Basic Assessment for the Elandsfontein Grid Corridor and Associated Infrastructure

Lichtenburg, North West Province

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CLIENT

Elandsfontein Grid (Pty) Ltd

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Report Name	**Basic Assessment for the Elandsfontein Grid Corridor and Associated Infrastructure**
Reference	**Lichtenburg PV Cluster**
Submitted to	Elandsfontein Grid (Pty) Ltd
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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. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

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1 Introduction

1.1 Background

Elandsfontein Grid (Pty) Ltd proposes the construction and operation of grid connection infrastructure for the proposed Elandsfontein PV cluster of two facilities near Lichtenburg in the North West Province (see Figure 1-1). The grid connection infrastructure comprises the following:

- One Eskom collector substation/ switching station;
- One double circuit 132 kV power line from the Elandsfontein collector substation/ switching station to the Watershed Main Transmission Substation (MTS).

Additional associated infrastructure will also be required for the grid connection solution, including access roads, feeder bays (inclusive of line bays, busbars, bussection and protection equipment), a fibre and optical ground wire (OPGW) layout, insulation and assembly structures.

A grid connection corridor of 200 m wide and ~6.6 km long is being assessed to allow for the optimisation of the grid connection and associated infrastructure., The grid connection infrastructure will be developed within the grid connection corridor, which will allow for the avoidance of identified environmental sensitivities.

The Biodiversity Company was appointed to undertake a fauna and flora baseline and impact assessment for the Elandsfontein Grid Connection Infrastructure (Figure 1-2).

This assessment was conducted per the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). This report was compiled to fulfil the requirement for a Terrestrial Biodiversity Assessment as per the 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 NEMA (GNR 320), as gazetted on 20 March 2020. This report is undertaken as supporting information as part of a greater environmental application process and is compliant in terms of the requirements in the above regulations in terms of Terrestrial Biodiversity. In terms of the 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 NEMA, gazetted on 30 October 2020, relating to requirements relating specifically to the Terrestrial Plant and Animal (species) themes, this report includes these requirements.

The following is deduced from the National Web-based Environmental Screening Tool:

- Terrestrial Biodiversity Theme sensitivity ranges from “Low - Very High” for the proposed project due to the project area traversing a CBA 2 area, an Ecological Support Area 1 and a Protected Areas Expansion Strategy;
- Plant Species Theme sensitivity ranges is “Medium” with several sensitive species predicted to be present; and
- Animal Species Theme sensitivity is classified as “Low”.

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

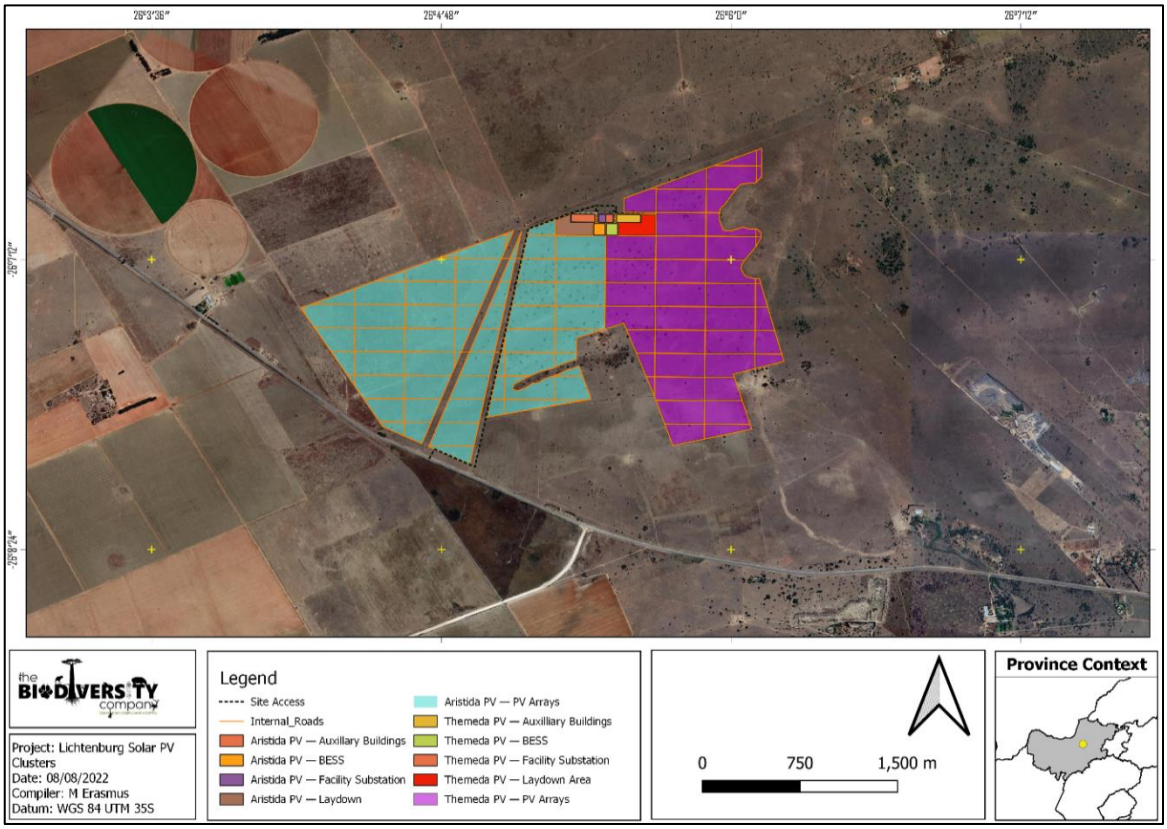

Figure 1-1 Map illustrating the location of the proposed Elandsfontein Cluster

Figure 1-2 Map illustrating the location and specific boundary of the Elandsfontein Grid Connection Infrastructure.

1.2 Scope of Work

The principal aim of the assessment was to provide information to guide the risk of the activity to the flora and fauna communities of the associated ecosystems within the project area. This was achieved through the following:

Desktop assessment to identify the relevant ecologically important geographical features within the project area;

Desktop assessment to compile an expected species list and possible threatened flora and fauna species that occur within the project area;

Field survey to ascertain the species composition of the present flora and fauna community within the project area;

Delineate and map the habitats and their respective sensitivities that occur within the project area; and

Completion of a risk assessment and the prescription of mitigation measures and recommendations for potential risks.

1.3 Key Legislative Requirements

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

Table 1-1 A list of key legislative requirements relevant to biodiversity and conservation in the North West

Region	Legislation
International	Convention on Biological Diversity (CBD, 1993)
	The Convention on Wetlands (RAMSAR Convention, 1971)
	The United Nations Framework Convention on Climate Change (UNFCC,1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
National	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 42946 (January 2020)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 43110 (March 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations
	National Protected Areas Expansion Strategy (NPAES)
	Environmental Conservation Act (Act No. 73 of 1983)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)

	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
Provincial	North-West Biodiversity Sector Plan of 2015 (READ, 2015).
	The North West Biodiversity Management Amendment Bill, 2017
	Bophuthatswana Nature Conservation Act (Act 3 of 1973)
	Transvaal Nature Conservation Ordinance (No. 12 of 1983)

2 Methods

2.1 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to develop digital cartographs and species lists. These datasets and their date of publishing are provided below.

2.1.1 Ecologically Important Landscape Features

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

National Biodiversity Assessment 2018 (Skowno et al, 2019) (NBA)- The purpose of the NBA is to assess the state of South Africa's biodiversity based on the 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 – an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.

Ecosystem Protection Level – an 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. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

Protected areas:

South Africa Protected Areas Database (SAPAD) (DEA, 2021) – The (SAPAD) Database contains spatial data for the conservation of South Africa. It includes spatial and attributes information for both formally protected areas and areas that have less formal protection. SAPAD is updated

continuously 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) (SANBI, 2017) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.

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 (IBAs) (BirdLife South Africa, 2015) – 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

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.

2.2 Desktop Flora Assessment

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and SANBI (2019) was used to identify the vegetation type that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA) database was accessed to compile a list of expected flora species within the project area. The Red List of South African Plants (Raimondo *et al.,* 2009; SANBI, 2020) was utilized to provide the most current national conservation status of flora species.

2.2.1 Desktop Faunal Assessment

The faunal desktop assessment comprised of the following, compiling an expected:

Amphibian list, generated from the IUCN spatial dataset (2017) and AmphibianMap database (Fitzpatrick Institute of African Ornithology, 2021a), using the 2427 quarter degree square;

Reptile list, generated from the IUCN spatial dataset (2017) and ReptileMap database (Fitzpatrick Institute of African Ornithology, 2021b), using the 2427 quarter degree square; and

Mammal list from the IUCN spatial dataset (2017).

2.3 Biodiversity Field Assessment

A single field survey was undertaken in March 2022, which is a wet-season survey, to determine the presence of Species of Conservation Concern (SCC) and for the identification and assessment of habitat features. Effort was made to cover all the different habitat types, within the limits of time and access.

2.3.1 Flora Survey

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

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps. The floristic diversity and search for flora SCC were conducted through timed meanders within representative habitat units delineated during the scoping fieldwork. Emphasis was placed mostly on sensitive habitats overlapping with the project areas.

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

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

2.3.2 Fauna Survey

The faunal assessment within this report pertains to herpetofauna (amphibians and reptiles), avifauna and mammals. The faunal field survey comprised of the following techniques:

Visual and auditory searches - This typically comprised of meandering and using binoculars to view species from a distance without them being disturbed, and listening to species calls;

Active hand-searches - are used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.); and

Utilization of local knowledge.

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

Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);

A Complete Guide to the Snakes of Southern Africa (Marais, 2004);

Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland (Bates et al, 2014);

A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);

Smithers' Mammals of Southern Africa (Apps, 2000); and

A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

2.4 Terrestrial Site Ecological Importance (SEI)

The different habitat types within the project area were delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern 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 on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 2-1 and Table 2-2, respectively.

Table 2-1 Summary of Conservation Importance (CI) criteria

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

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

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

BI can be derived from a simple matrix of CI and FI as provided in Table 2-3.

Table 2-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	**High**	**Medium**	**Low**	**Very low**
Functional Integrity (FI)	**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 2-4.

Table 2-4 Summary of Resource 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.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-5.

Table 2-5 Matrix used to derive Site Ecological Importance (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance (SEI)		Biodiversity Importance (BI)				
		Very high	**High**	**Medium**	**Low**	**Very low**
Receptor Resilience (RR)	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 2-6.

Table 2-6 Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities

Site Ecological Importance (SEI)	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.

2.5 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment area was based on the area provided by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The area was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends, however sufficient to derive meaningful baseline;
- Only a single season survey has been conducted for the respective studies, this would constitute a wet season survey; and
- The GPS used in the assessment has an accuracy of 5 m and consequently, any spatial features may be offset by 5 m.

3 Results & Discussion

3.1 Ecologically Important Landscape Features

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

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

Desktop Information Considered	Relevant/Irrelevant	Section
Renewable Energy Database	Adjacent to project "In Process" with several projects in the area "approved"	3.1.1
Renewable Energy Development Zone	The project area does not traverse any REDZ, the closest REDZ is 59 km from the project area.	-
Strategic Transmission Corridors (EGI)	The project area overlap with the Northern Corridor	3.1.2
Ecosystem Threat Status	Relevant – Located within a Least Concerned ecosystem	3.1.3.1
Ecosystem Protection Level	Relevant: The project area falls in a "Poorly Protected" area.	3.1.3.2
National Threatened Ecosystem	Irrelevant- The project area does not traverse any threatened ecosystem.	-
Protected Areas	Irrelevant –11.5 km from a protected area: SACAD-Marico Biosphere Reserve	-
National Protected Areas Expansion Strategy	The Elandsfontein Grid Corridor partially overlaps with a priority focus area. Furthermore the project area is located about 3 km from the Lichtenburg Game Breeding Centre.	3.1.6
Critical Biodiversity Area	Relevant – The area is classified as terrestrial CBA 2 and ESA 1. Also overlaps with aquatic ESA 1 & 2.according to the NWBSP	3.1.4
Important Bird and Biodiversity Areas	Irrelevant – Does not overlap IBA, is 67 km from the Botsalano Nature Reserve IBA	-
South African Inventory of Inland Aquatic Ecosystems	Relevant – The Elandsfontein Grid Corridor has a wetland that occurs within 500 meters	3.1.5
National Freshwater Priority Area	The NFEPA spatial data indicates that no FEPA wetlands were identified within the project area and the closest river is more than 2 km from the project area (NFEPA 0= None)	3.1.5
Strategic Water Source Areas	Irrelevant – Not located within a SWSA, closest SWSA is more than 200 km away. The project area does overlay the Bo-Molopo Karst Belt groundwater SWSA.	-
Vegetation Type	The project area occurs in the Carletonville Dolomite Grasslands (Gh15) Vulnerable (VU).	3.2.1.1

3.1.1 Renewable Energy Database

The Renewable Energy Database (http://egis.environment.gov.za/), shows that there are other projects in the near vicinity (Figure 3-1). This increases the potential cumulative impact on the habitats in the area.

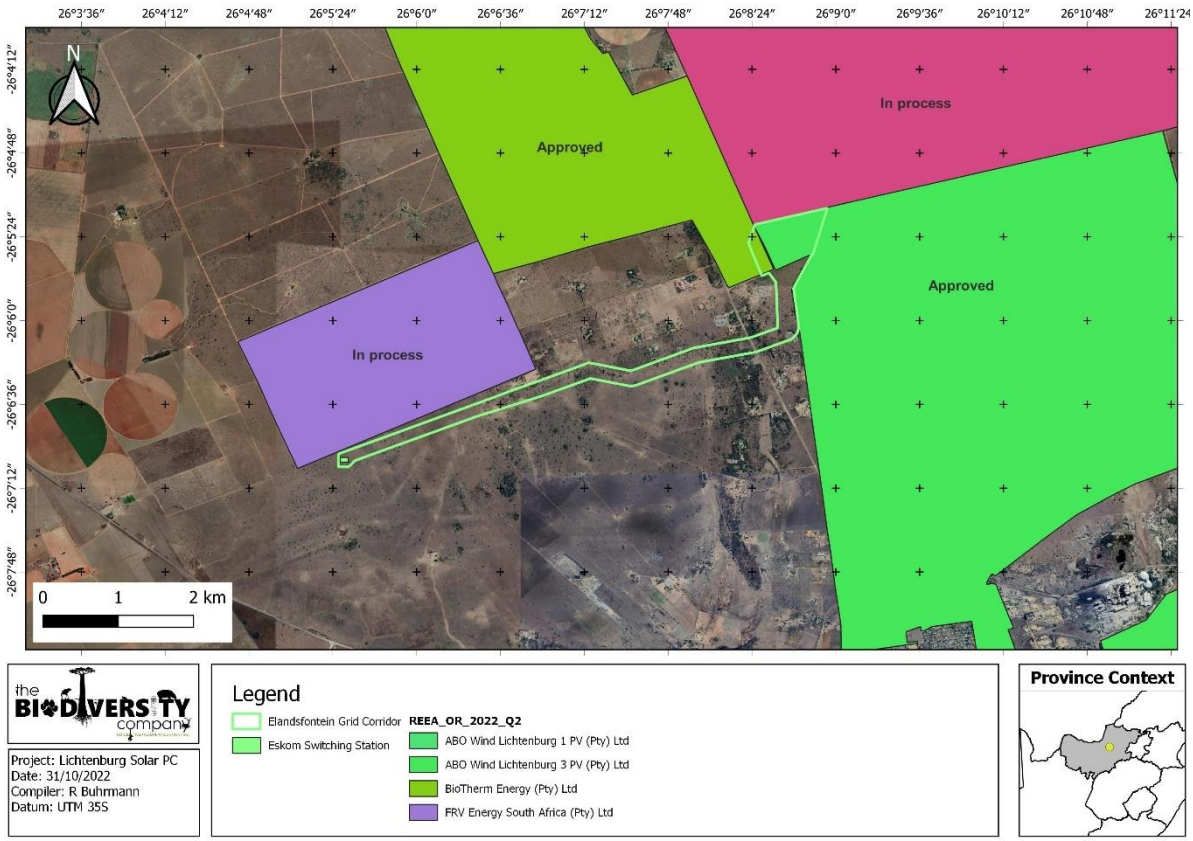

Figure 3-1 The project area in relation to the renewable energy database projects in the area

3.1.2 Strategic Transmission Corridors (EGI)

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

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors. More information on this can be obtained from https://egis.environment.gov.za/egi. Figure 3-2 shows project area overlaps with the Northern Corridor.

