetland features were identified, collectively classed as water resources from a terrestrial perspective. The ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and form an important habitat for various fauna and flora. This habitat provides surface water within the landscape and resource provision (such as food from aquatic and riparian biodiversity). Aids in trapping sediment and nutrients derived from land runoff. More information regarding this habitat and the state of the water resources can be found in the accompanying wetlands report (TBC, 2025). No fauna or flora SCC were observed nor are expected.

3.4 Site Ecological Importance

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. The PAOI was categorised as possessing habitats ranging from 'Very Low' to 'High' SEI (Table 3-4 and Figure 3-6). This indicates that the findings of this assessment are contrary to the Screening Tool with respect to the Combined Terrestrial Biodiversity Theme sensitivity.

Table 3-4 Summary of habitat types delineated within the PAOI

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Modified	**Low**	**Very Low**	**Very Low**	**High**	**Very Low**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Several major current negative ecological impacts.		Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Disturbed Thornveld	**Low**	**Low**	**Low**	**Medium**	**Medium**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance.		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.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Water Resources	**Medium**	**Medium**	**Medium**	**Low**	**High**
	> 50% of receptor contains natural habitat with potential to support SCC.	Only narrow corridors of good habitat connectivity. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance.		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.	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.

3.4.1 Desktop Ecological Senstivity

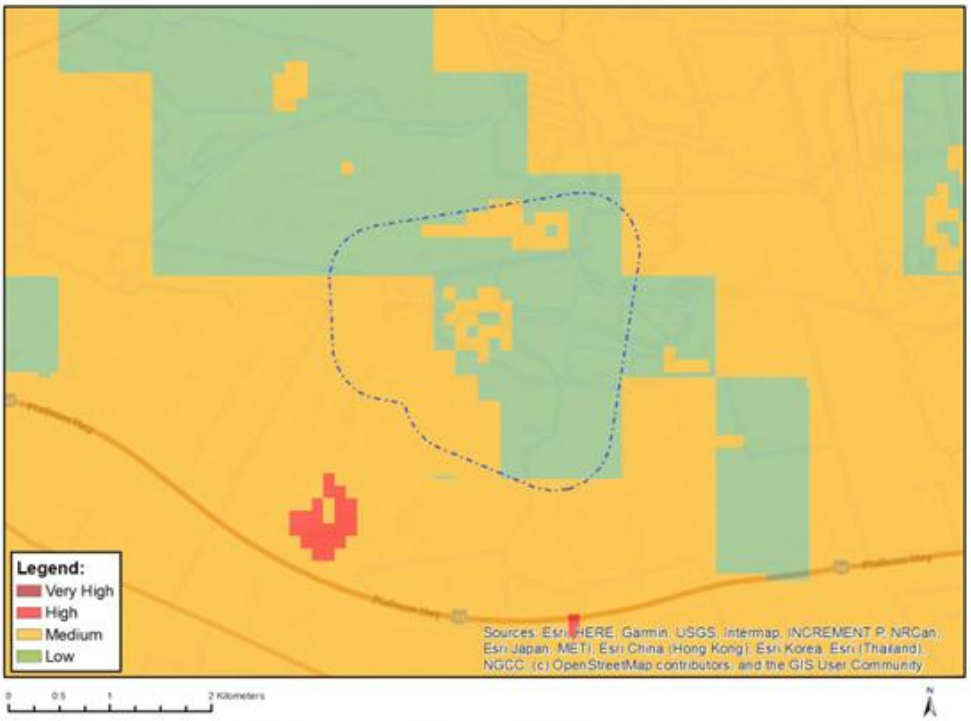
The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended:

- Animal Species Theme sensitivity is Medium for the proposed development area, due to two (2) medium sensitivity mammal species, and two (2) medium sensitivity avifaunal species likely to occur within the PAOI (Figure 3-3);

- Plant Species Theme sensitivity is Low for the proposed development area (Figure 3-4); and

- Terrestrial Biodiversity Theme sensitivity is Very High for the proposed development area, due to the PAOI overlapping with CBA 2, ESA 1, ESA 2, NPAES areas, and the endangered (EN) Marikana Thornveld (Figure 3-5).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation
Medium	Aves-Hydroprogne caspia
Medium	Aves-Aquila rapax
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Dasymys robertsii

Figure 3-3 Animal Species Theme Sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 3-4 Plant Species Theme Sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

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

Figure 3-5 Terrestrial Biodiversity Theme Sensitivity

3.4.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-5 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. A map illustrating the overall SEI allocations for the PAOI can be seen in Figure 3-6.

Table 3-5 Summary of the screening tool vs specialist assigned sensitivities.

Screening Tool Theme	Screening Tool		Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	**Medium**	**N/A**	**Low**	Disputed – This habitat is disturbed and/or modified due to anthropogenic activities (particularly mining), edge effects, and the presence of alien and invasive species, however it can still provide ecosystem services in terms of foraging/grazing, nesting and movement corridors. Limited potential for SCC inhabitants, which were also not observed.
Plant Theme	**Low**	**N/A**	**Low**	Validated – This habitat is disturbed and/or modified due to anthropogenic activities (particularly mining), edge effects, and the presence of alien and invasive species. No SCCs observed and limited potential for their occurrence.
Terrestrial Theme	**Very High**	**Degraded Thornveld**	**Medium**	Disputed – Habitat has been exposed to various disturbances such as mining-related activities and AIP invasions; however, the habitat does still exhibit limited thornveld ecosystem characteristics expected of this ecosystem type and hosts some important ecological functioning for the area – albeit substantial ecosystem functionality is lost due to anthropogenic impacts. No SCC observed and unlikely to occur.
		Water Resources	**High**	Disputed – Habitat disturbed due to historic and current anthropogenic activities (including various mining-related activities and artificial damming) and has therefore lost some ecosystem functionality as well as habitat integrity. However, this habitat-type does still play a role in water provision to the surrounding area.
		Modified	**Very Low**	Disputed – These areas have been modified and have little to no natural vegetation left, resulting in a loss of ecosystem functionality

