Terrestrial Biodiversity Assessment

WKN Benya PV & Grid

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1 Introduction & Background

1.1 Background

Benya Solar PV (RF) (Pty) Ltd is proposing the development of the proposed Benya Solar Photovoltaic (PV) Facility and associated infrastructure on the Remainder of Farm Portugal 198, as well as the Integrated Electrical Grid Connection Infrastructure (substations and power line) on the Remainder of Farm Portugal 198 and Farm Napoleon 216 in the Thabazimbi Local Municipality in the Waterberg District, Limpopo Province (Figure 1). As part of this application, a terrestrial biodiversity assessment is required.

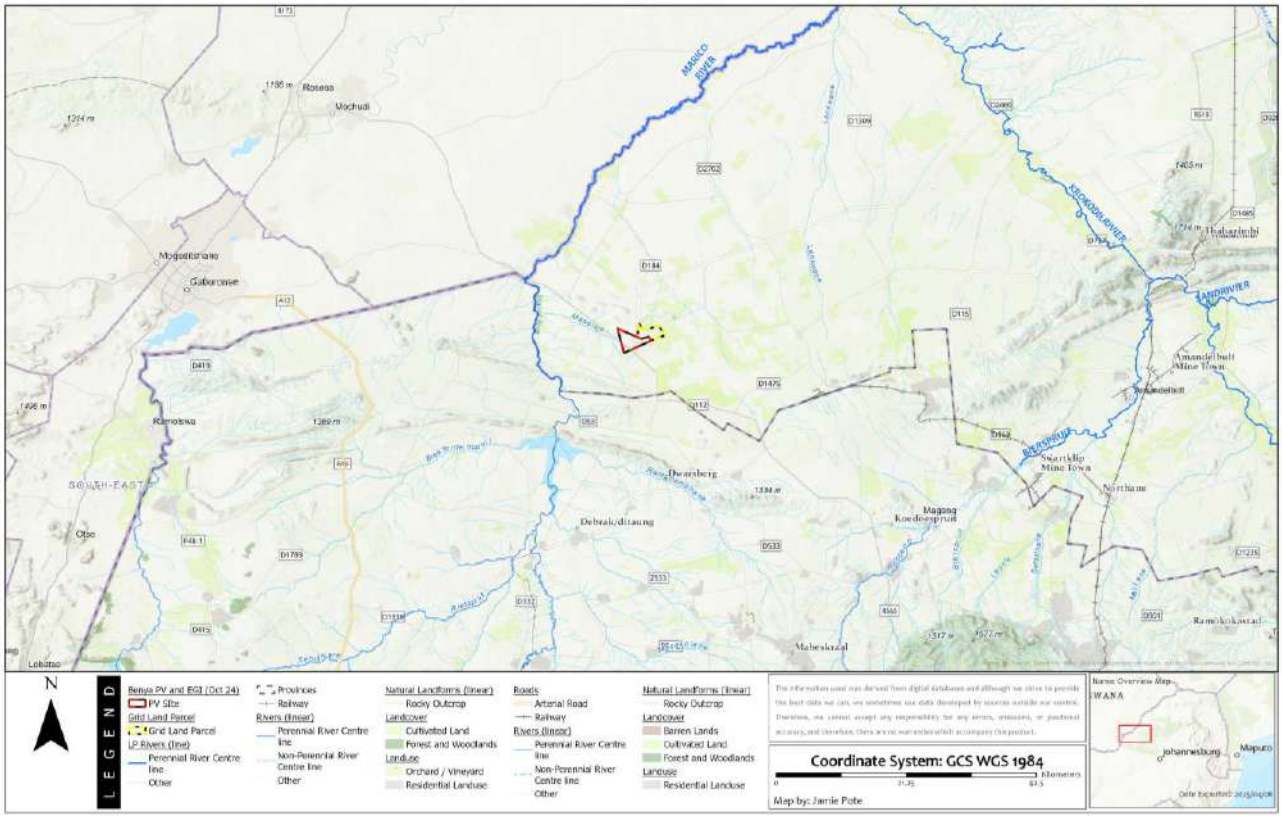

Figure 1: Locality Map.

1.2 Project Description

1.2.1 Activity Location and Description

Benya Solar PV (RF) (Pty) Ltd is proposing the development of the proposed Benya Solar Photovoltaic (PV) Facility and associated infrastructure on the Remainder of Farm Portugal 198, as well as the Integrated Electrical Grid Connection Infrastructure (substations and power line) on the Remainder of Farm Portugal 198 and Farm Napoleon 216 in the Thabazimbi Local Municipality in the Waterberg District, Limpopo Province.

The solar PV facility will comprise of several arrays of PV panels and associated infrastructure and at this stage it is anticipated that it will have a contracted capacity of up to 300 MW. The solar PV facility will also include associated electrical grid connection infrastructure, to evacuate the electricity generated, which will include a 33kV/132kV Independent Power Producer (IPP) Step-up Substation, a 132kV Eskom Switching Substation and 132kV overhead power line. The project site is accessible via the existing D113 and D1629 roads that pass through the site.

A study site of approximately 1 500 ha[1] is being assessed as part of this Environmental Process for the PV facility and supporting infrastructure (Figure 2), which includes the on-site and switching substations and grid connection corridors for the placement of the power line infrastructure required to connect the substations to one (1) of the nearby existing 132kV Eskom overhead power lines. It should be noted that the solar PV and electrical grid connection infrastructure would not cover the entire extent of the study sites.

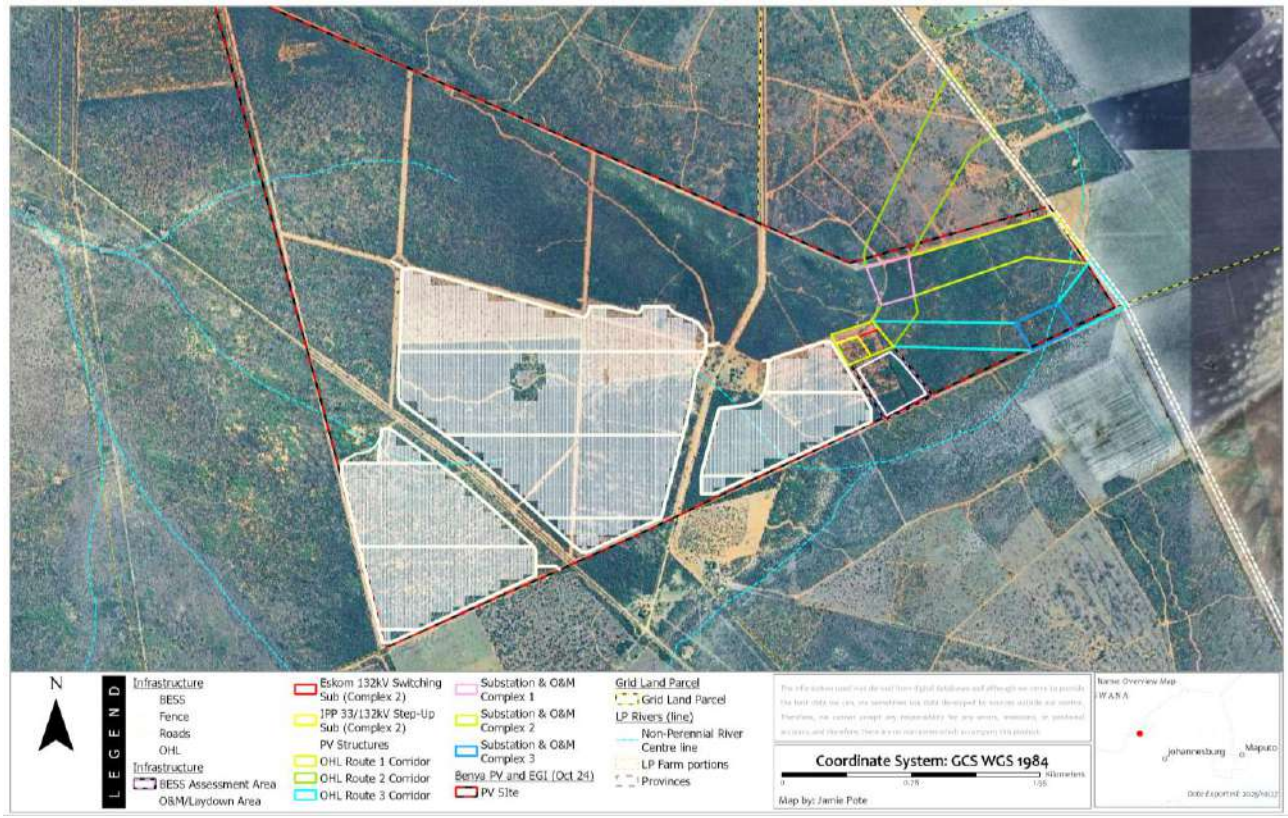

Figure 2: Aerial Photo and proposed site development plan.

The key infrastructure associated with the Benya Solar PV Development includes the following:

- PV modules and mounting structures, up to 6m in height and a maximum footprint of up to 350 ha.
- Inverters and transformers.
- Operation and Maintenance buildings (up to 6m in height), including a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance.
    - An area of up to 1.5 ha within the assessed development footprint will be occupied by buildings.
- Temporary and permanent laydown areas, situated within the assessed development footprint.
    - Temporary laydown areas will occupy up to 5 ha, while up to 1.5 ha will remain in place for the permanent laydown area, as required for facility operation.
- Site and internal access roads (between 6m and 8m wide). Existing internal roads will be used as far as possible.
- Perimeter fencing up to 3m in height.
- Battery Energy Storage System (BESS), up to 7.5 ha in extent and located within a 10-ha

[1] Please note that this size depicts the total extent of the study site and not the development footprint. A section of one (1) of the electrical grid connection corridor alternatives is located within a 642-ha study site (i.e. grid property), while the entire extent of the solar PV facility and majority of the electrical grid connection infrastructure alternatives are proposed within an 856-ha study site (i.e., solar PV property).

development area[2]
  - The infrastructure will be located within the assessed development footprint.
- Associated Electrical Grid Connection Infrastructure, including:
  - 33kV cabling between the project components and the on-site facility substation.
  - A 33kV/132kV Independent Power Producer (IPP) Step-up Substation, up to 1.83 ha in extent.
  - A 132kV Eskom Switching Substation, up to 1.64 ha in extent; and
  - A 132kV overhead power line (up to 40m in height) connecting the on-site switching substation to one (1) of the nearby 132kV Eskom overhead power lines, via a Loop In – Loop Out (LILO) connection.

The site is situated in a flat to gently undulating arid landscape, supporting a dry Thornveld vegetation, typical and widespread in the area. The broader landscape is bisected by minor non-perennial watercourses. Stock and game farming and cultivation is prevalent in the surrounding area, and levels of transformation relating to this are low to moderate. The PV area includes an area of approximately 860 Ha, which will be utilised for the proposed PV facility, with the additional adjacent farm portion being traversed by grid connection infrastructure. Placement of the proposed PV facility is yet to be determined during the assessment phase.

The following technical checklist is included as a quick reference roadmap for the proposed project.

PROJECT NAME		BENYA PV & GRID
Applicant Details	Applicant Name:	Benya Solar PV (RF) (Pty) Ltd
	Company	Registration Number:
	BBBEE Status:	N/A
	Project Name:	Benya Solar PV Facility and Integrated Electrical Grid Connection Infrastructure
Site Details		
Size of Property	Description of the affected property	PV Facility and Integrated Electrical Grid Connection Infrastructure Remainder of Farm Portugal 198 (PV & Grid) Farm Napoleon 216 (Grid Infrastructure – one of the three power line corridor alternatives)
Size of Study Area	Size in ha of initial study area.	PV Site: 856 ha[3] Electrical Grid Connection Site: 642 ha
Development Footprint	This includes the total footprint of PV panels, BESS auxiliary buildings, On-site Substation, Mini-substations, inverter stations and internal roads.	~440 ha[4]
PV Technology Details		
Capacity of the facility	Capacity of the PV facility (in MW)	Net generation capacity of up to 300 MWAC
Solar technology selection	Type of technology	Solar photovoltaic (PV) with Mono-facial or Bi-facial PV panels to be utilised. The panels will either be fixed to a single- and/or double-axis horizontal tracking structures, or fixed-tilt structure. PV panels with single axis tracking is preferred over fixed-axis or double axis tracking systems from a technical perspective. Both technology options are considered feasible for the project site, however, the technology type will be determined during the final design phase.
	Structure height	PV Panels up to 6m in height Buildings up to 6m in height Fencing up to 3m in height
	Surface area to be covered	

[2] 10 ha development area assessed by specialists for the placement of BESS infrastructure.

PROJECT NAME		BENYA PV & GRID
	(including associated infrastructure such as roads)	~350 ha
	Structure orientation	PV panels will either be fixed to a single- and/or double-axis horizontal tracking structure, or fixed-tilt structure, where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.
	Laydown area dimensions	Temporary and permanent laydown areas will be situated within the assessed development footprint and will occupy up to 5 ha, while 1.5 ha will remain in place for the permanent laydown area, as required for facility operation.
BESS Technology Details		
BESS technology	Capacity of BESS facility (in MWh)	Up to 300 MW capacity, with up to 1 800 MWh (6-hour) storage capacity
	Type of technology (preferred)	Pre-Assembled Solid-State Lithium-Ion or Sodium-Ion
	Type of technology (alternatives)	The BESS will make use of solid state or flow battery technology. Three (3) types of battery technologies can be considered for the proposed project: Lithium-ion (Lithium-Phosphate), Sodium-Sulphur or Vanadium Redox flow battery, depending on which is most feasible at the time of implementation.
	Structure height	Containerized types, including all solid-state types = maximum of 4m from ground level (may have vent pipes and lightning conductors exceeding 4m above ground level).
	Surface area to be covered (including associated infrastructure such as roads)	Up to 7.5 ha in extent and located within a 10 Ha study area[2]. The infrastructure will be located within the assessed development footprint.
	Structure locations	DC Coupled BESS within the PV field and AC coupled BESS adjacent to the project substation.
Grid Connection Infrastructure Details		
Grid connection technology	Power line capacity (in kV)	132kV
	Switching substation capacity (in kV)	132kV
	Switching substation footprint	1.64 ha
	Step-up substation capacity (in kV)	33kV/132kV
	Step-up substation footprint	1.83 ha
	Power line corridor length	OHL Corridor Alternative 1 = 1km OHL Corridor Alternative 2 = 1.5km OHL Corridor Alternative 3 = 1.3km
	Power line corridor footprint	OHL Corridor Alternative 1 = 21 ha OHL Corridor Alternative 2 = 36 ha OHL Corridor Alternative 3 = 25 ha
	Power line servitude	32m
	Power line pylons	Monopole or Lattice pylons, or a combination of both where required
	Structure height	Switching substation = up to 6m in height Power line = up to 40m in height

1.2.2 Aspects of the project that could potentially have Biodiversity related Impacts

The key components of the project and their respective impacts upon terrestrial biodiversity and ecological processes include the following:

COMPONENT	POTENTIAL BIODIVERSITY AND ECOLOGICAL IMPACTS
PV Facility	
The construction of the facility will require selective and localized clearing for PV infrastructure	The terrestrial environment will permanently be impacted where vegetation clearing is required to construct the PV facility and will be limited to the footprint area as well as any additional area for cut and fill requirements. It is likely

COMPONENT	POTENTIAL BIODIVERSITY AND ECOLOGICAL IMPACTS
	that some low vegetation will be retained during operations under the PV panels.
Overhead Powerline	
The construction of the proposed facility will require selective clearing for pylon construction.	The terrestrial environment will be temporarily impacted where vegetation clearing is required along grid corridors to construct any pylons and will be limited to a minimal width to accommodate the powerline and pylons. Some vegetation regeneration will occur within the powerline corridor, but trees will be removed or pruned during operations so not to interfere with the overhead lines.
BESS & Substations	
The construction of the substation will require selective and localized clearing for BESS infrastructure	The terrestrial environment will be permanently impacted where vegetation clearing is required to construct the substations and BESS and will result in hardened surfaces on completion. This will be limited to the footprint area.
Access/Roads	
The construction of the proposed facility will require selective clearing of vegetation along the existing access road for construction and operation and some new roads around the PV facility.	Access roads will be required to access the PV facility during construction as well as during operations for maintenance purposes. It is likely that the road will be heavily used during construction phase after which traffic will be relatively light, dependant on maintenance needs.

This assessment includes the PV, BESS and grid infrastructure (powerline plus substation).

1.3 Purpose of Report

1.3.1 Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes

This report has been 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 species theme**, this report includes these flora species requirements. The terrestrial biodiversity assessment also gives consideration of fauna, as per protocol requirements for terrestrial biodiversity reporting.

The principles that guide this process include protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources which are fundamental to sustainable development. Since the ecology of a landscape is a function of the relationships between living organisms, including humans, and their physical environment, this terrestrial biodiversity or ecological assessment report will consider not only vegetation but also flora and fauna as well as the physical environment in which they occur, which will determine the ecological processes that are affected within the site and immediate surrounds (area of influence).

While the above protocols are stipulated regarding specialist assessment, the specialist is also required to provide an objective analysis of the applicable circumstances.

Refer to Section 8.9: Appendix I: Site Sensitivity Verification Report. This assessment includes the PV, BESS and grid infrastructure (powerline plus substation).

1.4 Methodology and Approach

The methodology and approach for the terrestrial biodiversity assessment, as a minimum, will include the following:

1. A comprehensive desktop study and identification of potential risks for a terrestrial biodiversity assessment relating to of the site and immediate surrounding area (Are of Influence). This will include the relevant Regional Planning frameworks and review any previous studies conducted in the area, where available.
2. A site visit or series of seasonal site visits, depending on timing, to assess the following:
    a. Verification of findings of any previous specialists or studies and/or regional planning information and datasets.
    b. Broad level field survey of vegetation, flora and habitats present (including any riparian vegetation or wetland vegetation).
    c. Verify and update species list, identifying, highlighting, and locating *flora* species that are of Conservation Concern, Threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and any respective Provincial Ordinances. Mapping of any populations of such species observed during the site visit.
    d. Mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and flora species of special concern, the outcome being a detailed sensitivity map ranked into high, medium, or low classes.
    e. The proposed fee includes a single site visit only but depending on when the initial site visit is undertaken, additional follow-up visits in different seasons may be required, in order to meet the species assessment protocol requirements.
3. Detailed reporting will be comprised of a *Draft Terrestrial Biodiversity Assessment Report* (for public review and comment) and a *Final Terrestrial Biodiversity Assessment Report* for submission. The draft and final detailed reports will address the following (as per the gazetted Terrestrial Biodiversity Assessment Protocol):
    a. Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
    b. A detailed flora species list highlighting the various species of special concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds). Clearly indicate the need for any further permitting/licensing or detailed studies to specification of animal and plant species protocols.
    c. Faunal assessment will be compromised of a general fauna desktop assessment, as well as specific taxa specialist assessment were deemed necessary.
    d. Description and assessment of the habitat units and site sensitivities ranked into high, medium, or low classes based on sensitivity and conservation importance. A standard methodology has been developed based on other projects in the specific area.
    e. A habitat sensitivity map will be compiled, indicting the sensitivities as described above, inclusive of a riparian delineation for the aquatic report.
    f. A map indicating buffers to accommodate Regional Planning requirements (if required).
    g. Assessment of Impacts and Mitigation Measure, as well as specific measure that may be required for alternative development plans.
    h. A comprehensive EMPr for inclusion in the reports and EMP with specific management actions for construction and Operation.
    i. Address any comments raised by IAP's or identified in the project in the final draft and final report.

1.4.1 Data sources and references

Data sources that will be used include the following:

- National (DFFE) Web Based Environmental Screening Tool (referred to as NEST in this report) – to generate the sites potential environmental sensitivity.
- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019) – description of vegetation types, species (including endemic) and vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinances and NEM:BA Threatened or Protected Species (ToPS) & Bioregional Plans.
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI).
- International Union for Conservation of Nature (IUCN) – Red List of Threatened Species.
- Animal Demography Unit Virtual Museum (VM) – potential faunal species.
- Global Biodiversity Information Facility (GBIF) – potential faunal species.
- National Red Books and Lists – mammals, reptiles, frogs, dragonflies & butterflies.
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) – important catchments.
- National Protected Areas Expansion Strategy (NPAES, 2010 & 2018) and South Africa Protected Area database (SAPAD, 2022) – protected area information.
- SANBI BGIS – All other biodiversity GIS datasets.
- Aerial Imagery – Google Earth, Esri, Chief Surveyor General (http://csg.dla.gov.za).
- Cadastral and other topographical country data – Chief Surveyor General (http://csg.dla.gov.za).
- Other sources include peer-reviewed journals, regional and local assessments, and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

A Glossary and list of Abbreviations is provided in Section 8.2 Appendix B: Abbreviations and Glossary.

1.4.2 Site Visit

Site visits were conducted on 23 March 2024 (later summer/early winter), 03 & 04 December 2024 (early summer) & 01 May 2025 (autumn/late summer). The optimum sampling season for bushveld (Savannah), as per the assessment protocols is spring and summer (ideally after good rainfall). The combined site visits have allowed for a comprehensive sampling period across the optimum season that includes adequate sampling relatively early in the season, mid-season and towards, which will allow for detection of key dominant and characteristic species as well as variation in phenology and growth periods with the season. The site visit and assessment are undertaken by Mr Jamie Pote, SACNASP registered ecological scientist with a BSc (Hons) degree in Botany and a BSc degree in Botany and environmental Science, with over 20 years' experience undertaking ecological and terrestrial biodiversity assessments.

1.4.3 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this and subsequent reports may be subject to the following uncertainties and limitation:

- Any biodiversity surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times. Additionally, the rainfall may vary depending in arid environments and unseasonal rainfall may affect composition and flowering times. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.

- No assessment has been made of aquatic processes relating to any wetlands, pans, and rivers/seeps and/or estuaries, or avifauna and bats outside of the scope of those having an influence on terrestrial biodiversity.

2 Policy & Legislation

2.1 Legislation Framework

In terms of NEMA EIA Regulations (07 April 2014, as amended), the following specific listing notices have bearing on this report[3]:

Listing Notice 1 (GNR 327):

1. The development of facilities or infrastructure for the generation of electricity from a renewable resource where—
(i) the electricity output is more than 10 megawatts but less than 20 megawatts; or
(ii) the output is 10 megawatts or less, but the total extent of the facility covers an area in excess of 1 hectare.

Activity 1 will not be triggered as the total capacity of the proposed facility will exceed 20 MW (see LN 2 below).

11. The development of facilities or infrastructure for the transmission and distribution of electricity—
(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or
~~(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.~~

Activity 11 will be triggered as the total grid capacity of the proposed facility will exceed 33 kV.

12. The development of:
(ii) infrastructure or structures with a physical footprint of 100 square metres or more.
where such development occurs—
(a) within a watercourse.
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse: —

Watercourses are present on site but are likely to only be affected by watercourse crossings, as the trigger.

19. The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
but excluding where such infilling, depositing, dredging, excavation, removal or moving—
~~(a) will occur behind a development setback;~~
~~(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;~~
~~(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.~~
~~(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or~~
~~(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.~~

3 *The listed activities itemized are only those with Biodiversity relevance to this report and is not necessarily a complete list. Refer to EAP reporting.*

Watercourses are present on site but are likely to only be affected by watercourse crossings, as the trigger.

27. The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—
~~(i) the undertaking of a linear activity; or~~
~~(ii) maintenance purposes undertaken in accordance with a maintenance management plan.~~

Indigenous vegetation is present on site and will require clearing, but the listed activity will not be triggered as clearing will exceed 20 Ha (see LN 2 below).

Listing Notice 2 (GNR):
1. The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs —
(a) within an urban area; or (b) on existing infrastructure.

Activity 1 will be triggered if the renewable energy facility exceeds 20 MW (Full Scoping & EIA).

9. The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.

Activity 9 will not be triggered as the total capacity of the proposed grid facility will not exceed 275 kV.

15. The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—
~~(i) the undertaking of a linear activity; or~~
~~(ii) maintenance purposes undertaken in accordance with a maintenance management plan.~~

Indigenous vegetation is present on site and the listed activity will be triggered as clearing of indigenous vegetation will exceed 20 Ha (Full Scoping & EIA).