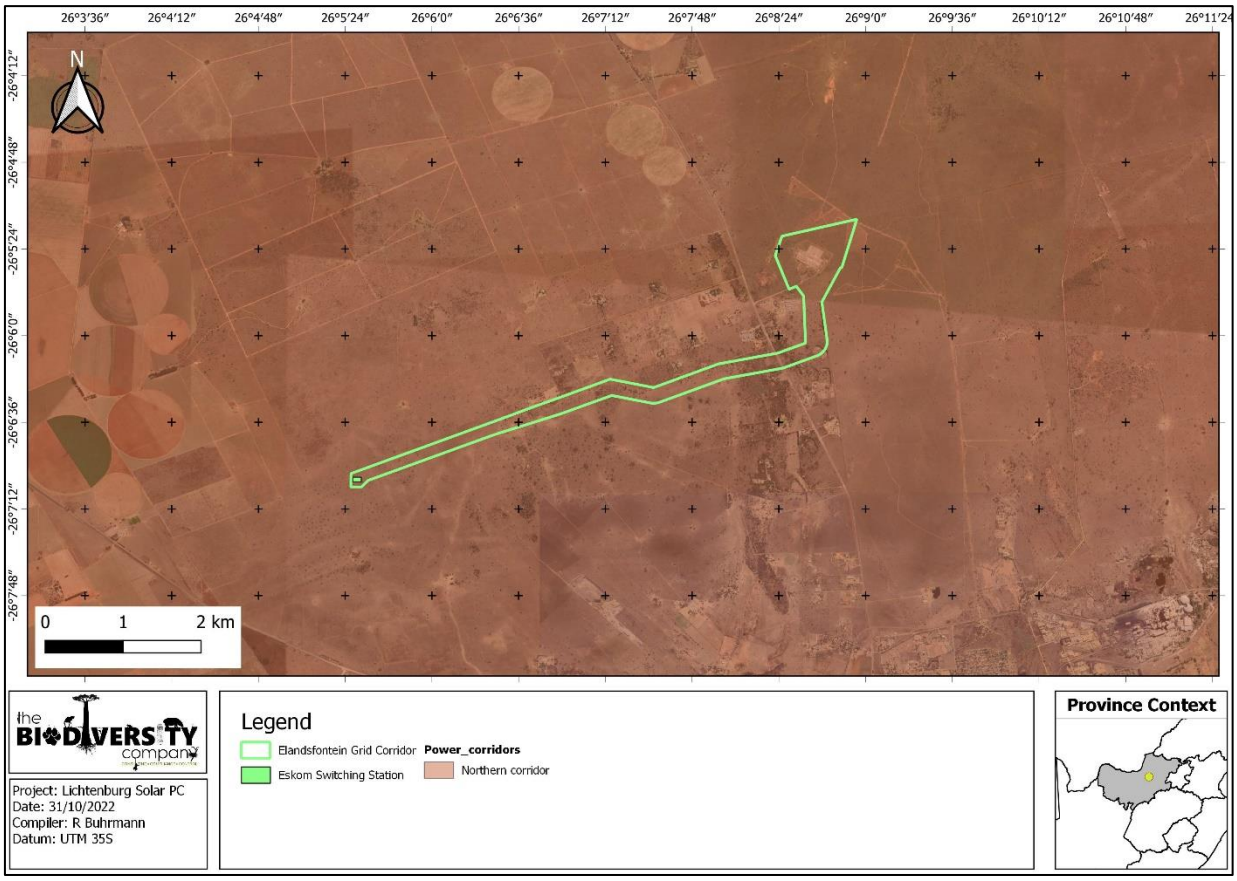

Figure 3-2 The project area in relation to the Northern Corridor

3.1.3 The National Biodiversity Assessment 2018

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over three years (Skowno *et al*., 2019).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors (Skowno *et al*., 2019).

The two headline indicators assessed in the NBA are *ecosystem threat status* and *ecosystem protection level* (Skowno *et al*., 2019). Government Notice No. 320[1] and Government Notice No. 1150[2] require reporting on the description of terrestrial biodiversity and ecosystems on the preferred site as per section 2.3.5 of the ''Theme-Specific Requirements". These procedures are for the assessment and minimum criteria for reporting on identified environmental themes when applying for environmental authorisation.

3.1.3.1 Ecosystem Threat Status

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

[1] Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020

[2] Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species as published in Government Gazette 43855 dated 30 October 2020

According to the spatial dataset the proposed development areas overlaps with LC ecosystem (Figure 3-3).

Figure 3-3 Map illustrating the ecosystem threat status associated with the assessment area

3.1.3.2 Ecosystem Protection Level

Indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed development areas overlap with PP ecosystems (Figure 3-4).

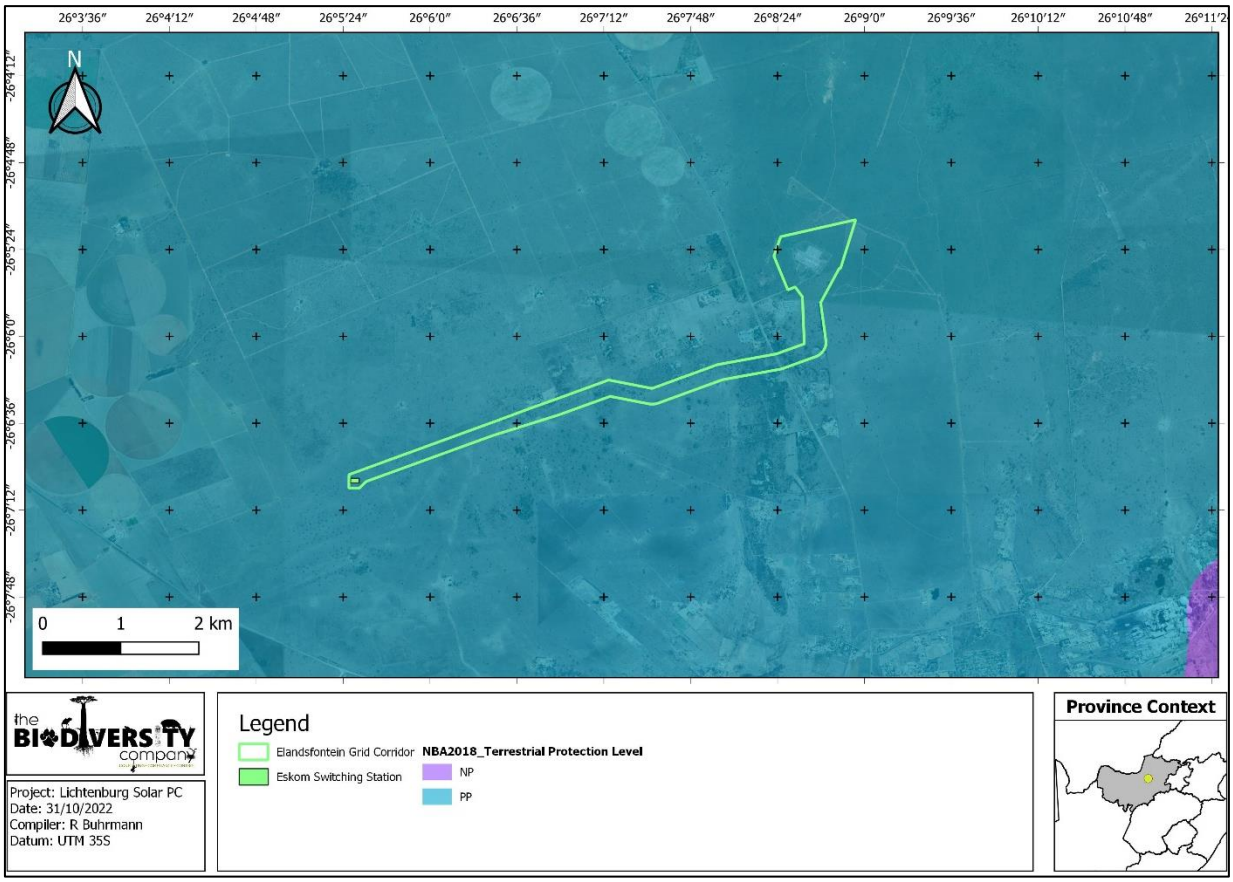

Figure 3-4 Map illustrating the ecosystem protection level associated with assessment area

3.1.4 Biodiversity Sector Plan

Conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017). The Elandsfontein Grid Corridor overlaps almost entirely with a CBA2 area, marginally with an ESA1 area and a small portion is unclassified (Figure 3-5) (Figure 3-6). According to the BSP the terrestrial CBA2 and aquatic ESA1 designations for the area refers to a corridor (T7) and dolomite recharge areas (W5) respectively.

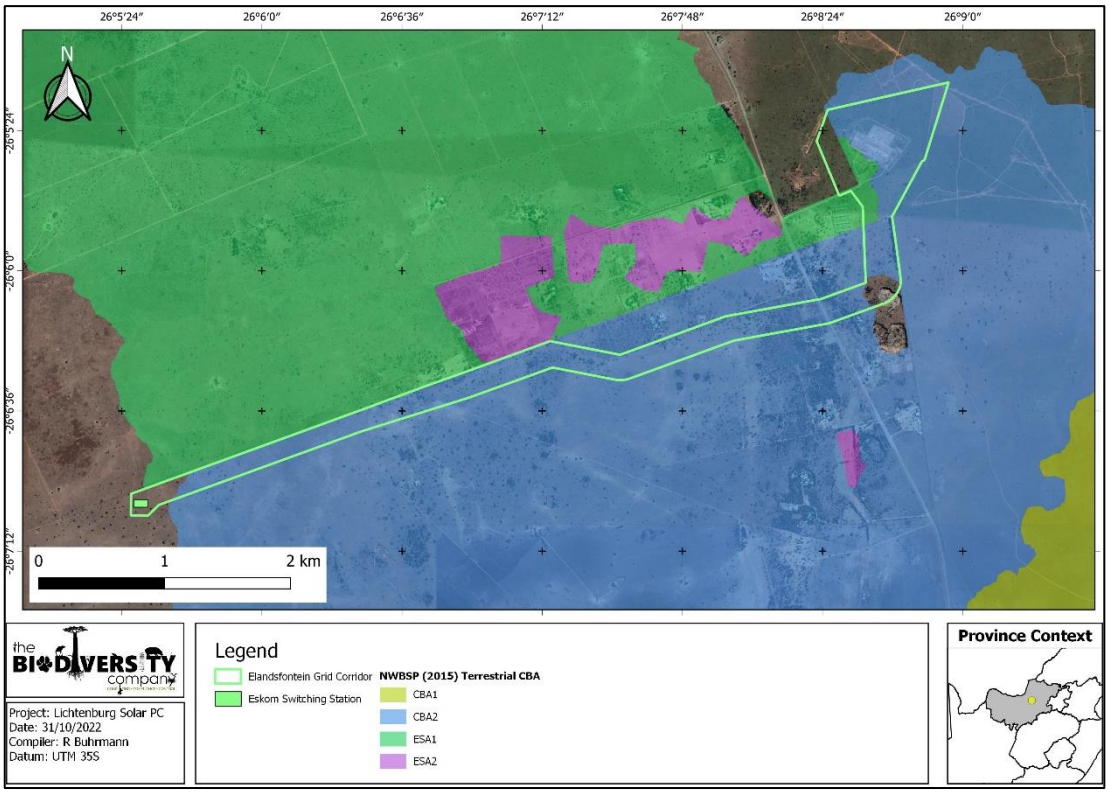

Figure 3-5 Map illustrating the terrestrial Critical Biodiversity Areas associated with the assessment area

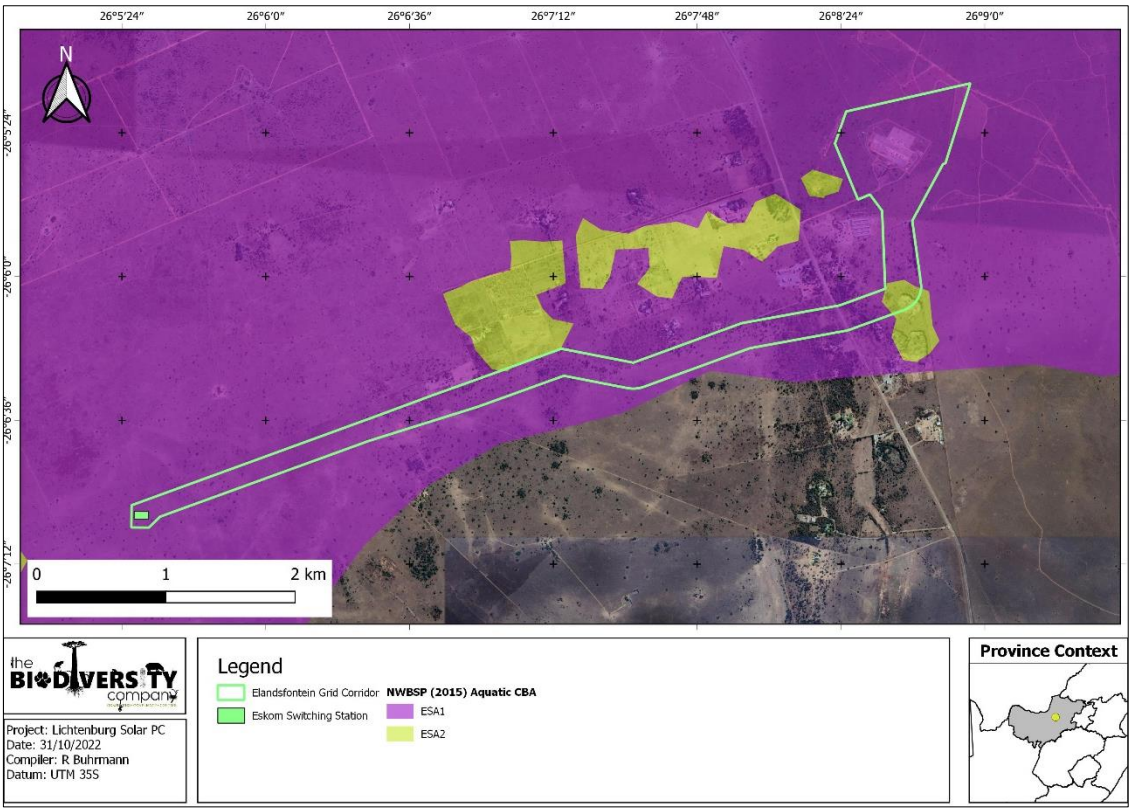

Figure 3-6 Map illustrating the aquatic Ecological Support Areas associated with the assessment area

3.1.5 South African Inventory of Inland Aquatic Ecosystems

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018. The two headline indicators assessed in the NBA are *ecosystem threat status* and *ecosystem protection level* (Skowno *et al*., 2019). According to the SAIIAE dataset some potential "unclassified" resources are located within the 500 m regulation area[3], but not within the areas proposed for development (Figure 3-7). The regulation areas have been delineated (separately) for each facility. The Elandsfontein Grid Corridor area is nearest to a wetland, but in excess of 250 m from the resource.

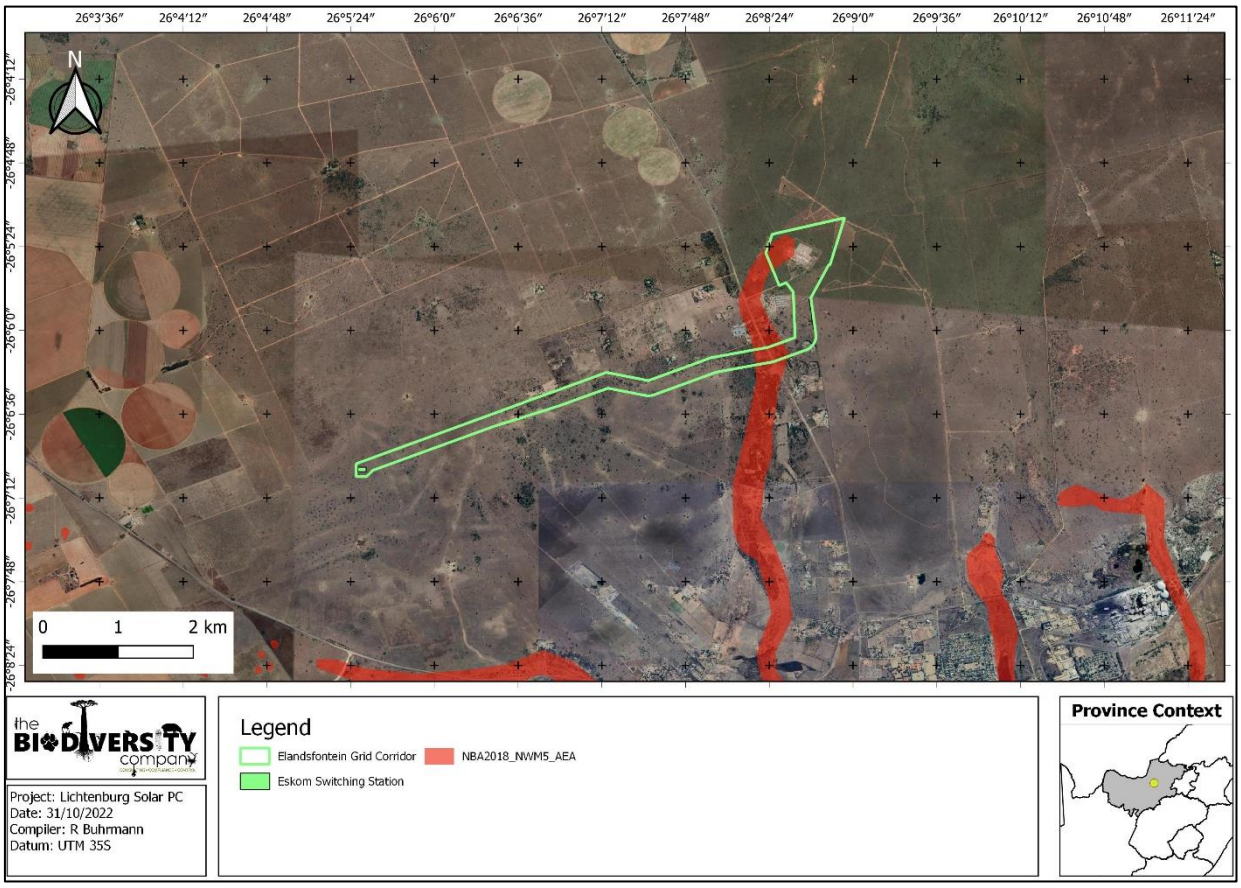

Figure 3-7 Map illustrating wetlands associated with the project area (NBA, 2018 and NFEPA wetland, 2011)

3.1.5.1 Ecosystem Threat Status

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Skowno *et al*., 2019).

Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno *et al*., 2019). The project area was superimposed on the aquatic ecosystem threat status (Figure 3-8). The Elandsfontein Grid Corridor area is more than 250 m from the CR river.

[3] The 500 m regulated area refers to a radius for Section 21 (c) and (i) of the NWA.