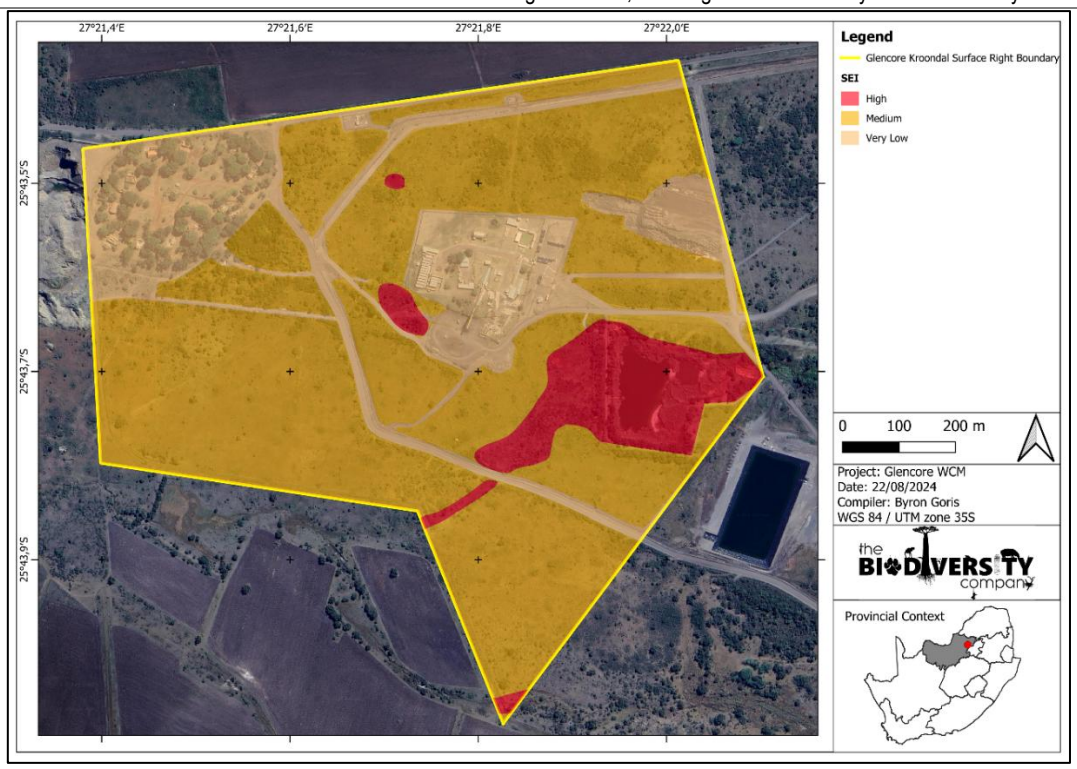


Figure 3-6 Map illustrating the site ecological importance for the PAOI

4 Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the project area, 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 and decommissioning phases. Mitigation measures were only applied to impacts identified within the impact analysis.

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 Terrestrial Impact Assessment

The impacts regarding the proposed development were assessed for planning, construction and the operational stages.

4.2.1 Anticipated Impacts

The anticipated impacts of the proposed activities are analysed to predict, quantify, and assess their 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
1. Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation	Displacement/loss of flora & fauna Increased potential for soil erosion Habitat fragmentation Increased potential for establishment of alien & invasive vegetation
	Access roads and servitudes	
	Soil dust precipitation	
	Leakages	
	Dumping of waste products	
	Random events such as fire (cooking fires or cigarettes)	

Main Impact	Project activities that can cause the spread and/or establishment of alien and/or invasive species	Secondary impacts anticipated
2. Spread and/or establishment of alien and/or invasive species	Vegetation removal	Habitat loss for native flora & fauna Spreading of potentially dangerous diseases due to invasive and pest species Alteration of fauna assemblages due to habitat modification
	Vehicles potentially spreading seed	
	Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents	
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	
Main Impact	**Project activities that can cause the Direct mortality of fauna**	**Secondary impacts anticipated**
3. Direct mortality of fauna	Clearing of vegetation	Loss of ecosystem services Increase in rodent populations and associated disease risk
	Roadkill due to vehicle collision	
	Pollution of water resources due to dust effects, chemical spills or sewage leakages	
Main Impact	**Project activities that can cause reduced dispersal/migration of fauna**	**Secondary impacts anticipated**
4. Reduced dispersal/migration of fauna	Loss of landscape used as corridor	Loss of ecosystem services Reduced plant seed dispersal
	Compacted roads	
	Removal of vegetation	
	Light, noise and dust disturbance	
Main Impact	**Project activities that can cause pollution in water courses and the surrounding environment**	**Secondary impacts anticipated**
5. Environmental pollution due to water runoff, operations on site, and various anthropogenic activities	Chemical (organic/inorganic) spills	Faunal mortality (direct and indirectly) Groundwater pollution Loss of ecosystem services
	Erosion and runoff	
Main Impact	**Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance and dust.**	**Secondary impacts anticipated**
6.Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and light pollution.	Operation of machinery (Large earth moving machinery, generators)	Loss of ecosystem services
	Vehicles	
Main Impact	**Project activities that can cause staff to interact directly with potentially dangerous fauna**	**Secondary impacts anticipated**
7. Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	All unregulated/supervised activities outdoors	Harm to fauna and/or staff

4.2.2 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
Hydrocarbon spills into the surrounding environment	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.

Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland and wetlands	Appropriate/Adequate fire management plan need to be implemented.

4.2.3 Alternatives Considered

- No Alternatives were considered.

4.2.4 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.

4.2.4.1 Destruction, further loss and fragmentation of the vegetation community

Through site clearing, more of the vegetation communities will be lost. Unmitigated, this will also lead to habitat fragmentation and the establishment of alien invasive species as well as soil erosion.

Activities that will contribute to this impact:

- Driving/ moving outside of designated areas;
- Physical removal of vegetation;
- Temporary site establishment (laydown, chemical toilets etc.);
- Soil dust precipitation as a result of site establishment;
- Dumping of waste products;
- Hydrocarbon storage and leakages; and
- Random events such as fire (cooking fires or cigarettes).

4.2.4.1.1 Cumulative Impacts

- Loss of habitat for indigenous species; and
- Spread of invasive species to surrounding areas.

4.2.4.1.2 Irreplaceable Loss of Resources

- Loss of CBA and ESA habitat.

4.2.4.2 Introduction of alien species, especially plants

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna assemblage will be changed. Activities that will contribute to this impact:

- Vegetation removal and disturbance of soil;
- Vehicles potentially spreading seed;
- Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and

- Eating area increasing pest species such as rats and flies.

4.2.4.2.1 Cumulative Impacts

- Loss of habitat for indigenous species; and
- Spread of disease to surrounding areas.

4.2.4.2.2 Irreplaceable Loss of Resources

- Loss of CBA and ESA habitat.

4.2.4.3 Erosion due to storm water runoff and wind

Erosion will lead to the loss of vegetation, the removal/ relocation of the topsoil and the destruction of habitat. Activities that will contribute to this impact:

- Storm water runoff from roads, and other paved areas;
- Vehicles driving outside demarcated areas;
- Footpaths outside demarcated areas;
- Clearing of vegetation;
- Runoff from areas with bare soil; and
- Compacting of roads.

4.2.4.3.1 Cumulative Impacts

- Removal of topsoil; and
- Loss of habitat for indigenous species.

4.2.4.3.2 Irreplaceable Loss of Resources

- Loss of CBA and ESA areas.

4.2.4.4 Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).

Faunal community will be influenced in a number of ways, including the loss of habitat, disturbances that will either make them move out of the area if possible or have to adapt and possible deaths due to physical harm or indirect harm. Activities that will contribute to this impact:

- Clearing of vegetation;
- Roadkill due to vehicle collision;
- Pollution of water resources due to dust effects and run-off;
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- Disease caused by increased dust levels;
- Increase in pest species in the area due to new food source created; and

- Vibrations, noise and rock chips skidding out due to the construction activities.

4.2.4.4.1 Cumulative Impacts

- Loss of habitat for indigenous species.

4.2.4.4.2 Irreplaceable Loss of Resources

- Loss of possible faunal SCCs.

4.2.4.5 Potential leaks, discharges, pollutants from machinery and storage leaching into the surrounding environment.

Hydrocarbons leaching into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species. This will also result in the contamination of the topsoil and reduce the likelihood of successful rehabilitation of an area.

Activities that will contribute to this impact:

- Loss of vegetation; and
- Loss of topsoil.

4.2.4.5.1 Cumulative Impacts

- Loss of usable water resources for fauna species; and
- Loss of viable habitat.

4.2.4.5.2 Irreplaceable Loss of Resources

- Loss of usable water resources for fauna species resulting in loss of possible SCC and other species.

4.2.5 Operational Phase

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

4.2.5.1 Continued encroachment of indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during operation of the various facilities

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed;
- Storm water runoff from roads, and other bare areas;
- Vehicles driving outside demarcated areas; and
- Footpaths outside demarcated areas.

4.2.5.1.1 Cumulative Impacts

- Loss of habitat; and
- Loss of indigenous flora species due to competition.

4.2.5.1.2 Irreplaceable Loss of Resources

- Loss of habitat and food sources for possible fauna SCCs.

4.2.5.2 Continued displacement and fragmentation of the faunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).

The operation and maintenance of the proposed development may lead to disturbance or persecution of fauna in the vicinity of the development through;

- Increased anthropogenic disturbances (noise, human presence, litter and poaching/snaring);
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- The disruption of natural faunal movement corridors.

4.2.5.2.1 Cumulative Impacts

- Loss of suitable habitat.

4.2.5.2.2 Irreplaceable Loss of Resources

- Loss of possible faunal SCCs.

4.2.5.3 Potential leaks, discharges, pollutants from waste overflows due to infrastructure damage/malfunction spreading into the surrounding environment.

Sewage and other contaminants leaking into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species and the associated habitat.

Activities that will contribute to this impact:

- Damage to/or leaking of sewage plant and infrastructure containing/transporting pollutants including vehicles.

4.2.5.3.1 Cumulative Impacts

- Loss of usable water resources for fauna species; and
- Loss of viable habitat.