Listing Notice 3 (GNR 324):

4. The development of a road wider than 4 metres with a reserve less than 13,5 metres
(a) In Limpopo province:
~~i. In an estuary;~~
ii. Outside urban areas, in:
~~(aa) A protected area identified in terms of NEMPAA, excluding disturbed areas;~~
~~(bb) National Protected Area Expansion Strategy Focus areas;~~
~~(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;~~
~~(dd) Sites or areas identified in terms of an International Convention;~~
(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
~~(ff) Core areas in biosphere reserves;~~
(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or
~~(hh) Areas seawards of the development setback line or within 1 kilometre from the high water mark of the sea if no such development setback line is determined; or~~
~~iii. In urban areas:~~
~~(aa) Areas zoned for use as public open space;~~
~~(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or~~
~~(cc) Seawards of the development setback line or within urban protected areas.~~

The site is within a designated CBA 2 and within 5 km of nature reserves to the west of the site, hence this listed activity will be applicable.

12. The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.
(a) In Limpopo province:
~~i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;~~
ii. Within critical biodiversity areas identified in bioregional plans;
~~iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or~~
~~iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.~~

The site is within a designated CBA 2, hence this listed activity will be applicable.

14. The development of -
~~(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or~~
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;
where such development occurs -
(a) within a watercourse;
~~(b) in front of a development setback; or~~
(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;
~~excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.~~
(a) In Free State, Limpopo, Mpumalanga and Northern Cape:
~~i. In an estuary;~~
ii. Outside urban areas, in:
~~(aa) A protected area identified in terms of NEMPAA, excluding conservancies;~~
~~(bb) National Protected Area Expansion Strategy Focus areas;~~
~~(cc) World Heritage Sites;~~
~~(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;~~
~~(ee) Sites or areas identified in terms of an International Convention;~~
(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
~~(gg) Core areas in biosphere reserves;~~
(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
~~(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or~~
~~iii. In urban areas:~~

The site is within a designated CBA 2 and within 5 km of nature reserves to the west of the site, hence this listed activity will be applicable but dependant on final layout and whether or not roads will traverse any watercourses.

This assessment includes the PV, BESS and grid infrastructure (powerline plus substation).

Other potentially relevant legislation, which will be evaluated as required, includes the following:

- NEMA: Environmental management principles set out in NEMA, and other Specific Environmental Management Acts (SEMA's) should guide decision making throughout the project life cycle to reflect the objective of sustainable development. One of the most important and relevant principles is that disturbance of ecosystems, loss of biodiversity, pollution and degradation of environment and sites that constitute the nation's cultural heritage should be avoided, minimised or as a last option remedied. This is supported by the Biodiversity Act as it relates to loss of biodiversity.
- Liability for any environmental damage, pollution, or ecological degradation: Arising from all -related activities occurring inside or outside the area to which the permission/right/permit relates is the responsibility of the rights holder. The National Water Act and NEMA both oblige any person to take all reasonable measures to prevent pollution or degradation from occurring, continuing or reoccurring (polluter pays principle). Where a person/company fails to take such measures, a relevant authority may direct specific measures to be taken and, failing that, may carry out such measures and recover costs from the person responsible.
- Public participation: Public consultation and participation processes prior to granting licences or authorisations can be an effective way of ensuring that the range of ways in which the activities impact on the environment, social and economic conditions are addressed, and taken into account when the administrative discretion to grant or refuse the licence is made. No specific public participation is undertaken as part of this assessment; however, it will be undertaken as part of the environmental application for which this report has been compiled. As part of that process, any comments raised in that process will be addressed as required. Where applicable, local persons, including landowners and residents, will be informally interviewed, where information pertaining to the terrestrial environment may provide value or information.
- Constitution of Republic of South Africa (1996): Section 24(a) of the Constitution states that everyone has the right '*to an environment that is not harmful to their health or well-being*'. Construction activities must comply with South African constitutional law by conducting their activities with due diligence and care for the rights of others.
- National Forests Act 84 of 1998 with Amendments: Lists Protected trees, requiring permits for removal Department of Agriculture, Forestry and Fisheries). Section (3)(a) of the National Forests Act stipulate that '*natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits*'.
- Provincial Nature and Environmental Conservation Ordinances: Lists Protected species, requiring permits for removal. Transvaal Nature Conservation Ordinance 12 of 1983 (TNCO).
- The National Water Act (No. 36 of 1998): Requires that provision is made both in terms of water quantity and quality for 'the reserve', namely, to meet the ecological requirements of freshwater systems and basic human needs of downstream communities. It is essential in preparing an EMP that any impacts on water resources be they surface water or groundwater resources, and/ or impacts on water quality or flow, are carefully assessed and evaluated against both the reserve requirement and information on biodiversity priorities. This information will be required in applications for water use licenses or permits and/or in relation to waste disposal authorisations.
- Conservation of Agricultural Resources Act 43 of 1993: Lists Alien invasive species requiring removal.
- Sustainable Development Goals: Goal 15: Life on Land: Protect, restore, and *promote sustainable use of terrestrial ecosystems*, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. The approach, assessment methodology and recommendations contained within this report are in line with this sustainable development goal.

Implications:

- The proposed PV activity will trigger activities for renewable energy generation as well as vegetation clearing and activities within a watercourse, hence triggering a full Scoping and EIA application process.

- The proposed grid connection activity will trigger activities pertaining to grid capacity and will thus require a basic assessment process for the grid component.
- The site is not within any designated REDZ or EGI corridor.

2.2 Systematic Planning Frameworks Summary

A screening of Systematic Planning Framework for the region was undertaken (summarised in Table 1), that included the following features:

- Critically Endangered, Endangered and Vulnerable Ecosystems.
- Critical Biodiversity Areas and Ecological Support Areas.
- River, Estuarine and Wetland Freshwater Ecosystem Priority Areas (FEPAs) and buffers.
- Regional Planning Frameworks (North-West Biodiversity Sector Plan, NWBSP, 2015)
- Protected Areas (and buffers) and Protected Area Expansion Strategy (PAES).
- Critical Habitat for endemic, protected and threatened species.

A summary of the key implications of the respective ecological receptors and indicators is provided in the sections below and further information is also provided in Section 8.3: Appendix C: Systematic Planning Frameworks.

Table 1: Summary of Regional Planning Biodiversity features.

FEATURE	DESCRIPTION	IMPLICATIONS/COMMENT
National Environmental Screening Tool (Terrestrial Biodiversity)	Very High Terrestrial Biodiversity Medium Animal Species Low Plant Species Very High Aquatic Biodiversity	Elevated sensitivity biodiversity indicators and designations include CBA 2 for intact habitat on the site and ESA 2 for degraded/transformed areas. A single sensitive species is flagged for the site. Aquatic features are also present, designated as very high sensitivity.
National Vegetation Map (NVM, 2018)	Dwaalboom Thornveld	Least Concern
Critically Endangered and Endangered Ecosystems (RLE, 2022)	N/A	N/A
Vulnerable Ecosystems (RLE, 2022)	N/A	N/A
Limpopo Conservation Plan (LCP, 2018)	Predominantly CBA 2 corresponding to intact thornveld, with ESA corresponding with a small transformed/degraded patch.	The site does overlap with designated CBA but also constitutes a small proportion of the overall extent of the vegetation unit, which does not have an elevated conservation status, and the respective impacts will be assessed accordingly.
Protected Areas (SAPAD)	Protected Areas in proximity to the site include the Madikwe nature reserve, situated 11 km ot the west and several small private nature reserves up to 2.2 km also to the west. No national parks are situated within 10 km of the site.	Additional listed activity triggers would be applicable associated with being within 10 km of a nature reserve.
NPAES	Site does not overlap with any NPAES designated areas.	N/A
Important Bird Areas (IBA's)	No IBA's within 50 km of the site.	N/A
Within 32 m of Watercourse	Non-perennial watercourses are present on the site.	Watercourses will be affected if the proposed activity is undertaken in proximity and buffers will require consideration (usually 32 m buffers, may be more to accommodate ecological corridors).
Within 100 m of a River	The site is not adjacent to any perennial river.	Site is within proximity to a river which may be affected if the proposed activity is undertaken in

FEATURE	DESCRIPTION	IMPLICATIONS/COMMENT
		proximity and buffers will require consideration, usually around 100 m.
Within 500 m of a Wetland	Wetlands are present within 500 m of the site, predominantly artificial farm dams or impoundments.	Site is within proximity to wetlands which would require aquatic assessment and may affect available footprint ito wetland buffers.
Critical Habitat for listed endemic/ protected species	Red listed flora & faunal species in the surrounding area and vegetation units that are known to have limited distributions are limited. These species, if present, could potentially have small, localized populations. Based on available information, there is likely not an elevated species risk (as only flagged species appears to be more common in areas away from the site)	

Implications:

- Dwaalboom Thornveld is not of conservation concern (Least Concern).
- Critical Biodiversity 2 is designated in the most recent conservation plan (LCP, 2018) that overlap with the site.
- National Protected Areas, National Protected Area Expansion Strategy areas and IBA's are not in close proximity to the site, but the site is near a cluster of Nature Reserves to the west (within 5 km).
- Watercourses are present within the site.

2.2.1 National Environmental Screening Tool

National Environmental Screening Tool (NEST, updated October 2025) flagged sensitivities are summarised below and assessed in more detail in the report.

- Terrestrial Biodiversity is Very High across the entire site (Figure 2).
- Plant species sensitivity is Medium & Low (Figure 3).
- Animal Species sensitivity is Medium (Figure 4).
- Aquatic Sensitivity is Low & Very High (Figure 5).

Table 2: Summary of Screening Tool flagged sensitivities.

SENSITIVITY	FEATURE(S) IN PROXIMITY
Terrestrial Sensitivity	
Very High	CBA 2, ESA 2
High	None
Medium	None
Plant Sensitivity	
Very High	None
High	None
Medium	Sensitive species 1259
Low	Present
Animal Sensitivity	
Very High	None
High	*Polemaetus bellicosus*
Medium	*Aquila rapax* (bird), *Sensitive species 5, Lycaon pictus* (Mammals)
Aquatic Sensitivity	
Very High	Rivers (C), Wetlands (Central Bushveld Bioregion, Depression))
High	None
Medium	None
Low	Present

Figure 3: Terrestrial Biodiversity Sensitivity.

Figure 4: Plant Species Sensitivity.

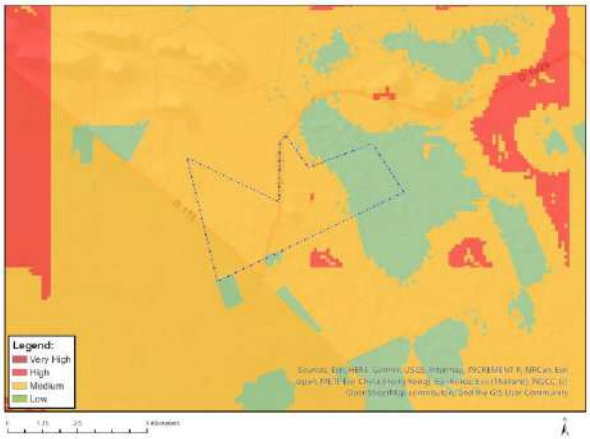

Figure 5: Animal Species Sensitivity.

Figure 6: Aquatic Sensitivity.

- Elevated sensitivity biodiversity indicators and designations including CBA 2 for most of the site, with ESA 2 in transformed/degraded areas.
- Flagged sensitive species limited to a two faunal species (Sensitive Species 5 & African Wild Dog) flagged most likely due to confirmed presence in the broader surrounding area.
- Limited aquatic features also present, designated as very high sensitivity. These are generally localised along watercourses and wetlands (probably farm dams).

NOTE: as per point 1.5 of the Terrestrial Biodiversity Specialist Assessment and Minimum Report Content Requirements:
'*If any part of the proposed development footprint falls within an area of 'very high' sensitivity, the assessment and reporting requirements prescribed for the 'very high' sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.*'

The site assessment will physically screen for the presence of the listed, and other possible species or sensitivities that are not identified in the screening tool. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

2.2.2 Vegetation of Southern Africa (National Vegetation Map 2024)

The site falls within a single vegetation unit (Figure 7, Mucina & Rutherford, 2006). The site is located entirely within *Dwaalboom Thornveld*, situated within the Central Bushveld Bioregion and currently has a Least Concern conservation statue (RLE/NBA, 2022), which is indicative of less than 40 % of the original extent being transformed. The vegetation unit has an extensive but somewhat patchy coverage (Figure 8) across the flats north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area but including a patch around Sentrum and extending slightly into Botswana. South of the Dwarsberge it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area.

The vegetation of Limpopo was remapped in 2023 (Desmet et al, 2024) and areas of Dwaalboom Thornveld have been reclassified as other Bushveld/Thornveld units, including Western Sandy Bushveld to the west and south and Zeerust Thornveld along the southern edge of the unit, as well as several smaller modifications. There is no change to the conservation status, it is only a refinement of the spatial coverage mapping. This report is aligned with the revised version.

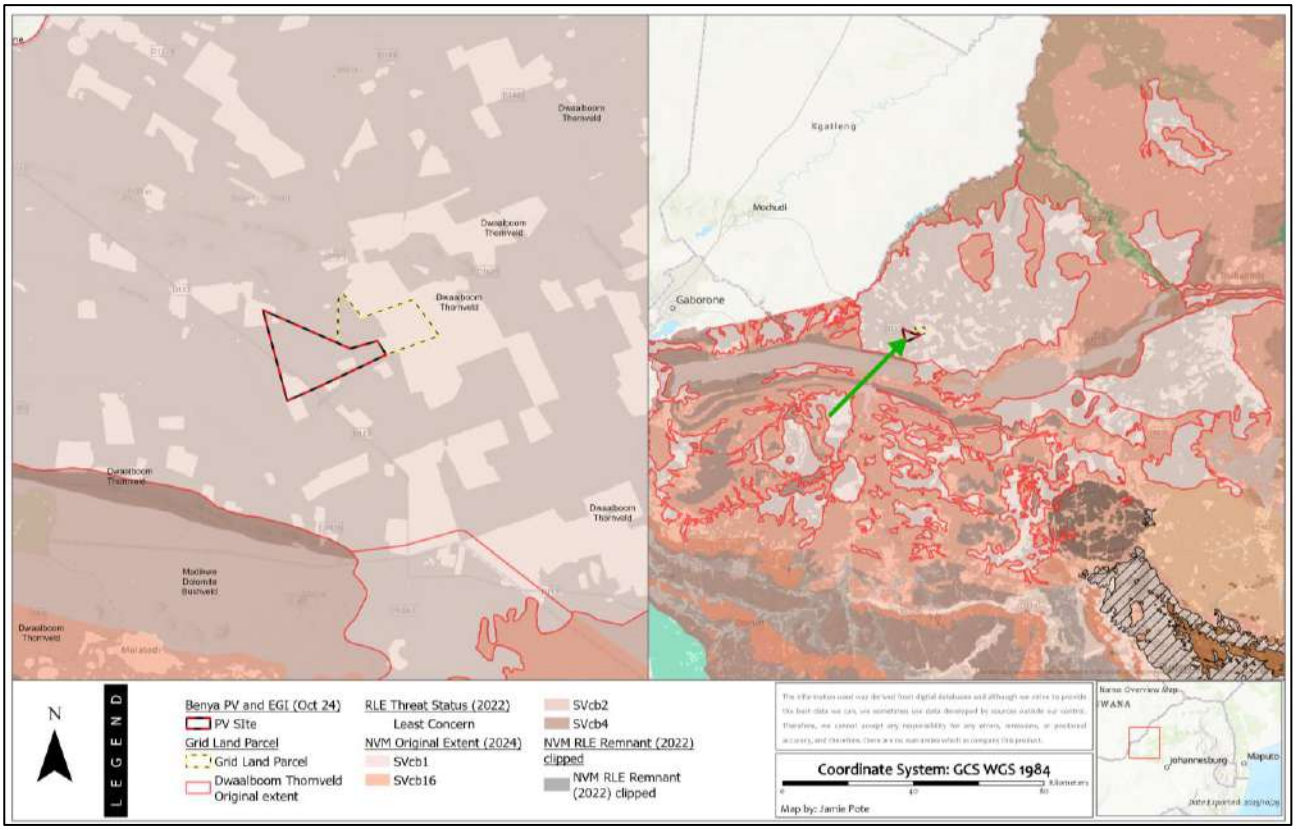

Figure 7: National Vegetation Map (2024) and National Biodiversity Assessment Status (2022) for site. Paler areas are indicative of transformed habitat, with darker indicative of natural/intact remnant habitat.

As per the revised National Vegetation map (2024), the original extent *of Dwaalboom Thornveld* is *estimated to have been* 667 160 Ha, previously *967 049 Ha* (6 671.6 sq. km, previously 9 670.4 sq. km), with 515 226 Ha, previously 766 944.8 Ha (5 152.3 sq. km, previously 7 669.4 sq. km) now remaining (2022) or 77 % (previously 80 %) being natural or near natural, with moderate to low levels of generally localised transformation (predominantly agricultural clearing). The 856 Ha site represents 0.13 % of the original extent and 0.17 % of the remaining extent of the vegetation unit. The 440 Ha footprint represents 0.07 % of the original extent and 0.09 % of the remaining extent of the vegetation unit. The site is situated centrally in the northern band of the unit's extent, separated from the somewhat patchy, southern band by a Madikwe Dolomite Bushveld ridge. The conservation target for the vegetation unit is 19 %, which is at the lower end of the generally accepted conservation target range (usually between 19 & 35 %).

A 440 Ha footprint, representing less than 0.1 % of the remaining extent of the vegetation unit would not be considered a significant area where the area to be retained (undeveloped) is 416 Ha (excluding the portion with the grid connection as the vegetation loss will be negligible.

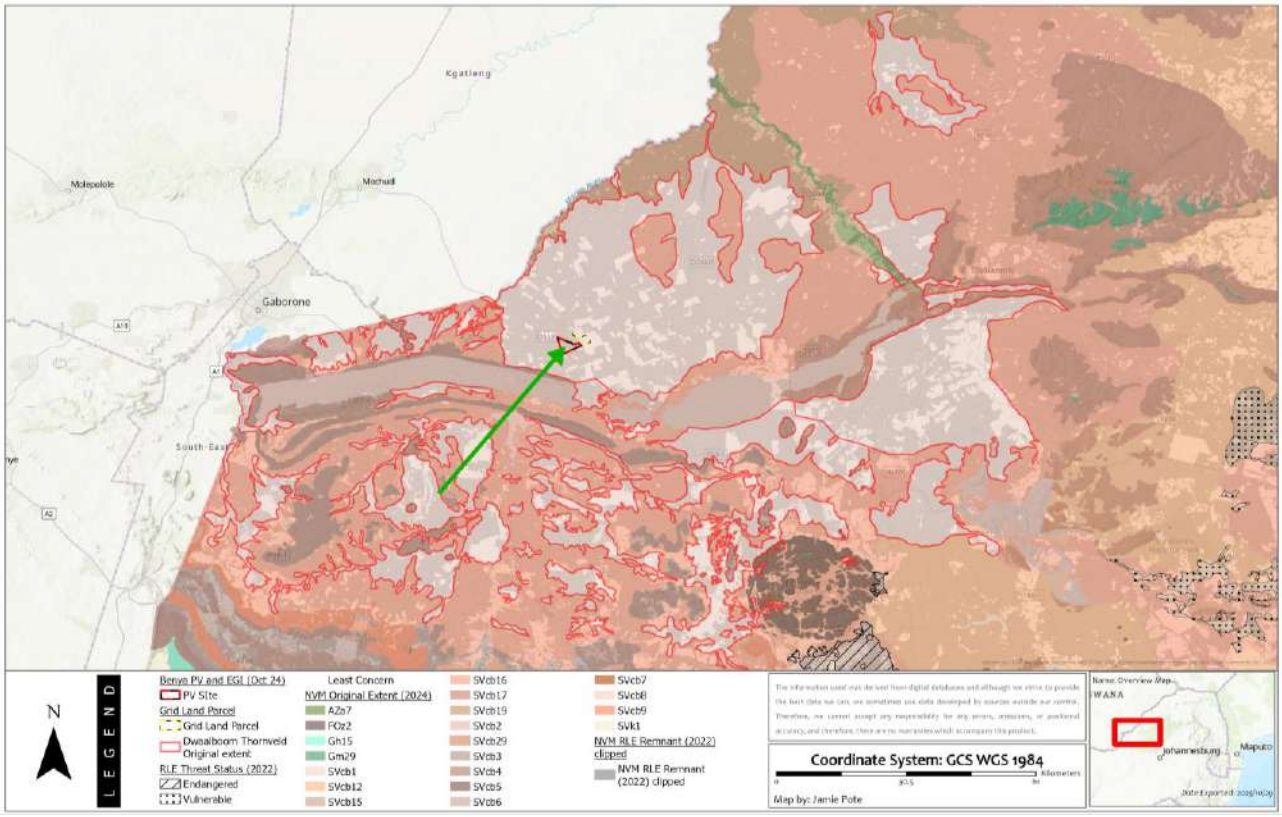

Figure 8: Extent of vegetation unit coverage.

Implications:

- Dwaalboom Thornveld is currently not of conservation concern (Least Concern).
- The vegetation assessed on site is typical of the vegetation unit, with extensive degraded areas of the unit.
- Several South Africa and North-West endemic species are recorded from the represented vegetation units, some having localised distributions and others are widespread.

2.2.3 National Biodiversity Assessment (Red Listed Ecosystems)

The National Biodiversity Assessment Red Listed Ecosystems (NBA, RLE, 2022) is the primary tool for monitoring and reporting on the state of biodiversity in South Africa and informs policies, strategic objectives, and activities for managing and conserving biodiversity more effectively. Ecosystem protection level is an indicator that tracks how well represented an ecosystem type is in the protected area network. It has been used as a headline indicator in national reporting in South Africa since 2005.

The status categorisation is based on a complex set of criteria, but for the purposes of this reporting, can be summarised as follows (NBA RLE, 2022):

STATUS	DESCRIPTION
Least Concern	These ecosystems have lost only a small proportion (~more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).

The outcome of the most recent National Biodiversity Assessment (2018) indicates that Mafikeng Bushveld currently has a *Least Concern* conservation status (Table 1), which indicates that less than 40 % of the unit has been transformed, and that ecosystem functioning is currently not under threat. Based on revised NVE coverage (NMV, 2025) and most recent remaining extent (RLE, 2022) coverages 77 % of the un9t still remains, which accounts for 77 % of the original coverage still remaining.

Implications:

- Dwaalboom Thornveld is not currently of conservation concern (Least Concern).