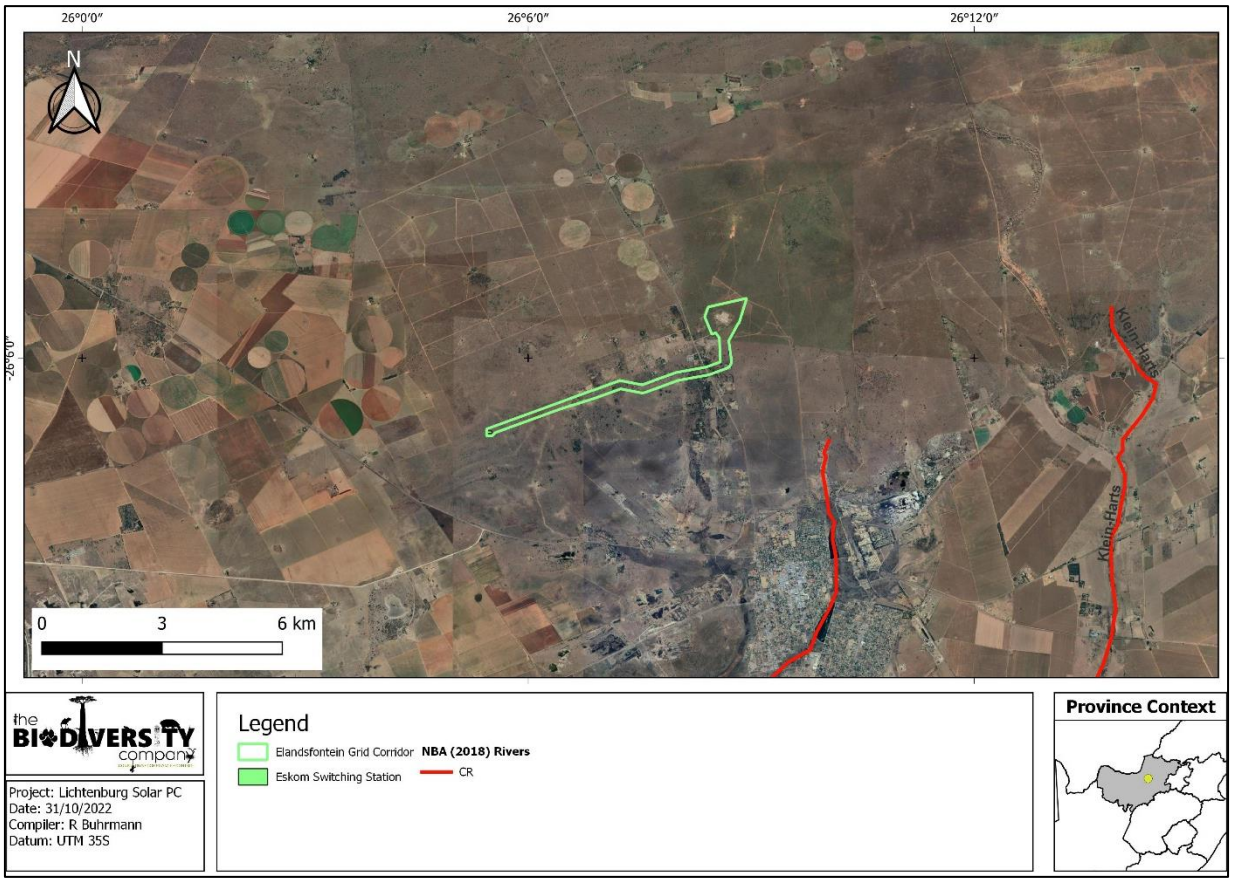

Figure 3-8 The project area showing the regional ecosystem threat status of the associated aquatic ecosystems (NBA, 2018)

3.1.5.2 Ecosystem Protection Level

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al*., 2019).

The project area was superimposed on the ecosystem protection level map to assess the protection status of aquatic ecosystems associated with the development (Figure 3-9). Based on Figure 3-9 the aquatic ecosystems associated with the project area are rated as *poorly protected / not protected.*

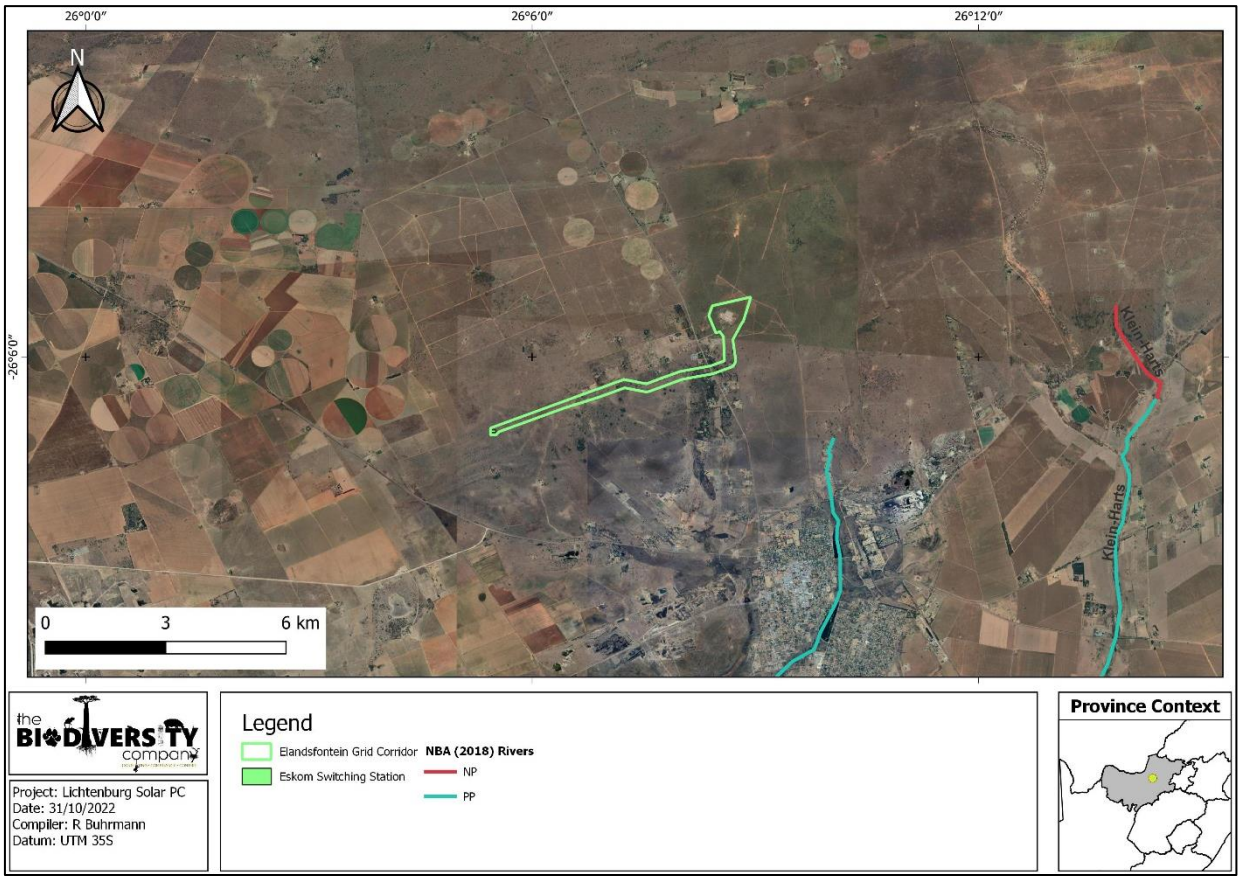

Figure 3-9 The project area showing the regional level of protection of aquatic ecosystems (NBA, 2018)

3.1.6 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2017 (NPAES) focus areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine-scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2017). The Elandsfontein Grid Corridor completely overlaps with a priority focus area (Figure 3-10). Furthermore the project area also overlaps with the Lichtenburg Game Breeding Centre. The breeding centre is operated by the National Zoological Gardens of South Africa and is there mainly to further the breeding programmes of endangered species already in place by the National Zoo, and to supplement the populations of local and international zoos (Figure 3-10)

Figure 3-10 The project area in relation to the National Protected Areas Expansion Strategy areas

3.2 Flora Assessment

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

3.2.1 Vegetation Type

The project area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

a) Seasonal precipitation; and

b) The minimum temperatures in winter (Mucina & Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

On a fine-scale vegetation type, the project area overlaps with the Carletonville Dolomite Grassland vegetation type (Figure 3-11).

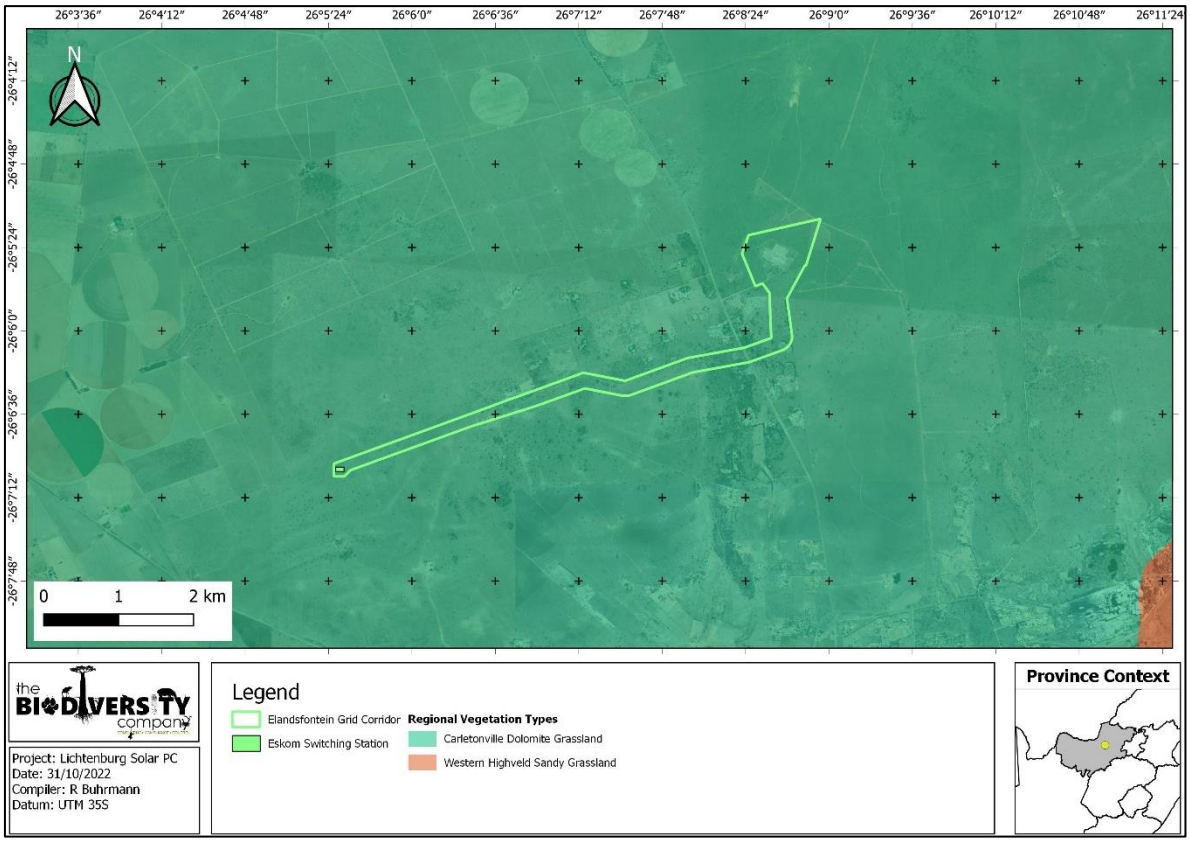

Figure 3-11 Map illustrating the vegetation type associated with the assessment area

3.2.1.1 Carletonville Dolomite Grassland

This vegetation type occurs on slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species (Mucina & Rutherford, 2006). This vegetation type occurs in the North-West, Gauteng and marginally into the Free State Province: In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

Important Plant Taxa

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

The following species are important in the **Carletonville Dolomite Grassland** vegetation type:

Graminoids: *Aristida congesta, Brachiaria serrata, Cynodon dactylon, Digitaria tricholaenoides, Diheteropogon amplectens, Eragrostis chloromelas, E. racemosa, Heteropogon contortus, Loudetia simplex, Schizachyrium sanguineum, Setaria sphacelata, Themeda triandra, Alloteropsis semialata subsp. eckloniana, Andropogon schirensis, Aristida canescens, A. diffusa, Bewsia biflora, Bulbostylis burchellii, Cymbopogon caesius, C. pospischilii, Elionurus muticus, Eragrostis curvula, E. gummiflua, E. plana, Eustachys paspaloides, Hyparrhenia hirta, Melinis nerviglumis, M. repens subsp. repens, Monocymbium ceresiiforme, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides, Tristachya leucothrix, T. rehmannii.*

Herbs: *Acalypha angustata, Barleria macrostegia, Chamaecrista mimosoides, Chamaesyce inaequilatera, Crabbea angustifolia, Dianthus mooiensis, Dicoma anomala, Helichrysum caespititium, H. miconiifolium, H. nudifolium var. nudifolium, Ipomoea ommaneyi, Justicia anagalloides, Kohautia*

amatymbica, Kyphocarpa angustifolia, Ophrestia oblongifolia, Pollichia campestris, Senecio coronatus, Vernonia oligocephala.

Geophytic Herbs: *Boophone disticha, Habenaria mossii.*

Low Shrubs*: Anthospermum rigidum subsp. pumilum, Indigofera comosa, Pygmaeothamnus zeyheri var. rogersii, Searsia magalismontana, Tylosema esculentum, Ziziphus zeyheriana.*

Geoxylic Suffrutices: *Elephantorrhiza elephantina, Parinari capensis subsp. capensis*.

Conservation Status of the Vegetation Type

According to Mucina and Rutherford (2006), this vegetation type is classified as Vulnerable (VU). The national target for conservation protection for both these vegetation types is 24%, but only a small extent is conserved in statutory (Sterkfontein Caves — part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams.

3.2.2 Expected Flora Species

The Plants of Southern Africa (POSA) database indicates that 282 species of indigenous plants are expected to occur within the project area (Appendix A). No SCC based on their conservation status could be expected to occur within the project, however the threatened *Vachellia erioloba* (Camel thorn) is expected. This is a nationally protected tree (Table 3-2).

Table 3-2 Threatened flora species that may occur within the project area.

Family	Taxon	Author	IUCN	Ecology
Fabaceae	*Vachellia erioloba*	(E.Mey.) P.J.H.Hurter	LC	Indigenous

3.2.3 Faunal Assessment

3.2.3.1 Amphibians

Based on the IUCN Red List Spatial Data and AmphibianMap, 19 amphibian species are expected to occur within the area (Appendix B). One (1) are regarded as threatened (Table 3-3).

Table 3-3 Threatened amphibian species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Pyxicephalus adspersus	Giant Bullfrog	NT	LC	High

Giant Bull Frog (*Pyxicephalus adspersus*) is a species of conservation concern that will possibly occur in the project area, especially in the area with the wetlands. The Giant Bull Frog is listed as near threatened on a regional scale. It is a species of drier savannas where it is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rains, and breed in shallow, temporary waters in pools, pans and ditches (IUCN, 2017).

3.2.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 42 reptile species are expected to occur within the area (Appendix C). None are regarded as SCC

3.2.3.3 Mammals

The IUCN Red List Spatial Data lists 68 mammal species that could be expected to occur within the area (Appendix D). This list includes large mammal species that are normally restricted to protected areas, as these were observed during the screening assessment. Ten (10) (smaller non protected area restricted

species) of these expected species are regarded as threatened (Table 3-4), five of these have a low likelihood of occurrence based on the lack of suitable habitat and food sources in the project area. Descriptions of species with a moderate likelihood of occurrence are discussed below.

Table 3-4 Threatened mammal species that are expected to occur within the project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Aonyx capensis	Cape Clawless Otter	NT	NT	Low
Atelerix frontalis	South Africa Hedgehog	NT	LC	Moderate
Crocidura mariquensis	Swamp Musk Shrew	NT	LC	Low
Felis nigripes	Black-footed Cat	VU	VU	Moderate
Hydrictis maculicollis	Spotted-necked Otter	VU	NT	Low
Mystromys albicaudatus	White-tailed Rat	VU	EN	Low
Panthera pardus	Leopard	VU	VU	Low
Parahyaena brunnea	Brown Hyaena	NT	NT	Moderate
Poecilogale albinucha	African Striped Weasel	NT	LC	Low
Smutsia temminckii	Temminck's Ground Pangolin	VU	VU	Low

Atelerix frontalis (South African Hedgehog) has a tolerance to a degree for habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), A. frontalis populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Suitable grasslands occur in the project area, although somewhat disturbed, that can function as habitat for this species, as such the likelihood of occurrence is rated as moderate.

Felis nigripes (Black-footed cat) is endemic to the arid regions of southern Africa. This species is naturally rare, has cryptic colouring, is small in size and is nocturnal. These factors have contributed to a lack of information on this species. The highest densities of this species have been recorded in the more arid Karoo region of South Africa. The habitat in the project area can be considered to be somewhat suitable for the species and the likelihood of occurrence is therefore rated as moderate.

Parahyaena brunnea (Brown Hyaena) is endemic to southern Africa. This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna. Given its known ability to persist outside of formally protected areas the likelihood of occurrence of this species in the project area is moderate to good. The presence of moderate to large herbivores on adjacent farms increases the likelihood of occurrence of this species.

4 Field Assessment

A single field survey was undertaken in March 2022, which is a wet-season survey, to determine the presence of Species of Conservation Concern (SCC) and for the identification and assessment of habitat features. Effort was made to cover all the different habitat types, within the limits of time and access.

4.1 Floral Assessment

4.1.1 Indigenous Flora

The vegetation assessment was conducted throughout the extent of the project area. A total of 64 trees, shrubs, herbaceous and graminoid plant species were recorded in the project area during the field assessment (Table 4-1). Plants listed as Category 1 alien or invasive species under the NEMBA appear in green text.

The list of plant species recorded is by no means comprehensive, a survey conducted under guard may likely yield up to 40% additional flora species for the project area. However, floristic analysis conducted to date is regarded as a sound representation of the local flora for the project area.