4.2.5.3.2 Irreplaceable Loss of Resources

- Loss of usable water resources for fauna species resulting in loss of possible SCC and other species.

4.2.6 Decommissioning Phase

This phase will initially involve the dismantling of infrastructure and rehabilitation of any cleared/disturbed areas.

4.2.6.1 Continued encroachment of indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during dismantling and removal of infrastructure.

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed.

4.2.6.1.1 Cumulative Impacts

- Loss of habitat; and
- Loss of indigenous flora species due to competition.

4.2.6.1.2 Irreplaceable Loss of Resources

- Loss of habitat and food sources for Fauna SCCs.

4.2.6.2 Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).

- Habitat loss; and
- The disruption of natural faunal movement corridors.

4.2.6.2.1 Cumulative Impacts

- Loss of suitable habitat.

4.2.6.2.2 Irreplaceable Loss of Resources

- Loss of fauna and suitable habitat.

4.2.7 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 as well as cumulative and irreplaceable loss.

Table 4-3 Assessment of significance of potential impacts on terrestrial biodiversity associated with the project.

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
Construction Phase								
(refer to 5.1)	Destruction, further loss and fragmentation of the vegetation community	-11	-9	High	2	1	1.13	-10,13
(refer to 5.3)	Introduction of alien species, especially plants	-11	-6	High	2	1	1.13	-6,75

(refer to 5.4)	Erosion due to storm water runoff and wind	-8,25	-5,25	High	2	1	1.13	-5,91
(refer to 5.2)	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	-9	-6	High	2	1	1.13	-6,75
(refer to 5.5)	Potential leaks, discharges, pollutants from machinery and storage leaching into the surrounding environment.	-9	-4	Medium	2	1	1.13	-4,50
Operational Phase								
(refer to 5.3)	Continued encroachment of indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during operation of the various facilities	-14	-8,25	High	2	2	1.25	-10,31
(refer to 5.2)	Continued displacement and fragmentation of the faunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).	-9.75	-7,5	High	2	1	1.13	-8,44
(refer to 5.5)	Potential leaks, discharges, pollutants from waste overflows due to infrastructure damage/malfunction spreading into the surrounding environment.	-13	-7,5	High	2	2	1.25	-9,38
Decommissioning Phase								
(refer to 5.3)	Continued encroachment of	-11	-6.75	High	2	2	1.25	-8.44

	indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during dismantling and removal of infrastructure.							
(refer to 5.2)	Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).	-9	-6	High	2	1	1.13	-6.75

5 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 5-1 to Table 4-3 presents the recommended mitigation measures and the respective time frames, targets, and performance indicators relative to the terrestrial assessment.

The focus of mitigation measures is to reduce the significance of the likely impacts associated with the development, and thereby:

- Prevent the further loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the PAOI;
- Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the PAOI.

There are five (5) main management outcomes, namely:

- Vegetation and Habitats (refer to 5.1)
- Fauna (refer to 5.2)
- Alien and Invasive Species (refer to 5.3)
- Erosion (refer to 5.4)
- Waste Management (refer to 5.5)
- Dust (refer to 5.6)
- Environmental Awareness Training (refer to 5.7)

Impact assessments for the most relevant project phases are included for each management outcome, with corresponding mitigation plans thereafter.

5.1 Management outcome: Vegetation and Habitats

Table 5-1 Impact Assessment for relevant project phase

Project Phase	Impact	Description	Contributing Activities	Cumulative Impacts	Irreplaceable Loss of Resources
Construction Phase	Destruction, further loss and fragmentation of the vegetation community	Through site clearing, more of the vegetation communities will be lost, which are already impacted by existing disturbances. Unmitigated, this will also lead to habitat fragmentation and the establishment of alien invasive species as well as soil erosion.	• Driving/ moving outside of designated areas; • Physical removal of vegetation; • Temporary site establishment (laydown, chemical toilets etc.); • Soil dust precipitation as a result of site establishment; • Dumping of waste products; • Hydrocarbon storage and leakages; and • Random events such as fire (cooking fires or cigarettes).	• Further loss of EN vegetation type (limited to delineated Degraded Thornveld Habitat);	• Loss of EN vegetation type (limited to delineated Degraded Thornveld Habitat)

Table 5-2 Vegetation and Habitats: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already Modified areas and should take up the smallest footprint possible.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
It is recommended that areas to be developed/disturbed be specifically demarcated so that during the phase, only the demarcated areas be impacted upon.	Construction & Decommissioning Phase	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible.	Construction & Decommissioning Phase	Project manager, Environmental Officer	Development footprint	Ongoing
All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles.	Life of Operation & Decommissioning	Project manager, Environmental Officer	Development footprint	Ongoing
The clearing of indigenous vegetation must be minimized where possible. Clearing of AIP vegetation, which dominated the PAOI, is advocated. All activities must be restricted to within the authorized areas.	Life of operation & Decommissioning	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.	Planning Phase, Pre-Construction	Project manager, Environmental Officer & Contractor	Plant & animal species	Once off