2.2.4 Limpopo Conservation Plan (LCP, 2018)

The Limpopo Conservation Plan (LCP, Ver 2, 2018), as depicted in *Figure 9* below, is based on biodiversity planning analyses performed and data sets available at that time. The input data and analyses are summarised in Appendix B. The Limpopo Conservation Plan (LCP, 2018) was developed in line with the principles and methods gazetted in the National Environmental Management: Biodiversity Act No 291 of 2009, *"Guideline regarding the determination of Bioregions and the Preparation of and publication of Bioregional Plans"*. The LCP designates the following CBA categories, based on national standards:

- Critical Biodiversity Area 1 & Critical Biodiversity Area 2
- Ecological Support Area 1 & Ecological Support Area 2
- Other Natural Areas (ONA) & No Natural Area Remaining (NNAR)

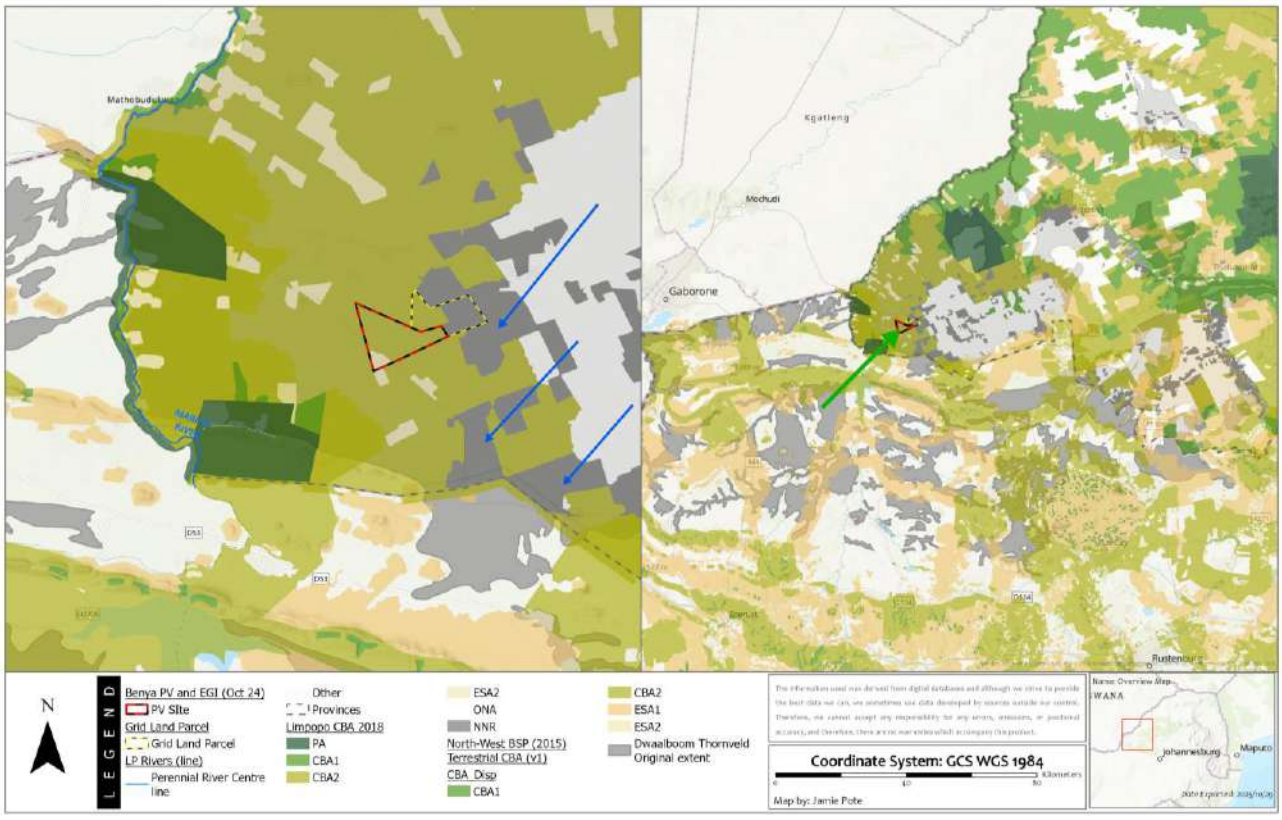

Figure 9: Limpopo Conservation Plan (LCP, Ver 2, 2018). Note transformed area (No Natural Remaining) to the south and south-east of the site (indicated by blue arrows).

As per *Figure 9*, most of the site is within a designated CBA 2 area with a patch of ESA 2 corresponding to old lands (historically transformed, now secondary thornveld. The site located within an area that is surrounded by an extensive if somewhat fragmented and transformed agricultural landscape in all directions, but more so to the south and east, with extensive sprawling urban settlements further to the south-east (Matlametlong, Mokgalaneng & Disake). Much of the natural area of the site, which is

designated CBA 2 (Degraded, rehabilitate), would in terms of the CBAS 2 designation (degraded, rehabilitate) be required primarily to meet conservation targets for the respective vegetation unit. The respective Limpopo guidelines do not recommend development or further loss of CBA 2 designated areas.

However, the vegetation unit has an extensive coverage, with 515 226 Ha of the original 667 160 Ha remaining (~77 % remaining). and development of the site is unlikely to actually compromise conservation targets of the vegetation unit. Furthermore, the site is not situated in what would be considered a connectivity 'pinch-point', or where it would result in loss of irreplaceable habitat, neither of which are applicable in this case. The grid connection infrastructure is unlikely to pose any risk due to limited terrestrial footprint pylons only with limited clearing along short OHL route.

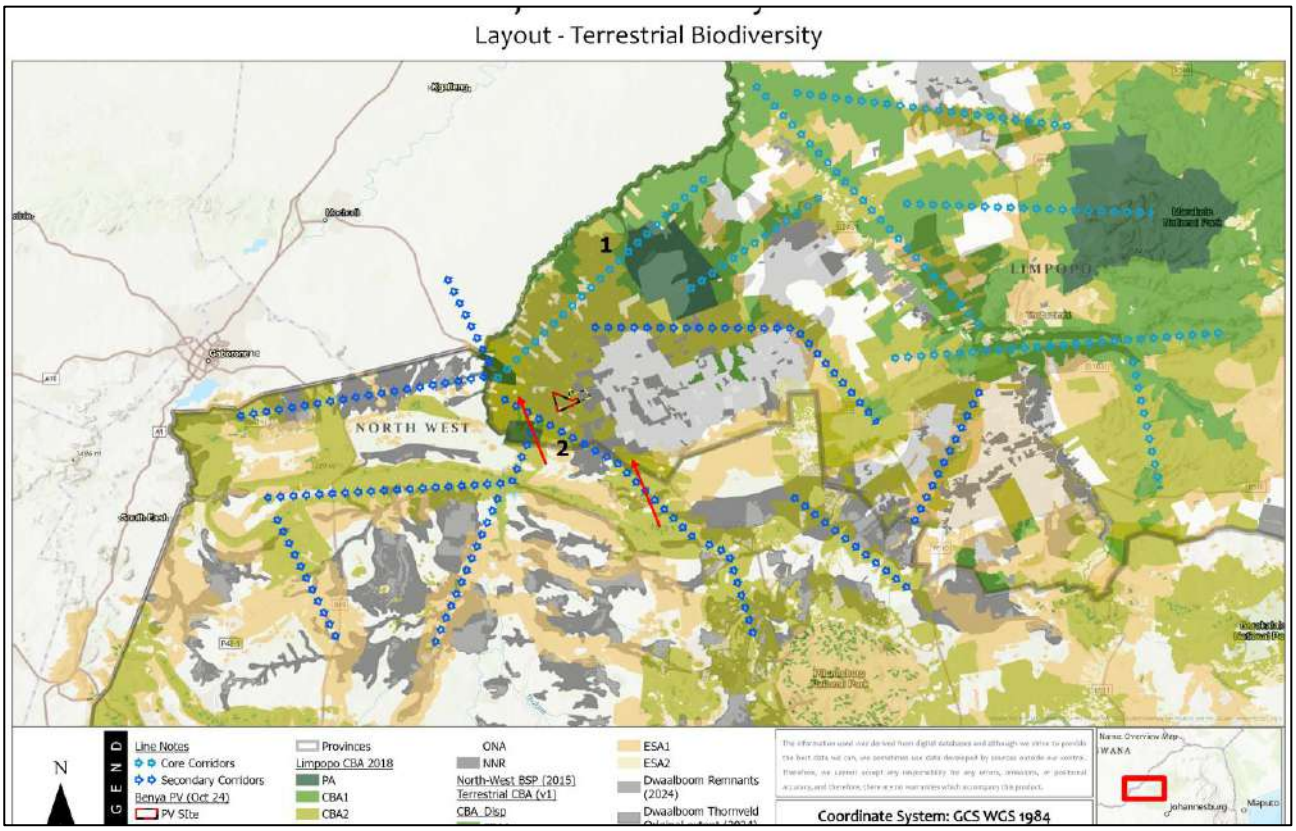

Figure 10: Coverage of Dwaalboom Thornveld with regional plan designations (Limpopo Conservation Plan and North-West Bioregional Plans). Red arrow indicated CBA corridor overlap with North West BSP to Madikwe. Blue arrows indicated core CBA/ESA.

As per *Figure 10* the core CBA/ESA corridors associated with Dwaalboom Thornveld (blue arrows) are as follows:

1. Primary linkage (CBA 1 & CBA 2) is from the north-western side of the Dwaalboom extent (Madikwe) to the north-eastern extent (Atherstone Protected Environment and towards Thabazimbi-Marakele) comprising of CBA 2 in the north-west and CBA 1 in the north and east (*Figure 10*, light blue arrows). The site being investigated is peripheral to this linkage, being on the southern edge and not a pinch point.
2. Several secondary linkages (CBA 2 & ESA) are present linking the northern block of Dwaalboom Thornveld to the Southern Block of Dwaalboom Thornveld (*Figure 10*, dark blue arrows). The only one of these linkages in proximity to the site or potentially affected, runs on the west side of the site, and

the site is also peripheral to this linkage, being on the eastern edge and not a pinch point and also due to the east and south sides of the site being adjacent to significant transformed areas.

Based on the CBA 1 designations within the Limpopo Bioregional Plan, the northern area (Madikwe to Thabazimbi-Marakele) are clearly the most important areas (i.e. CBA1 or Irreplaceable) for conservation targets for the unit, which encompasses representation of Dwaalboom Thornveld as well as several other vegetation units. The southern side from the site southwards and into North-West province are clearly of secondary value for conservation targets and ESA designation (with CBA 2 and ESA), which are more prevalent.

While the bioregional plan guidelines are clear regarding the objectives relating to CBA and ESA, when considering the actual proportion of the site and the extent and coverage of the vegetation unit, as well as the proportion of the unit that is designated as CBA (*Figure 10*), development of a small proportion would not pose any significant risk to the conservation of such an extensive and low status vegetation unit. Bioregional plans designations are significantly higher priority in vegetation units with less extensive coverages and/or where significant transformation and fragmentation has occurred present, and the vegetation unit would be under threat. Land use guidelines for the represented CBA 2 & ESA 2 designations are as follows:

1. Critical Biodiversity Area (2): **Best Design Selected Sites**. Areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets. Maintain in a natural state with limited or no biodiversity loss. Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species. Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes. Current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and ecotourism operations, so long as these are managed in a way to ensure populations of threatened species are maintained and the ecological processes which support them are not impacted. Any activities compatible with CBA 2 are considered suitable. Urban land--uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines) are not suitable as well as more intensive agricultural production than currently undertaken on site. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to CBA 2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets.

2. Ecological Support Areas (2): Areas with no natural habitat that is important for supporting ecological processes. Avoid additional / new impacts on ecological processes. Maintain current land- use. Avoid intensification of land use, which may result in additional impact on ecological processes. Existing activities (e.g. arable agriculture) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favoured. Any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas (e.g. Change of floodplain from arable agriculture to urban land use or from recreational fields and parks to urban) should be avoided.

Critical Biodiversity Areas within the bioregion are the portfolio of sites that are required to meet the region's biodiversity targets and need to be maintained in the appropriate condition for their category. A map of CBAs for Limpopo was produced as part of this plan and sites were assigned to CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes (See Appendices, *Table 12* & *Figure 60*).

Based on the Limpopo Conservation Plan (See Appendices, *Table 12* & *Figure 60*), 40% of the province is designated as Critical Biodiversity Area. These CBAs have been split into CBA 1 and CBA 2 on the basis of selection frequency and the underlying characteristics of the biodiversity features which are being

protected (i.e. location fixed features such as sites for Critical species) and flexible ones such as Least Cost Corridors). The majority of the CBAs in the province are CBA 1 (22 %), which are considered "irreplaceable" in that there is little choice in terms of areas available to meet targets in terms of the regional plan description. However, this is not the case where a vegetation unit is not under threat (i.e. Least Concern). Habitat would only be considered irreplaceable if for example it contained habitat for an Endangered or Critically Endangered species, or where the vegetation unit has an Endangered or Critically Endangered status. The designated CBA and ESA within the province far exceeds the conservation target for the vegetation units, further indicating that it is in fact not 'irreplaceable'.
According to the Limpopo bioregional plan, if CBA 1 areas are not maintained in a natural state, then 'targets cannot be achieved', which should be more accurately interpreted as 'more difficult to achieve'. CBA 2's are considered "optimal" as there is significant design involved in their identification, make up 18 % of the province. CBA 2's represents areas where there are spatial options for achieving targets and the selected sites are the ones that best achieve targets within the landscape design objectives of the plan. In general conservation targets for vegetation units are between 19 and 30 %, the combined CBA 1 & 2 designation alone for the province this exceeds conservation targets as a whole, hence the limitation indicated by the bioregional plan are not strictly true.

An additional 23% of the province is designated as Ecological Support Area. This category has also been split on the basis of land-cover into ESA 1 (16%) and ESA 2 (7%), with ESA 1 being in a largely natural state while ESA 2 areas are no longer intact but potentially retain significant importance from a process perspective (e.g. maintaining landscape connectivity). The ESA designed area alone exceeds the conservation target of 19 % for the vegetation unit, so some loss should be able to be accommodated as long as the site development and assessment give due consideration and accommodate landscape connectivity.

Specifically pertaining to Dwaalboom Thornveld coverages and Bioregional Plan designations (within both Limpopo and North-West provinces), 217 721 Ha of Dwaalboom Thornveld falls within designated CBA and ESA in Limpopo bioregional plan, while 193 182 Ha falls within designated CBA and ESA in North-West Bioregional Plan (both excluding area falling within protected areas). The combined proportion of Dwaalboom Thornveld that is designated CBA and/or ESA is 410 903 Ha across both provinces is 62% of the original coverage of the vegetation unit. **This is more than double the 30% IUCN conservation target, and more than three times the SA conservation target of 19%. Since the actual designated CBA and ESA for the vegetation unit is more than double the actual minimum conservation target, it can be deduced that a more or less 50% percent development footprint within designated CBA and ESA areas within Dwaalboom Thornveld would be deemed acceptable without compromising the objective of the IUCN 30 % biodiversity target., as long as consideration id given to landscape connectivity.**

The North-West BSP has a small area of overlap with the Limpopo CBA plan, where there is a narrow CBA 2 corridor to the west of the site that links Madikwe to the North-West Province-designated CBA area, as well as a small area to the south of the site, both within Dwaalboom Thornveld (see *Figure 10*, red arrows). The site is outside of the North-West plan designated CBA 2 area, but overlaps with the Limpopo plan designated CBA 2 area.

The combined CBA & ESA designated areas for the Limpopo province are in the region of 70 % of the remaining extent of the vegetation units, which significantly exceeds the conservation targets for the represented vegetation units. Th conservation plan thus appears to be significantly conservative which suggests that it does account for some expected losses within designated areas. Development on the site will thus not reduce the CBA designated areas below thresholds. Furthermore, if looking closer at the CBA designations, it is clear that the primary CBA corridor links Madikwe to the east with the complex of nature reserves (Atherstone Protected Natural Environment) to the north and north-east of the site (refer also to Figure 11), encompassing an extensive area of Dwaalboom Thornveld. The area to the south

and south-east of the site is fragmented and transformed from agriculture (*Figure 9*, blue arrows), so the status quo situation is that there is no connectivity to the south or south-east of the site. The north and west side of the site, in contrast is less fragmented and transformed and connectivity to the west (Madikwe) and north (sma) is significantly better. The site is thus not a pinch point, but rather a peripheral CBA area, and development thereof will not significantly alter connectivity or increase fragmentation above current baseline levels within the broader landscape (i.e. to the south and south-east). Development on the site will thus not impede the primary CBA corridors linking Madikwe to the north-east, nor southwards from Madikwe extending into North-West province. In terms of CBA and Conservation Targets, the remainder of the CBA/ESA and protected area (as well as NPAES) is well represented across Dwaalboom Thornveld to the west, north and north-east, and the nominal loss due to the proposed PV on the site will not significantly alter long term conservation goals. The non designation of the site as NPAES (i.e. future expansion of protected areas), as outlined in the protected area section below (Section 2.2.5: Protected Areas) also has relevance to the site not being a priority conservation area.

The site would not be considered irreplaceable, nor a critical connectivity corridor based on its position within the broader designated CBA areas and also due to the vegetation unit not having an elevated conservation status.

Implications:

- The site intersects with LCP (2018) designated Critical Biodiversity Areas (CBA 2) and a small area of Ecological Support Area (ESA 2).
- The site would not be considered a pinch point and due to the extensive coverage of the vegetation unit and relatively low levels of transformation, as well as surrounding transformation to the south, east and south-east, which fragments the site from the surrounding landscape southwards. The relevance of a CBA or ESA designation of the site is thus problematic, as the site is not required to meet conservation targets, nor would it be considered to be irreplaceable habitat, nor is it significantly improving landscape connectivity.
- Extensive suitable areas of similar habitat is thus potentially available for conservation targets and connectivity at a regional level, including the corridors to the west, north and north-east with a significant area overlapping with Dwaalboom Thornveld.
- Furthermore, the Limpopo and North-West designated CBA and ESA areas far exceed the conservation target as clearly outlined in the section above.

2.2.5 Protected Areas

When projects are located in legally protected and internationally recognized areas, clients should ensure that project activities are consistent with any national land use, resource use, and management criteria (including Protected Area Management Plans, National Biodiversity Strategy and Action Plans (NBSAP's), or similar documents).

Protected Areas in proximity to the site include Madikwe Nature Reserve (National Protected Area) with the eastern boundary along the Marico River generally situated 12 km to the west of the site, with the closest point 10.2 km from the site at the south-eastern corner. Several Private Nature Reserves surround the site and broader area, the closest (Weltevrede Private Nature Reserve) situated up to 2.2 km to the west of the site (Figure 11). Additional listed activity triggers will be applicable for within 5 km of a nature reserve, but not within 10km of a National Park. Numerous additional nature reserves (private nature reserves) are also within 50 km and 30 km of the site (Figure 12). Much of these protected areas are also identified within the NPAES protected area expansion strategy areas, whereas the site is not flagged for

protected area expansion. Based on most recent datasets (SAPAD, 2025 & NVM Remnant extents, 2022), approximately 20 437 sq. km (2 043 700 Ha) of remaining intact Dwaalboom Thornveld is now situated within nature reserves and protected areas.

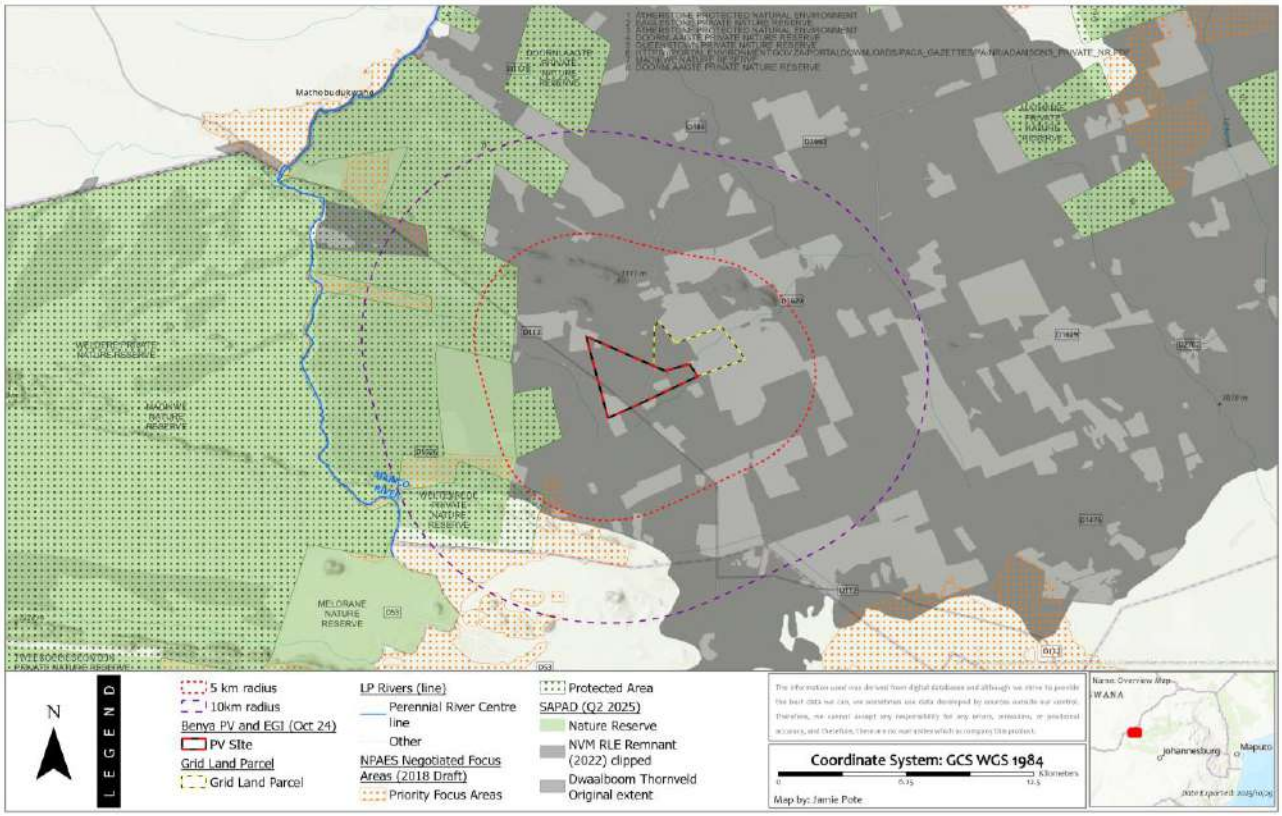

Figure 11: Protected Areas and Nature Reserves in proximity to the site (green shaded) and NPAES designated areas (orange/green speckled).

Within the protected areas that represent, Dwaalboom Thornveld represents approximately 136 671.5 Ha (1 366.7 sq. km), or 20 %, based on most recent available coverages (SAPAD, 2025; NVM, 2024 & NVM Remnants, 2022). The transformed proportion within the protected areas is a relatively small proportion of the area (~2 % transformed). Based on current designations and coverages, the area contained within protected areas currently is significantly more than the 6% statutorily conserved that was determined in 2006. With a conservation target assumed of 19%, the Dwaalboom Thornveld would be considered to be well protected (i.e. more than 90 % of the biodiversity target is achieved within protected areas), or Moderately Protected (i.e. between 50 % and 90 % of the biodiversity target is achieved within protected areas), based on IUCN conservation target[4] of 30% (Kunming–Montreal Global Biodiversity Framework).

No IBA's or KBA's are situated within 50 km of the site. Nearest IBA's include the Pilanesberg to the south-east, Waterberg and Northern Turf Thornveld to the east (Figure 12).

No NPAES designated Priority Focus Area overlap with the site, indicating it is not identified as a priority area for Protected Area expansion. The regional NPAES in proximity are unlikely to be directly or indirectly affected, and no specific management objectives are outlined for NPAES, other than they are generally

[4] The IUCN conservation target is the global goal to protect and effectively conserve at least 30% of the planet's land, inland waters, and oceans by 2030. This is often referred to as the "30x30" target, and it is enshrined in the Kunming–Montreal Global Biodiversity Framework (GBF), adopted in December 2022 by more than 190 countries.

not deemed suitable for large scale transforming development. Since the areas are aligned with the designated CBA/ESA areas, the recommendations for these plans would thus apply.

No protected areas nor any ecological processes associated with them are directly affected nor likely to be indirectly affected significantly. While species associated with these nature reserves could potentially be transient with the site, in particular species with extensive ranges, the most sensitive of these species are large mammals and the current game fencing around the site would in any event largely exclude them.

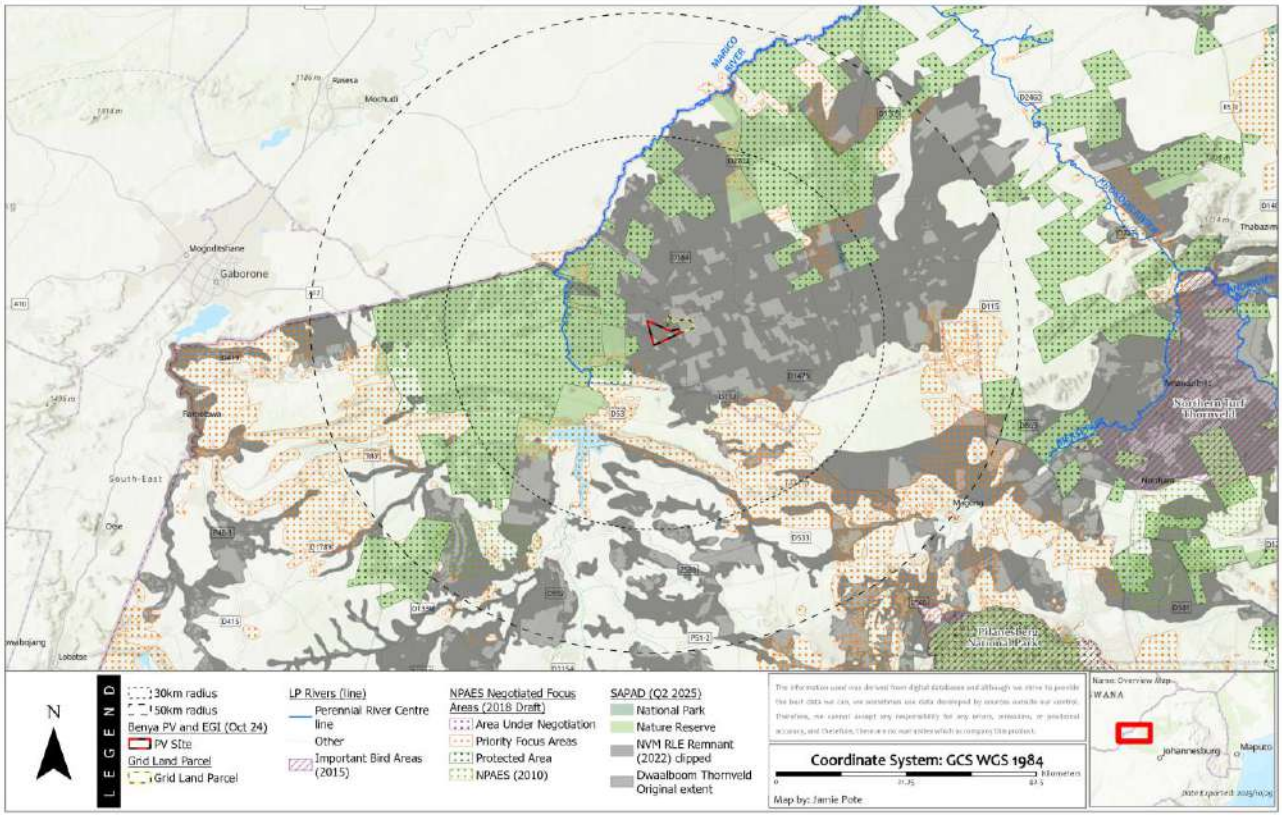

Figure 12: Regional Protected Areas and Nature Reserves in located further afield (green shaded), NPAES designated areas (orange/green speckled) and IBA areas (purple hatch).