Table 4-1 Trees, shrubs and herbaceous plant species recorded in the project area

Scientific Name	Common Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
Albuca setosa	Soldier-in-the-box	LC	Indigenous, Not Endemic	
Aloe greatheadii var. davyana	Spotted Aloe	LC	Indigenous, Not Endemic	
Argemone mexicana	Mexican Prickly Poppy	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Aristida bipartita	Rolling grass	LC	Indigenous, Not Endemic	
Aristida congesta subsp barbicollis	Spreading Three-awn	LC	Indigenous, Not Endemic	
Aristids congesta subsps congesta	Tassel Three-awn	LC	Indigenous, Not Endemic	
Asparagus laricinus Burch.	Cluster-leaf asparagus	LC	Indigenous, Not Endemic	
Berkheya onopordifolia	Mohato	LC	Indigenous, Not Endemic	
Bidens pilosa	Blackjack	NE	Not Indigenous; Naturalized exotic weed	
Boophone disticha	Poison Bulb	LC	Indigenous, Not Endemic	
Bothriochloa insculpta	Pinhole Grass	LC	Indigenous, Not Endemic	
Buddleja saligna	Olive Sagewood	LC	Indigenous, Not Endemic	
Bulbine abyssinica	Bushy Bulbine	LC	Indigenous, Not Endemic	
Celtis africana	White Stinkwood	LC	Indigenous, Not Endemic	
Celtis africana	White Stinkwood, Witstinkhout	LC	Indigenous, Not Endemic	
Chloris gayana	Rhodes grass	LC	Indigenous, Not Endemic	
Conyza bonariensis	Flax-leaf Fleabane	NE	Not Indigenous; Naturalized exotic weed	Naturalized exotic weed
Cynodon dactylon	Couch gras	LC	Indigenous, Not Endemic	
Datura ferox	Large Thorn Apple	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Dichrostachys cinerea subsp. nyassana	Sickle Bush, Kalahari Christmas Tree	LC	Indigenous, Not Endemic	
Digitaria eriantha	Finger Grass	LC	Indigenous, Not Endemic	
Eragrostis chloromelas	Blue Love Grass	LC	Indigenous, Not Endemic	
Eragrostis curvula	Weeping Love Grass	LC	Indigenous, Not Endemic	

Eragrostis lehmanniana var. lehmanniana	Eastern Province Vlei Grass, Land-Grass, Lehman Love Grass	LC	Indigenous, Not Endemic	
Eragrostis superba	Wilman Lovegrass	LC	Indigenous, Not Endemic	
Flaveria bidentis	Speedyweed	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Gomphocarpus tomentosus Burch. subsp. Tomentosus	Woolly Milkweed	LC	Indigenous, Not Endemic	
Grass Loudetia simplex	Common Russet	LC	Indigenous, Not Endemic	
Grewia flava	Velvet Raisin	LC	Indigenous, Not Endemic	
Grewia flava	Wild Raisin	LC	Indigenous, Not Endemic	
Grewia monticola	Cross Berry	LC	Indigenous, Not Endemic	
Grewia monticola	Grey Raisin	LC	Indigenous, Not Endemic	
Helichrysum aureum	Bright Yellow Everlasting	LC	Indigenous, Not Endemic	
Heteropogon contortus	Tanglehead, Spear Grass	LC	Indigenous, Not Endemic	
Hyparrhenia hirta	Common Thatching Grass, Blougras (a)	LC	Indigenous, Not Endemic	
Hypoxis hemerocallidea	Star-flower	LC	Indigenous, Not Endemic	
Hypoxis rigidula Baker var. pilosissima Baker	Hypoxis	LC	Indigenous, Not Endemic	
Imperata cylindrica	Cotton-wool Grass	LC	Indigenous, Not Endemic	
Ipomoea papilio Hallier f.	Morning Glory	LC	Indigenous, Not Endemic	
Lantana camara	Lantana	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Ledebouria revoluta	Common African Hyacinth	LC	Indigenous, Not Endemic	
Loudetia simplex	Russet Grass	LC	Indigenous, Not Endemic	
Melia azedarach	Chinaberry	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Melinis repens	Natal Red Top	LC	Indigenous, Not Endemic	
Ozoroa paniculosa	Bushveld Ozoroa	LC	Indigenous, Not Endemic	
Ozoroa paniculosa	Common Resin Tree	LC	Indigenous, Not Endemic	
Panicum maximum	Guinea Grass	LC	Indigenous, Not Endemic	
Panicum natalense	Natal Buffalo Grass	LC	Indigenous, Not Endemic	
Pogonarthria squarrosa	Herringbone Grass	LC	Indigenous, Not Endemic	

Polygala hottentotta	Small Purple Broom	LC	Indigenous, Not Endemic	
Schkuhria pinnata	Dwarf Marigold	NE	Not Indigenous; Naturalized exotic weed	
Searsia lancea	Karee	LC	Indigenous, Not Endemic	
Senegalia mellifera (Vahl) Seigel & Ebinger subsp. detinens	Black Thorn	LC	Indigenous, Not Endemic	
Sesbania bispinosa (Jacq.) W.Wight var. bispinosa	Spiny Sesbania	NE	Indigenous, Not Endemic	
Setaria sphacelata var. sphacelata	Common bristle grass; Golden Timothy Grass	LC	Indigenous, Not Endemic	
Solanum aculeatissimum	Love-apple Nightshade	NE	Not Indigenous; Naturalized exotic weed	
Solanum sisymbriifolium	Wild Tomato, Dense; Thorned Bitter Apple	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Sporobolus africanus	Ratstail Dropseed; Rush Grass	LC	Not Endemic	
Tagetes minuta	Khaki Bush, Khaki Weed, African Marigold	NE	Not Indigenous; Naturalized exotic weed	
Themeda triandra	Angle Grass	LC	Indigenous, Not Endemic	
Verbena Brasiliensis	Brazilian Vervain	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Ximenia americana	Blue Sour Plum	LC	Indigenous, Not Endemic	
Zinnia peruviana	Peruvian zinnia		Not Indigenous; Naturalized exotic weed	
Ziziphus zeyheriana	Dwarf Buffalothorn	LC	Indigenous, Not Endemic	

Figure 4-1 ***A collage of images illustrating some of the species recorded in the project area, A) Ziziphus mucronata, B) Ledebouria revoluta, C) Berkheya onopordifolia, D) Zinnia peruviana, E) Hypoxis hemerocallidea.***

4.1.2 Invasive Alien Plants

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

NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182 on, 24th of February 2021. The legislation calls for the removal and/or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

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

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

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

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

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

Notify the competent authority in writing

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

- Section 75 of the NEMBA;
- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the NEMBA.

Eight (8) IAP species were recorded within the project area. These species are listed under the Alien and Invasive Species List 2021, Government Gazette No. 44182 as Category 1b. Category 1b species must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA, as stated above.

Table 4-2 IAP species recorded in the project area

Scientific Name	Common Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
Argemone mexicana	Mexican Prickly Poppy	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Conyza bonariensis	Flax-leaf Fleabane	NE	Not Indigenous; Naturalized exotic weed	Naturalized exotic weed
Datura ferox	Large Thorn Apple	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Flaveria bidentis	Speedyweed	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Lantana camara	Lantana	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Melia azedarach	Chinaberry	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Solanum sisymbriifolium	Wild Tomato, Dense; Thorned Bitter Apple	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Verbena brasiliensis	Brazilian Vervain	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.

4.1.3 Ethnobotanical and Red Data Listed Plant Species

Ethnobotany is a branch of botany that places focus on the use of plants for medicines and other practical purposes. The use of native plants for ethnobotanical uses can be detrimental to populations that are overexploited. According to the Department of Agriculture, Forestry and Fisheries (DAFF) medicinal plants are those used in herbalism and thought to have certain extractable/compounds in their leaves, stems, flowers and fruit and used as inputs in the pharmaceutical, nutraceutical, insecticide and other chemical industries (DAFF, 2013). It is estimated that more than 750 plant species in South Africa are actively utilised for their medicinal attributes (Van Wyk and Prinsloo, 2018). Plant species of medicinal importance that were recorded on site are listed in Table 4-3.

Species of conservation concern are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), as protected trees by the National Forests Act (NFA) (Act No. 84 of 1998), or as Protected Trees and Plants by The NEMBA Threatened or Protected Species Regulations 152 of 2007 ("TOPS Regulations") and the Lists of Critically Endangered, Endangered, Vulnerable and Protected Species (TOPS Lists) and the provincial nature conservation legislation, in the context of this report the North West Biodiversity Management Act (Act No. 4 of 2016) (NWBMA). No species of conservation concern nationally or under the NWBMA (2016) or the Transvaal Nature Conservation Ordinance (Ordinance 12 of 1983) or globally were recorded during the infield assessment.

Table 4-3 Plant species of ethnobotanical importance that were recorded in the project area

Scientific Name	Common Name	Medicinal uses
Datura ferox	Large Thorn Apple	Datura plant as a whole has several characteristic properties including anti-spasmodic, analgesic, sleep-inducing, expectorant, sedative, hypnotic, intoxicant, uterine stimulant and bronchodilator properties
Dichrostachys cinerea subsp. africana	Small-leaved Sickle Bush	The bark, roots, and leaves are used in the treatment of dysentery, headaches, toothaches, elephantiasis, snakebites and scorpion stings, leprosy, syphilis, coughs, epilepsy, gonorrhoea, boils, and sore eyes. It can also be used as a contraceptive for women, as a laxative, and for massage of fractures
Tagetes minuta	Khaki Bush	The repellent properties of essential oil have been known for a long time and were found to be effective in preventing sheep from becoming infected with blow-fly larvae. Many gardeners use warm water extracts of the fresh plant to keep roses and other garden plants free from insects and fungal diseases. The essential oil is used in perfumery and as a flavourant in food, beverages and tobacco.
Ziziphus mucronata	Buffalo thorn	Warm bark infusions (sometimes together with roots or leaves added) are used as expectorants (also as emetics) in cough and chest problems, while root infusions are a popular remedy for diarrhoea and dysentery. Decoctions of roots and leaves (or chewed leaves) are applied externally to boils, sores and glandular swellings, to promote healing and as an analgesic.

4.2 Faunal Assessment

Herpetofauna and mammal observations and recordings are addressed in this section.

4.2.1 Amphibians and Reptiles

Five common reptile species (Table 4-4), and no SCC were recorded thus herpetofauna diversity was considered low. The lack of species was likely due to the combination of the disturbed nature of the site and the inherently secretive nature of reptile species.

Table 4-4 Summary of herpetofauna species recorded within the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Cacosternum boettgeri	Boettger's Caco	LC	LC
Pseudaspis cana	Mole Snake	LC	Unlisted
Pyxicephalus edulis	African Bullfrog	LC	LC
Trachylepis capensis	Cape Skink	LC	Unlisted
Trachylepis varia	Variable Skink	LC	LC

4.2.2 Mammals

Three mammal species were observed during the survey based on either direct observation or the presence of visual tracks and signs, these are listed in Table 4-5. Cape ground squirrels (*Xerus inauris*) have been recorded to be sharing the burrows with the yellow mongoose, luckily all species were recorded in high numbers through visual recording of the species.

Table 4-5 Summary of mammal species recorded within the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Cynictis penicillata	Yellow Mongoose	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Xerus inauris	Cape Ground Squirrel	LC	LC

Figure 4-2 Some of the small mammal species recorded in the project area: A) Yellow Mongoose (Cynictis penicillata), and B) Cape ground squirrel (Xerus inauris)

4.3 Habitat Assessment and Site Ecological Importance

4.3.1 Habitat Assessment

Figure 4-3 includes habitats within the boundary as well as habitats in adjacent areas, only the habitats described in the text below are specific to the boundary.

Three vegetation units or rather habitat types were recorded within the Elandsfontein Grid Corridor project area, these include the following (Table 4-6 and Figure 4-3):

Open Savanna Grassland

The Open Savanna Grassland represents grasslands with a few scattered trees that are typical of savanna landscapes i.e. *Celtis africana, Grewia flava*, *Gymnosporia sp* and *Vachellia sp* an open tree canopy (i.e., scattered trees) above a continuous tall grass understory (the vegetation layer between the forest canopy and the ground). In this particular habitat the Grasses formed the dominant layer, however forbs where also quite prominent and relive high in diversity. Higher shrubs and trees were typically clustered together with such clumps scattered throughout the grassland layer. The ridge habitat which is considered outcrops and rock habitats that support a flora assemblage that is unique and diverse within the local landscape, occurs within this habitat. The habitat is used by faunal species as fine-scale habitats.

Wetlands (Depression)

A wetland and associated with non-perennial drainage lines occur to the south of the project site. The unit is subjected to high grazing pressure and there are signs of trampling. It is dominated by weedy and pioneer species, including *Cynodon dactylon*, *Gomphocarpus tomentosus*, *Bidens pilosa*, *Tagetes minuta* and a few grassland species such as *Eragrostis curvula* and *Hyparrhenia hirta* as well as a patch of *Imperata cylindrica*. In addition to the wetland there are artificial dams or rather reservoirs in the project area. The wetlands (and riparian zone) habitat unit is considered to be of very high ecological sensitivity due to the contribution of the various wetland features to faunal migratory connectivity, ecoservices provision and the unique habitat provided for faunal and floral species.

Although within the project area, the project footprint won't encroach on this habitat.

Transformed

The Transformed habitat unit which is the smallest of the three units represents areas where vegetation cover has been significantly impacted by current agricultural activities as well as through infrastructure placement such as artificial dams/reservoirs as well as access roads. From an ecological perspective the habitat has a low conservation value.

Degraded Wooded Grassland

The Degraded Wooded Grassland represents areas that are similar to the Wooded Grassland, however the distinguishing factor is the fact that these habitats are not entirely transformed but in a constant disturbed state. They cannot recover to a more natural state due to ongoing disturbances and impacts received from AIP encroachment, active agricultural practices and past agricultural practices. The vegetation that has slightly denser vegetation as opposed to scattered trees within a grassland dominated landscape. The trees recorded also typical of savanna landscapes i.e. *Celtis africana, Grewia flava, Gymnosporia sp and Vachellia sp* an open tree canopy, however the grass understory (the vegetation layer between the forest canopy and the ground) is dominated by short grasslands as well as a few succulents and geophytic species, such as *Aloe greatheadii* var. *davyana* and *Boophone disticha.* It must be noted that the savanna/wooded grassland types are variations of the Carletonville Dolomite Grassland vegetation type that is found in the project area.

Wooded Grassland

This habitat type has a similar species composition to that of the degraded Wooded Grassland with the exception of the AIP species and the increaser grass species found there due to disturbance. The Wooded grassland does have some patches where it is exposed to edge effects from the nearby disturbances. Overall this habitat has a moderate sensitivity.

Figure 4-3 Habitats identified in the project area

4.3.2 Screening Sensitivity

The following are desktop screening sensitivities associated with the Elandsfontein Grid Corridor area and the other areas within the cluster:

- Terrestrial Biodiversity Theme sensitivity ranges from “Low - Very High” for the proposed project due to the project area traversing a CBA 2 area, an ESA 1 and a Protected Areas Expansion Strategy;
- Plant Species Theme sensitivity ranges is “Medium” with several sensitive species predicted to be present; and
- Animal Species Theme sensitivity is classified as “Low”.

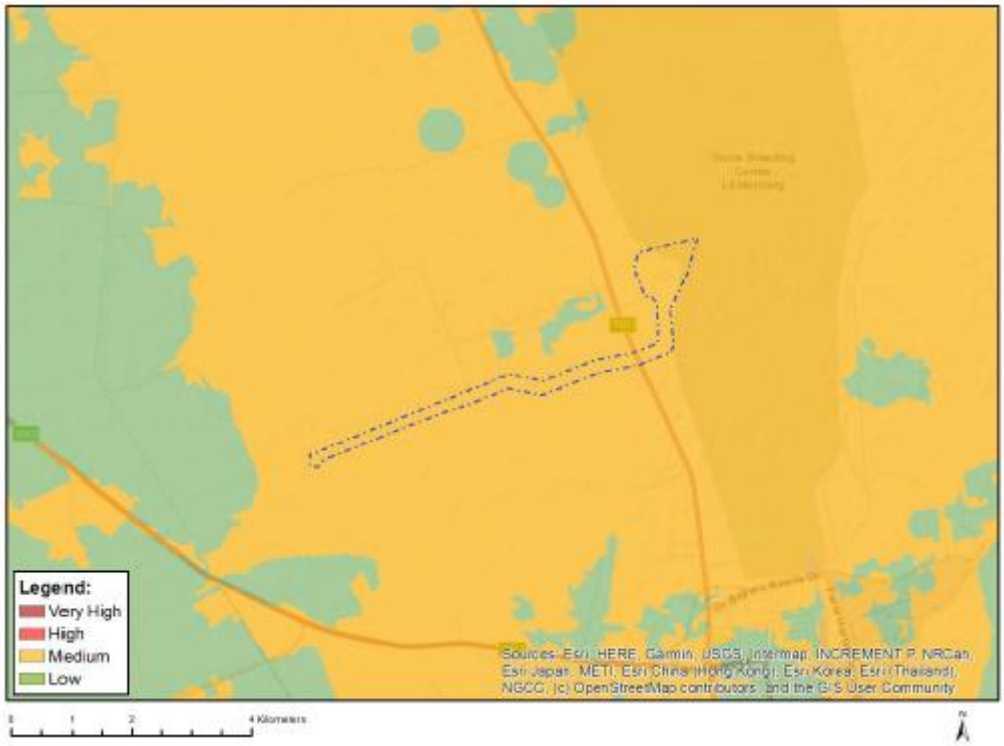

Figure 4-4 Map illustrating the Flora Theme Sensitivity as generated from the National Environmental Screening Tool