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Although not noted during the site visit, any observed TOPS (Threatened or Protected Species) of plants must be clearly demarcated prior to the commencement of site clearing. If construction activities are likely to affect any SCC or protected plants these individuals must be relocated as part of a plant rescue and protection plan, and a permit must be obtained before doing so.	Planning Phase	Environmental Officer	Protected plants and SCC	During phase
Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction & decommissioning phase has been concluded. No permanent construction phase structures should 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 laydown areas.	Life of Operation & Decommissioning	Environmental Officer, Design Engineer, and Contractor	Laydown areas	Ongoing
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. All grazing mammals must be kept out of the areas that have recently been re-planted.	Operational & Decommissioning phase, Rehabilitation	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
A habitat rehabilitation plan must be implemented, and areas of bare ground must be revegetated with species indigenous to the region.	Life of Operation, Decommissioning and Rehabilitation	Project manager, Environmental Officer	Rehabilitation	Ongoing
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. • All servicing and refueling of equipment/vehicles on site to be undertaken in suitably designated areas, unless necessary. • All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers and disposed of at a licenced hazardous waste facility. • 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. • Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting any ecosystem functioning, which must be prevented.	Life of operation & Decommissioning	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.	Life of operation & Decommissioning	Environmental Officer & Contractor	Fire Management	During Phase
All construction waste must be removed from site at the completion of the construction phase and decommissioning phase.	Construction & Decommissioning phase	Environmental Officer & Contractor	Construction waste	During Respective Phase

5.2 Management outcome: Fauna

Table 5-3 Impact Assessment for relevant project phase

Project Phase	Impact	Description	Contributing Activities	Cumulative Impacts	Irreplaceable Loss of Resources
Construction Phase	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Faunal community will be influenced in a number of ways, including the loss of habitat, disturbances that will either make them move out of the area if possible or have to adapt and possible deaths due to physical harm or indirect harm.	• Clearing of vegetation; • Roadkill due to vehicle collision; • Pollution of water resources due to dust effects and run-off; • Intentional killing of fauna for food (hunting) or otherwise (killing of snakes); • Disease caused by increased dust levels; • Increase in pest species in the area due to new food source created; and • Vibrations, noise and rock chips skidding out due to the construction activities.	• Loss of habitat for indigenous species.	• Potential loss of fauna biodiversity.
Operational Phase	Continued displacement and fragmentation of the faunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).	During the operational phase, the faunal community faces displacement and fragmentation due to ongoing disturbances from project infrastructure. The compressor house and 11kV powerline generate noise and vibrations, disrupting wildlife behaviour. Access roads increase roadkill risks by intersecting wildlife corridors. Dust from operations affects plant health, reducing food resources for herbivores. Litter and pollution from facilities like the administration offices threaten habitats and water sources. Increased human presence may lead to poaching, endangering certain target species.	• Increased anthropogenic disturbances (noise, human presence, pollution and poaching/snaring); • Intentional killing of fauna for food (hunting) or otherwise (killing of snakes); • The disruption of natural faunal movement corridors	• Loss of suitable habitat.	• Potential loss of fauna.
Decommissioning Phase	Continued displacement and fragmentation of the faunal community (including	The dismantling of infrastructure and increased human activity can disrupt natural habitats, leading to further habitat loss and fragmentation. Noise, dust, and vibrations	• Ongoing anthropogenic disturbances (noise, dust and vibrations) • Habitat degradation/loss (litter, road mortalities and/or poaching).	• Loss of suitable habitat.	• Loss of fauna and suitable habitat.

	threatened or protected species)	from decommissioning activities may disturb wildlife, forcing them to relocate or adapt to altered environments. Additionally, the removal of structures may temporarily expose areas to increased human access, heightening the risk of poaching and further habitat degradation.

Table 5-4 Fauna: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified environmental control officer must be on site throughout construction and decommissioning phases, as well as periodically during operation. A site walk through must be performed by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.	Construction & Decommissioning Phase	Environmental Officer, Contractor	Presence of any floral or faunal SCC	During phase
Clearing and disturbance activities must be conducted in a progressive manner, always outwards and away from the centre of the PAOI and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.	Construction Phase	Environmental Officer & Contractor	Progressive land clearing operations and the movement of fauna	Ongoing
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.	Life of Operation & Decommissioning	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
No trapping, killing, or poisoning of any wildlife is to be allowed and **s**igns must be put up to enforce this. Monitoring must take place in this regard.	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light	Ongoing
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 of must be enforced to ensure that road killings and erosion is limited. 1. **General Site Roads: 20 to 40 km/h to ensure safe navigation around the site.** 2. **Operational Areas:**10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents. 3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less. 4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control.	Life of operation	Health and Safety Officer	Compliance to the training	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day	Ongoing
Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.	Planning and construction	Environmental Officer & Contractor, Engineer	Fauna movement corridor	Ongoing

5.3 Management outcome: Alien and Invasive Species

Table 5-5 Impact Assessment for relevant project phase

Project Phase	Impact	Description	Contributing Activities	Cumulative Impacts	Irreplaceable Loss of Resources
Construction Phase	Introduction of alien species, especially plants	The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna assemblage will be changed.	• Vegetation removal and disturbance of soil; • Vehicles potentially spreading seed; • Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and • Eating area increasing pest species such as rats and flies.	• Loss of habitat for indigenous species; and • Spread of disease to surrounding areas.	• Loss of CBA 2, ESA 1, ESA 2, NPAES habitat (limited to delineated Degraded Thornveld Habitat).
Operational Phase	Continued encroachment of indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during operation of the various facilities	The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss.	• Vehicles potentially spreading seed; • Unsanitary conditions during infrastructure removal promoting the establishment of alien and/or invasive; • Storm water runoff from roads and other bare areas; • Vehicles driving outside demarcated areas; and • Footpaths outside demarcated areas.	• Loss of habitat; and • Loss of indigenous flora species due to competition.	• Loss of habitat and food sources for fauna.
Decommissioning Phase	Continued encroachment of indigenous EN vegetation community by alien invasive plant species, erosion due to disturbed soils and water runoff, as well as environmental pollution due to littering, leaching of chemical residues, and other pollutants during dismantling and removal of infrastructure.	The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss.	• Vehicles potentially spreading seed.	• Loss of habitat; and • Loss of indigenous flora species due to competition.	• Loss of habitat and food sources for Fauna SCCs.