Implications:

- The activity is unlikely to have any significant direct, indirect or cumulative terrestrial biodiversity impact on any protected environment or nature reserve in proximity.
- Based on current Protected Area coverage, the vegetation unit is deemed to be Well (SA target of 19%) to Moderately Protected (IUCN conservation target of 30%) and the loss of the small area proposed for the PV facility will in no way significantly impact the achievability of this target.

2.2.6 Landcover

Landcover is indicated in Figure 13 (site aerial photo). Landcover is predominantly indicated as open woodland (thornveld) with secondary or transformed areas as depicted, which correlates with what can be observed on the ground.

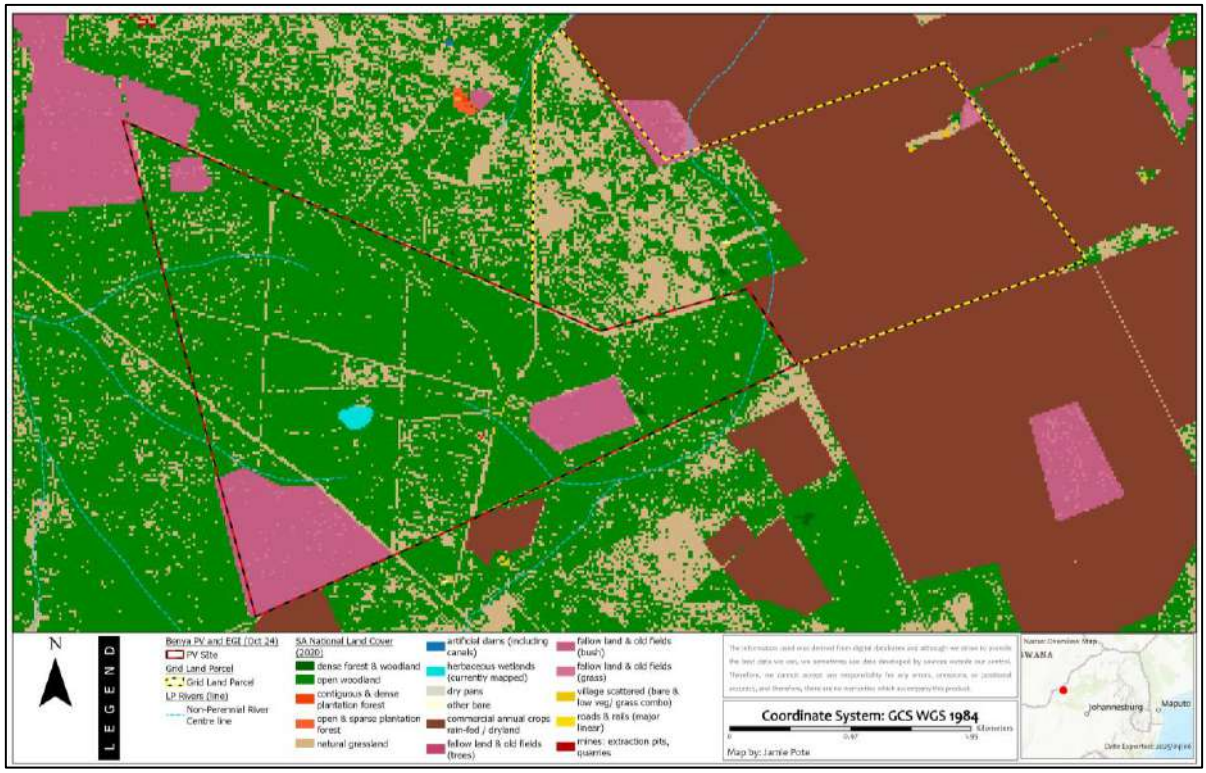

Figure 13: National Landcover (2020): Green – woodland, Cream - natural grassland (confirmed to be cleared woodland), pink indicates old lands (secondary woodland).

Landcover is more or less aligned with the remaining extent of the vegetation units, which is expected as the remaining vegetation extent dataset, which is updated periodically, is derived from landcover.

2.2.7 Key Biodiversity Areas

The site is not located within any designated Key Biodiversity Areas (KBA's) nor within 50 km of any such areas. Closet KBA's include South-east Botswana to the west, Waterberg to the east and Pilanesberg/Magaliesberg to the south.

2.2.8 Important Bird Areas

Important Bird and Biodiversity Areas (IBA's) are sites of international significance for the conservation of the world's birds and other biodiversity. They also provide essential benefits to people, such as food, materials, water, climate regulation and flood attenuation, as well as opportunities for recreation and spiritual fulfilment.

The Pilanesberg, Magaliesberg, Waterberg and Northern Turf Thornveld IBA's are situated between 50 and 100 km to the east and south-east of the site. The site potentially falls outside the normal foraging range of large bird species, which are associated with the Magaliesberg IBA, such as raptors and vultures.

Implications:

- Refer to separate avifaunal assessment for specific avifaunal assessment.

2.2.9 Cumulative Renewable Energy Project Impacts

As depicted in Figure 14, the site is not situated in close proximity to any other renewable energy projects in progress or approved (based on most recent available datasets), other than a PPC Dwaalboom Cement Plant Heat Recovery Plant situated 7.5 km to the south-east. Cumulative impacts will thus not be significant ito other renewable energy projects, as they do not cover an extensive proportion of the vegetation unit and substantially less than agricultural related activity or clearing. The area is somewhat fragmented locally due to agricultural transformation surrounding the site, and there will be a nominal general cumulative impact, but unlikely to be significant. The area to the east is significantly transformed and degraded as a result of urban settlements. As noted above, the current remaining extend is approximately 77 %, cleared vegetation is primarily due to agriculture and urban development. Combined, the renewable energy project that are planned within Dwaalboom Thornveld will not likely alter the conservation status of the vegetation unit, not increase the cleared areas significantly above current levels.

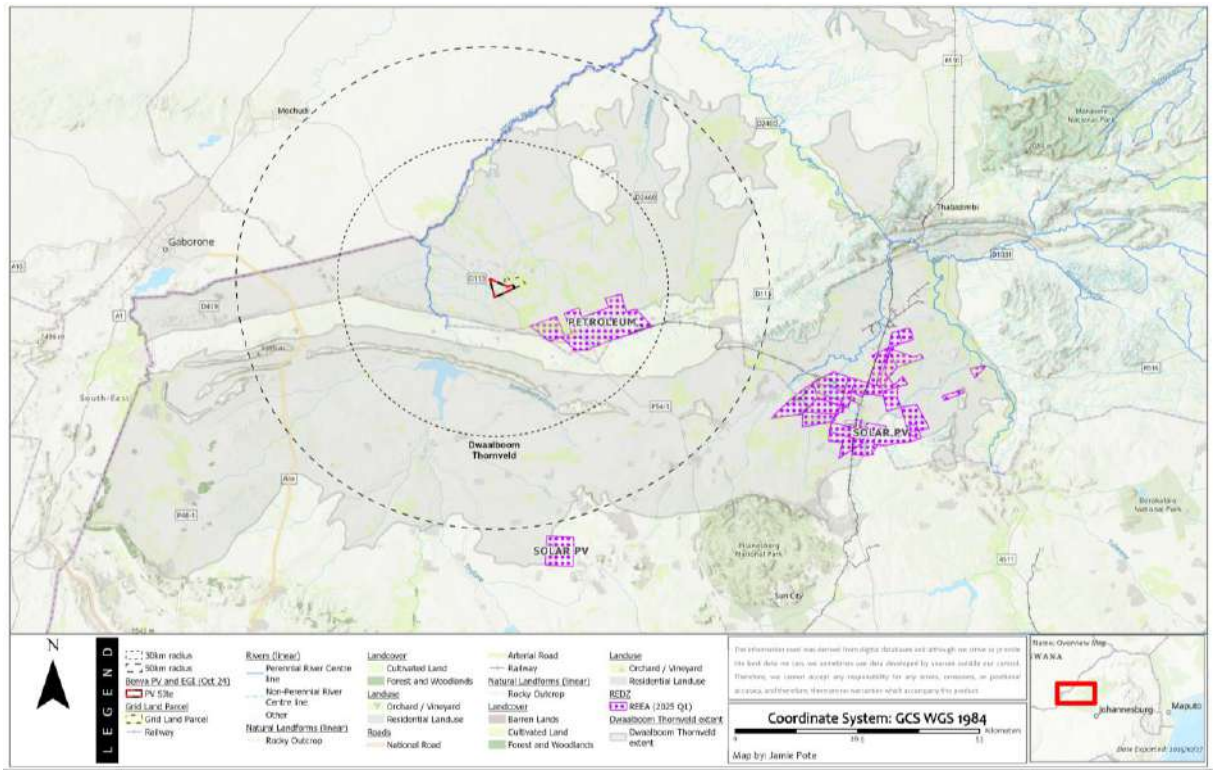

Figure 14: Renewable Energy EIA Applications (REEA) or projects and existing transformed agricultural areas (fragmentation).

2.2.10 Other Biodiversity Sector Plans

The site is outside of the planning domain of any other regional Biodiversity Sector Plans.

2.2.11 Freshwater And Aquatic Features

The site is drained by several small minor non-perennial watercourses (Figure 15 & Figure 16). The non-perennial watercourses are tributaries of the Marico River which is situated 10 km to the north and west of the site. The watercourses are not incised and generally surrounded by a woody thornveld vegetation. The site also has several scattered small dams (man-made impoundments). While they may serve as water sources in an otherwise arid landscape, they are not likely to provide significant ecological value being

mostly undeveloped. The terrestrial assessment will however not assess aquatic risks, which is assessed in a separate aquatic assessment.

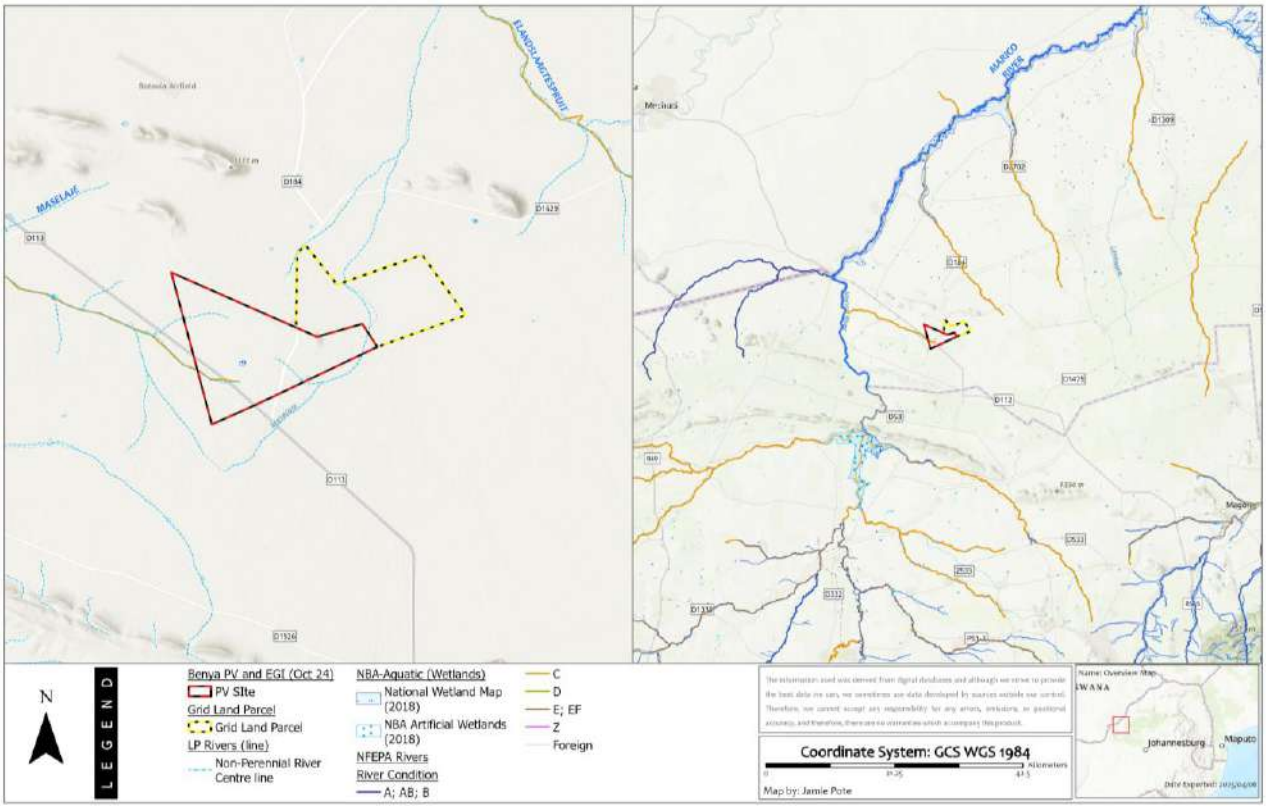

Figure 15: Regional Aquatic Resources Map indicating Rivers, Watercourses, Wetlands, NFEPA and SWSA (not present).

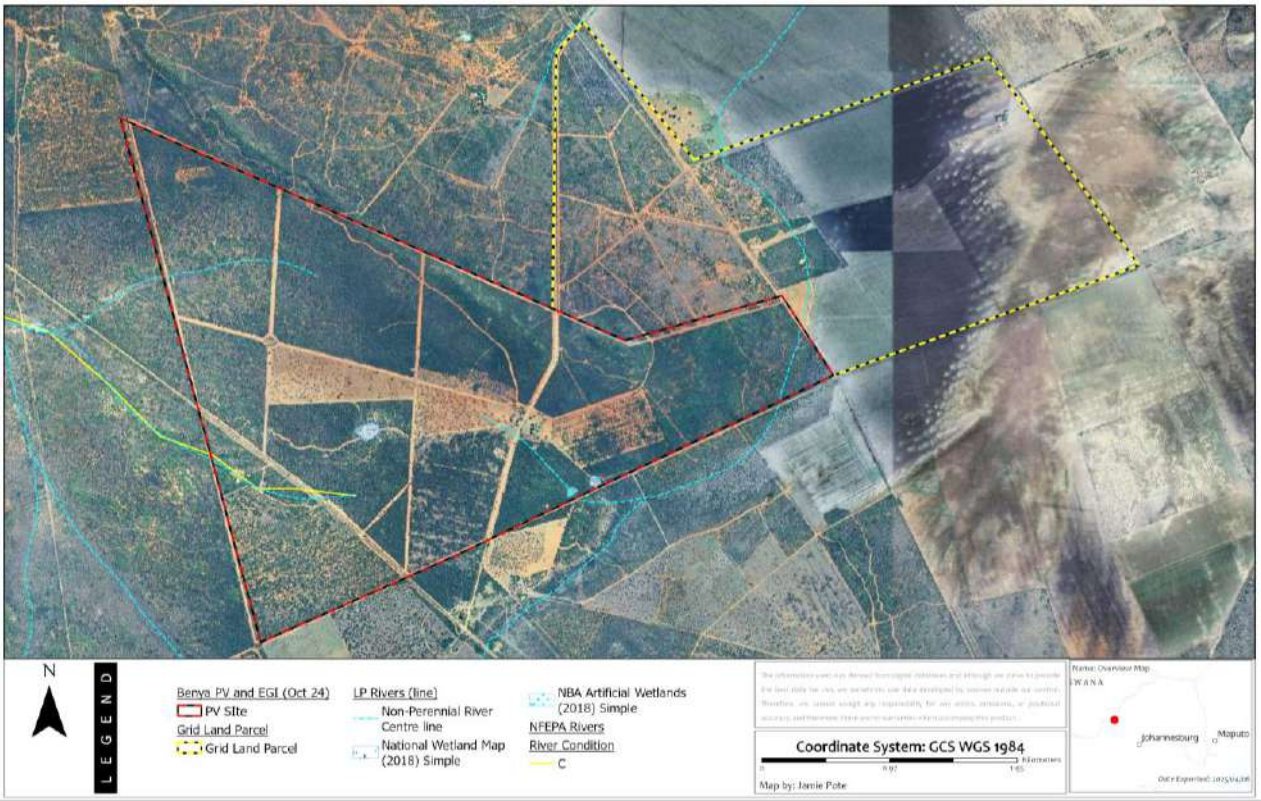

Figure 16: Local aquatic resources map indicating rivers, watercourses and wetlands (including farm dams).

Two small wetland areas are present on the western side of the site that provides several ecological and biodiversity attributes associated with seasonal habitat and water. The terrestrial assessment is aligned with the aquatic assessment that these features shou be retained.

3 Biodiversity Risk Identification and Assessment

3.1 Baseline Biodiversity Description

The vegetation on site (*Figure 18*) broadly aligns with the associated vegetation unit (Dwaalboom Thornveld). The site falls within a summer rainfall area with very dry winters. Annual rainfall ranges from about 500–600 mm and the highest mean annual potential evaporation of savanna vegetation units outside the two Kalahari bioregions. Frost is also fairly frequent in winter.

The unit occurs on vertic black ultramafic clays which developed from norite and gabbro, also locally in small depressions along streams, with some areas having less clay and sometimes with high base status and eutrophic red soils. Underlying geology is an Archaean granite-gneiss terrane that is covered in parts by the mainly clastic as well as chemical sediments and volcanics of the Rayton and Silverton Formation. Mafic intrusive rocks of the Rustenburg Layered Suite, Bushveld Igneous Complex (Late Vaalian) are present in the east and include the Bierkraal Manetite Gabbro. Bronzite, harzburgite, norite and anorthosite are the major mafic rocks of the Rustenburg Suite.

Dwaalboom Thornveld typically occurs on plains with a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs, with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. *Acacia tortilis* and *Acacia nilotica* usually dominate on the medium clays, while on particularly heavy clays most other woody plants are excluded and the diminutive *Acacia tenuispina* dominates at a height of less than 1 m above ground. On the sandy clay loam soils *Acacia erubescens* is often the most prominent tree. The alternation of these substrate types creates a patchy mozaic, notable in the area around the site and area west of Thabazimbi. Small slightly elevated rocky habitat occasionally occurs, with less developed shallow soils with a less prominent herbaceous and grass layer. As per *Figure 17*, there is some variation in vegetation cover, use and Thornveld density, mapped in *Figure 18* and the surrounding landscape to the east has extensive transformation, as well as significant transformation/fragmentation to the south, whereas the landscape to the north and west is relatively undisturbed.

Dwaalboom Thornveld, Madikwe Dolomite Bushveld, Western Sandy Bushveld and Dwarsberg-Swartruggens Mountain Bushveld form a matrix of related vegetation units that is positioned ecologically at a transition between the arid western bushveld to the west and the more mesic eastern woodlands of Limpopo. The dominant woody trees and shrubs tend ot be more drought-resistant than found in the moister bushveld types, and winter fires (although infrequent) or frost may burn or check woody encroachment. Drought periods—frequently present—put both plants and dependent fauna under physiological stress. Absence of fire, as well as large herbivores such as Rhinocerus and Elephant and long term over utilisation can lead to bush encroachment or densification of pioneer thorny tree species.

The site is flat, with deep somewhat sandy-clay soils, except for a small ridge running parallel with the northern boundary at the intersection with the D1629 road (on the north side of the road) and a small slightly elevated hill (on the south side of the road), offering marginal elevation. While the elevation is marginal, this manifests locally as slightly rockier substrate with shallower soil compared to the surrounding landscape, manifesting marginal characteristics of mountain bushveld. Within this context the vegetation found across the site is typical of the Dwaalboom Thornveld. Within the intact Thornveld on the site, some habitat variation and use is noted in terms of species composition and vegetation structure and density, most likely due to minor soil differences and/or historical and/or current land use practices.

Figure 17: Aerial photo of the site.

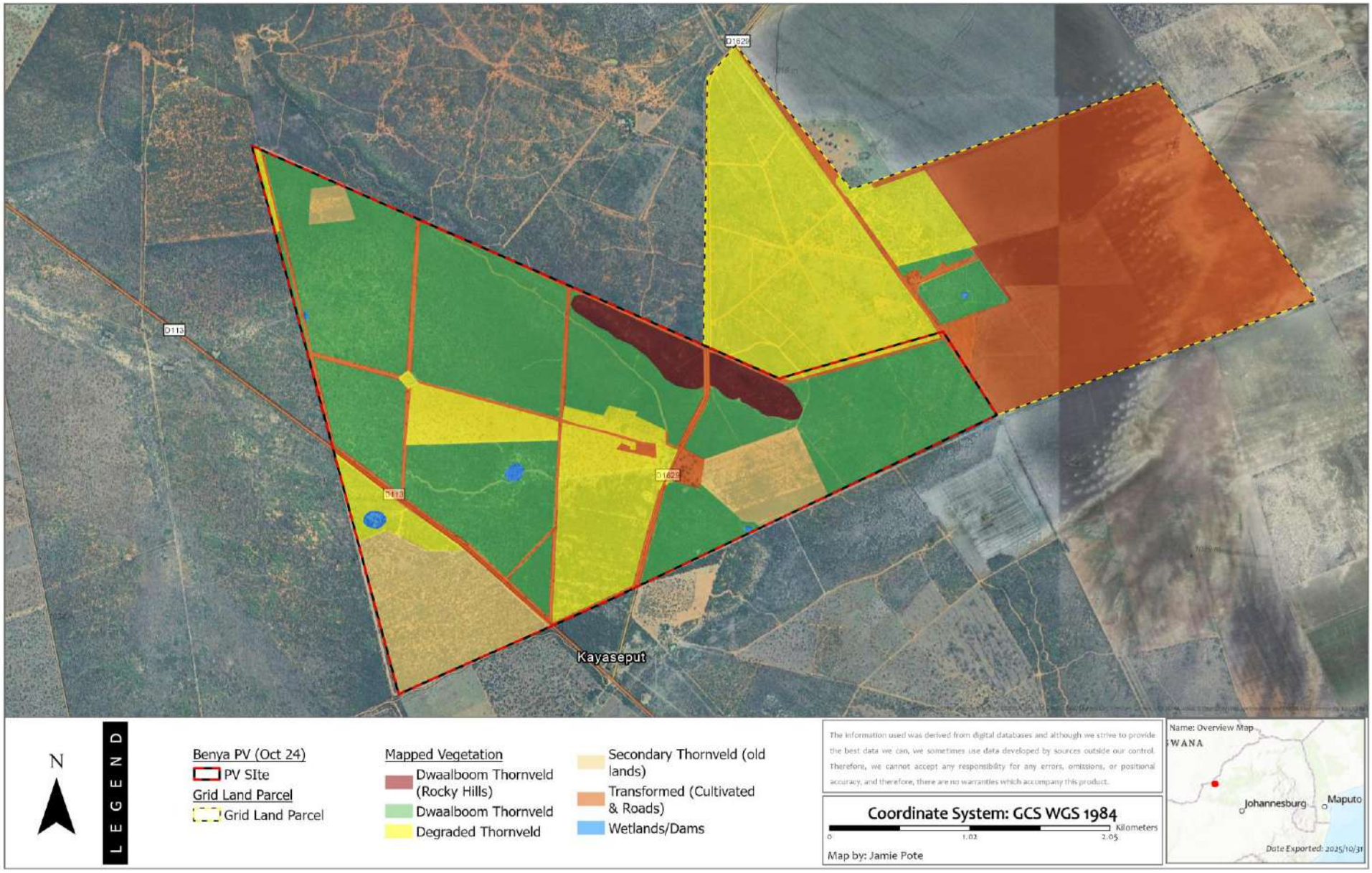

Figure 18: Mapped vegetation of the site.