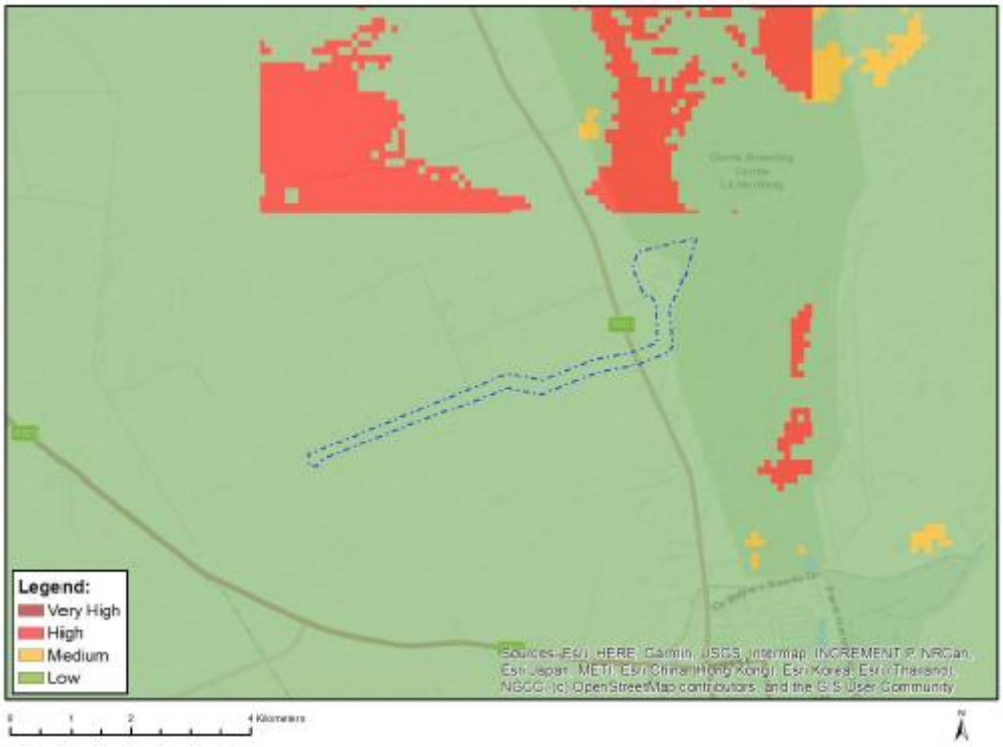

Figure 4-5 Map illustrating the Fauna Theme Sensitivity as generated from the National Environmental Screening Tool

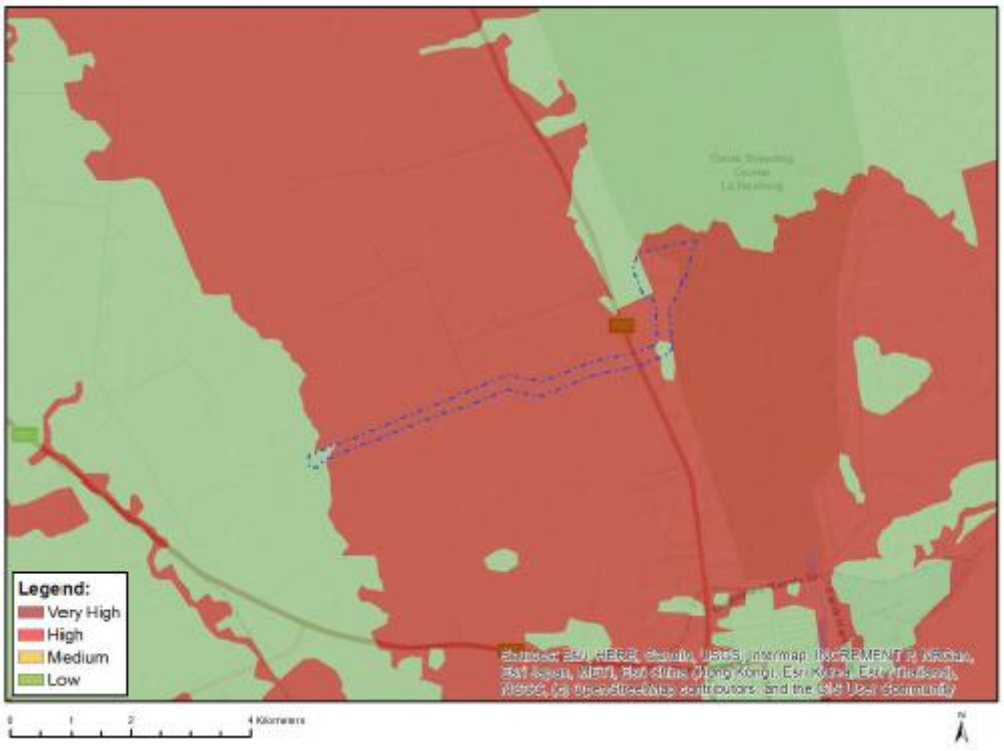

Figure 4-6 Map illustrating the combined Terrestrial Theme Sensitivity as generated from the National Environmental Screening Tool

4.3.3 Confirmation of Site Sensitivity

The medium to low sensitivity for the Plant Species Theme is confirmed for a certain portion of the project area (Figure 4-7). Figure 4-7 indicates the true sensitivity confirmed on site. The low Animal Species Theme sensitivity is disputed as several faunal species or signs of any were recorded in the project area and this also includes a SCC thus the site was assigned a medium species sensitivity. The very high Terrestrial Biodiversity Sensitivity for the entire project area is disputed as a majority of the project area has a medium sensitivity due to the degraded state of the wooded grassland in the project area as well and certain areas have a low sensitivity due to the transformed areas.

4.4 Site Ecological Importance

The location and extent of all habitats are illustrated in Figure 4-3 below. Based on the criteria provided in Section 2.4 of this report, all habitats within the assessment area of the project were allocated a sensitivity category (Table 4-6). The sensitivities of the habitat types delineated are illustrated Figure 4-7 below. * Although *within the project area, the project footprint won't encroach on this habitat.*

Table 4-7 provides guidelines for interpreting Site Ecological Importance in the context of the development activities. The SEI matrix approach links ecosystem types or habitat types to ecosystem services, species present and ecological condition by providing a score for to the sensitivity based on the matrices as per section 2.4. The table above should be read with the habitat descriptions above, vegetation condition in each habitat and species present as well as the methodology provided in section 2.4.

Table 4-6 Summary of habitat types delineated within the field assessment area of the Elandsfontein Grid Corridor and their respective SEI

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance

Transformed	Very Low	Low	Very Low	Very High	Very Low
Degraded Wooded Grassland	Medium	Medium	Medium	Medium	Medium
Wooded Grassland	Low	Medium	Low	Low	Medium
Open Savanna Grassland	Medium	High	Medium	Medium	Medium
Wetland (Depression) Ridge*	Medium	High	Medium	Very Low	High

** Although within the project area, the project footprint won't encroach on this habitat.*

Table 4-7 Guidelines for interpreting Site Ecological Importance in the context of the development activities

Site Ecological Importance	Interpretation in relation to development activities
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.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

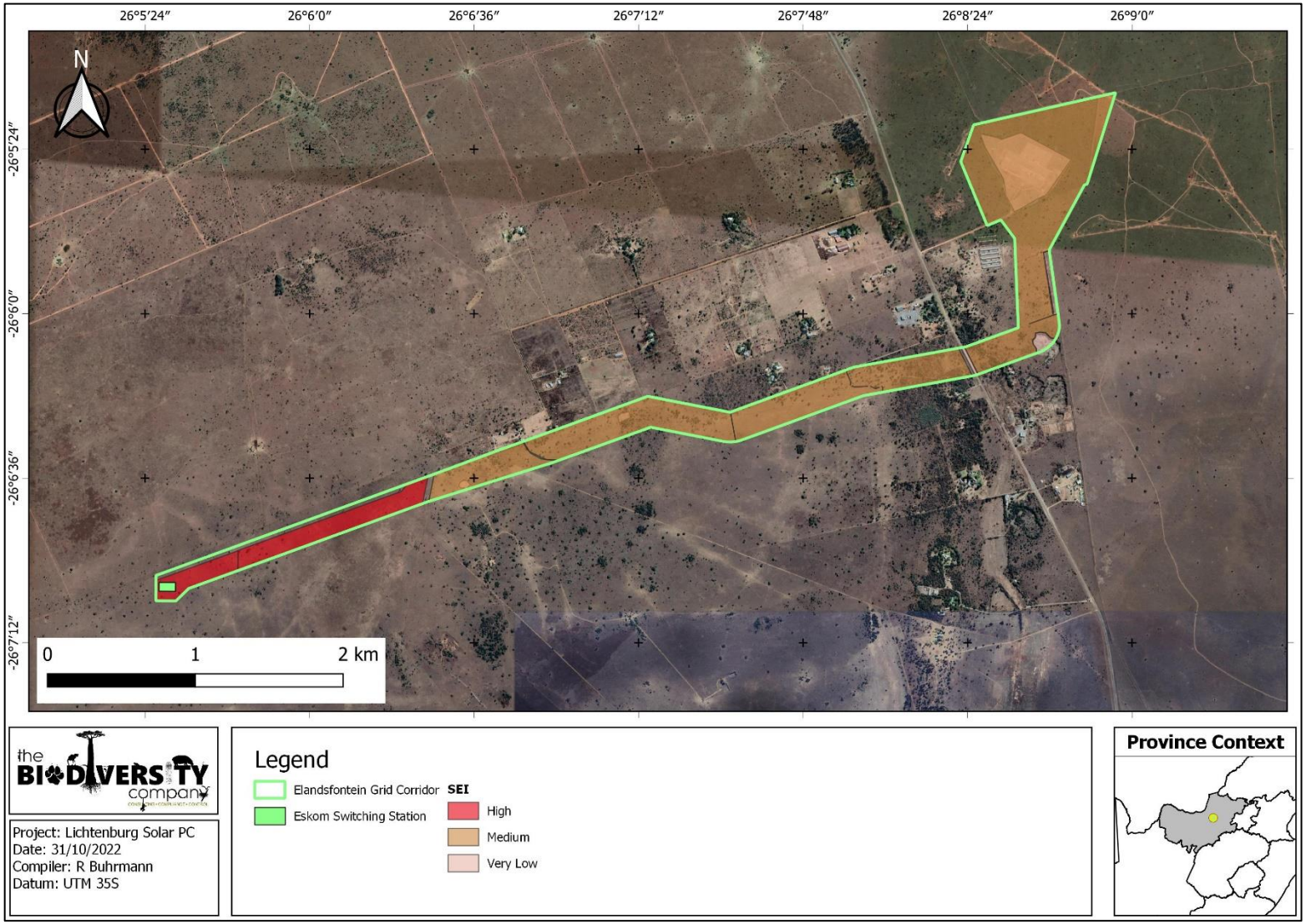

Figure 4-7 Ecological sensitivity map of the project area.

5 Impact Assessment

Potential impacts were evaluated against the data captured during the desktop-and field assessment to identify relevance to the development area. The relevant impacts associated with the proposed grid connection development were then subjected to a prescribed impact assessment methodology which is described below.

Mitigation measures were only applied to impacts deemed relevant based on the impact analysis. The likelihood and consequence descriptors are presented in Table 5-1 and Table 5-2. The significance rating matrix is presented in Table 5-3.

Table 5-1 Likelihood descriptors

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	**Rating**
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

Table 5-2 Consequence Descriptors

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	**Rating**
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5
Duration of impact	**Rating**
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

Table 5-3 Significance Rating Matrix

	CONSEQUENCE (Severity + Spatial Scope + Duration)															
	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Absent
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	Low
	3	6	9	12	15	18	21	24	27	301	33	36	39	42	45	
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	Moderate
LIKELIHOOD (Probability + Sensitivity)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	Moderately High
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	High
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	Critical
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

5.1 Alternatives Considered

No layout alternatives were considered.

5.2 Terrestrial Impact Assessment

5.2.1 Current impacts

The current impacts observed during surveys are listed below, these are informed by the 2019 SEA, where the key potential impacts and their mitigation is listed.

- Livestock grazing and over trampling;
- Footpaths and litter associated with the human infringement;
- Erosion;
- Alien and/or invasive plants;
- Litter and rubble dumping;
- Soil waste dumping; and
- Vegetation removal.

5.2.2 Anticipated Impacts

The development area overlaps in a CBA 1 and ESA 2 area. CBA 1 areas must maintain a natural or near natural state and only low impact biodiversity sensitive land uses are appropriate. ESA 1 areas must be maintained in a functional near natural state, with some loss of habitat is acceptable provided that the underlying biodiversity objectives and ecological functioning are not compromised.

Table 5-4 presents the aspects anticipated for the proposed infrastructure considered to predict and quantify these impacts and assess & evaluate the magnitude on the identified terrestrial biodiversity.

Table 5-4 Anticipated impacts for the proposed development on terrestrial biodiversity

Main Impact	Project activities that can cause loss/impacts to habitat (especially with regard to the proposed infrastructure areas):	Secondary impacts anticipated
1. Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation, possibly protected species. Access roads and servitudes	Displacement/loss of flora & fauna (including possible SCC) Increased potential for soil erosion

	Soil dust precipitation	Habitat fragmentation Erosion Increased potential for establishment of alien & invasive vegetation
	Dumping of waste products	
	Random events such as fire (cooking fires or cigarettes)	
	Water leakages	
Main Impact	**Project activities that can cause the spread and/or establishment of alien and/or invasive species**	**Secondary impacts anticipated**
2. Spread and/or establishment of alien and/or invasive species	Vegetation removal	Habitat loss for native flora & fauna (including SCC) Spreading of potentially dangerous diseases due to invasive and pest species Alteration of fauna assemblages due to habitat modification
	Vehicles potentially spreading seed	
	Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents	
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	
Main Impact	**Project activities that can cause direct mortality of fauna**	**Secondary impacts anticipated**
3. Direct mortality of fauna	Clearing of vegetation	Loss of habitat 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, etc.	
	Intentional killing of fauna for food (hunting)	
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	Reduced dispersal/migration of fauna Loss of ecosystem services Reduced plant seed dispersal
	Compacted roads	
	Removal of vegetation	
Main Impact	**Project activities that can cause pollution in watercourses and the surrounding environment**	**Secondary impacts anticipated**
5. Environmental pollution due to water runoff, spills from vehicles and erosion	Chemical (organic/inorganic) spills	Pollution in watercourses and the surrounding environment Faunal mortality (direct and indirectly) Groundwater pollution Loss of ecosystem services
	Erosion	
Main Impact	**Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance.**	**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, vehicles)	Disruption/alteration of ecological life cycles due to noise Loss of ecosystem services Secondary impacts associated with disruption/alteration of ecological life cycles due to dust Loss of ecosystem services
	Project activities that can cause disruption/alteration of ecological life cycles due to dust	
	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	Loss of possibly present SCCs

5.2.3 Loss of Irreplaceable Resources

Based on the spatial data, portion of a CBA 2 area will be lost. In terms of managing the loss of natural habitat in CBAs, the NWBSP 2015 states, amongst others, that 'further loss of natural habitat should be avoided in CBA 1, as similar approach must be adapted for the CBA 2 area that will be lost.

5.2.4 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 5-5 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 5-5 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 the 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 ridges	Appropriate/Adequate fire management plan need to be implemented.
Wind erosion	Reduce habitat and remove topsoil layer	Rehabilitation and erosion monitoring plan

5.2.5 Construction Phase

The main anticipated impact includes the clearing and disturbance of vegetation, which will ultimately lead to trampling and compaction drilling as well as habitat destruction and the proliferation of alien plant species along the roads and cleared areas. From a faunal perspective the severing of movement corridors for fauna, loss of fauna and flora SCCs (if present) and the fragmentation of habitat is expected. Soil disturbance is expected to be minimal and concentrated in small areas. The following potential impacts were considered:

Destruction, fragmentation and degradation of habitats and ecosystems;

Spread and/or establishment of alien and/or invasive species;

Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration); and

Mortalities and displacements of fauna and flora SCCs;

Chemical pollution associated with dust suppressants for roads and laydown areas.

5.2.6 Operational Phase

The operational phase of the impact of daily activities is anticipated to further spread the alien invasive plants, 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. The following potential impacts were considered:

Continued fragmentation and degradation of habitats, ecosystems and CBA areas;

Spread of alien and/or invasive species; and

Displacement, direct mortalities and reduced dispersal/migration of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration).

5.2.7 Decommissioning Phase

This phase is when the scaling down of activities ahead of temporary or permanent closure is initiated. During this phase, the operational phase impacts will persist until of the activity reduces and the rehabilitation measures are implemented. The following potential impacts were considered:

Continued fragmentation and degradation of habitats and ecosystems; and

Spread of alien and/or invasive species.

5.2.8 Assessment of Significance

The assessment of impact significance considers pre-mitigation as well as implemented of post-mitigation scenarios. The mitigation actions required to lower the risk of the impact are provided in Section 7 of this report.

5.2.8.1 Construction Phase

Table 5-6 summarises the significance of potential impacts associated with the grid connection on fauna and flora before and after implementation of mitigation measures.

The loss of habitat and the degradation of habitat were rated as “Moderate-high” significance prior to mitigation measurers, this is partly attributed to majority of the footprint classified as a CBA area. Through the implementation of mitigation measures such as the restriction and demarcation of the development area this can be reduced to ‘Low’, it can however not be mitigated completely as habitat and plant species will still be lost.

The risk of the spread of alien invasive species was rated “Moderate” prior to the implementation of an alien management plan. Should the alien spread be successfully mitigated the risk can be reduced to “Low”.

Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration) was rated as “Moderately” and after considered mitigation measures was adjusted to “Low”.

Mortalities and displacements of fauna and flora SCCs was rated as “Moderate” but mitigation measures allowed for the adjustment to “Low” significance. This is specifically pertinent to the Protected Trees found in the project area.

5.2.8.2 Operational Phase

Table 5-7 summarises the significance of the operational phase impacts on biodiversity before and after implementation of mitigation measures. The continued disruption of the habitat and CBA areas were rated as ‘Moderate’ pre-mitigations and ‘Low’ post mitigations. The impact significance of displacement and direct mortalities of fauna were rated as “Moderate” prior to mitigation. Implementation of mitigation measures reduced the significance of the impact to a ‘Low’ level. Unchecked the spread of alien and/or invasive species was rated as ‘Moderate’ but after mitigation adjusted to “Low”.

5.2.8.3 Decommissioning Phase

The fauna and flora would have become accustomed to the changed habitat and the disturbance of this habitat would now result in a further fragmentation. The significance of this impact prior to mitigations were rated as “Moderate” and was reduced to “Low” post mitigation (Table 5-8). Alien invasive species will flourish in the now newly disturbed areas, and this will need to be monitored quarterly for two years post decommissioning.