Table 5-6 Alien and Invasive Species: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	**Responsible Party**	**Phase**	**Frequency**
An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.	Life of operation & Decommissioning/Rehabilitation	Project manager, Environmental Officer & Contractor	Manage and assess presence and encroachment of alien vegetation	Twice a year
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths which adhere to regulated requirements and the Mine Health and Safety Act (MHSA).	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.	Life of operation	Environmental Officer & Health and Safety Officer	Evidence or presence of pests	Life of operation

5.4 Management outcome: Erosion

Table 5-7 Impact Assessment for relevant project phase

Project Phase	Impact	Description	Contributing Activities	Cumulative Impacts	Irreplaceable Loss of Resources
Construction Phase	Erosion due to storm water runoff and wind	Erosion will lead to the loss of vegetation, the removal/ relocation of the topsoil and the destruction of habitat.	• Storm water runoff from roads, and other paved areas; • Vehicles driving outside demarcated areas; • Footpaths outside demarcated areas; • Clearing of vegetation; • Water runoff from areas with bare soil; and • Compacting of roads.	• Removal of topsoil; and • Loss of habitat for indigenous species.	• Loss of CBA 2, ESA 1, ESA 2, NPAES areas (limited to delineated Degraded Thornveld Habitat).

Table 5-8 Erosion: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Frequency
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.	Life of operation & Decommissioning	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Only existing access routes and walking paths, or those constructed during this project, may be made use of. Using informal routes through vegetation can reduce ground cover and lead to erosion.	Life of operation & Decommissioning	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.	Life of operation & Decommissioning	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented if necessary.	Life of operation & Decommissioning	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

5.5 Management outcome: Waste Management

Table 5-9 Impact Assessment for relevant project phase

Project Phase	Impact	Description	Contributing Activities	Cumulative Impacts	Irreplaceable Loss of Resources
Construction Phase	Potential leaks, discharges, pollutants from machinery and storage leaching into the surrounding environment.	Hydrocarbons leaching into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species. This will also result in the contamination of the topsoil and reduce the likelihood of successful rehabilitation of an area.	• Loss of vegetation; and • Loss of topsoil.	• Loss of usable water resources for fauna species; and • Loss of viable habitat.	• Loss/pollution of usable water resources for fauna species resulting in loss of fauna species. • Destruction of EN ecosystem vegetation (limited to delineated Degraded Thornveld Habitat).
Operational Phase	Potential leaks, discharges, pollutants from waste overflows due to infrastructure damage/malfunction spreading into the surrounding environment.	Sewage or other contaminants spilling or leaking into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species and the associated habitat.	• Overflowing/damaged sewage plant • Leakages or damage to infrastructure or vehicles	• Loss of usable water resources for fauna species; and • Loss of viable habitat.	• Loss of usable water resources for fauna species resulting in potential loss of biodiversity.

Table 5-10 Waste Management: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Frequency
Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible.	Life of operation & Decommissioning	Environmental Officer & Contractor	Waste Removal	Weekly
Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan.	Construction & Decommissioning Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
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	Construction Phase	Environmental Officer & Contractor	Cement mixing and spills	Every occurrence

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Frequency
being removed from site and treated in situ or removed, placed in containers, and disposed of at a licenced hazardous waste facility.				
Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.	Life of operation & Decommissioning	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.	Life of operation & Decommissioning	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste	Ongoing
Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried in open pits.	Life of operation & Decommissioning	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste	Ongoing
Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.	Life of operation & Decommissioning	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days

5.6 Management outcome: Dust

**Aspects of dust and its associated impacts to other management outcomes have been discussed in impact assessments from section 5.1 to section 5.5 and are not repeated here.*

Table 5-11 Dust: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Frequency
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.	All project phases	Contractor	Dustfall	Dust monitoring program.

5.7 Management outcome: Environmental Awareness Training

Table 5-12 Environmental Awareness Training: Project specific mitigation measures including requirements for timeframes, roles and responsibilities.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Frequency
All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.	Any phase where new personnel attend the project	Health and Safety Officer, Environmental Officer	Compliance to the training	Ongoing

6 Conclusion

The PAOI exists in a predominantly modified and disturbed state having been subjected to various anthropogenic impacts such as human ingress, brush cutting and vegetation clearing, dumping of rubble, high numbers of alien and invasive plants, mining activities, and edge effects from agriculture. The modified and disturbed habitats are unlikely to recover without human intervention and will continue to degrade further without active rehabilitation. No fauna or flora SCC found nor expected throughout the PAOI.

- Completion of the terrestrial biodiversity assessment led to the dispute of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall terrestrial sensitivity ranging from 'Very Low' to 'Medium' (with 'High' for water resources within the site – which includes artificial water features and a natural HGM 1 depression – please refer to the accompanying wetland report for detailed sensitivity information (TBC, 2024)).

According to the Mining Guide dataset for Biodiversity Risk & Importance (SANBI, 2013), the PAOI is overlapped by 'C - High Risk for Mining' which translated to 'High biodiversity importance'.