Within the site, the following nominal communities and/or features are distinguished (*Figure 18*):

1. Dwaalboom Thornveld – intact Thornveld on deeper developed soils.
2. Dwaalboom Thornveld (Rocky Hills) – rocky areas where herbaceous layer is less prominent.
3. Degraded Thornveld – Thornveld that has elevated levels of man-made degradation.
4. Transformed – areas that have undergone clearing for cultivated lands and/or other uses.
5. Wetlands and Dams – seasonally aquatic features with periodic riparian vegetation.

Table 3: Approximate coverage areas of habitat in hectares (PV and grid farm portions).

HABITAT	AREA (Ha)	PERCENT
Dwaalboom Thornveld	516.3 Ha	34.4%
Dwaalboom Thornveld (Rocky Hills)	36.6 Ha	2.4%
Degraded Thornveld	384.0 Ha	25.6%
Secondary Thornveld (old lands)	127.5 Ha	8.5%
Transformed	431.6 Ha	28.8%
Wetland/Dam	3.4 Ha	0.2%
TOTAL	**~1 500 Ha**	**100%**

The approximate coverage of the habitat units is provided in *Table 3*. Vegetation coverage on the PV and grid sites combined is more or one third intact Dwaalboom Thornveld, one quarter Degraded Thornveld and Transformed (cultivated & roads), with the remainder comprising Secondary Thornveld (old lands), Rocky Hills and Wetlands/Dams. Further description of the mapped communities is provided below. Refer to *Figure 19* to *Figure 52* for photos of the respective habitat and Appendix A for additional general site photos from the site visits.

3.1.1 Dwaalboom Thornveld (Intact)

This tree-shrub-grass Savanna is generally characterised by a discontinuous microphyllous (small-leaved), mostly thorny (hence thornveld) tree strata and a well-developed grassy herb layer with the tree layer typically with comprising a dispersed low to medium-high deciduous thorn trees and shrubs," with few, often larger broad-leaved trees in the matrix. Where historical degradation including bush clearing and overgrazing or heavy utilisation has occurred, the vegetation may trend towards densification of the thorny microphyllous (small-leaved) tree strata. Dominant small trees include primarily thorny species *Senegalia mellifera, Vachellia tortilis, Vachellia karroo as well as Grewia flava, Gymnosporia buxifolia* and *Ziziphus mucronata*. Several areas have distinctive dense almost impenetrable growth of *Senegalia mellifera, Vachellia tortilis* and *Vachellia karroo*, indicative of bush encroachment and also where there has been regeneration from historical clearing (i.e. old lands), see degraded Thornveld below. Occasional larger trees are present but do not constitute a significant proportion of the vegetation where there is dense growth. These include *Sclerocarya birrea* subsp. *caffra* and occasional *Vachellia erioloba*. Small trees and shrubs include *Vachellia hebeclada, Combretum hereroense, Diospyros lycioides, Euclea undulata, Tarchonanthus camphoratus, Vachellia tenuispina, Aptosimum elongatum* and *Pavonia burchellii*. Herbaceous layer includes primarily *Talinum caffrum, Rhynchosia minima* and *Nidorella hottentotica*. Grasses include *Aristida bipartita, Bothriochloa insculpta, Digitaria eriantha, Eragrostis curvula, Ischaemum afrum* and *Panicum maximum*.

Within the site, the most intact areas having less bush encroachment and a higher concentration of the larger tree species include the area to the north-west and west of the proposed west PV block, along the northern boundary, extending into the eastern part of the site. The denser areas include a central band running from north of the central PV block, across the rocky hill area and extending across to the north

of the proposed eastern PV block (between the eastern PV block and the D1629 road). Only a small area of relatively good condition Thornveld falls within the central PV block, around the wetland area.

Figure 19: Typical intact Thornveld.

Figure 20: Typical intact Thornveld.

Figure 21: Typical intact Thornveld.

Figure 22: Typical intact Thornveld.

Figure 23: Typical intact Thornveld.

Figure 24: Typical intact Thornveld.

Figure 25: Typical intact Thornveld.

Figure 26: Typical intact Thornveld.

Figure 27: Typical intact Thornveld.

Figure 28: Typical intact Thornveld.

3.1.2 Dwaalboom Thornveld (Rocky Hills)

Locally important habitat for reptiles. Generally, a somewhat dense small tree layer comprising primarily *Senegalia mellifera, Vachellia tortilis* and *Vachellia karroo,* but also including *Combretum hereroense, Diospyros lycioides, Grewia flava* and *Tarchonanthus camphoratus.* Herb and grasses tend to be sparse in the rocky hill area.

Figure 29: Typical intact Thornveld (Rocky Hills).

Figure 30: Typical intact Thornveld (Rocky Hills).

Figure 31: Typical intact Thornveld (Rocky Hills).

Figure 32: Typical intact Thornveld (Rocky Hills).

3.1.3 Degraded Thornveld

Areas that were historically cleared but where there has been tree generation also tend to have dense growth of the thorny small tree species (*Senegalia mellifera, Vachellia tortilis, Vachellia karroo*). Of the three proposed PV blocks (west, central and east), the eastern block is almost entirely regenerated old lands (degraded thornveld, approximately 50 % of the central block) and just under 50 % of the eastern block). These are areas that have undergone heavy utilisation in the past or where there has been some removal or opening up of bush or management of bush encroachment to improve grazing.

Figure 33: Typical degraded Thornveld.

Figure 34: Typical degraded Thornveld.

Figure 35: Typical degraded Thornveld.

Figure 36: Typical degraded Thornveld.

Figure 37: Typical degraded Thornveld.

Figure 38: Typical degraded Thornveld.

3.1.4 Secondary Thornveld (old lands)

This includes areas that were cleared of vegetation and cultivated in around the 1980's and 1990's, where there has been regeneration of secondary bushveld in recent times. This secondary vegetation tends to favour the pioneer thorny trees and generalist herbs and grasses and lack the diversity, structure and complexity of intact bushveld.

Figure 39: 3.1.4 Secondary Thornveld (old lands).

Figure 40: Secondary Thornveld (old lands).

Figure 41: Secondary Thornveld (old lands).

Figure 42: Secondary Thornveld (old lands).

3.1.5 Transformed

These area areas that are maintained a transformed state and include roads (unsurfaced district and internal roads and firebreaks, as well as currently cultivated lands (in particular on the grid farm portion, around dwelling and other areas related to farming activities such as livestock enclosures where livestock aggregate.

Figure 43: Transformed areas.

Figure 44: Transformed areas.

Figure 45: Transformed areas.

Figure 46: Transformed areas.

3.1.6 Dams and Wetlands

Localised important seasonal habitat for amphibians as well as a range of insects and invertebrates and important water sources for local fauna.

Figure 47: Wetland habitat after summer rainfall.

Figure 48: Wetland habitat after summer rainfall.

3.1.7 Present Ecological State

In summary, the following general observations can be noted regarding the site:

- The area in and around the site is natural to near natural with some extensive degraded and transformed areas such as roads and agricultural lands. The broader habitat is comprised of a mozaic of the Renosterveld and Alluvial vegetation with varying levels of degradation. There is evidence of significant historical disturbance most likely due to livestock grazing, evident through erosion and also to some extent species composition.
- Alien invasion is low, comprising a few individuals of *Opuntia ficus-indica* (Prickly Pear) and other ruderal weeds common to disturbed areas. Recently disturbed areas do not appear particularly susceptible to alien and weed proliferation but does occur.
- Ecological processes are thus primarily natural but with some fragmentation present from roads and other man-made features.
- Fauna species include mainly species typical of natural areas in proximity to an urban area and the site would not be considered a wilderness area.

3.1.8 Vegetation and Ecological Processes and Corridors

Landscapes corridors are a combination of Critical Biodiversity Areas (areas required to meet conservation targets) and Ecological Support Areas that link habitats, as well as linking inland mountains to the coastline (and therefore beyond municipal boundaries). Rivers and their associated riparian or riverbank habitats often provide the basis for many of these large-scale (landscape level) ecological processes.

The farm is completely enclosed in game fencing and further split into three portions separated by public unsurfaced roads and also game fenced (*Figure 49* to *Figure 52*). The area of these portions is ~200 Ha (south-east portion), ~100 Ha (south-west portion) and ~500 Ha (north-central portion) and is used for stock and livestock farming. This will significantly affect the availability of habitat for natural population of larger mammals where movement will be restricted and thus unlikely to serve as suitable habitat for any populations of such larger mammal species. Fences are typically

Figure 49: Typical 18 strand game fence.

Figure 50: Typical 18 strand game fence.

Figure 51: Typical 18 strand game fence with lower mesh.

Figure 52: Typical 18 strand game fence with full mesh.

Critical Biodiversity Areas (CBA) are generally regarded as being critical for meeting conservation objectives for vegetation units in an optimal manner. Where a vegetation unit is not under threat (i.e. Least Concern status), there is some flexibility, ito alternatives; however, as conservation status increases (a vegetation unit is under threat due to high levels of transformation), alternative options to meet conservation targets are significantly reduced. CBA 1 areas are generally natural or near natural, whereas CBA 2 are degraded and/or transformed areas where restoration would be required and/or recommended.

Ecological Support Areas (ESA) are supporting zones or areas which must be safeguarded as they are needed to prevent degradation of Critical Biodiversity Areas and formal Protected Areas. Although many ESA's consist of natural veld, there are areas of land - partially or wholly transformed or degraded -that have been classified as ESA even though they are no longer in a natural state. Although these areas are heavily degraded or transformed, they still play an important role in supporting ecological processes. This is particularly the case with riparian areas, some key catchment areas, and key pieces of corridors. ESA 1 areas are generally natural or near natural, whereas ESA 2 are degraded and/or transformed areas where restoration would be required and/or recommended. An ESA that is vegetated but not natural or near natural can still serve to retain some connectivity and support ecological processes, but in a significantly reduced manner. For example, trees in an apple orchard will provide perches for some birds and grassy groundcover will still allow for movement of some small animals such as rodents and reptiles. Certain species are significantly more at risk, as they may not be able to adapt to a modified environment, whereas others may not be affected.

While the site falls within a broader important ecologically connected area (i.e. ESA 2) with habitat deemed somewhat important for attaining conservation targets (i.e. CBA), the site is somewhat peripheral to the corridors and would not be considered a 'pinch point', as well as not being prioritised in terms of protected area expansion. Furthermore, as reflected above, the vegetation on site does have indications of having been historically degraded to some extent and the proposed PV and associated

infrastructure footprint will constitute a portion of the site not the whole site and has furthermore prioritised degraded and secondary habitat and will also retain a portion of vegetation together with the fact that it constitutes a negligible portion of the remaining extent of the vegetation unit regionally, . The proposed PV facility will thus have negligible footprint within areas deemed to have significantly modified habitat, and thus unlikely to significantly impact or disturb any ecological processes above current baseline levels.

3.1.9 Historical Land Use Context

With reference to the historical aerial photo from 1985 in *Figure 53*, historical levels of degradation and land use are clearly evident. Factoring in potential climatic factors (i.e. drought period), it is clear that the farm and surrounding farms under different management regimes displayed different vegetation cover. Examples of areas with likely high levels of degradation are indicated with blue arrows and include areas in the surrounding landscape as well as across most of the site. In contrast areas with visibly better vegetation cover (to west of the site) ar indicated with green arrows for comparative purposes.

Figure 53: Historical Aerial Photo (1985) showing historical levels of degradation and land use. Note existing lands at that time (red arrows) that correspond to current designated old lands, high levels of degradation (blue arrows) surrounding and within the site and less degraded areas (green arrows).

The historical aerial provides context, confirming that the areas that are designated as old lands are old lands and also confirming that levels of degradation of the farm were historically high, which will have had influence on the state of current vegetation cover and diversity. Forty years later and the historical management of the farm is still evident, where old lands are still noticeably different in structure and composition and also explains the high occurrence of dense stands of thorny trees, likely resulting from the historical over utilisation.

Note existing lands at that time (red arrows) that correspond to current designated old lands on the site.

3.2 Flora & Fauna

The unique ecological character of this vegetation type, especially its mosaic of grassland, bushveld, and scattered woodlands, is underpinned by distinctive climate, soils, flora, and fauna

3.2.1 Flora

No endemic and range restricted species were recorded to be present. The area is generally not considered a hotspot for endemic species of significant population of species of conservation concern, as is the case for other areas within the country. Several species are known from the surrounding area, but unlikely to be affected by the activity.

Red Listed, Endemic and Protected Flora

The site falls within the general distribution range of several endemic species and other species with a highly localised distribution, some of which are Critically Endangered, Endangered, Vulnerable or Rare. Some of these species are also only from a single or a few populations.

Table 4: Flora Species of Special Concern

SCIENTIFIC NAME	**FAMILY**	STATUS[5]	COMMENT/PRESENCE
Sensitive species 1259		NEST (M), Endangered	The site falls within the distribution range of this species, which occurs within Dwaalboom Thornveld in a limited range between Ramotswa in the west and Dwaalboom in the east, although it may extend into Botswana. Site visit undertaken during (spring/early summer) December 2024 and follow up in May (late summer) was unable to locate any of the species on site, despite being within a highly favourable rainfall season.

A single Flora Species of Conservation Concern (SCC) is flagged, Sensitive species 1259, having an Endangered status (see *Table 4* for a species summary and *Figure 54* for the projected distribution based on few known records).

The status and EOO (164 square kilometres) are based on only two to three historical records, two near Ramotswa and Dwaalboom to the west of the site in Limpopo province and one to the east in Botswana. The site falls within the predicted distribution range of this species, which occurs within *Dwaalboom Thornveld* in a limited area between Ramotswa in the west and Dwaalboom in the east, although it may extend into Botswana. Preliminary distribution records indicate that there are two sub populations, one near Dwaalboom and the other near Ramotswa. Original collection record indicates known only from the type locality found *near Lekker-lach in the Marico district of Transvaal in 1940 (described in 1943)' on a stony mountain slope in grassveld.* There does appear to be some discrepancy regarding exact locality. Species within this group are notoriously difficult to locate and are often highly seasonal. Original collection date (December 1940) suggests that a mid-summer sampling period may be suitable, but this would not be conclusive. During this assessment, three site visits were undertaken to survey for the species - March 2024 (later summer/early winter), December 2024 (early to mid-summer) & 01 May 2025 (autumn/late summer), but were unsuccessful. The seasonal surveys are deemed ot be adequate for the requirements of this assessment. It is thus concluded that the likelihood of the species occurring within the site is low, and if present it is unlikely that it constitutes a significant or large population. No additional flora species

5 **PNCO -** Provincial Nature Conservation Ordinance (1974); **NFA** - National Forests Act of (1998); ToPS – Threatened or Protected Species; **IUCN:** CR - Critically - Endangered, En - Endangered, Vu - Vulnerable; LC - Least Concern; NE – Not Evaluated; DD – Data Deficient

are flagged or were identified other than widespread species that are protected in terms of the respective provincial ordinances. The total site area also constitutes only ~5 % of the total projected EOO coverage of the species. Previous attempts to investigate and survey the species in the broader area have not proved successful

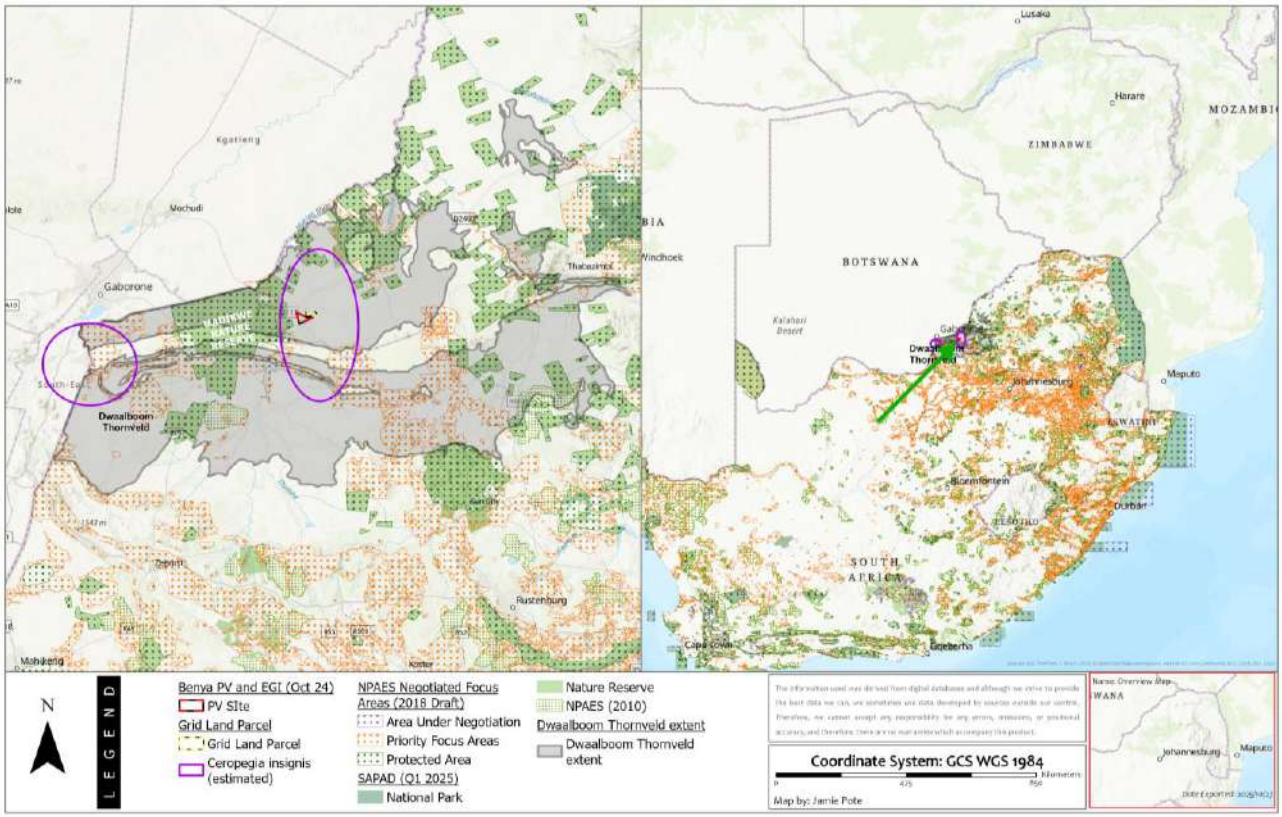

Figure 54: Distribution records of Flora Species of Conservation Concern (GBIF, October 2025) with known records in the vicinity of the site. NOTE some distribution records may have an offset for biosecurity purposes and/or accuracy errors but will non the less give an indication of general locality.

As per Table 4, a single Endangered flora species is flagged as possibly occurring on the site. Despite three seasonal surveys during this assessment, no evidence was found that the species is present, and the specialist thus disputes the National Environmental Screening Tool Medium Sensitivity designation for the species and assigns a low species sensitivity. was confirmed to be present nor are known to be present in the affected area.

Other sources and site observations were used to screen the likelihood of other Endangered or Critically Endangered species being present in the broader surrounding area or within the site and concluded that no other Species of Conservation Concern (having an elevated conservation status) are present or likely to occur.
Several species are present that will require permits in term of the regional ordinances as well as a search and rescue before site preparation and construction commences.

3.2.2 Fauna

The property being assessed is surrounded by game fencing and is bisected by two unsurfaced gravel roads an east west road more or less centrally and a north-south road on the western side. The baseline of habitat available under status quo conditions for fauna can be described as a farm portion that while providing potential habitat in the form of natural and degraded Thornveld, is such that it precludes free movement of large mammals from the surrounding landscape due to game fencing. No natural populations of any large mammals are present, except for Kudu, which are able to jump over typical game proof fencing. Furthermore, the ~856 Ha farm is fenced with game fencing into three areas, 100 Ha, 200

Ha and 556 Ha, which are unlikely to meet the requirements for maintaining any large mammal natural population within the fenced area, nor will it accommodate free movement of large mammals that may be part of a natural population in the surrounding area. Although the farm being used in part as a game farm (in conjunction with stock farming), certain species may be introduced for breeding/hunting from time to time.

Large to medium sized mammals that have the potential to be present (based on observations and supplemented by nearby records) include *Alcelaphus buselaphus caama* (Red Hartebeest), *Connochaetes taurinus* (Common Wildebeest), *Damaliscus lunatus* (Topi), *Crocuta crocuta* (Spotted Hyaena), *Kobus ellipsiprymnus* (Waterbuck), *Aepyceros melampus* (Impala), *Tragelaphus oryx* (Common Eland), *Tragelaphus angasii* (Nyala), *Tragelaphus scriptus* (Bushbuck), *Tragelaphus strepsiceros* (Greater kudu), *Panthera pardus* (Leopard), *Phacochoerus africanus* (Common Warthog), *Proteles cristata* (Aardwolf). Many of these species occur and are widespread in the surrounding area, but due to game fencing restricting free movement of larger mammals as well as the relatively small size of the site, adequate and suitable habitat would not be available, other than Kubu which tends to be able to get over game fencing. This significantly limits the potential for the site to provide adequate habitat for viable population of such large mammal species.

Smaller mammals present or highly likely (based on observations and supplemented by nearby records) include *Raphicerus campestris* (Steenbok), *Oreotragus oreotragus transvaalensis* (Transvaal klipspringer), *Sylvicapra grimmia* (Common duiker), *Vulpes chama* (Cape fox), *Otocyon megalotis* (Bat-eared fox), *Papio ursinus* (Chacma Baboon), *Paraxerus cepapi* (Smith's Bush Squirrel), *Aethomys chrysophilus* (Red Rock Rat), *Chlorocebus pygerythrus* (Vervet Monkey), *Ichneumia albicauda* (White-tailed mongoose), *Mungos mungo* (Banded Mongoose), *Rhabdomys pumilio* (Four-striped Grass Mouse), *Geosciurus inauris* (Cape ground squirrel) and *Rattus rattus* (Black rat). The smaller mammals are less likely to be constrained by game fencing, although portions of the fence were noted to include mesh fencing which may restrict movement of some of the larger ones.

Reptiles diversity is relatively high and species present or highly likely (based on observations and supplemented by nearby records) include *Acanthocercus atricollis* (Southern Tree Agama), *Acontias occidentalis* (Western burrowing skink), *Aparallactus capensis* (Black-headed Centipede-eater), *Atractaspis bibronii* (Bibron's Stiletto Snake), *Bitis arietans* (Puff Adder), *Chamaeleo dilepis* (Flap-necked chameleon), *Chondrodactylus turneri* (Turner's Thick-toed Gecko), *Cordylus jonesii* (Limpopo girdled lizard), *Dasypeltis scabra* (Common Egg-eater), Dendroaspis polylepis (Black Mamba), *Dispholidus typus* (Boomslang), *Gerrhosaurus flavigularis* (Black-lined Plated Lizard), *Hemidactylus mabouia* (Tropical house gecko), *Homopholis walbergii* (Wahlberg's velvet gecko), *Kinixys spekii* (Speke's Hinged Tortoise), *Leptotyphlops scutifrons* (Peter's Thread Snake), *Lygodactylus capensis* (Common Dwarf Gecko), *Matobosaurus validus* (Giant Plated Lizard), *Meroles squamulosus* (Common Desert Lizard), *Mochlus sundevallii* (Sundevall's Writhing Skink), *Naja mossambica* (Mozambique Spitting Cobra), *Nucras intertexta* (Spotted Sandveld Lizard), *Pachydactylus affinis* (Transvaal thick-toed gecko), *Pelomedusa subrufa* (Helmeted Turtle), *Pelusios sinuatus* (Serrated hinged terrapin), *Psammophis brevirostris* (Short-snouted Grass Snake), *Psammophis subtaeniatus* (Western yellow-bellied sand snake), *Psammophylax tritaeniatus* (Three-striped Grass Snake), *Rhinotyphlops lalandei* (Delalande's beaked blind snake), *Stigmochelys pardalis* (Leopard Tortoise), *Thelotornis capensis* (Southern vine snake), *Trachylepis capensis* (Cape Skink), *Trachylepis punctatissima* (Speckled Rock Skink), *Trachylepis varia* (Eastern variable skink), *Varanus albigularis* (Rock monitor) and *Varanus niloticus* (Nile Monitor).