Table 5-6 Assessment of significance of potential impacts on the terrestrial fauna and flora associated with the construction phase of the project

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Destruction, fragmentation and degradation of habitats and ecosystems.	4	3	4	4	4		3	2	2	2	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Highly likely	**Moderately High**	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Likely	**Low**
Spread and/or establishment of alien and/or invasive species	4	3	3	4	3		3	3	3	3	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	**Moderate**	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Possible	**Low**
Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions,	3	4	3	4	3		2	3	2	4	3	
	One year to five years: Medium Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	**Moderate**	One month to one year: Short Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Likely	**Low**

noise, light, dust, vibration);												
Mortalities and displacements of fauna and flora SCCs	3	3	3	4	3		2	3	2	4	3	
	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	**Moderate**	One month to one year: Short Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Likely	**Low**
Chemical pollution associated with dust suppressants	3	3	3	3	3		1	2	5	3	1	
	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	**Moderate**	One day to one month: Temporary	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Disastrous / ecosystem structure and function seriously to critically altered	Ecology moderately sensitive/ /important	Highly unlikely	**Low**

Table 5-7 Assessment of significance of potential impacts on terrestrial fauna and flora associated with the operational phase of the project

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Continued fragmentation and degradation of habitats, ecosystems and CBA areas;	4	3	2	3	3		4	2	2	2	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	**Moderate**	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	**Low**
Spread of alien and/or invasive species	4	3	3	3	3		4	3	3	2	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	**Moderate**	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/importance	Likely	**Low**
Displacement, direct mortalities and reduced dispersal/migration of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration).	4	3	3	3	3		4	2	2	3	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	**Moderate**	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	**Low**

Table 5-8 Assessment of significance of potential impacts on terrestrial fauna and flora associated with the decommissioning phase of the project

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Continued fragmentation and degradation of habitats and ecosystems	5	3	3	3	3		2	2	2	3	2	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	**Moderate**	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	**Low**
Spread and/or establishment of alien and/or invasive species	5	3	3	3	3		2	2	2	3	3	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	**Moderate**	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	**Low**

5.2.9 Potential Cumulative Impacts

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

Solar energy projects as part of the Renewable Energy Database indicated that the region will experience surface clearing for several PV projects, projects that were considered in terms of their potential cumulative terrestrial ecological impacts are in an approximate 30 km radius of the Elandsfontein grid. Eleven PV Solar projects can be found in this area, their cumulative impacts is expected to be high if all these projects are approved. Cumulatively these developments will be responsible for the destruction of a large portion of relatively intact grasslands that are home to several SCC including *Vachellia erioloba, Parahyaena brunnea* and Cape vulture or Cape griffon (*Gyps coprotheres*).

6 Specialist Management Plan

The aim of the management outcomes is to present the mitigations in such a way that the can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring. Table 6-1 presents the recommended mitigation measures and the respective timeframes, targets and performance indicators for the terrestrial assessment.

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

Prevent the further loss and fragmentation of vegetation communities and the ecologically sensitive areas in the vicinity of the project area;

As far as possible, reduce the negative fragmentation effects of the development and enable safe movement of faunal species; and

Prevent the direct and indirect loss and disturbance of faunal species and community (including potentially occurring species of conservation concern).

Table 6-1 The Biodiversity Impact Management Actions for the proposed solar Grid Corridor

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Management outcome: Vegetation and Habitats				
All high sensitivity areas outside of the direct development area should be avoided and the work area must be demarcated to avoid these areas.	Construction Phase	Project manager & Farmer Environmental Officer	Development footprint	Ongoing
Indigenous vegetation which does not interfere with the safe development and operation of the powerline and substation must be left undisturbed;	Construction Phase	Project manager & Farmer Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary, outside of the development footprint areas should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted too within the low/medium sensitivity areas. No further loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
Existing access routes, especially roads must be made use of.	Construction Phase	Project manager & Farmer	Roads and paths used	Ongoing
Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;	Construction Phase	Project manager & Farmer	Roads and paths used	Ongoing
All laydown etc. should be restricted to low/moderate sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction structures should be permitted. No storage of vehicles or equipment will be allowed in high sensitivity areas or undeveloped medium sensitivity areas	Construction Phase	Environmental Officer & Design Engineer	Development footprint	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.	Construction phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

prevent them leaking and entering the environment. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.				
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be complied and implemented to restrict the impact fire might have on the surrounding areas, if not already in place for the reserve.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
A qualified environmental control officer must be on site. A site walk through by a suitably qualified ecologist must take place prior to any construction activities. In situations where the protected plants 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 of a search, rescue and recovery program is suggested for the protection of these species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program.	Life of operation	Project manager, Environmental Officer	Protected Tree species	Ongoing
Search, rescue and replanting of all protected species likely to be damaged during project development must be identified by the Botanical Specialist and completed prior to any development or clearing;	Construction Phase	Project manager, Environmental Officer	Protected Tree species	Ongoing
Permits for removal must be obtained from the relevant Competent Authority prior to the cutting or clearing the affected species, and they must be filed;	Construction Phase	Project manager, Environmental Officer	Protected Tree species	Ongoing
All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off if required in accordance with the site No-Go procedure	Construction Phase	Project manager & Farmer Environmental Officer	Development footprint	Ongoing
Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard, should not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
Rocks not utilised in the construction may not be piled in sensitive areas and must be removed from site or be used as part of erosion control.	Construction	Environmental Officer & Contractor	Rock Piles	During Phase
Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.	Decommissioning phase	Environmental Officer & Contractor	Woody material removed	During Phase
Management outcome: Fauna				

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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 Phase	Environmental Officer, Contractor	Presence of any faunal species.	During phase
No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;	Construction Phase	Environmental Officer, Contractor	Presence of any faunal species.	During phase
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, • Signs must be put up to enforce this	Construction Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of any further approved construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna. Construction must take place in the winter months to ensure nests and migratory species are not disturbed.	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 minimize all possible disturbances to amphibian species and nocturnal mammals	Construction Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed • Signs must be put up to enforce this;	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.	Construction 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 must still be enforced to ensure that road killings and erosion is limited.	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.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day in the case.	Ongoing
All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	Construction phase	Project manager, Environmental Officer	Presence of Nests and faunal species	Planning, Construction and Rehabilitation
Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight; • Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing

Management outcome: Alien species				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
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. Footprint of the roads must be kept to prescribed widths.	Construction Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation

Management outcome: Dust				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO.	Construction Phase	Environmental Officer & Health and Safety Officer	Dustfall	Ongoing
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. • No non environmentally friendly suppressants may be used as this could result in pollution of water sources	Life of operation	Project manager, Environmental Officer & Contractor	Dust monitoring program.	Ongoing
Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening with water; particularly during prolonged periods of dry weather in summer. Such measures must also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, chipping);	Life of operation	Project manager, Environmental Officer & Contractor	Dustfall	Ongoing
Vehicle speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas.	Construction Phase	Environmental Officer & Health and Safety Officer	Dustfall	Ongoing

Management outcome: Waste management				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored effectively.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily

The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;	Construction Phase	Environmental Officer & Contractor	Utilisation of toilets/ablution facilities	Ongoing
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	Life of operation	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 project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste.	Ongoing
The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of hazardous waste.	Ongoing
Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days

Management outcome: Environmental awareness training

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMPr. The avoidance and protection of the wetland areas must be included into a site induction. Contractors and employees must all undergo the induction and made aware of the areas to be avoided.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing

Management outcome: Erosion

Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Speed limits must be put in place to reduce erosion. • Reducing the dust generated by the listed activities above, especially the earth moving machinery, through wetting the soil surface and putting up signs to enforce speed limit; • Signs must be put up to enforce this.	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing

Where possible, existing access routes and walking paths must be made use of.	Life of operation	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 and strong winds.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
The engineer must include adequate stormwater management measures to ensure proper erosion control	Life of operation	Engineer	Management plan	Before construction phase: Ongoing

7 Conclusion and Impact Statement

It is the opinion of the ecologists that this study provides the relevant information required in order to implement an Integrated Environmental Management plan. As well as to ensure that the best long-term use of the ecological resources in the project area are made in support of the principle of sustainable development. The construction and operation of the infrastructure are not anticipated to pose significant threats to the receiving environment provided the mitigation measures are effectively applied, thus the proposed development can obtain approval.

It is the opinion of the ecologists that this study provides the relevant information required in order to implement Integrated Environmental Management and to ensure that the best long-term use of the ecological resources in the project area will be made in support of the principle of sustainable development. The construction and operation of the infrastructure are not anticipated to pose significant threats to the receiving environment provided the mitigation measures are effectively applied, thus the proposed development can obtain approval.

The grid connection solution and substation intersect three habitats, namely the Degraded Wooded Grassland, Wooded Grassland and Transformed habitat unit. No high sensitivities were determined for the corridor in any of the mentioned habitat units. The transformed habitat unit has been completely transformed and the ecological functionality and integrity has been severely compromised. Although the other identified habitats are impacted to a certain degree, they have as they still provide habitat for a number of important species.

Local factors that may lead to parts of the sites having elevated ecological sensitivity are parts of the project area falling within both a Priority Focus Area as can be seen in and overlapping with the Lichtenburg Game Breeding Centre. The breeding centre is operated by the National Zoological Gardens of South Africa and is there mainly to further the breeding programmes of endangered species already in place by the National Zoo, and to supplement the populations of local and international zoos reserve and overlapping with CBA 2 and ESA 1 classified areas. There is also one protected trees *Vachellia erioloba* that was found in the project area. A protected tree assessment prior to clearing commencing is highly recommended to georeferenced and mark all protected trees along the proposed servitude to facilitate application for permit application for removal of the trees or possible realignment to avoid the trees.

7.1 Impact Statement

The normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible. The main expected impacts of the proposed infrastructure will include the following:

Habitat loss and fragmentation;

Degradation of surrounding habitat;

Sensory disturbance and possible extirpation of SCC;

Disturbance and displacement caused during the construction and maintenance phases;

Direct mortality during the construction phase; and

Mitigation measures as described in this report can be implemented to reduce the significance of the risk but there is still a possibility of impacts.

Considering the above-mentioned information, no fatal flaws are evident for the proposed project. The average post-mitigation impact significance for each phase of the project is expected to be low. It is the opinions of the specialists that the project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

8 References

ADU (Animal Demography Unit). (2017). Virtual Museum.

Alexander, G. & Marais, J. (2007). A guide to the Reptiles of Southern Africa. Struik, Cape Town.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). 2014. Atlas and Red List of Reptiles of South Africa, Lesotho, and Swaziland. Suricata 1. South African Biodiversity Institute, Pretoria.

BGIS (Biodiversity GIS). (2017). http://bgis.sanbi.org/

BODATSA-POSA. (2022). Plants of South Africa - an online checklist. POSA ver. 3.0. http://newposa.sanbi.org/.

Boycott, R. and Bourquin, R. 2000. The Southern African Tortoise Book – A Guide to Southern African Tortoises, Terrapins and Turtles. Revised Edition. Hilton. 228 pages.

Branch, W.R. (1998). Field Guide to Snakes and Other Reptiles of Southern Africa. Struik, Cape Town.

Bird Atlas Project (SABAP2). (2012). http://vmus.adu.org.za/

Broadley, D.G. 1990. FitzSimons' Snakes of Southern Africa. Jonathan Ball & Ad Donker Publishers. 387pp.

Business and Biodiversity Offsets Programme (BBOP). 2012. Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets. BBOP, Washington, D.C.

Desmet, P. G., Holness, S., Skowno, A. & Egan, V.T. (2018). 2018 Limpopo Province Map of Critical Biodiversity Areas and Ecological Support Areas. http://bgis.sanbi.org/SpatialDataset/Detail/5707

Du Preez, L. & Carruthers, V. (2009) A Complete Guide to the Frogs of Southern Africa. Struik Nature, Cape Town.

Eskom. (2015). Taylor, M.R., Peacock, F. & Wanless, R.M. (Eds). The 2015 Eskom Red Data Book of birds of South Africa, Lesotho, and Swaziland. BirdLife South Africa, Johannesburg.

EWT. (2016). Mammal Red List 2016. www.ewt.org.za

EWT (Endangered Wildlife Trust). (2017). Threatened Amphibian Programme. (2015). The Southern African Frog Atlas Project https://www.ewt.org.za/TAP/refrence.html (SAFAP, now FrogMAP). http://vmus.adu.org.za

Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. (2015). Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions. SANBI, Pretoria.

Goff, F. G., Dawson, G. A., & Rochow, J. J. (1982). Site examination for threatened and endangered plant species. Environmental Management, 6(4), 307-316.

IUCN. (2021). The IUCN Red List of Threatened Species. www.iucnredlist.org

Johnson, S. & Bytebier, B. (2015). Orchids of South Africa: A Field Guide. Struik publishers, Cape Town.

MammalMap. (2017). http://mammalmap.adu.org.za/

Measey, G.J. (2011). Ensuring a Future for South Africa's Frogs: A Strategy for Conservation Research. South African National Biodiversity Institute, Pretoria.

Minter, L., Burger, M., Harrison, J.A. & Kloepfer, D. (2004). Atlas and Red Data Book of the Frogs of South Africa, Lesotho, and Swaziland. Smithsonian Institute Avian Demography Unit, Washington; Cape Town.

Monadjem, A., Taylor, P.J., Coterrill, F.D.P. & Schoeman, C. (2010). Bats of southern and central Africa: a biogeographic and taxonomic synthesis. Wits University Press, Johannesburg.

Mucina, L. & Rutherford, M.C. (Eds.). 2006. The vegetation of South Africa, Lesotho, and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria, South African.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. Vegetation map of South Africa, Lesotho, and Swaziland. 1:1 000 000 scale sheet maps. 2nd ed. South African National Biodiversity Institute, Pretoria.

National Protected Areas Expansion Strategy for South Africa (NPAES) (2016). Department of Environmental Affairs, Pretoria, South Africa.

NBA (2018). National Biodiversity Assessment spatial data. http://bgis.sanbi.org/

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Raimonde, D. (2009). Red list of South African Plants. SANBI, Pretoria.

SADAP (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2021). http://egis.environment.gov.za

SANBI. 2013. Grasslands Ecosystem Guidelines: landscape interpretation for planners and managers. Compiled by Cadman, M., de Villiers, C., Lechmere-Oertel, R. and D. McCulloch. South African National Biodiversity Institute, Pretoria. 139 pages.

SANBI-BGIS. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning.

SANBI. (2017). South African National Biodiversity Institute – Red List of South African Plants. http://redlist.sanbi.org/

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

Stuart, C., & Stuart, T. (2000). A field guide to the tracks and signs of southern and east African wildlife. Cape Town.

Taylor, M. R, Peacock, F., & Wanless, R. 2015. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho & Swaziland.

Van Deventer, H., Smith-Adao, L., Collins, N.B., Grenfell, M., Grundling, A., Grundling, P-L., Impson, D., Job, N., Lötter, M., Ollis, D., Petersen, C., Scherman, P., Sieben, E., Snaddon, K., Tererai, F. and Van der Colff D. 2019. South African National Biodiversity Assessment 2018: Technical Report. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. http://hdl.handle.net/20.500.12143/6230.

Van Deventer, H., Smith-Adao, L., Mbona, N., Petersen, C., Skowno, A., Collins, N.B., Grenfell, M., Job, N., Lötter, M., Ollis, D., Scherman, P., Sieben, E. & Snaddon, K. 2018. South African National Biodiversity Assessment 2018: Technical Report. Volume 2a: South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Version 3, final released on 3 October 2019. Council for Scientific and Industrial Research (CSIR) and South African National Biodiversity Institute (SANBI): Pretoria, South Africa.