- The site inspection results, and screening tool comparison highlighted a variety of factors that indicate the PAOI is no longer characteristic of biodiversity category C;

- As this PAOI occurs in a predominately modified and disturbed area, expected impacts from the undertaking of this project do not carry the same risk were these to take place in a site with intact ecosystems confirmed as priority biodiversity areas; and

- As described in section 3.4.2, the majority of the PAOI is impacted by several anthropogenic activities past and present, where physical evidence on-site suggests the biodiversity importance of the area is now lower than indicated by the above SANBI Mining guide dataset, which was released over a decade ago.

6.1 Impact Statement

The location, state and size of the ecosystem suggests that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities.

6.2 Specialist Opinion

It is the opinion of the specialist that the proposed development is favourable only if all mitigation measures provided in this and other specialist reports are implemented.

As previously stated, both surveys were conducted during dry season conditions and substantial portions of the site were recently burned, limiting accurate biodiversity representation. These factors constitute limitations. Due to the modified condition of the PAOI and the limited observable indigenous biodiversity this project only necessitates a compliance statement, and the seasonality would unlikely affect the outcome of this study in a substantial way. Additionally, most of the high-impact construction for the project development is planned for the already 'Modified' areas. A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.

6.3 Layout Approval

Following refinement and further specialist input a SWMP was developed after the completion of the specialist report and therefore this section aims to provide consideration by the specialist of the new clean water dam infrastructure in the context of the overall study. The remaining clean water dam will

now incorporate a constructed wetland system, designed to enhance passive treatment, water quality improvement, and ecological function. Figure 6-1 presents the updated layout.

The siting, design, and scale of this dam have been informed by specialist findings, ecological sensitivities, and site conditions. This change does not represent a significant deviation from the original project scope; rather, it results in a net improvement in environmental outcomes introducing a multifunctional, ecologically beneficial wetland system.

These updates are detailed in the stormwater management plan drawing (Drawing No. P2501017-SW-ST2-710). Minor adjustments to infrastructure layout, are considered acceptable and do not affect the conclusions of the original specialist assessment. The revised design is supported by the specialist and is regarded as favourable for environmental authorisation.

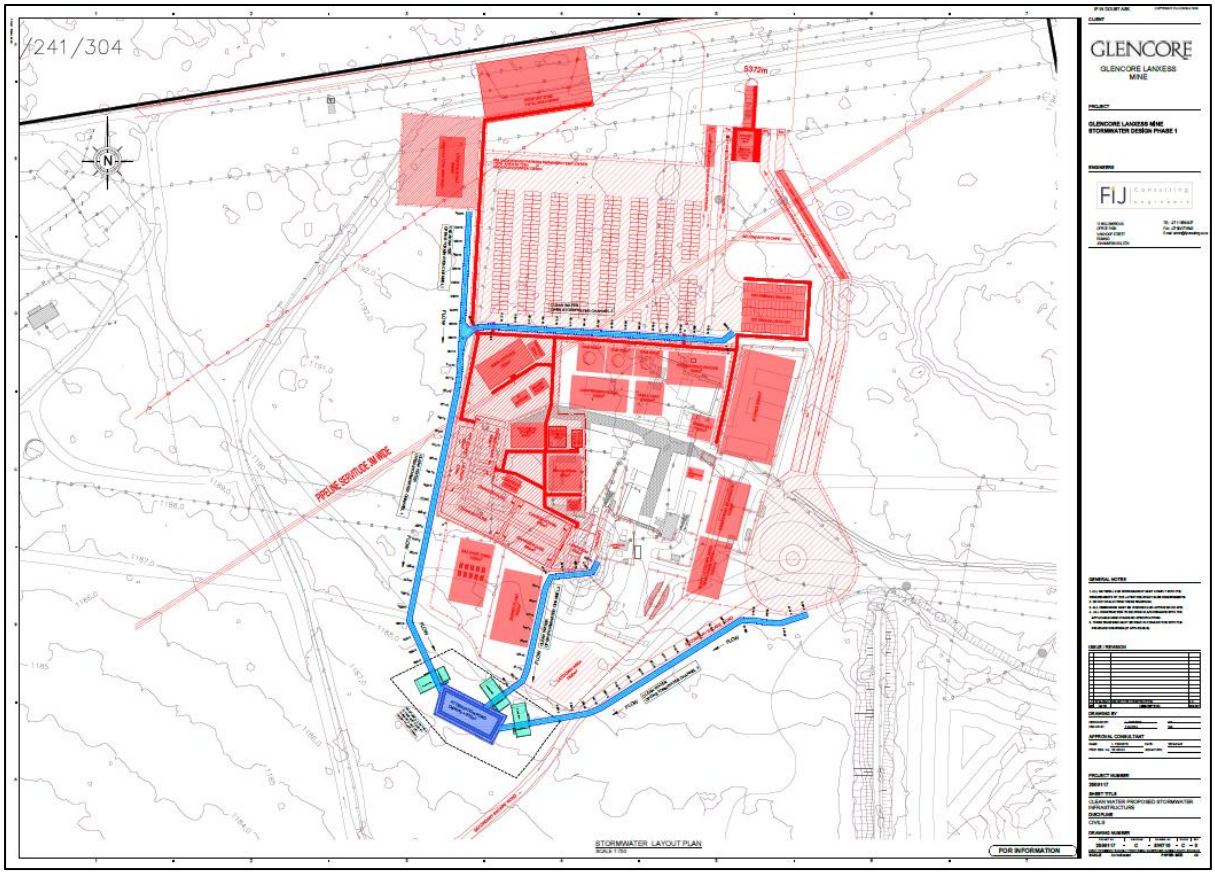


Figure 6-1 The updated layout

The updated layout, within the originally assessed area, remains within already modified and low-sensitivity zones. These adjustments are therefore considered acceptable. The introduction of a constructed wetland system is favourable, offering new habitat heterogeneity, foraging potential, and faunal movement corridors, without negatively affecting the conservation importance or functional integrity of terrestrial habitats.