Amphibians present or highly likely (based on observations and supplemented by nearby records) include *Chiromantis xerampelina* (Grey Foam-nest Treefrog), *Kassina senegalensis* (Senegal Land Frog), *Ptychadena anchietae* (Plain Grass Frog), *Pyxicephalus edulis* (Lesser Bull-Frog) and *Schismaderma carens* (African Red Toad).

Numerous other less commonly occurring species could also occur or be transient to the site. Refer to a more comprehensive species list in Appendices (Section 8.4.2: Fauna)

Faunal species list based on site observations as well as potential or expected fauna (based on records within vegetation unit and/or in proximity to the site and/or likelihood of occurrence) is provided in Section 8.4.2: Appendix D: Species List.

While the site does provide habitat for faunal species the fact that there are man-made modifications (game fencing and unsurfaced roads) present that will have an underlying impact on the baseline faunal processes, and the site should not be incorrectly perceived as a 'pristine landscape' for fauna. Furthermore, farms in the surrounding landscape are also modified and include several that have extensive clearing of natural vegetation for crop cultivation which will further fragment the landscape and will have implications on the existing faunal assemblages.

Figure 55: Game fencing and unsurfaced roads.

Figure 56: Cultivated lands on surrounding farms.

Game fences are used to enclose wildlife for conservation, hunting, or management purposes and can have significant negative ecological effects on fauna including the following:

Habitat Fragmentation

1. Barrier to movement: Fences restrict the natural movement of animals, especially migratory species.
2. Genetic isolation: Populations separated by fences may not interbreed, leading to reduced genetic diversity.
3. Disruption of ecological processes: Movement of non-avifaunal pollinators, seed dispersers, and predators can be hindered, affecting ecosystem dynamics.

Mortality and Injury

1. Fence entanglement: Animals can get caught in or injured by fences, especially during panic or escape responses.
2. Predator traps: Fences can trap prey species, making them easy targets for predators.
3. Roadkill increase: Animals funnelled by fences may crossroads at specific points, increasing collision risks.

Altered Species Composition

1. Exclusion of non-target species: Fences may prevent access to certain species not intended to be managed, altering local biodiversity.
2. Overpopulation inside fences: Without natural predators or emigration, some species may overpopulate, leading to overgrazing and habitat degradation.

Behavioural Changes

1. Stress and altered movement: Animals may exhibit stress behaviours or change their home ranges due to confinement.
2. Disrupted migration and dispersal: Especially critical for wide-ranging species like large carnivores or ungulates.

Species-Specific Outcomes

1. Some species adapt well to fenced environments, while others suffer severely. For example, territorial animals may cope better than migratory ones.

Fence Design Matters

1. Permeable or wildlife-friendly fences (e.g., with gaps for small animals or corridors for migration) can mitigate negative effects.
2. Electrified or high fences tend to have more severe ecological consequences.

In addition, the unsurfaced roads bisecting the site are to some extent also likely to pose risks including:
Habitat Fragmentation

1. Roads divide ecosystems, creating isolated patches of habitat.
2. This can limit animal movement, reduce access to resources, and disrupt migration routes.

Wildlife Mortality

1. Roadkill is a major issue, especially for slow-moving or nocturnal animals.
2. Species like amphibians, reptiles, and mammals are particularly vulnerable.

Noise and Light Pollution

1. Traffic noise can interfere with animal communication, mating calls, and predator-prey interactions.
2. Artificial lighting disrupts nocturnal species and can alter behavior and physiology.

Genetic Isolation

1. Fragmented populations may not interbreed, leading to reduced genetic diversity and increased inbreeding.

Edge Effects

2. Roads create “edge” habitats that differ from interior habitats.
3. These edges may favour invasive species or predators, altering local biodiversity.

Behavioural Changes

1. Animals may avoid roads due to noise, light, or perceived danger.
2. Some species may change their movement patterns, feeding behavior, or breeding sites.

Disease Spread

1. Roads can facilitate the movement of domestic animals and humans, increasing the risk of disease transmission to wildlife.

Of the large mammals that do occur in the surrounding area, few would be able to get onto the site past the 18-strand game fence other than Kudu, which are generally tho most mobile for the large mammal. Free movement of the remaining large mammals across the landscape would thus be restricted. Over and above that many species such as Elephant, Rhinocerus, Sensitive species 5, African Wild Dog are restricted to protected areas and do not freely roam the landscape. Typical large mammal which occur locally including Impala, Red Hartebeest, Springbok, Side-striped Jackal, Black-backed Jackal, White Rhinoceros, Common Wildebeest, Spotted Hyaena, Topi, Bontebok, Black Rhinoceros, Plains Zebra, Southern Giraffe, Common Hippopotamus, Sable Antelope, Brown Hyaena, Cape Porcupine and Waterbuck, are thus

unlikely to occur on the site unless they are introduced or a few individuals were historically present at the time of fencing.

Based on a conservative Large Stock Unit (LSU) stocking rate for Dwaalboom Thornveld of 10 ha/LSU/year, which is the recommended stocking rate under drought conditions, (*6–8 ha/LSU/year* under average conditions), a maximum of 85 large mammal can survive sustainable on the farm portion. It would thus not be feasible to assume that the site (as a fenced off area) can sustainably support any significant population of any large mammal. Small herd of smaller mammals such as Impala and Springbok are often retained on smaller farms and game farms, but for larger mammals, usually only a few are kept and active breeding management (i.e. commercial game farming) must be followed (i.e. in order to accommodate healthy gene flow). For this reason, the farm in its current form would not be deemed to have significant conservation value in terms of large mammal conservation. Lack of a healthy population of large mammals will also have influence on vegetation cover, as can be seen with densification of thorny tree species. Large mammals such as Elephant and Rhinocerus are required in order to

Red Listed and Protected Fauna

As per Table 5 & Figure 57, two faunal species (excluding avifauna) are flagged as potentially being present in terms of the National Environmental Screening Tool. Two avifaunal species are flagged, but these are outside the scope of this terrestrial assessment and are dealt with in the separate Avifaunal Assessment.

Table 5: Fauna Species of Special Concern (SCC)

SCIENTIFIC NAME	COMMON NAME	STATUS[6]	COMMENT/PRESENCE
Mammals			
Sensitive species 5	-	NEST (M), VU	Within distribution range. Likely to have occasional transient visits from adjacent areas, as the site will be within the foraging range of this species. The species would in any event be in conflict with current land use for livestock breeding. Site development not likely to significantly affect the species as suitable habitat is plentiful in the surrounding area including several nature reserves.
Lycaon pictus	African Wild Dog	NEST (M), EN	Within distribution range. Landowner indicated it is not present; however, the site is in principle within the foraging range of current distribution, however it is not likely to occur as in any event it would be in conflict with current land use (stock farming).
Birds			
Aquila rapax (bird)	Tawny eagle	NEST (M), En (SA), LC (Intl)	Refer to Avifaunal assessment.
Polemaetus bellicosus (bird)	Martial Eagle	NEST (M, H),	Refer to Avifaunal assessment.
Reptiles			
None flagged			N/A
Amphibians			
None flagged			N/A
Invertebrates			
None flagged			N/A

Two mammal species are also flagged, the Sensitive Species 5 and the African Wild Dog. (See *Figure 57* for distribution map). The sensitive species flags for these two mammal species are likely due to records in

6 **PNCO** - Provincial Nature Conservation Ordinance (1974); ToPS – Threatened or Protected Species, **IUCN:** Cr - Critically - Endangered, En - Endangered, Vu - Vulnerable; LC - Least Concern.

the broader area. Sensitive Species 5 may be a transient visitor, but habitat is plentiful, and they would generally require extensive habitat in a natural setting. African Wild Dog is unlikely to be present, being generally confirmed to protected areas and surrounds. Based on distribution records, it would appear that the species are generally isolated to protected areas, and while the site is potentially within the home range of the species, the likelihood of occurrence and any populations is low due to conflict with livestock farming and also urban settlement to the east. Nearest known records for this species in the vegetation unit (or other records) are more than 30 km to the west and east of the site. There are thus no records of the species within 30 km of the site, which does not necessarily preclude it potentially being present as a transient visitor but does suggest that the risk is low. Avifaunal species (*Aquila rapax* –Tawny Eagle & *Polemaetus bellicosus* - Martial Eagle) are subject to a separate assessment.

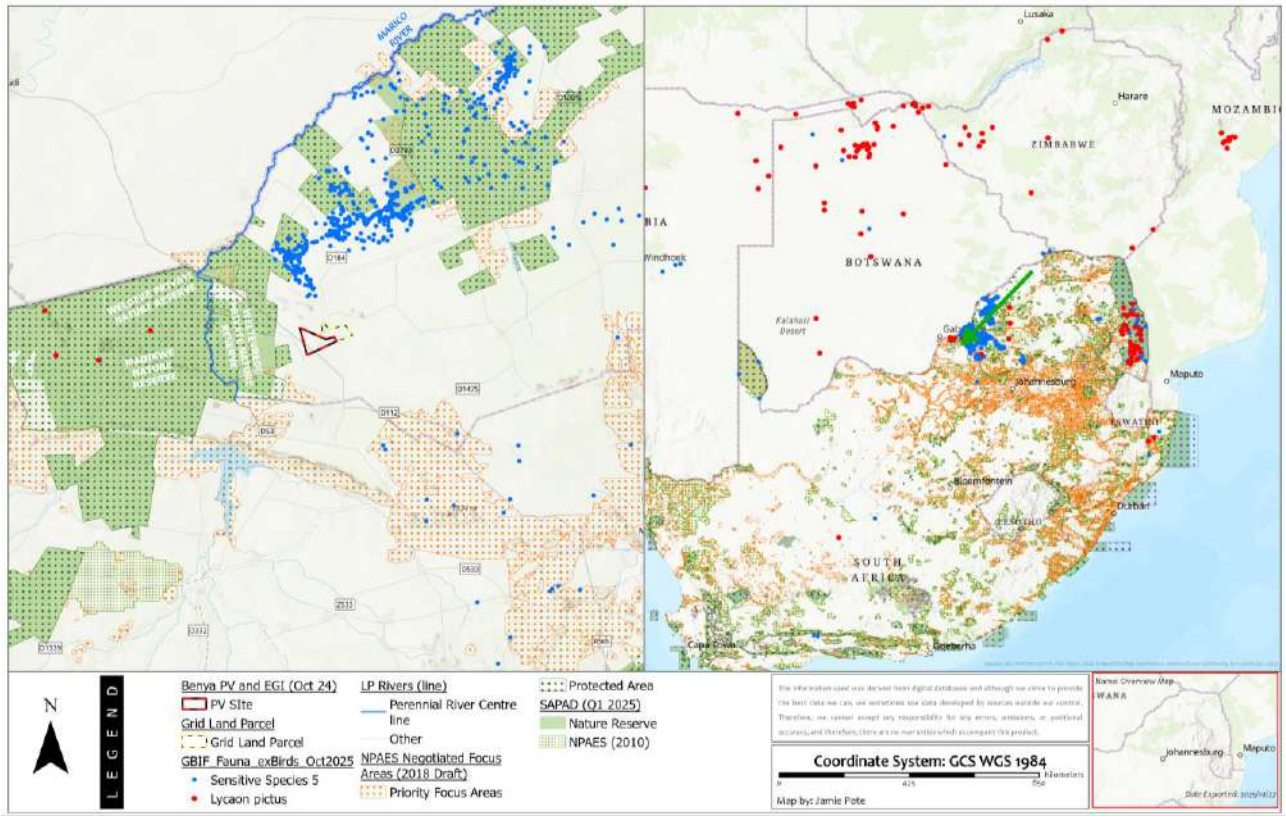

Figure 57: Distribution records of Fauna Species of Conservation Concern (GBIF, October 2025) with known records in the vicinity of the site. NOTE some distribution records may have an offset for biosecurity purposes and/or accuracy errors but will non the less give an indication of general locality.

Any disturbance or habitat destruction as a direct result of the activity is unlikely to pose a significant negative impact faunal species nor any species of conservation concern. The findings of this assessment conclude that no Endangered or Critically fauna species were found to be present nor are known to be present in close proximity to the affected area nor are likely to be directly affected by the activity.

Several fauna species are flagged as having extant geographical ranges that overlap with the site, many of which are no longer present or unlikely to be transient due to exclusion due to game fencing and the site not being large enough to accommodate a viable population. These include Black Rhinoceros (Critically Endangered), African Wild Dog and Elephant (Endangered), Common Hippopotamus & Lion (Vulnerable). African Buffalo, Brown Hyaena, Plains Zebra and White Rhinoceros (Near Threatened).

Several other larger mammal species with elevated status that are not present and unlikely to be transient as a result of the farm being surrounded by game fencing include Mountain Reedbuck (Endangered). Other faunal species including Serval, Leopard and Sensitive Species 5 do occur locally, but also likely to be excluded due to game fencing and also would be in conflict with current land uses (livestock and game farming), so would be removed anyway.

The reptiles, Cape Purple-glossed Snake and Striped-neck variable skink (both Data Deficient) could potentially occur as the site is on the edge of the extant geographic distribution. The Lobatse hinge-back tortoise (Vulnerable occurs in Dwaalboom Thornveld vegetation but its range is to the north-east and not expected to occur within the site.

The National Environmental Screening Tool flags only two faunal species (excluding avifauna), namely Sensitive Species 5 and African Wild Dog. African Wild Dog is almost exclusively associated with protected areas and nature reserves, including the Madikwe Nature Reserve. The game fencing on the farm will exclude this animal and thus unlikely to occur. Similarly Sensitive Species 5 has historically been recorded in the area, including Madikwe and the nature reserve complex to the north-east of the site. In principle individuals could be transient, as they would be less susceptible to exclusion due to game fencing and pass through the site occasionally, but would be discouraged due to conflict with current land uses (livestock and game farming). Furthermore, the home range of Sensitive species 5 is extensive, ranging from about 15 km² to over 700 km. The site would thus comprise a nominal proportion of the range of any individuals of this species, hence the activity is unlikely to pose any risk of significance.

In summary, the only fauna species with an elevated conservation status that has the potential to occur is the Striped-neck variable skink (*Trachylepis laevigata*), a reptile with a Data Deficient status. Furthermore, an analysis of existing distribution records (GBIF, 2025), suggest that the species is associated with mountainous areas (preferred habitat being open, rocky montane grassland and savanna, rather than sandy bushveld/Thornveld) including the mountain ridges between Rustenberg and Loskop Dam, as well as around Pilanesberg and around Thabazimbi-Mokopane. It can thus be concluded that the species is unlikely to occur on the site. In the unlikely event that it is present, it would not likely be affected by the proposed activity where a substantial proportion of the farm will be retained in a natural state, which would provide suitable habitat for relocation and/or displacement.

Fauna PNCO permits are recommended as small species such as lizards, geckos and snakes are present in and will likely require relocation before commencement.

Alien Invasive Species

On 18 September 2020, the Minister of Environmental Affairs published the Alien and Invasive Species Regulations ("the Regulations") which came into effect on the 18 October 2020 in a bid to curb the negative effects of IAPs. The Regulations call on landowners and sellers of land alike to assist the Department of Environmental Affairs to conserve our indigenous fauna and flora and to foster sustainable use of our land. Non-adherence to the Regulations by a landowner or a seller of land can result in a criminal offence punishable by a fine of up to R 5 million (R 10 million in case of a second offence) and/or a period of imprisonment of up to 10 years.

- Category 1a and 1b listed invasive species must be controlled and eradicated.
- Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property.
- The growing of Category 3 species is subject to various exemptions and prohibitions.

Some invasive plants are categorised differently in different provinces. *For example*: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014). Alien control programs are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is

essential. This will save time, money, and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. A general rule of thumb is to first target lightly infested areas before tackling densely invaded areas and prioritize sensitive areas such as riverbanks and wetlands. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

Exotic invasive and other weed species are not common within the site and surrounding area. Proliferation of weedy and exotic species often indicate disturbance especially during or after construction. A list of species is included in Table 6, some of which have the potential for introduction and proliferation during construction. During construction it is highly likely that species currently not on site could be introduced through the construction process. A weed management programme is recommended after construction to counter the weed proliferation that would be expected after construction.

Table 6: Alien (exotic) invasive and other weed species and status.

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS[7]	PRESENCE
Cenchrus clandestinus	Kikuyu grass	Poaceae	CARA 1b	Present, occasional
Cortaderia selloana	Pampas grass	Poaceae	CARA 1b	Present, occasional
Opuntia ficus-indica	Prickly Pear	Cactaceae	CARA 1b	Present, occasional
Ricinus communis	Castor Oil Plant	Euphorbiaceae	CARA 2	Present, occasional
Solanum sisymbriifolium	Wild tomato	Solanaceae	CARA 1b	Present, occasional

Eradication protocol

The act required the removal of these species, being the responsibility of the landowner/contractor. Several other common weed species are also present which should also be managed as part of post construction management,

Specific eradication and management procedures must be stipulated in the EMP as to the methods to be implemented to remove and control the various alien invasive species as they tend to require species specific techniques. A management plan should be incorporated into the EMP, and a detailed action plan compiled and implemented by the ECO.

3.2.3 Aquatic Habitat

Aquatic systems do not function in isolation and in terms of ecological processes, the aquatic systems are intricately linked to the terrestrial system. A riverine and riparian community that drains the surrounding urban landscape forms an integral link between upstream and downstream communities and as a corridor for various faunal especially avifaunal species as well as wetlands that provide seasonal habitat and are a water source in an otherwise arid landscape. Two small wetland areas are present on the western side of the site that provides several ecological and biodiversity attributes associated with seasonal habitat and water. The terrestrial assessment is aligned with the aquatic assessment that these features shou be retained.

3.2.4 Terrestrial Vegetation Sensitivity Assessment

An overall vulnerability assessment of the activity, incorporating key vegetation and ecological indicators was undertaken and includes the following key criteria:

- relative levels of *intactness* in terms of overall loss of indigenous vegetation cover.

[7] CARA - Conservation of Agricultural Resources Act (1993); National List of Invasive Species in Terms Sections 70(1), 71(3) and 71A (2016); Weed – an exotic ruderal weed species, not indigenous but not a declared invasive species.

- presence, diversity, and abundance of *species of special concern* (weighted in favour of local endemic species).
- extent of *invasion* (severity and overall ecological impact), as well as the degree to which successful rehabilitation could take place.
- overall degradation incorporating above factors.
- relative importance of the vegetation communities relative to regional conservation status - indicated as vulnerability of the area because of loss.

Intactness

Three basic classes are differentiated as follows:

- **Low**: > 75 % of original vegetation has been removed or lost; and/or no species of special concern present that are critically endangered, endangered, or endemic with highly localised distribution.
- **Moderate**: 25 - 75 % of original vegetation has been removed/lost; and or presence of species of special concern but not having high conservation status or high levels of endemicity or highly localised distributions.
- **High**: < 25 % of original vegetation has been removed or lost; and or presence of species with a highly endemicity and or high conservation status (endangered or critically endangered).

Intactness for the site is **Low/Moderate**.

Alien Invasion

Three classes are differentiated as follows:

- **Low**: no or few scattered individuals.
- **Moderate**: individual clumps of invasives present but cover less than 50% or original area.
- **High**: dense, impenetrable stands of invasives present, or cover > 50 % of area with substantial loss functioning. Rehabilitation will most likely require specialised techniques over an extended period (> 5 years).

Alien invasion for the site is **Low to Very Low**.

Degradation

Overall Degradation is determined from the above alien invasion and intactness scores, according to the following matrix:

INTACTNESS	INVASION		
	LOW	MODERATE	HIGH
High	Pristine	Near Pristine	Moderately Degraded
Moderate	Near Pristine	Moderately Degraded	**Severely Degraded**
Low	Moderately Degraded	Severely Degraded	**Transformed**

Degradation for the site is **Low/Moderate**.

Overall Sensitivity score

Overall vulnerability (or Sensitivity) of the vegetation within the site is calculated according to the following matrix which combines degradation and overall conservation status of the vegetation units of the site.

DEGRADATION	CONSERVATION STATUS			
	LEAST CONCERN	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED
Severely degraded/ Transformed	Very Low/Low	Low	Moderate	Moderate - High
Moderately degraded	Low	Moderate	High	High

DEGRADATION	CONSERVATION STATUS			
	LEAST CONCERN	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED
Ecologically Pristine or near Pristine (no such areas identified)	Moderate	Moderate - High	High	Very High (No-Go area)

Habitat Sensitivity

Habitat Sensitivity can be summarised as follows:

- HIGH OR VERY HIGH SENSITIVITY areas are limited to the wetland and rocky thornveld habitat. These areas are recommended to be avoided.
- MODERATE SENSITIVITY portions are designated where there is remnant natural or near natural Dwaalboom Thornveld vegetation including some patches within the proposed PV portion. The affected vegetation unit does have an elevated conservation status, and the specific areas to be impacted are shown to have likely been degraded historically to some extent due to overutilisation.
- LOW SENSITIVITY areas include ares that are currently transformed (cultivated, roads and dwellings), old lands now having secondary thornveld and degraded thornveld where there is persistent loss of structure, function and diversity due to historical overutilisation. 60% of the proposed PV footprint within the farm portion is designated low sensitivity and falls within one of the applicable habitat units.
- While no specific Very High Sensitivity or Critical Habitat Areas are identified, it is recommended that the high sensitivity wetland and rocky hill habitat is avoided. Furthermore, due to the CBA 2 designation it is has been recommended that the entire remaining extent was not developed or a core area was retained in order to serve conservation and connectivity objectives, including ongoing use for livestock and game farming.

Figure 59 shows the proposed PV and associated infrastructure (including substations, BESS & overhead line corridors) overlain on the vegetation sensitivity. *Red arrows* (*Figure 59*) indicate connectivity between the natural vegetation that will be retained to the surrounding landscape. The retained area is situated on the north side of the PV facility, where it is adjacent to natural vegetation on the north and west sides of the property. This will allow for ecological connectivity northwards and westwards. Since the grid connection infrastructure, situated on the south-east corner of the site will be comprised of relatively small footprints for the BESS and substations, rather than complete blanket clearing, and the overhead line will not significantly impede free movement of fauna (excluding avifauna), in principle a corridor that is contiguous with the northern retained vegetation, will also be retained southwards to the surrounding landscape. The PV layout is also optimised to maximise the overlap with degraded Thornveld and also sited to maximise the footprint along the D1629 and D113 roads, keeping the area to the north intact and thus maximising connectivity with the most intact surrounding vegetation (to the north and west). The vegetation to the south and east of the site is significantly more transformed (*~green dots, Figure 59*) and fragmented compared to the north and west which is fairly intact *(~orange dots, Figure 59*).

The actual vegetation loss breakdown for the proposed PV facility layout including BESS, O&M and Substations is estimated to be approximately 182.5 Ha Intact Thornveld (41.2%), 120.0 Ha Degraded Thornveld (27.1%), 120.6 Ha Secondary Thornveld (27.2%) and 20.0 Ha Transformed (4.5 %). The actual loss of intact Thornveld (but shown to have been historically degraded), which has a Least Concern status, is designated CBA 2, indicating it is not irreplaceable habitat (and conservation targets can be achieved without) and not prioritised for protected area expansion (i.e. NPAES), is actually only 182.5 Hectares.