9 Appendices

9.1 Appendix A – Flora species expected to occur in the project area.

Family	Species Name	Author1	IUCN	Ecology
Oleaceae	*Olea europaea subsp. cuspidata*	L.		Indigenous
Pteridaceae	*Pellaea calomelanos var. calomelanos*	(Sw.) Link	LC	Indigenous
Ranunculaceae	*Clematis brachiata*	Thunb.	LC	Indigenous
Poaceae	*Triraphis andropogonoides*	(Steud.) Phillips	LC	Indigenous
Verbenaceae	*Verbena bonariensis*	L.		Not indigenous; Naturalised; Invasive
Cactaceae	*Cylindropuntia imbricata*	(Haw.) F.M. Knuth		Not indigenous; Naturalised; Invasive
Apiaceae	*Pastinaca sativa*	L.		Not indigenous; Naturalised
Fabaceae	*Indigastrum costatum subsp. macrum*	(Guill. & Perr.) Schrire	LC	Indigenous
Poaceae	*Eustachys paspaloides*	(Vahl) Lanza & Mattei	LC	Indigenous
Aizoaceae	*Nananthus vittatus*	(N.E.Br.) Schwantes	DD	Indigenous
Apocynaceae	*Raphionacme hirsuta*	(E. Mey.) R.A. Dyer	LC	Indigenous
Fabaceae	*Leobordea hirsuta*	(Schinz) B.-E.van Wyk & Boatwr.	LC	Indigenous; Endemic
Polygalaceae	*Polygala hottentotta*	C.Presl	LC	Indigenous
Fabaceae	*Pearsonia cajanifolia subsp. cajanifolia*	(Harv.) Polhill	LC	Indigenous; Endemic
Fabaceae	*Indigofera oxytropis*	Benth. ex Harv.	LC	Indigenous
Casuarinaceae	*Casuarina cunninghamiana*	Miq.	NE	Not indigenous; Naturalised; Invasive
Boraginaceae	*Cynoglossum austroafricanum*	Hilliard & B.L. Burtt	LC	Indigenous
Verbenaceae	*Lantana rugosa*	Thunb.	LC	Indigenous
Lamiaceae	*Mentha aquatica*	L.	LC	Indigenous
Poaceae	*Setaria incrassata*	(Hochst.) Hack.	LC	Indigenous
Malvaceae	*Brachychiton populneus*	(Schott & Endl.) R.Br.		Not indigenous; Naturalised
Asteraceae	*Senecio digitalifolius*	DC.	LC	Indigenous
Asteraceae	*Berkheya onopordifolia var. onopordifolia*	(DC.) O. Hoffm. ex Burtt Davy	LC	Indigenous
Cannabaceae	*Cannabis sativa var. sativa*	L.	NE	Not indigenous; Naturalised
Ebenaceae	*Diospyros lycioides subsp. lycioides*	Desf.	LC	Indigenous
Poaceae	*Eragrostis barbinodis*	Hack.	LC	Indigenous
Santalaceae	*Viscum verrucosum*	Harv.	LC	Indigenous
Menispermaceae	*Antizoma angustifolia*	(Burch.) Miers ex Harv.	LC	Indigenous
Asteraceae	*Helichrysum callicomum*	Harv.	LC	Indigenous
Poaceae	*Oropetium capense*	Stapf	LC	Indigenous
Poaceae	*Schizachyrium sanguineum*	(Retz.) Alston	LC	Indigenous
Chrysobalanaceae	*Parinari capensis subsp. capensis*	Harv.	LC	Indigenous
Cucurbitaceae	*Cucumis zeyheri*	Sond.	LC	Indigenous
Poaceae	*Brachiaria marlothii*	(Hack.) Stent	LC	Indigenous
Convolvulaceae	*Ipomoea bathycolpos*	Hallier f.	LC	Indigenous; Endemic
Acanthaceae	*Blepharis squarrosa*	(Nees) T. Anderson	LC	Indigenous; Endemic
Poaceae	*Andropogon schirensis*	Hochst. ex A. Rich.	LC	Indigenous

Aizoaceae	*Drosanthemum sp.*			
Scrophulariaceae	*Chaenostoma patrioticum*	(Hiern) Kornhall	LC	Indigenous
Aizoaceae	*Delosperma sp.*	L.Bolus		
Asteraceae	*Geigeria aspera var. aspera*	Harv.	LC	Indigenous
Commelinaceae	*Cyanotis speciosa*	(L.f.) Hassk.	LC	Indigenous
Poaceae	*Hyparrhenia hirta*	(L.) Stapf	LC	Indigenous
Orobanchaceae	*Striga gesnerioides*	(Willd.) Vatke	LC	Indigenous
Poaceae	*Trichoneura grandiglumis*	(Nees) Ekman	LC	Indigenous
Poaceae	*Aristida vestita*	Thunb.	LC	Indigenous
Rubiaceae	*Kohautia amatymbica*	Eckl. & Zeyh.	LC	Indigenous
Asteraceae	*Nidorella hottentotica*	DC.	LC	Indigenous
Poaceae	*Themeda triandra*	Forssk.	LC	Indigenous
Agavaceae	*Chlorophytum cooperi*	(Baker) Nordal	LC	Indigenous
Asteraceae	*Tarchonanthus parvicapitulatus*	P.P.J. Herman	LC	Indigenous
Poaceae	*Aristida stipitata subsp. graciliflora*	Hack.	LC	Indigenous
Caryophyllaceae	*Silene undulata*	Aiton		Indigenous
Fabaceae	*Tephrosia lupinifolia*	DC.	LC	Indigenous
Cyperaceae	*Cyperus congestus*	Vahl	LC	Indigenous
Asteraceae	*Cirsium vulgare*	(Savi) Ten.		Not indigenous; Naturalised; Invasive
Scrophulariaceae	*Jamesbrittenia atropurpurea subsp. atropurpurea*	(Benth.) Hilliard	LC	Indigenous
Gentianaceae	*Chironia palustris subsp. palustris*	Burch.	LC	Indigenous
Fabaceae	*Vachellia erioloba*	(E. Mey.) P.J.H. Hurter	LC	Indigenous
Crassulaceae	*Crassula natans var. natans*	Thunb.	LC	Indigenous
Orchidaceae	*Habenaria epipactidea*	Rchb.f.	LC	Indigenous
Fabaceae	*Senegalia hereroensis*	(Engl.) Kyal. & Boatwr.	LC	Indigenous
Lamiaceae	*Stachys spathulata*	Burch. ex Benth.	LC	Indigenous
Scrophulariaceae	*Nemesia fruticans*	(Thunb.) Benth.	LC	Indigenous
Malvaceae	*Grewia flava*	DC.	LC	Indigenous
Solanaceae	*Solanum lichtensteinii*	Willd.	LC	Indigenous
Hyacinthaceae	*Albuca prasina*	(Ker Gawl.) J.C. Manning & Goldblatt		Indigenous
Asteraceae	*Litogyne gariepina*	(DC.) Anderb.	LC	Indigenous
Poaceae	*Eragrostis superba*	Peyr.	LC	Indigenous
Acanthaceae	*Barleria macrostegia*	Nees	LC	Indigenous
Scrophulariaceae	*Selago sp.*			
Asteraceae	*Helichrysum harveyanum*	Wild	LC	Indigenous
Acanthaceae	*Crabbea angustifolia*	Nees	LC	Indigenous; Endemic
Asteraceae	*Nicolasia stenoptera subsp. stenoptera*	(O. Hoffm.) Merxm.	LC	Indigenous
Onagraceae	*Oenothera rosea*	L'Her. ex Aiton		Not indigenous; Naturalised; Invasive
Rubiaceae	*Vangueria pygmaea*	Schltr.	LC	Indigenous
Geraniaceae	*Pelargonium dolomiticum*	R. Knuth	LC	Indigenous
Lamiaceae	*Salvia runcinata*	L.f.	LC	Indigenous
Poaceae	*Leptochloa fusca*	(L.) Kunth	LC	Indigenous
Convolvulaceae	*Convolvulus ocellatus var. ocellatus*	Hook.	LC	Indigenous

Cupressaceae	*Cupressus sempervirens*	L.		Not indigenous; Cultivated; Naturalised
Ricciaceae	*Riccia argenteolimbata*	O.H. Volk & Perold		Indigenous
Plantaginaceae	*Plantago lanceolata*	L.	LC	Indigenous
Cyperaceae	*Cyperus sp.*			
Fabaceae	*Chamaecrista biensis*	(Steyaert) Lock	LC	Indigenous
Asphodelaceae	*Bulbine abyssinica*	A. Rich.	LC	Indigenous
Fabaceae	*Leobordea divaricata*	Eckl. & Zeyh.	LC	Indigenous
Lamiaceae	*Salvia radula*	Benth.	LC	Indigenous
Boraginaceae	*Trichodesma angustifolium subsp. angustifolium*	Harv.	LC	Indigenous
Meliaceae	*Melia azedarach*	L.	NE	Not indigenous; Naturalised; Invasive
Apocynaceae	*Cynanchum virens*	(E. Mey.) D.Dietr.	LC	Indigenous
Convolvulaceae	*Ipomoea obscura var. obscura*	(L.) Ker Gawl.	LC	Indigenous
Poaceae	*Tragus berteronianus*	Schult.	LC	Indigenous
Celastraceae	*Gymnosporia buxifolia*	(L.) Szyszyl.	LC	Indigenous
Poaceae	*Cynodon dactylon*	(L.) Pers.	LC	Indigenous
Polygalaceae	*Polygala producta*	N.E.Br.	LC	Indigenous
Rubiaceae	*Breonadia sp.*			
Poaceae	*Microchloa kunthii*	Desv.	LC	Indigenous
Poaceae	*Calamagrostis epigejos var. capensis*	(L.) Roth	LC	Indigenous
Cupressaceae	*Cupressus arizonica*	Greene		Not indigenous; Cultivated; Naturalised
Fabaceae	*Lessertia frutescens subsp. microphylla*	(L.) Goldblatt & J.C. Manning	LC	Indigenous
Potamogetonaceae	*Potamogeton pectinatus*	L.	LC	Indigenous
Poaceae	*Brachiaria serrata*	(Thunb.) Stapf	LC	Indigenous
Asteraceae	*Felicia muricata subsp. muricata*	(Thunb.) Nees	LC	Indigenous
Polygonaceae	*Oxygonum dregeanum subsp. canescens*	Meisn.	NE	Indigenous
Cyperaceae	*Abildgaardia ovata*	(Burm.f.) Kral	LC	Indigenous
Poaceae	*Eragrostis pseudobtusa*	De Winter	NE	Indigenous; Endemic
Poaceae	*Pogonarthria squarrosa*	(Roem. & Schult.) Pilg.	LC	Indigenous
Solanaceae	*Lycium hirsutum*	Dunal	LC	Indigenous
Poaceae	*Panicum stapfianum*	Fourc.	LC	Indigenous
Malvaceae	*Sida chrysantha*	Ulbr.	LC	Indigenous
Asteraceae	*Ursinia nana subsp. leptophylla*	DC.	LC	Indigenous
Dipsacaceae	*Scabiosa columbaria*	L.	LC	Indigenous
Fabaceae	*Zornia milneana*	Mohlenbr.	LC	Indigenous
Poaceae	*Melinis repens subsp. grandiflora*	(Willd.) Zizka	LC	Indigenous
Fabaceae	*Rhynchosia monophylla*	Schltr.	LC	Indigenous
Asteraceae	*Geigeria brevifolia*	(DC.) Harv.	LC	Indigenous
Asteraceae	*Flaveria bidentis*	(L.) Kuntze		Not indigenous; Naturalised; Invasive
Poaceae	*Cymbopogon pospischilii*	(K. Schum.) C.E. Hubb.	NE	Indigenous
Caryophyllaceae	*Dianthus mooiensis subsp. mooiensis*	F.N. Williams	NE	Indigenous; Endemic
Anacardiaceae	*Ozoroa paniculosa var. paniculosa*	(Sond.) R. Fern. & A. Fern.	LC	Indigenous

Amaranthaceae	*Hermbstaedtia odorata var. odorata*	(Burch.) T. Cooke	NE	Indigenous
Santalaceae	*Thesium goetzeanum*	Engl.	LC	Indigenous
Rhamnaceae	*Ziziphus zeyheriana*	Sond.	LC	Indigenous
Fabaceae	*Eriosema salignum*	E. Mey.	LC	Indigenous
Solanaceae	*Lycium cinereum*	Thunb.	LC	Indigenous
Verbenaceae	*Chascanum adenostachyum*	(Schauer) Moldenke	LC	Indigenous
Cannabaceae	*Celtis africana*	Burm.f.	LC	Indigenous
Poaceae	*Brachiaria nigropedata*	(Ficalho & Hiern) Stapf	LC	Indigenous
Boraginaceae	*Ehretia alba*	Retief & A.E.van Wyk	LC	Indigenous
Poaceae	*Aristida congesta subsp. congesta*	Roem. & Schult.	LC	Indigenous
Fabaceae	*Melilotus albus*	Medik.	NE	Not indigenous; Naturalised; Invasive
Hyacinthaceae	*Dipcadi marlothii*	Engl.	LC	Indigenous
Apiaceae	*Deverra burchellii*	(DC.) Eckl. & Zeyh.	LC	Indigenous
Cucurbitaceae	*Cucumis myriocarpus subsp. myriocarpus*	Naudin	LC	Indigenous
Ricciaceae	*Riccia albolimbata*	S.W. Arnell		Indigenous
Asteraceae	*Helichrysum nudifolium var. nudifolium*	(L.) Less.	LC	Indigenous
Ranunculaceae	*Ranunculus multifidus*	Forssk.	LC	Indigenous
Poaceae	*Eragrostis curvula*	(Schrad.) Nees	LC	Indigenous
Asteraceae	*Xanthium spinosum*	L.		Not indigenous; Naturalised; Invasive
Poaceae	*Loudetia simplex*	(Nees) C.E. Hubb.	LC	Indigenous
Asteraceae	*Chrysocoma obtusata*	(Thunb.) Ehr.Bayer	LC	Indigenous
Poaceae	*Diheteropogon amplectens var. amplectens*	(Nees) Clayton	LC	Indigenous
Poaceae	*Stipagrostis uniplumis var. neesii*	(Licht.) De Winter	LC	Indigenous
Agavaceae	*Chlorophytum sp.*			
Anacardiaceae	*Schinus molle*	L.	NE	Not indigenous; Naturalised; Invasive
Ebenaceae	*Diospyros austroafricana var. microphylla*	De Winter	LC	Indigenous
Lobeliaceae	*Lobelia erinus*	L.	LC	Indigenous
Cyperaceae	*Kyllinga alba*	Nees	LC	Indigenous
Asteraceae	*Nidorella resedifolia subsp. resedifolia*	DC.	LC	Indigenous
Asphodelaceae	*Trachyandra laxa var. rigida*	(N.E.Br.) Oberm.	LC	Indigenous
Fabaceae	*Medicago laciniata var. laciniata*	(L.) Mill.	NE	Not indigenous; Naturalised
Poaceae	*Sporobolus festivus*	Hochst. ex A. Rich.	LC	Indigenous
Iridaceae	*Gladiolus permeabilis subsp. edulis*	D.Delaroche	LC	Indigenous
Poaceae	*Hyparrhenia filipendula var. pilosa*	(Hochst.) Stapf	LC	Indigenous
Poaceae	*Aristida diffusa subsp. burkei*	Trin.	LC	Indigenous
Malvaceae	*Triumfetta sonderi*	Ficalho & Hiern	LC	Indigenous; Endemic
Orobanchaceae	*Striga elegans*	Benth.	LC	Indigenous
Poaceae	*Melinis repens subsp. repens*	(Willd.) Zizka	LC	Indigenous
Iridaceae	*Tritonia nelsonii*	Baker	LC	Indigenous
Fabaceae	*Trifolium africanum var. africanum*	Ser.	NE	Indigenous
Poaceae	*Leersia denudata*	Launert	LC	Indigenous

Orobanchaceae	*Cycnium adonense*	E. Mey. ex Benth.	LC	Indigenous
Poaceae	*Chrysopogon serrulatus*	Trin.	LC	Indigenous
Cleomaceae	*Cleome maculata*	(Sond.) Szyszyl.	LC	Indigenous
Poaceae	*Microchloa caffra*	Nees	LC	Indigenous
Fabaceae	*Vachellia hebeclada subsp. hebeclada*	(DC.) Kyal. & Boatwr.	LC	Indigenous
Cucurbitaceae	*Acanthosicyos naudinianus*	(Sond.) C.Jeffrey	LC	Indigenous
Cyperaceae	*Cyperus rubicundus*	Vahl	LC	Indigenous
Convolvulaceae	*Falkia oblonga*	Bernh. ex C. Krauss	LC	Indigenous
Poaceae	*Digitaria sanguinalis*	(L.) Scop.	NE	Not indigenous; Naturalised
Poaceae	*Sporobolus fimbriatus*	(Trin.) Nees	LC	Indigenous
Iridaceae	*Gladiolus sp.*			
Hyacinthaceae	*Dipcadi viride*	(L.) Moench	LC	Indigenous
Asteraceae	*Dicoma anomala subsp. anomala*	Sond.	LC	Indigenous
Onagraceae	*Oenothera glazioviana*	Micheli		Not indigenous; Naturalised; Invasive
Asteraceae	*Anthemis cotula*	L.		Not indigenous; Naturalised
Poaceae	*Urochloa brachyura*	(Hack.) Stapf	LC	Indigenous
Poaceae	*Eragrostis gummiflua*	Nees	LC	Indigenous
Amaryllidaceae	*Crinum graminicola*	I.Verd.	LC	Indigenous
Iridaceae	*Moraea pallida*	(Baker) Goldblatt	LC	Indigenous
Acanthaceae	*Blepharis angusta*	(Nees) T. Anderson	LC	Indigenous; Endemic
Lamiaceae	*Salvia stenophylla*	Burch. ex Benth.		Indigenous
Marsileaceae	*Marsilea macrocarpa*	C.Presl	LC	Indigenous
Verbenaceae	*Chascanum pinnatifidum var. pinnatifidum*	(L.f.) E. Mey.	LC	Indigenous
Asteraceae	*Chrysocoma ciliata*	L.	LC	Indigenous
Poaceae	*Cymbopogon caesius*	(Hook. & Arn.) Stapf	LC	Indigenous
Asteraceae	*Osteospermum scariosum var. scariosum*	DC.	NE	Indigenous
Poaceae	*Eragrostis sp.*			
Malvaceae	*Hermannia stellulata*	(Harv.) K. Schum.	LC	Indigenous
Myrtaceae	*Eucalyptus sideroxylon*	A. Cunn. ex Woolls		Not indigenous; Cultivated; Naturalised; Invasive
Poaceae	*Setaria sphacelata var. torta*	(Schumach.) Stapf & C.E. Hubb. ex M.B. Moss	LC	Indigenous
Commelinaceae	*Commelina livingstonii*	C.B. Clarke	LC	Indigenous
Polygonaceae	*Rumex lanceolatus*	Thunb.	LC	Indigenous
Lamiaceae	*Acrotome inflata*	Benth.	LC	Indigenous
Poaceae	*Eragrostis biflora*	Hack. ex Schinz	LC	Indigenous
Poaceae	*Paspalum dilatatum*	Poir.	NE	Not indigenous; Naturalised; Invasive
Malvaceae	*Hibiscus trionum*	L.		Not indigenous; Naturalised
Malvaceae	*Corchorus asplenifolius*	Burch.	LC	Indigenous
Asphodelaceae	*Trachyandra burkei*	(Baker) Oberm.	LC	Indigenous
Fabaceae	*Gleditsia triacanthos*	L.	NE	Not indigenous; Naturalised; Invasive
Asphodelaceae	*Bulbine frutescens*	(L.) Willd.	LC	Indigenous