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8 Appendix Items

8.1 Appendix A: Methods

8.1.1 Desktop Dataset Assessment

8.1.1.1 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:

- Ecosystem Threat Status – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).

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

- Protected areas:

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

    - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that

are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:

  The North-West Department of Rural, Environment, and Agricultural Development (READ), as custodian of the environment in the North West, is the primary implementing agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines (READ, 2015).

- Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and

- Freshwater Ecology:

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

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

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

- 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 8-1 presents the four different categories and the implications for mining within each of these categories.

Table 8-1 Summary of the Mining and Biodiversity Guidelines

Category	Biodiversity priority areas	Risk for mining	Implications for mining
A. Legally protected	• Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)	**Mining prohibited**	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. 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.
B. Highest biodiversity importance	• CE and EN • CBAs (or equivalent areas) from provincial spatial biodiversity plans • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1 km buffer around these FEPAs • Ramsar Sites	**Highest risk for mining**	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. 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. 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

Category	Biodiversity priority areas	Risk for mining	Implications for mining
			authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.
C. High biodiversity importance	• Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone • Estuarine functional zone	**High risk for mining**	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. 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. Mining options may be limited in these areas, and limitations for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.
D. Moderate biodiversity importance	• Ecological support areas • Vulnerable ecosystems • Focus areas for protected area expansion (land-based and offshore protection)	**Moderate risk for mining**	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. Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.

8.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field surveys, 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 8-2 and Table 8-3 respectively.

Table 8-2 Summary of Conservation Importance (CI) criteria

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

Table 8-3 Summary of Functional Integrity (FI) criteria

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

BI can be derived from a simple matrix of CI and FI as provided in Table 8-4.

Table 8-4 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**
Functional Integrity	**Very High**	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 8-5.

Table 8-5 Summary of Receptor Resilience (RR) criteria

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

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 8-6.

Table 8-6 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 8-7.

Table 8-7 Guideline for interpreting Site Ecological Importance in the context of proposed activities

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

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

8.3 Appendix C: Specialist Declaration of Independence

I, Byron Goris, 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.

Byron Goris

Terrestrial Ecologist

The Biodiversity Company

June 2025

I, Andine Erasmus, 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 Erasmus

Ecologist

The Biodiversity Company

June 2025

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

June 2025

8.4 Appendix D: Specialist CVs

Byron Goris

B.Sc Hons in Global Socio-Ecological Systems Change (Cert. Nat. Sci.)

Cell: +27 81 790 8603
Email: byron@thebiodiversitycompany.com
Identity Number: 9904145161083
Date of birth: 14 April 1999

Profile Summary

Environmental work experience across South Africa (2 years).

Theoretical and practical understanding of methodology in both aquatic, terrestrial, and global change ecology.

General training and experience in aspects of conservation, biogeography, and socio-economic sustainability.

Areas of Interest

Ecological systems approaches, global environmental change, socio-economic sustainability, multi/trans-disciplinarity, sports ecology, traditional medicinal plant science.

Key Experience

- Aquatic, Terrestrial, and Wetland Ecological Assessments
- Environmental Field work and basic field methodology
- Business sustainability
- Sports Ecology Research
- Habitat delineation
- Field work and research

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient

Afrikaans – Basic

Qualifications

- BSc (Hons) Animals, Plants, and Environmental Sciences; University of the Witwatersrand
- BSc Biology, University of the Witwatersrand
- Certificated Natural Scientist (170720)

CURRICULUM VITAE: Byron Goris

Andine Erasmus

M.Sc. Zoology

Candidate Natural Scientist 164894

Cell: +27 64 417 6320

Email: andine@thebiodiversitycompany.com

Identity Number: 9504080028089

Date of birth: 8 April 1995

Profile Summary

Work experience in South Africa and Mauritius.

Biodiversity specialist experience in projects related to infrastructure development, renewable energy, mining, and prospecting.

Specific expertise includes terrestrial ecology, including mammals, herpetofauna, avifauna and flora, as well as report writing for environmental compliance, monitoring, management, and rehabilitation.

Areas of Interest

Zoology, Biodiversity, Conservation, Rehabilitation and Marine Biology.

Key Experience

- Terrestrial Ecological Assessments
- Rehabilitation plans and monitoring
- Habitat delineation
- Field work and research
- Environmental Management Programs (EMPr)
- Invasive Species Plans

Country Experience

South Africa

Mauritius

Nationality

South African

Languages

English – Proficient

Afrikaans – Proficient

Qualifications

- MSc Zoology *(Cum Laude)*, University of Pretoria
- BSc (Hons) Zoology, University of Pretoria
- BSc Zoology, University of Pretoria
- Cand Sci Nat (164894)
- Africa Land-Use Training, Grass Identification (2024)

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Angola, Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mauritius, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

CURRICULUM VITAE: Andrew Husted