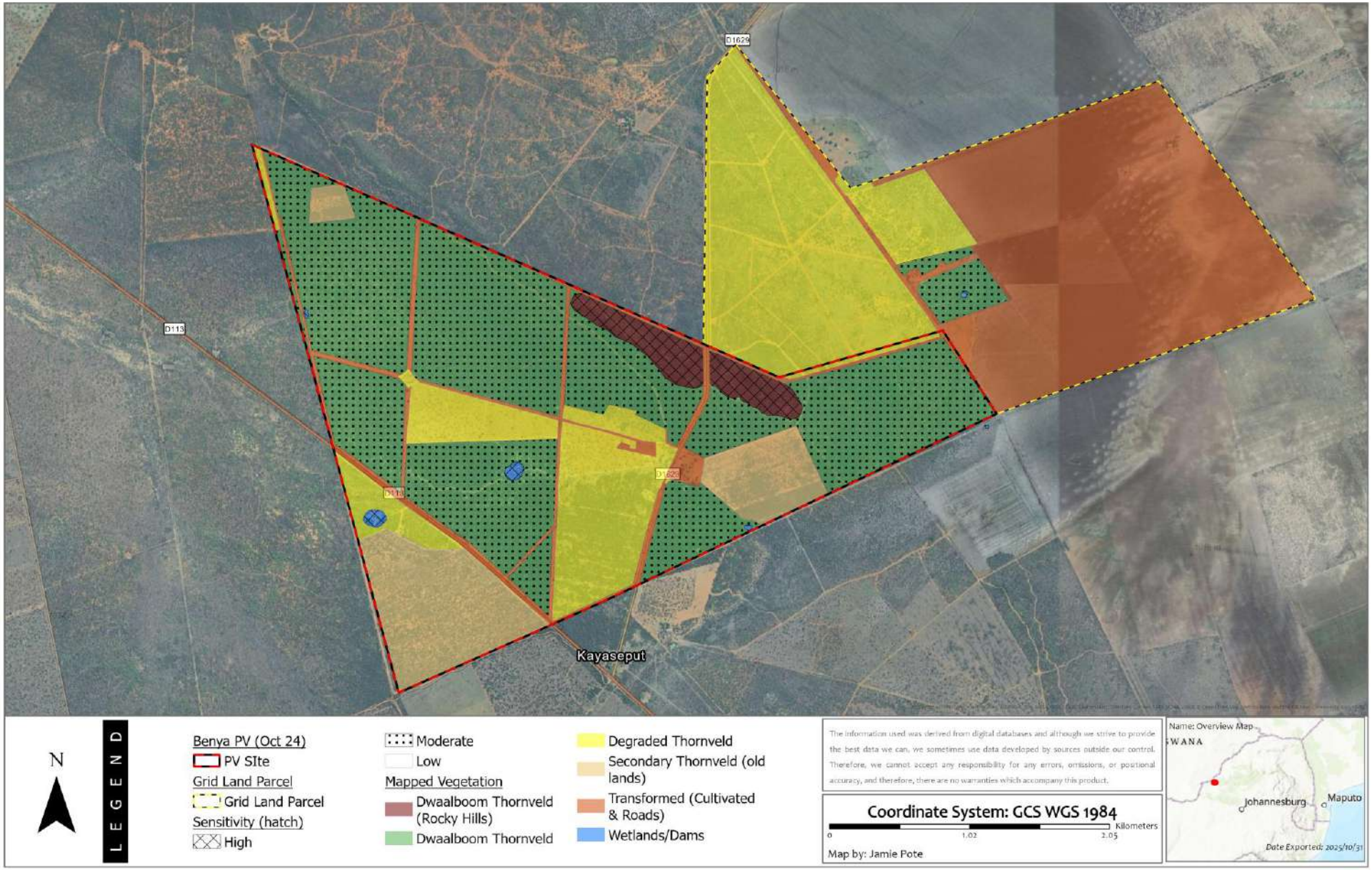

Figure 58: Vegetation Sensitivity of the site.

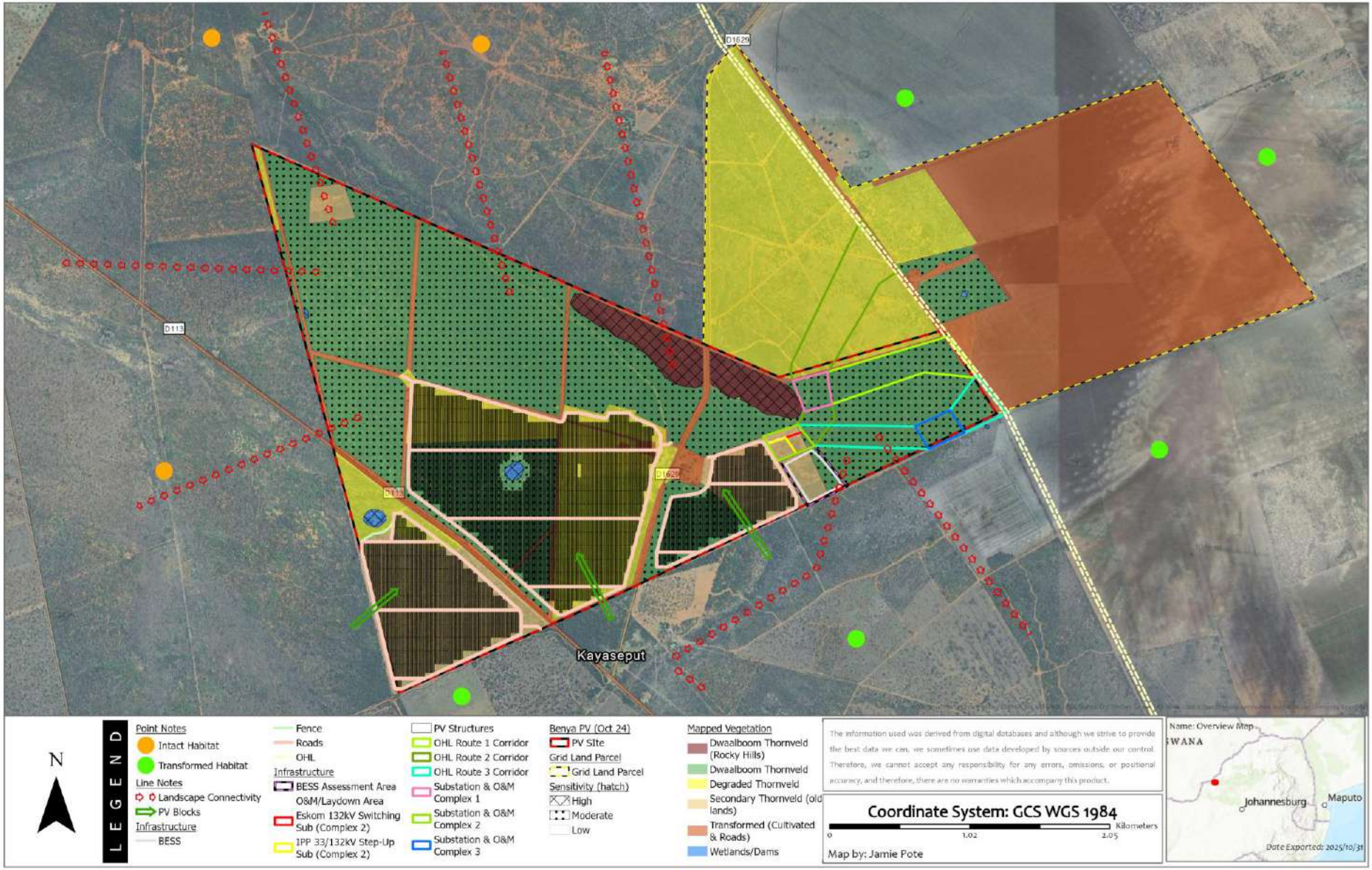

Figure 59: Vegetation Sensitivity of the site with proposed Site Development Plan. Red arrows indicate retained landscape connectivity; green arrows indicate 3 x PV blocks (optimised in degraded areas). Green dots indicate surrounding transformed areas and orange dots indicate surrounding natural vegetation Grid infrastructure primarily on the far eastern side.

The area of intact Thornveld that will be retained is approximately 454 Ha. The effective intact thornveld loss thus represents 40 % of the intact thornveld that is on the site and 60% of intact thornveld will be retained. By identifying habitat value and sensitivity in the early stages so that the facility design is informed by the terrestrial biodiversity sensitivity it is possible to reduce the impacts significantly before impact assessment. The 182.5 Hectares of intact Dwaalboom Thornveld that will be lost is negligible in regional terms and represents only 0.03 % of original extent and 0.04% of the remaining extent. Of the total original extent of Dwaalboom Thornveld, approximately 251 718 Ha has been cleared (32 %), and the 182.5 Ha (near-natural only) represents an increase in clearing of only 0.07% and the 302.5 Ha (near natural plus degraded) represents an increase in clearing of only 0.12 %.

3.2.5 No-Go Areas

No specific No-Go areas are identified within the site, but in the prelim investigations and design it was recommended to avoid the wetland areas and also the rocky habitat along the northern boundary on ither side of the D1629 unsurfaced district road, which has been enacted. Retention of a portion of natural vegetation on the north side will also serve to accommodate the CBA designation whereby some natural vegetation (near 50%) will be retained

3.2.6 Potential Development Footprints

The remainder of the site outside of the identified no-go areas above is considered to be developable, with consideration of conservation targets and landscape connectivity.

3.3 Terrestrial Biodiversity Impact Assessment

3.3.1 Summary of actions, activities, or processes that require mitigation.

The main impacts associated with the unauthorised activity include the following and are described in *Table 7*:

1. Permanent or temporary loss of indigenous vegetation cover.
2. Loss of Flora Species of Conservation Concern.
3. Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species.
4. Susceptibility of some areas to wind and water erosion associated with uncontrolled stormwater runoff.
5. Disturbances to Ecological Processes.
6. Impact to Aquatic and Riparian processes (Terrestrial aspects).
7. Loss of faunal Species of Conservation Concern, Habitat and Processes.

3.3.2 Potential Terrestrial Biodiversity Impacts (Direct)

Overall impacts to terrestrial biodiversity are likely to be nominal, with loss resulting from removal of a limited footprint, within the vegetated areas within the site (relative to the regional habitat extent). The PV facility including associated infrastructure (BESS, substations, laydown areas, etc) will require clearing of vegetation. The overhead powerline will likely require limited clearing to accommodate pylons and spanning of overhead lines, with operational maintenance to prune or remove trees.

Table 7: Potential Impacts to Terrestrial Biodiversity.

IMPACT	Nature of Impact
Vegetation	Permanent or temporary loss of indigenous vegetation cover because of site clearing of the affected footprint. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.

IMPACT	Nature of Impact
Flora Species[8]	Loss of flora Species of Conservation Concern during pre-construction site clearing activities within the PV site and along the grid corridor. Several species of Conservation Concern are known from surrounding areas, which could be destroyed during site preparation, including species for which removal permits will be required.
Alien Invasive Species	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.
Erosion	Susceptibility of some areas to erosion because of construction related disturbances, including at watercourse crossings. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
Ecological Processes	Disturbances to ecological processes: Activity may result in disturbances to ecological processes.
Aquatic and Riparian processes	Aquatic and Riparian processes: Activity could affect aquatic and riparian process, which could include terrestrial aspects (i.e. fauna species dependant on water sources and/or aquatic vegetation. This does not include any aquatic or geomorphology aspects that are assessed in the separate aquatic assessment.
Faunal Species, Habitat and Processes	Loss of faunal SCC due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species. Loss of Faunal Habitat: Activity may result in the loss of habitat for faunal species, which could result in disturbance and displacement of faunal species. Impacts to faunal processes because of the activity.

3.3.3 Assessment of Impact Methodology

The potential terrestrial biodiversity impacts will be assessed according to the methodology outlines below.

NATURE		
Include a brief description of the impact of the environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).

[8] Subject to findings of follow-up species survey.

4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
`		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible, but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact results in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		

1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects

SIGNIFICANCE

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.
The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

3.3.4 Assessment of Direct Impacts

Assessment of impacts is summarised in the tables below. The rating values as per the criteria described above, as identified during the assessment. In summary, the following can be concluded based on the findings of this assessment:

- The proposed footprint comprises an insignificant portion of the vegetation unit regionally and extensive areas of natural vegetation are present surrounding the site (to the north and east).
- The site is not flagged as NPAES for protected area expansion.
- The site is designated CBA 1 and ESA 2, which indicates, while it is desirable to retain for conservation and connectivity, it is not irreplaceable, nor would the site be considered a 'pinch point' (i.e. loss will significantly affect the connectivity of ecological process or faunal movement in the landscape). Since the site is already game fenced and bisected by two district roads, the status quo condition is already not ideal for free faunal movement across the site.
- Cumulative impact to ecological processes both locally and regionally will be negligible. Furthermore, it is likely that some (non-tree) vegetation regrowth within the SEF footprint will occur after construction, hence cumulative impacts would be slightly reduced, and ecological processes are likely to persist if in a limited capacity during operation.
- Operation of the site will be long term (± 25-year anticipated lifespan). Some revegetation, potentially including regeneration of species of conservation concern, will occur within the SEF

footprint once construction is completed similar to what is present in the old lands vegetation currently seen on site, which were previously cleared.

- Since the proposed footprint has a minimal area, cumulative impact to terrestrial biodiversity locally and regionally will be negligible as the vegetation unit has extensive coverage and the site constitutes a very small proportion.
- While present in the broader area, species of conservation concern are not prevalent within the SEF or OHL footprint. All species that are present are widespread species, and removal will not result in any significant impact to any flora species or population. Furthermore, it is likely that some flora species will regenerate within the footprint once construction is completed, hence cumulative impacts would be negligible. No species having an elevated conservation status were found to be present within the project footprint.
- Faunal species of conservation concern are present within the affected area, which could be destroyed during site clearing. All species are widespread species, and removal will not result in any significant impact to any flora species or population. Fauna species may return to the project site once construction is completed, including transient species or to the area that will be retained on the northern portion of the site. Activities associated with site preparation and killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.
- Cumulative impact to faunal species locally and regionally will be negligible due to small area of site relative to regional extent. All fauna species are widespread species, and removal will not result in any significant impact to any fauna species or population. Furthermore, it is likely that some fauna species will return to the project footprint once construction is completed, hence cumulative impacts would be negligible. No species having an elevated conservation status were found to be present within the project footprint.
- Residual risks include possible clearing of areas outside of the proposed footprint, killing of perceived harmful fauna during construction or not relocating any species, but are likely to be negligible.
- Residual risks include possible clearing of natural or near natural vegetation outside of the proposed footprint, or not relocating any species, but are likely to be negligible.
- Exotic (weed) and alien invasive species may proliferate during and after construction in disturbed areas. Areas disturbed during construction, having no vegetation cover, including temporary stockpile areas, are often susceptible to invasion by weedy and alien invasive species, which can not only become invasive but also prevent natural flora from becoming established.
- Disturbed areas are generally subject to weed proliferation, but with implementation of a weed management plan, cumulative impact is potentially negligible. Residual risks are primarily related to inadequate initial and ongoing implementation of the weed management plan.
- Diversion and increased velocity of surface water flows during construction and operation could alter the hydrological regime and result in changes to water quality as well as loss of riparian vegetation / aquatic habitat. Removal of vegetation cover and soil disturbance during construction may result in some areas being susceptible to soil erosion, in particular during unexpected heavy rainfall, although the site is relatively flat. The footprint is outside of any aquatic features, and baseline disturbance and risks relating to aquatic features as well as erosion is already elevated around the wetland area that that can be easily traversed without placing any pylons within the wetland. Cumulative impacts locally and regionally will thus be negligible. Residual risks include inadequate protection from flooding or erosion (including stockpiles topsoil) as a result of unexpected heavy rainfall, mostly during construction and early after construction is completed (until vegetation cover is established).

Impacts expected to occur during the construction phase

**E - Extent, p - Probability, R - Reversibility, I - Irreplaceability, D - Duration, C - Cumulative Effect, M - Magnitude, IS - Impact Significance, -ve: negative; +ve: positive*

Nature of the Impact	Status		E	P	R	I	D	C	M	IS	Impact Rating (Before mitigation)	Can impact be mitigated?	Impact Rating (After mitigation)	Is impact acceptable?	Proposed Mitigation Measures
Permanent or temporary loss of indigenous vegetation cover	Before mitigation	ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below.
	After mitigation	-ve	1	4	1	2	4	1	1	13	Low (6-28)		Low (6-28)		
Loss of flora species of Conservation Concern during pre-construction site clearing activities	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Invasion of disturbed areas after construction alien invasive and weed species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	3	2	2	4	1	1	13	Low (6-28)		Low (6-28)		
Susceptibility of some areas to erosion because of construction related disturbances	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disturbances to ecological processes as a result of the activity	Before mitigation	-ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disruptions to Aquatic and Riparian habitat that might affect terrestrial biodiversity aspects	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Loss of Faunal Habitat, Processes & Species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	3	2	2	4	1	1	13	Low (6-28)		Low (6-28)		

Impacts expected to occur during the operational phase

**E - Extent, p - Probability, R - Reversibility, I - Irreplaceability, D - Duration, C - Cumulative Effect, M - Magnitude, IS - Impact Significance, -ve: negative; +ve: positive*

Nature of the Impact	Status		E	P	R	I	D	C	M	IS	Impact Rating (Before mitigation)	Can impact be mitigated?	Impact Rating (After mitigation)	Is impact acceptable?	Proposed Mitigation Measures
Invasion of disturbed areas after construction alien invasive and weed species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	3	2	2	4	1	1	13	Low (6-28)		Low (6-28)		
Susceptibility of some areas to erosion because of construction related disturbances	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disturbances to ecological processes as a result of the activity	Before mitigation	-ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disruptions to Aquatic and Riparian habitat that might affect terrestrial biodiversity aspects	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		

Impacts expected to occur during the decommissioning phase

**E - Extent, p - Probability, R - Reversibility, I - Irreplaceability, D - Duration, C - Cumulative Effect, M - Magnitude, IS - Impact Significance, -ve: negative; +ve: positive*

Nature of the Impact	Status		E	P	R	I	D	C	M	IS	Impact Rating (Before mitigation)	Can impact be mitigated?	Impact Rating (After mitigation)	Is impact acceptable?	Proposed Mitigation Measures
Invasion of disturbed areas after construction alien invasive and weed species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	3	2	2	4	1	1	13	Low (6-28)		Low (6-28)		
Susceptibility of some areas to erosion because of construction related disturbances	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disturbances to ecological processes as a result of the activity	Before mitigation	-ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disruptions to Aquatic and Riparian habitat that might affect terrestrial biodiversity aspects	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		

Cumulative Impact Assessment

**E - Extent, p - Probability, R - Reversibility, I - Irreplaceability, D - Duration, C - Cumulative Effect, M - Magnitude, IS - Impact Significance, -ve: negative; +ve: positive*

Nature of the Impact	Status		E	P	R	I	D	C	M	IS	Impact Rating (Before mitigation)	Can impact be mitigated?	Impact Rating (After mitigation)	Is impact acceptable?	Proposed Mitigation Measures
Permanent or temporary loss of indigenous vegetation cover	Before mitigation	-ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	4	1	2	4	1	1	13	Low (6-28)		Low (6-28)		
Loss of flora species of Conservation Concern during pre-construction site clearing activities	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Invasion of disturbed areas after construction alien invasive and weed species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	3	2	2	4	1	1	13	Low (6-28)		Low (6-28)		
Susceptibility of some areas to erosion because of construction related disturbances	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disturbances to ecological processes as a result of the activity	Before mitigation	-ve	1	4	1	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Disruptions to Aquatic and Riparian habitat that might affect terrestrial biodiversity aspects	Before mitigation	-ve	1	2	2	2	4	1	2	24	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below
	After mitigation	-ve	1	2	2	2	4	1	1	12	Low (6-28)		Low (6-28)		
Loss of Faunal Habitat, Processes & Species	Before mitigation	-ve	1	3	2	2	4	1	2	26	Low (6-28)	Yes	Low (6-28)	Yes	See Table 8 below

All impacts are assessed to be of Low significance before mitigation and can be reduced to Very Low (or insignificant) with the implementation of the mitigation measures to minimise long term loss of vegetation within the PV facility.

3.3.5 Potential Terrestrial Biodiversity Impacts (Indirect)

No significant indirect terrestrial biodiversity impacts are anticipated.

3.3.6 Potential Terrestrial Biodiversity Impacts (Cumulative)

No cumulative terrestrial biodiversity impacts of significance are expected as a result of the proposed PV and Grid development, providing recommendation and mitigation measures are adhered to, due to the limited disturbance area.

3.3.7 Terrestrial Biodiversity Impact Reversibility

In general, most impacts will have a moderate (long term recovery) to low (short term recovery) reversibility in the affected habitat for the PV and grid components, excluding hardened surfaces where reversibility is likely to be low.

3.3.8 Impacts and Risks to Irreplaceable Biodiversity Resources

Risks to Irreplaceable Biodiversity Resources is low to very low.

3.3.9 Residual Risks and Uncertainties

No residual risks or uncertainties are anticipated.

3.3.10 Recommended Mitigation Measures

Table 8 outlines specific mitigation measures that must be implemented and adhered to for both the POV and grid components. These must be considered to be conditions of authorisation.

Table 8: Specific Mitigation Measures and Recommendations

IMPACT	MITIGATIONS
Vegetation	Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place. Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. Any site camps and temporary laydown areas requiring clearing must be located within already disturbed areas away from watercourses.
Flora Species	A search and rescue would be recommended before construction commences. Any flora search and rescue will likely include a few individuals of widespread, cosmopolitan or common but protected species. Respective permits to be obtained beforehand.
Alien Invasive Species	Alien species (including alien invasive trees) and weeds must be removed from the site as per CARA/NEMBA requirements. A suitable weed management strategy to be implemented during construction and operation phases as outlined in the EMPr section of this report. It is imperative that any actions are implemented timeously as once alien and weed species generate seeds, the problem is exacerbated. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust.
Erosion	Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. Topsoil must be stripped and stockpiled separately and replaced on completion. If natural vegetation re-establishment does not occur, a suitable grass must be applied.

IMPACT	MITIGATIONS
Ecological Processes	Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences. Rehabilitation or revegetation should be implemented on completion of construction.
Aquatic and Riparian processes	Except for infrastructure explicitly identified in the assessed layout, no activity to occur within watercourses or wetlands. The OHL portion traversing the wetland will require spanning with no pylons placed in the wetland. Stormwater discharge into watercourses to be protected against erosion. Suitable measures must be implemented in areas that may be susceptible to erosion (such as slopes) and all excavations or excavated areas must be protected from erosion. Topsoil must be stripped and stockpiled separately and protected from erosion and replaced on completion. If natural vegetation re-establishment does not occur naturally (bushveld typically regenerates well with minimal intervention), a suitable local grass seed mix must be applied.
Faunal Habitat, Processes & Species	Blanket clearing of vegetation must be limited to the footprint. The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of Conservation Concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A retile handler should be on call for such circumstances. Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. A pre-commencement faunal search and rescue is recommended but not necessarily required. Respective permits to be obtained beforehand. No animals are to be harmed or killed during the course of operations including use of snares.

3.4 Biodiversity Offsets

The National Biodiversity Offset Guidelines were published for implementation, under section 24J of the National Environmental Management Act, 1998 (Act No. 107 of 1998) on 23 June 2023.

3.4.1 Context

A Biodiversity Offset refers to *the measurable outcome of compliance with a formal requirement contained in an environmental authorisation to implement an intervention that has the purpose of counterbalancing the residual negative impacts of an activity, or activities, on biodiversity, through increased protection and appropriate management, after every effort has been made to avoid and minimise impacts and rehabilitate affected areas.*

The purpose of the published guideline is to indicate when biodiversity offsets are likely to be required as mitigation by any competent authority (CA), to lay down basic principles for biodiversity offsetting and to guide offset practice in the environmental authorisation (EA) application context.

The guideline is an implementation guideline contemplated in section 24J of the National Environmental Management Act, 1998 (NEMA). Guidelines published in terms of that section give guidance on, inter alia, the implementation, administration, and institutional arrangements of the Environmental Impact Assessment Regulations, 2014 (EIA Regulations) or subsequent regulations regarding the environmental impact assessment process. The guideline does not replace NEMA's provisions regarding EA processes, or the EIA Regulations. It guides the implementation of NEMA and the EIA Regulations in the context of mitigation of biodiversity impacts and use of biodiversity offsets and should therefore be read in

conjunction with those laws. It should be noted that the published document is thus a guideline and not a law and should thus be used accordingly by the respective parties.

The guideline is applicable to applications for EA in terms of section 24 of NEMA. However, it may also be applicable to relevant authorities responsible for taking decisions in other regulatory contexts which may involve biodiversity offsetting. Those relevant authorities include the organs of state responsible for taking decisions regarding applications for EA in terms of section 24G of NEMA, emergency directives contemplated in section 30A of NEMA, applications for licences under the National Water Act, 1998, the National Forests Act, 1998 and the National Environmental Management: Waste Act, 2008, applications for development rights in terms of the Spatial Planning and Land Use Management Act, 2013 and requests for the de-proclamation, or the withdrawal of declarations, of protected areas in terms of provincial legislation or NEMPAA.

Biodiversity offsetting is a mitigation measure that is potentially applicable in all EA application processes regardless of the identity of the applicant. This guideline is therefore applicable to EA applications made by private persons or entities, as well as organs of state.