Amaranthaceae	*Cyphocarpa angustifolia*	(Moq.) Lopr.	LC	Indigenous
Poaceae	*Urochloa panicoides*	P. Beauv.	LC	Indigenous
Rubiaceae	*Kohautia caespitosa subsp. brachyloba*	Schnizl.	LC	Indigenous
Fabaceae	*Indigastrum parviflorum subsp. parviflorum*	(B. Heyne ex Wight & Arn.) Schrire	NE	Indigenous
Apocynaceae	*Pentarrhinum insipidum*	E. Mey.	LC	Indigenous
Polygalaceae	*Polygala gracilenta*	Burtt Davy	LC	Indigenous
Anacardiaceae	*Searsia pyroides var. pyroides*	(Burch.) Moffett	LC	Indigenous
Campanulaceae	*Wahlenbergia denticulata var. denticulata*	(Burch.) A.DC.	LC	Indigenous
Cyperaceae	*Fuirena pubescens var. pubescens*	(Poir.) Kunth	LC	Indigenous
Asparagaceae	*Asparagus laricinus*	Burch.	LC	Indigenous
Fabaceae	*Vigna unguiculata subsp. stenophylla*	(L.) Walp.	LC	Indigenous
Convolvulaceae	*Convolvulus thunbergii*	Roem. & Schult.	LC	Indigenous
Poaceae	*Urelytrum agropyroides*	(Hack.) Hack.	LC	Indigenous
Poaceae	*Fingerhuthia africana*	Lehm.	LC	Indigenous
Rubiaceae	*Anthospermum rigidum subsp. rigidum*	Eckl. & Zeyh.	LC	Indigenous
Rubiaceae	*Galium capense subsp. capense*	Thunb.	LC	Indigenous
Poaceae	*Panicum coloratum*	L.	LC	Indigenous
Poaceae	*Anthephora pubescens*	Nees	LC	Indigenous
Poaceae	*Heteropogon contortus*	(L.) Roem. & Schult.	LC	Indigenous
Fabaceae	*Ophrestia oblongifolia var. oblongifolia*	(E. Mey.) H.M.L. Forbes	LC	Indigenous
Fabaceae	*Vachellia karroo*	(Hayne) Banfi & Galasso	LC	Indigenous
Poaceae	*Tragus racemosus*	(L.) All.	LC	Indigenous
Apocynaceae	*Brachystelma foetidum*	Schltr.	LC	Indigenous
Polygalaceae	*Polygala rehmannii*	Chodat	LC	Indigenous
Lobeliaceae	*Cyphia stenopetala*	Diels	LC	Indigenous
Cyperaceae	*Cyperus marginatus*	Thunb.	LC	Indigenous
Poaceae	*Eragrostis chloromelas*	Steud.	LC	Indigenous
Lamiaceae	*Teucrium trifidum*	Retz.	LC	Indigenous
Poaceae	*Echinochloa holubii*	(Stapf) Stapf	LC	Indigenous
Rubiaceae	*Pygmaeothamnus zeyheri var. zeyheri*	(Sond.) Robyns	LC	Indigenous
Poaceae	*Aristida canescens subsp. canescens*	Henrard	LC	Indigenous
Fabaceae	*Indigofera heterotricha*	DC.	LC	Indigenous
Asteraceae	*Senecio sp.*			
Geraniaceae	*Monsonia burkeana*	Planch. ex Harv.	LC	Indigenous
Poaceae	*Elionurus muticus*	(Spreng.) Kunth	LC	Indigenous
Lamiaceae	*Plectranthus neochilus*	Schltr.	LC	Indigenous
Malvaceae	*Pavonia burchellii*	(DC.) R.A. Dyer	LC	Indigenous
Asphodelaceae	*Bulbine narcissifolia*	Salm-Dyck	LC	Indigenous
Fabaceae	*Erythrostemon gilliesii*	Klotzsch		Not indigenous; Naturalised; Invasive
Malvaceae	*Hermannia tomentosa*	(Turcz.) Schinz ex Engl.	LC	Indigenous
Poaceae	*Eragrostis micrantha*	Hack.	LC	Indigenous

Poaceae	*Phragmites australis*	(Cav.) Steud.	LC	Indigenous
Poaceae	*Eragrostis plana*	Nees	LC	Indigenous
Amaryllidaceae	*Crinum macowanii*	Baker	LC	Indigenous
Fabaceae	*Melilotus indicus*	(L.) All.	NE	Not indigenous; Naturalised; Invasive
Apocynaceae	*Gomphocarpus fruticosus subsp. fruticosus*	(L.) W.T. Aiton	LC	Indigenous
Poaceae	*Aristida congesta subsp. barbicollis*	Roem. & Schult.	LC	Indigenous
Lobeliaceae	*Lobelia thermalis*	Thunb.	LC	Indigenous
Euphorbiaceae	*Euphorbia inaequilatera*	Sond.	LC	Indigenous
Boraginaceae	*Cynoglossum lanceolatum*	Forssk.	LC	Indigenous
Commelinaceae	*Commelina africana var. krebsiana*	L.	LC	Indigenous
Poaceae	*Chloris virgata*	Sw.	LC	Indigenous
Rubiaceae	*Rubia petiolaris*	DC.	LC	Indigenous
Asteraceae	*Gnaphalium filagopsis*	Hilliard & B.L. Burtt	LC	Indigenous
Poaceae	*Digitaria eriantha*	Steud.	LC	Indigenous
Asteraceae	*Dicoma anomala subsp. gerrardii*	Sond.	LC	Indigenous
Crassulaceae	*Crassula lanceolata subsp. transvaalensis*	(Eckl. & Zeyh.) Endl. ex Walp.	LC	Indigenous
Poaceae	*Eragrostis trichophora*	Coss. & Durieu	LC	Indigenous
Cucurbitaceae	*Coccinia sessilifolia*	(Sond.) Cogn.	LC	Indigenous
Poaceae	*Setaria sp.*			
Onagraceae	*Epilobium hirsutum*	L.	LC	Indigenous
Asteraceae	*Nolletia ciliaris*	(DC.) Steetz	LC	Indigenous
Elatinaceae	*Bergia decumbens*	Planch. ex Harv.	LC	Indigenous
Rhamnaceae	*Ziziphus mucronata subsp. mucronata*	Willd.	LC	Indigenous
Malvaceae	*Sida cordifolia subsp. cordifolia*	L.	LC	Indigenous
Asteraceae	*Geigeria burkei subsp. burkei*	Harv.	NE	Indigenous
Nyctaginaceae	*Commicarpus pentandrus*	(Burch.) Heimerl	LC	Indigenous
Asteraceae	*Geigeria burkei subsp. burkei*	Harv.	NE	Indigenous
Poaceae	*Aristida scabrivalvis subsp. scabrivalvis*	Hack.	LC	Indigenous
Asteraceae	*Berkheya pinnatifida subsp. stobaeoides*	(Thunb.) Thell.	LC	Indigenous
Zygophyllaceae	*Tribulus terrestris*	L.	LC	Indigenous
Amaranthaceae	*Aerva leucura*	Moq.	LC	Indigenous
Caryophyllaceae	*Pollichia campestris*	Aiton	LC	Indigenous
Poaceae	*Trachypogon spicatus*	(L.f.) Kuntze	LC	Indigenous
Poaceae	*Setaria nigrirostris*	(Nees) T. Durand & Schinz	LC	Indigenous
Solanaceae	*Solanum campylacanthum*	Hochst. ex A. Rich.		Indigenous
Cyperaceae	*Bulbostylis burchellii*	(Ficalho & Hiern) C.B. Clarke	LC	Indigenous
Verbenaceae	*Lippia scaberrima*	Sond.	LC	Indigenous
Convolvulaceae	*Ipomoea oblongata*	E. Mey. ex Choisy	LC	Indigenous
Poaceae	*Triraphis schinzii*	Hack.	LC	Indigenous
Scrophulariaceae	*Selago densiflora*	Rolfe	LC	Indigenous

9.2 Appendix B – Amphibian species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Amietia delalandii	Delalande's River Frog	LC	Unlisted
Amietia fuscigula	Cape River Frog	LC	LC
Breviceps adspersus	Bushveld Rain Frog	LC	LC
Cacosternum boettgeri	Common Caco	LC	LC
Kassina senegalensis	Bubbling Kassina	LC	LC
Phrynobatrachus natalensis	Snoring Puddle Frog	LC	LC
Phrynomantis bifasciatus	Banded Rubber Frog	LC	LC
Ptychadena anchietae	Plain Grass Frog	LC	LC
Pyxicephalus adspersus	Giant Bullfrog	NT	LC
Schismaderma carens	African Red Toad	LC	LC
Sclerophrys capensis	Raucous Toad	LC	LC
Sclerophrys garmani	Olive Toad	LC	LC
Sclerophrys gutturalis	Guttural Toad	LC	LC
Sclerophrys poweri	Power's Toad	LC	LC
Strongylopus fasciatus	Striped Stream Frog	LC	LC
Tomopterna cryptotis	Tremelo Sand Frog	LC	LC
Tomopterna natalensis	Natal Sand Frog	LC	LC
Tomopterna tandyi	Tandy's Sand Frog	LC	LC
Xenopus laevis	Common Platanna	LC	LC

9.3 Appendix C – Reptile species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Acontias gracilicauda	Thin-tailed Legless Skink	LC	LC
Afrotyphlops bibronii	Bibron's Blind Snake	LC	LC
Agama aculeata distanti	Eastern Ground Agama	LC	LC
Agama atra	Southern Rock Agama	LC	LC
Aparallactus capensis	Black-headed Centipede-eater	LC	LC
Bitis arietans arietans	Puff Adder	LC	Unlisted
Boaedon capensis	Brown House Snake	LC	LC
Causus rhombeatus	Rhombic Night Adder	LC	LC
Chamaeleo dilepis	Common Flap-neck Chameleon	LC	LC
Cordylus vittifer	Common Girdled Lizard	LC	LC
Crotaphopeltis hotamboeia	Red-lipped Snake	LC	Unlisted
Dasypeltis scabra	Rhombic Egg-eater	LC	LC
Gerrhosaurus flavigularis	Yellow-throated Plated Lizard	LC	Unlisted
Hemachatus haemachatus	Rinkhals	LC	LC
Hemidactylus mabouia	Common Tropical House Gecko	LC	Unlisted
Kinixys lobatsiana	Lobatse hinged-back Tortoise	LC	LC
Lamprophis aurora	Aurora House Snake	LC	LC
Leptotyphlops scutifrons scutifrons	Peters' Thread Snake	LC	Unlisted
Lycodonomorphus rufulus	Brown Water Snake	LC	Unlisted
Lycophidion capense capense	Cape Wolf Snake	LC	Unlisted
Lygodactylus capensis	Common Dwarf Gecko	LC	Unlisted
Monopeltis capensis	Cape Worm Lizard	LC	LC
Naja nivea	Cape Cobra	LC	Unlisted
Nucras holubi	Holub's Sandveld Lizard	LC	Unlisted
Pachydactylus capensis	Cape Gecko	LC	Unlisted
Panaspis wahlbergi	Wahlberg's Snake-eyed Skink	LC	Unlisted
Pelomedusa galeata	South African Marsh Terrapin	Not evaluated	Unlisted
Prosymna ambigua	Angolan Shovel-snout	Unlisted	LC
Prosymna sundevallii	Sundevall's Shovel-snout	LC	LC
Psammophis brevirostris	Short-snouted Grass Snake	LC	Unlisted
Psammophis trinasalis	Fork-marked Sand Snake	LC	Unlisted
Psammophylax rhombeatus	Spotted Grass Snake	LC	Unlisted
Psammophylax tritaeniatus	Striped Grass Snake	LC	LC
Pseudaspis cana	Mole Snake	LC	Unlisted
Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	LC	Unlisted
Stigmochelys pardalis	Leopard Tortoise	LC	LC
Trachylepis capensis	Cape Skink	LC	Unlisted
Trachylepis punctatissima	Speckled Rock Skink	LC	LC
Trachylepis punctulata	Speckled Sand Skink	LC	Unlisted
Trachylepis varia	Variable Skink	LC	LC
Varanus albigularis albigularis	Southern Rock Monitor	LC	Unlisted
Varanus niloticus	Water Monitor	LC	Unlisted

9.4 Appendix D – Mammal species expected to occur within the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Aethomys ineptus	Tete Veld Rat	LC	LC
Aethomys namaquensis	Namaqua rock rat	LC	LC
Aonyx capensis	Cape Clawless Otter	NT	NT
Atelerix frontalis	South Africa Hedgehog	NT	LC
Atilax paludinosus	Water Mongoose	LC	LC
Canis mesomelas	Black-backed Jackal	LC	LC
Caracal caracal	Caracal	LC	LC
Crocidura cyanea	Reddish-grey Musk Shrew	LC	LC
Crocidura mariquensis	Swamp Musk Shrew	NT	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Dendromus melanotis	Grey Climbing Mouse	LC	LC
Desmodillus auricularis	Short-tailed Gerbil	LC	LC
Elephantulus brachyrhynchus	Short-snouted Sengi	LC	LC
Elephantulus myurus	Eastern Rock Sengi	LC	LC
Eptesicus hottentotus	Long-tailed Serotine Bat	LC	LC
Felis nigripes	Black-footed Cat	VU	VU
Felis silvestris	African Wildcat	LC	LC
Genetta genetta	Small-spotted Genet	LC	LC
Gerbilliscus brantsii	Highveld Gerbil	LC	LC
Gerbilliscus leucogaster	Bushveld Gerbil	LC	LC
Gerbillurus paeba	Hairy-footed Gerbil	LC	LC
Graphiurus microtis	Large Savanna African Dormouse	LC	LC
Herpestes sanguineus	Slender Mongoose	LC	LC
Hydrictis maculicollis	Spotted-necked Otter	VU	NT
Hystrix africaeaustralis	Cape Porcupine	LC	LC
Ichneumia albicauda	White-tailed Mongoose	LC	LC
Ictonyx striatus	Striped Polecat	LC	LC
Lemniscomys rosalia	Single-striped Mouse	LC	LC
Lepus capensis	Cape Hare	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Lepus victoriae	African Savanna Hare	LC	LC
Malacothrix typica	Gerbil Mouse	LC	LC
Mastomys coucha	Multimammate Mouse	LC	LC
Mellivora capensis	Honey Badger	LC	LC
Mungos mungo	Banded Mongoose	LC	LC
Mus indutus	Desert Pygmy Mouse	LC	LC

Mus musculus	House Mouse	Unlisted	LC
Mystromys albicaudatus	White-tailed Rat	VU	EN
Neoromicia capensis	Cape Serotine Bat	LC	LC
Nycteris thebaica	Egyptian Slit-faced Bat	LC	LC
Orycteropus afer	Aardvark	LC	LC
Otocyon megalotis	Bat-eared Fox	LC	LC
Panthera pardus	Leopard	VU	VU
Papio ursinus	Chacma Baboon	LC	LC
Parahyaena brunnea	Brown Hyaena	NT	NT
Pedetes capensis	Springhare	LC	LC
Phacochoerus africanus	Common Warthog	LC	LC
Poecilogale albinucha	African Striped Weasel	NT	LC
Procavia capensis	Rock Hyrax	LC	LC
Proteles cristata	Aardwolf	LC	LC
Raphicerus campestris	Steenbok	LC	LC
Rattus rattus	House Rat	Exotic (Not listed)	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	LC	LC
Rhinolophus darlingi	Darling's Horseshoe Bat	LC	LC
Saccostomus campestris	Pouched Mouse	LC	LC
Sauromys petrophilus	Flat-headed Free-tail Bat	LC	LC
Scotophilus dinganii	Yellow House Bat	LC	LC
Smutsia temminckii	Temminck's Ground Pangolin	VU	VU
Steatomys krebsii	Krebs's Fat Mouse	LC	LC
Steatomys pratensis	Fat Mouse	LC	LC
Suncus varilla	Lesser Dwarf Shrew	LC	LC
Suricata suricatta	Suricate	LC	LC
Sylvicapra grimmia	Common Duiker	LC	LC
Tadarida aegyptiaca	Egyptian Free-tailed Bat	LC	LC
Thallomys paedulcus	Tree Rat	LC	LC
Vulpes chama	Cape Fox	LC	LC
Xerus inauris	Cape Ground Squirrel	LC	LC

9.5 **Appendix A** – Protocol Checklist

"Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity" gazetted 20 March 2020, published in Government Notice No. 320

Paragraph	Item	Pages	Comment
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	i	
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	7	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these.	46, 55	
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site	46, 55	
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna.	26	
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub catchments.	17-34	
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: (a) main vegetation types; (b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified.	34-54	
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification.	-	Site contains small portions of low sensitivity areas, however the majority of the area is medium sensitivity.
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: (a) the reasons why an area has been identified as a CBA; (b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation; (c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s); (d) the impact on ecosystem threat status; (e) the impact on explicit subtypes in the vegetation; (f) the impact on overall species and ecosystem diversity of the site; and (g) the impact on any changes to threat status of populations of species of conservation concern in the CBA.	19; 37-44; 49-53	
2.3.7.2	Terrestrial ecological support areas (ESAs), including:	19; 37-44	The project area traverses ESA1 areas and these ESA

	(a) the impact on the ecological processes that operate within or across the site; (b) the extent the proposed development will impact on the functionality of the ESA; and (c) loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna.		1 areas function as linkages/corridors (comprising of natural vegetation) between the important biodiversity areas and major freshwater resource and their fringing terrestrial habitats
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- (a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan.	24-25	
2.3.7.4	Priority areas for protected area expansion, including- (a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network.	-	Does not overlap NPAES areas
2.3.7.5	SWSAs including: (a) the impact(s) on the terrestrial habitat of a SWSA; and (b) the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses)	-	Does not overlap a SWSA
2.3.7.6	FEPA sub catchments, including- (a) the impacts of the proposed development on habitat condition and species in the FEPA sub catchment	29	
2.3.7.7	indigenous forests, including: (a) impact on the ecological integrity of the forest; and (b) percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.	-	No forest habitats within the area
3.1.1.	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae.	Cover page i	
3.1.2	A signed statement of independence by the specialist.	84-85	
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment.	12	
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant.	11-15	
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations.	16	
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant).	37-44	Wetlands to be avoided

3.1.7	Additional environmental impacts expected from the proposed development.	69	
3.1.8	Any direct, indirect and cumulative impacts of the proposed development.	56-59	
3.1.9	The degree to which impacts and risks can be mitigated.	70-75	
3.1.10	The degree to which the impacts and risks can be reversed.	50-56	
3.1.11	The degree to which the impacts and risks can cause loss of irreplaceable resources.	59	
3.1.12	Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr).	69-75	
3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate.	-	N/A
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not;	76-77	
3.1.15	any conditions to which this statement is subjected	77	

9.6 Appendix B – Specialist Declaration of Independence

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

April 2022

I, Lusanda Matee, 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.

Lusanda Matee

Terrestrial Ecologist

The Biodiversity Company

April 2022