Biodiversity offsetting has the potential to encourage more rigorous consideration of feasible development alternatives which avoid and minimise negative impacts on biodiversity, to help remedy and counterbalance the degradation and loss of biodiversity through increased protection and appropriate management, and to help South Africa to meet its international biodiversity and protected area targets. Biodiversity offsetting can therefore play a role in ensuring that biodiversity and ecological infrastructure can continue to provide the ecosystem services on which people depend for their livelihoods and contribute to the achievement of the environmental right in section 24 of the Constitution.

In the environmental management context, biodiversity offsetting consists of actions that are taken to comply with biodiversity offset outcomes required in conditions in EAs, Biodiversity Offset Implementation Agreements and environmental management programmes (EMPrs). The environmental management system provided for by NEMA, and the EIA Regulations provide for a CA to grant EAs subject to conditions. In appropriate circumstances, a CA may grant an EA subject to the condition that a measurable biodiversity offset is implemented by the EA holder.

As already noted above, this guideline is an implementation guideline contemplated in section 24J of NEMA. It must, in accordance with section 24O of NEMA and regulation 18 of the EIA Regulations, be considered by a CA when considering an application for an EA. It is therefore not absolutely binding and can be deviated from when justifiable under the circumstances.

3.4.2 Recommended Requirements

The Biodiversity Guidelines indicate that a biodiversity offset is required when a proposed listed or specified activity, or activities, is/are likely to have residual negative impacts on biodiversity of **medium or high significance**. These negative impacts could affect biodiversity patterns (e.g., threatened ecosystems, species, or special habitats), ecological processes (e.g., migration patterns, climate change corridors enabling shifts in species distributions over time, or wetland function), ecosystem services (e.g., provision of clean water) or a combination of all three.

A residual biodiversity impact is the impact of an activity, or activities, on biodiversity that remains after all efforts have been made to avoid and minimise the impacts of the activity, or activities, and to rehabilitate the affected area to the fullest extent possible.

As part of an EIA, an EAP or a specialist is required to predict the possible negative impacts of an activity, or activities, on biodiversity, including direct impacts, indirect impacts (including the potential impacts of an activity on the climate, where climate change could have negative impacts on biodiversity), and cumulative impacts. After those impacts have been identified, the EAP or specialist must investigate alternative project locations, designs, technologies, scales and layouts to determine if and how potentially significant negative impacts on biodiversity could be avoided or minimised. The EAP or specialist must also determine if, to what extent, and how successfully, impacted areas could be rehabilitated.

It is possible that biodiversity offsets could be required as conditions to the granting of authorisations other than EA, such as licences in terms of the National Forests Act, 1998, which imposes restrictions on development in natural forest ecosystems.

If predictions in the EIA state that all negative impacts on biodiversity cannot be avoided, and/or that impact minimisation and rehabilitation of the affected area cannot, with a high degree of certainty, fully mitigate the impacts of the activity, or activities, on biodiversity, the proposed development would have residual negative biodiversity impacts. The mitigation hierarchy (Avoid>Minimise>Rehabilitate>Offset), as set out in section 2(4)(a)(i) of NEMA, and applicable guidelines, should be followed to determine if there will likely be residual impacts.
Where residual negative biodiversity impacts are evaluated to be of medium or high significance, a biodiversity offset would be required. Biodiversity offsets are unlikely to be required when the residual negative impacts of a proposed activity, or activities, on biodiversity are evaluated to be of low significance. Biodiversity offsets are not appropriate when an activity, or activities, will have residual impacts on biodiversity of very high significance, including when residual negative impacts will result in loss of irreplaceable biodiversity. As already indicated, those developments are fatally flawed and should be avoided.

3.4.3 Determining the basic offset ratio

The standard approach to determining a basic biodiversity offset ratio is based on biodiversity targets. Those targets are, in turn, based on Ecosystem Extent, Ecosystem Protection Level and Ecosystem Threat Status of the various ecosystem types identified in the ecosystem assessment conducted as part of the determination of ecosystems that are threatened and in need of protection in terms of the National Environmental Management: Biodiversity Act, 2004. The proposed applicable ratios are listed in the look-up table, provided in the Biodiversity Offset Guidelines. The standard approach is shortly as follows:

1. If the Remaining Ecosystem Extent (REE) is less than or equal to 30%, the precautionary principle demands that a 30:1 ratio must be applied.
2. If the remaining Ecosystem Extent is between 30 and 70%, the ratios provided for in the look-up table in the Biodiversity Guidelines, which takes into consideration Ecosystem Extent and Ecosystem Protection Level (EPL), should be applied. The ratios in that range of Ecosystem Extent vary between 1:22 to 1:1 depending on the extent of the ecosystem remaining and how much of the relevant ecosystem type is protected. In the table below, ratios were assigned to 6 different "bands" based on remaining ecosystem extent and ecosystem protection level.
3. Remaining Ecosystem Extents above 70 % are allocated an offset ratio of nil (0) at all protection levels, indicating that no Biodiversity Offset is required.
4. Taking into consideration the Ecosystem Threat Status (ETS): it is recommended that the following ratios are applied for the different ecosystem threat statuses:
    a. Critically Endangered: 30:1.
    b. Endangered: 10:1.
    c. Vulnerable: 5:1.

d. **LEAST CONCERN: NIL [DWAALBOOM THORNVELD HAS A LEAST CONCERN STATUS]**

5. Following the precautionary approach, it is recommended that the highest of the two ratios described in 2 and 4 above is selected as the starting ratio.

It should be noted that a biodiversity offset could still be required for an activity, or activities, that are likely to have a significant residual negative impact on an ecosystem of Least Concern with an Ecosystem Extent of greater than 70%. In those cases, the starting ratio would be based on the information before the decision-maker, such as the reasons why the biodiversity offset is (or isn't) required.

One of the factors influencing the standard approach was to consider biodiversity spatial plans. This was integrated so as to support the achievement of the biodiversity targets set in those plans. The biodiversity targets set in those plans are not based purely on Ecosystem Extent and Ecosystem Threat Status. Other factors also influence the identification of Critical Biodiversity Areas and Ecological Support Areas, such as the presence of species or important ecological infrastructure.

Biodiversity spatial plans in South Africa usually identify Critical Biodiversity Areas (CBAs) in their respective planning domains (they are ordinarily done at Provincial level). CBAs are areas that must stay in, or be rehabilitated to, a largely natural ecological condition to ensure that a viable representative sample of all ecosystem types and species can persist. In most biodiversity spatial plans, there are two sub-categories of CBAs: CBA 1 and CBA 2. In most of those spatial biodiversity plans, CBA 1 sites are selected because there are no other options in the relevant planning domain for the relevant target to be met. They are therefore sometimes called CBA: Irreplaceable. The selection of CBA 2 sites is based on a range of factors, including spatial efficiency, complementarity, connectivity, avoidance of conflict with other land uses, and alignment with socio-economic opportunities for conservation if these are known. They are often known as CBA: Optimal.

It is recommended in the Guideline that significant negative impacts on biodiversity in CBA 1's are avoided because of the irreplaceability of those sites. For this reason, a punitive 30:1 ratio is applied to all CBA 1 sites. For significant residual negative impacts on biodiversity in CBA 2's, it is recommended that the Starting Offset Ratio (D) is multiplied by a factor of 1.5. The rationale for the latter recommendation is that whilst **CBA 2's represent the best locations to meet conservation targets, the sites are not irreplaceable and as such, the application of a punitive 30:1 ratio cannot be justified.**

Ideally, a site should only be selected as a CBA if it is currently in good ecological condition. However, in some circumstances it may be necessary to select a site in fair ecological condition as a CBA. Only in exceptional circumstances, when biodiversity targets for representation cannot otherwise be met, will a site that is severely modified be selected as a CBA. It is therefore not always the case that only areas in good ecological condition are selected as CBAs. CBA 1 and CBA 2 mean different things in some biodiversity spatial plans. For example, in the Western Cape Biodiversity Spatial Plan (2017), CBA 1's areas are CBA's in good ecological condition and CBA 2's are CBA's in fair or modified ecological condition.

It is emphasised here that the standard approach is not binding, but a guide based on relevant scientific information on ecosystems. Competent authorities must apply their minds to each case, which would involve considering additional factors, such as the size of the historical extent of the ecosystem measured against the extent of the residual negative impact (if a large percentage of the extent of the ecosystem would be impacted on, a higher ratio would be justified) and the cumulative residual negative impact of the activity, or activities, on biodiversity.

Some provincial conservation authorities or CAs have adopted, or may in future adopt, province- specific approaches to determining biodiversity offset ratios, based on province-specific biodiversity targets.

Those approaches take precedence over the standard approach provided for in this guideline provided that they are scientifically defensible.

Consideration also needs to be given to how ratios are determined for development in the urban setting. It is likely that there would be good reasons for adjusting biodiversity offset ratios down for activities in the urban setting given the relative scarcity of space and natural areas in those areas. In this regard, consideration should be given to approaches for determining biodiversity offset ratios for development in the urban environment.

Biodiversity offsets require that ecosystems are considered, protected and managed within their landscape and functional context. Some ecosystems, namely forests and wetlands, require a slightly different approach to determining the size of offsets from the standard approach described above. For these ecosystems, historical guidance, mitigation practice, and/or specific legal protection, necessitate this different approach. However, it is desirable for there to be alignment between the different approaches to biodiversity offsetting wherever possible. The approach for natural forests is discussed below.

3.4.4 Wetland Ecosystem Types

Wetland ecosystems require mitigation for the loss of biodiversity (i.e. wetland ecosystem type and wetland species), and for impacts on wetland (hydrological) functioning. The standard approach described in the Biodiversity Offset Guidelines (2023) also applies to wetlands. However, the negative impacts of an activity, or activities, on wetland functioning need to be addressed through the rehabilitation of degraded wetland systems, careful location of biodiversity offset sites in the wider hydrological landscape, and/or the removal, reversal or curbing of activities or processes threatening their effective functioning. Increasing wetland offset area is often not a suitable substitute for improving wetland functioning as an offset. *Wetland Offsets: A Best Practice Guideline for South Africa (2016)* provides more guidance on wetland offsets, which should be read in conjunction with this guideline.

3.4.5 Forest Ecosystem Types

Activities which have residual negative impacts on forest ecosystems often require both an EA and a licence in terms of the National Forests Act, 1998 (NFA). The NFA, the primary law for the protection of natural forests in South Africa, provides that natural forests must not be destroyed save in **exceptional circumstances**. This implies that the target for conserving remaining forests is the remaining extent of the forest ecosystem type (i.e., they constitute irreplaceable biodiversity). Where an activity would have the effect of negatively impacting on a natural forest, and the "exceptional circumstances" referred to in the NFA are present, ecological compensation would be required. This compensation may include, but is not necessarily limited to, removing or reducing the activities or processes that impede or threaten forest regeneration, or that result in ongoing loss of that forest type, or a nearby related type. The strong protection given to natural forests by the National Forests Act, 1998 due the rarity of the biome and its high ecosystem services, in practice means that any impacts on such forests are regarded as serious, and in the case of endangered forest types, as fatally flawed.

As already stated, an offset may well be required where a listed or specified activity would involve the removal of one or more protected tree species, despite the fact that application of this guideline's approach for determining when an offset is required suggests that no biodiversity offset is required. In such instances, the biodiversity offset requirements should involve an offset area to maintain or increase viable populations of the same tree species as those impacted or involve reducing or removing other activities or processes that threaten the persistence, recruitment or survival of protected trees, or both.

3.5 Implications of Biodiversity Offset Guidelines

Refer to *Table 9* for respective Biodiversity Offset information summary pertaining to the site and affected vegetation units.

Table 9: Biodiversity Offset Guidelines Status for vegetation units represented.

Ecosystem Type		Dwaalboom Thornveld
ETS[9]		Least Concern
REE[10] (%)		80
Transformation Band		4
A. TPC[11] Ratio	NP[12]	
	PP	
	MP	
	WP	
B. RE[13] & EPL[14] Ratios	NP	
	PP	0
	MP	
	WP	
C. ETS Ratios	NP	
	PP	0
	MP	
	WP	
D. Starting Ratios	NP	
	PP	0
	MP	
	WP	

Findings of the original terrestrial biodiversity assessment report of relevance can be summarised as follows:

- Affected Vegetation Units: **Dwaalboom Thornveld**
- Ecosystem Threat Status (RLE, 2022): Least Concern with moderate to high levels of transformation, potential Biodiversity Offset trigger.
- Remaining Ecosystem Extents: 80%, above threshold to trigger biodiversity offset.
- Critical Biodiversity Area 1 & 2: Site overlaps designated CBA 2.
- Ecological Support Area 1 & 2: Small portion overlaps with ESA 1.
- Other legislation: None applicable.

The nominal intact indigenous vegetation affected by the activity (PV & grid), represents less than 0.01 % of the remaining extent of the represented vegetation unit, hence the nominal loss is deemed negligible. All terrestrial biodiversity impacts assessed are deemed to have a low significance after mitigation, with no anticipated residual impact expected, hence no Biodiversity Offsets are deemed to be applicable. Thi is aligned with the remaining ecosystem extent being above the threshold for a biodiversity offset trigger. Note that in order to accommodate some retention of habitat and to maintain connectivity with the

[9] Ecosystem Threat Status
[10] Remaining Ecosystem Extent
[11] Threshold of Potential Concern
[12] Not Protected, Poorly Protected, Moderately Protected & Well Protected.
[13] Remaining Extent
[14] Ecosystem Protection Levels

surrounding landscape, a portion of the site will be retained undeveloped. This includes areas of habitat that were deemed nominally more sensitive than the general habitat on site.

3.6 Findings, Outcomes and Recommendations

3.6.1 Summary of Findings

- The vegetation unit represented is not under threat (i.e. Least Concern) and has a somewhat extensive coverage across the Limpopo and North-West provinces (5 152.3 square kilometres remaining of original coverage of 6 671 square kilometres.
- The nominal intact indigenous vegetation occurring within the site (856 Ha), represents 0.13 % of the original extent and 0.17 % of the remaining extent of the vegetation unit, hence the nominal loss associated with development of a portion of the site (440 Ha) is deemed negligible. All terrestrial biodiversity impacts assessed are deemed to have a low significance after mitigation, with no anticipated residual impact expected, hence no Biodiversity Offsets are deemed to be applicable.
- The site falls within designated CBA 2 and ESA 2 areas. Regional planning guidelines do indicate that they represent areas where there are spatial options for achieving targets and the selected sites are the ones that best achieve targets within the landscape design objectives of the plan. Consideration must also be given to the extensive coverage of the vegetation unit, where the 440 Ha footprint represents 0.07 % of the original extent and 0.09 % of the remaining extent of the vegetation unit. The small proportion of the proposed site, as well as the surrounding area that is designated CBA (and ESA) across the provinces and surrounding the site where the vegetation unit is present.
- Whilst CBA 2 areas represent the 'best locations to meet conservation targets', the sites are not deemed irreplaceable. Since this site is designated CBA 2 rather than CBA 1, it confirms the specialist's opinion that the site is not within habitat that would be deemed irreplaceable. Furthermore, the site is not situated within a 'pinch point', and development thereof is not going to significantly affect faunal movement, more so as the current farm is already game fences, so baseline impacts are already present.
- The site is also not prioritised for protected area expansion, i.e. not designated NPAES.
- The single Flora Species of Conservation Concern (SCC), having an Endangered status is noted to have a very limited distribution and historical records appear to indicate it occurs in the vicinity further to the east and west. These may be disjunct populations or could be connected in which case the site would fall in the area between these two sites. Three seasonal surveys to date have not located this species within the site and it is deemed unlikely to be present, this is aligned with previous findings relating to the species where it was determined that historical degradation may have impacted on the species distribution (Hahn, 2013).
- The faunal Species of Conservation Concern, the Sensitive Species 5 and African Wild Dog, while having a Vulnerable and Endangered status respectively, do not have any records in close proximity to the site and both species generally have a widespread distribution and vast foraging ranges, although in particular for the African Wild Dog, current populations are restricted to protected areas. Both species can have extensive home ranges and while the site is potentially within the home range of records in the vicinity, they are generally not favoured in livestock farming areas and would thus be at risk under status quo conditions, the small size of the site is also unlikely to result in significant loss as these species have extensive habitat requirements and the surrounding area would provide such habitat.
- The vegetation on site is generally natural to near natural, with evidence of degradation, and some historical transformation.
- The wetland features will require exclusion (as guided by the separate aquatic assessment), which will restrict the loss of important and scares habitat in an arid environment.

- No Sensitive plant or Animal species identified as per the National Environmental Screening Tool were confirmed to be present or likely to be present within the site.
- Although the site falls within a broader designated CBA 2 and ESA 2 designated areas, development of the southern portion of the site will not significantly
- The PV facility has prioritised development withi secondary or regraded areas of thornveld.

- HIGH OR VERY HIGH SENSITIVITY areas are limited to the wetland and rocky thornveld habitat. These areas are recommended to be avoided.
- MODERATE SENSITIVITY portions are designated where there is remnant natural or near natural Dwaalboom Thornveld vegetation including some patches within the proposed PV portion. The affected vegetation unit does have an elevated conservation status, and the specific areas to be impacted are shown to have likely been degraded historically to some extent due to overutilisation.
- LOW SENSITIVITY areas include ares that are currently transformed (cultivated, roads and dwellings), old lands now having secondary thornveld and degraded thornveld where there is persistent loss of structure, function and diversity due to historical overutilisation. 60% of the proposed PV footprint within the farm portion is designated low sensitivity and falls within one of the applicable habitat units.
- While no specific Very High Sensitivity or Critical Habitat Areas are identified, it is recommended that the high sensitivity wetland and rocky hill habitat is avoided. Furthermore, due to the CBA 2 designation it is has been recommended that the entire remaining extent was not developed or a core area was retained in order to serve conservation and connectivity objectives, including ongoing use for livestock and game farming.

- No significant direct, indirect or cumulative impacts are anticipated, and no high residual impacts are likely to occur.
- The nominal intact indigenous vegetation affected by the activity (PV facility & associated infrastructure), represents less than 0.01 % of the remaining extent of the represented vegetation units, hence the nominal loss is deemed negligible.
- All terrestrial biodiversity impacts assessed are deemed to have a low significance after mitigation, hence no Biodiversity Offsets are deemed to be applicable, as per the Biodiversity Offset Guidelines.

In general PV sites, while requiring clearing during construction, during operations, they will accommodate some ecological connectivity and movement of fauna such as birds and smaller mammals and reptiles, similar to current baseline conditions. They will limited movement of larger mammals, also similar to current game fence-imposed restrictions to large mammal movement.

The PV facility and associated infrastructure is unlikely to pose any significant risk to natural ecological processes, vegetarian or plant and animal species of conservation concern due to the limited footprint and significantly degraded and/or transformed nature of the site(s). The proposed PV facility and associated infrastructure is thus deemed to be acceptable and unlikely to result in any significant terrestrial biodiversity, plant or animal species impacts.

The three substation and grid route alternatives are fairly similar in terms of terrestrial biodiversity impacts and all three have more or less equivalent sensitivities, and any option would be feasible. Since substation and O&M Complex 2 is situated within transformed area and would result in a more compact and slightly less fragmented layout, the terrestrial biodiversity impact would be marginally lower would have a marginally lower level of fragmentation. Similarly, the OHL route 2 corridor traverses Degraded (Secondary) Bushveld between the site and the connection point to the existing Eskom OHL and would

thus also be marginally lower. The recommended grid option is thus Substation and O&M Complex 2 and OHL grid route 2.

No fatal flaws pertaining to terrestrial biodiversity, flora or fauna have been identified in this scoping phase.

3.7 Open Space Management/Conservation Plan

None are applicable for this project.

3.8 Maintenance Management Plan

Ongoing maintenance is likely to be required in the long-term, which could include ongoing repairs to the PV facility and associated infrastructure (roads, cabling, pylons and OHL'S). All measures of this report, including the EMPr should be adhered for any maintenance requirements. Any excavated areas must be stabilised and rehabilitated as per the measures indicated in this report.

4 Organizational Capacity and Competency

Successful Implementation will be in part be dependent on the organisational capacity and competency of the applicant and any implementing agents. The following aspects are likely to pose risk to the successful mitigation of the project:

- Budget constraints – budget allocated for environmental management tends to be inadequate for construction projects.
- Organisational Structure – implementing agents may or may not have adequate capacity and competency to ensure appropriate and adequate environmental management.

5 Emergency Preparedness and Response

Emergency Preparedness Plan must be included in the EMPr and should address specific measures relating to the following emergency risks:

- Fire management and response.
- Spill management and incident response.
- Waste management and incident response.
- Response to emergency site shutdown, including labour and protest actions.

6 Stakeholder Engagement

Possible Stakeholders relating to Biodiversity could include the following key groups:

- Neighbouring Property Owners
- Local Regional and National Conservation Authorities

No Stakeholder Engagement was conducted specifically by the Specialist. Stakeholder Engagement will be undertaken by the EAP as part of the environment application public participatory process. Any comments raised relating to Biodiversity will be addressed by the specialist in the final report.

7 Monitoring and Review

Key monitoring activities should include the following:

1. Pre-construction
   a) Ensure flora permits are in place timeously (PNCO only) – allow at least 1 or 2 months before commencement.
   b) Environmental Awareness and training (EAT) – Ensure all labour are informed and plant operators are aware of risks, issues, do's and don'ts and no-go areas.
2. Bush clearing
   a) Ensure working plant has no oil or hydraulic leaks
   b) Check delineated footprints area not exceeded.
3. Construction

a) Regular checks on trenches for trapped animals and possible drowning risks
b) Regular checks of fences for snares

4. Rehabilitation
   a) Check quality of topsoil and weed free.
   b) Check for weed regrowth and manage timeously (before seed is set)
5. Operation monitoring
   a) Weed management on ongoing basis.

Erosion to be addressed on ongoing basis

8 Appendices

8.1 Appendix A: References

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- United Nations Environment Programme (UNEP), *A to Z Areas of Biodiversity Importance:* http://www.biodiversitya-z.org
- United Nations Environment Programme (UNEP), *World Database on Protected Areas*, Protected Planet: http://www.protectedplanet.net
- World Resources Institute (WRI): https://www.wri.org

8.2 Appendix B: Abbreviations and Glossary

8.2.1 Abbreviations

CARA	Conservation of Agricultural Resources Act, Act 43 of 1983
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs (*now DEFF, see below*)
DFFE	The Department of Environmental Affairs was renamed the Department of Forestry Fisheries and the Environment, incorporating the forestry and fisheries functions from the previous Department of Agriculture, Forestry and Fisheries.
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
DEMC	Desired Ecological Management Class
DWS	Department of Water Affairs and Sanitation
DWAF	Department of Water Affairs and Forestry (former department name)
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMC	Ecological Management Class
EMP	Environmental Management Plan
EMPr	Environmental Management Programme report
ER	Environmental Representative
ESS	Ecosystem Services
IAP's	Interested and Affected Parties
IEM	Integrated Environmental Management
LM	Local Municipality
masl	meters above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, Act 107 of 1998
NFA	National Forests Act
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NFA	National Forest Act, Act 84 of 1998
PEMC	Present Ecological Management Class
PES	Present Ecological State
TNCO	Transvaal Nature Conservation Ordinance (No. 12 of 1983).
RDL	Red Data List
RHS	Right Hand Side
RoD	Record of Decision
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SoER	State of the Environment Report
SCC	Species of Conservation Concern
ToPS	Threatened of Protected Species
ToR	Terms of Reference
+ve	Positive
-ve	Negative

8.2.2 Glossary

Alien Invasive Species (AIS)	An alien species whose introduction and/or spread threaten biological diversity (Convention on Biological Diversity). Note: "*Alien invasive species*" is considered to be equivalent to "*invasive alien species*". An alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity (*IUCN*).
Best Environmental Practice	The application of the most appropriate combination of environmental control measures and strategies (Stockholm Convention).
Best Management Practice	Established techniques or methodologies that, through experience and research, have proven to lead to a desired result (BBOP).
Biodiversity	Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.
Biodiversity Offset	Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people's use and cultural values associated with biodiversity (BBOP).
Bioremediation	The use of organisms such as plants or microorganisms to aid in removing hazardous substances from an area. Any process that uses microorganisms, fungi, green plants, or their enzymes to return the natural environment altered by contaminants to its original condition.
Boundary	Landscape patches have a boundary between them which can be defined or fuzzy (Sanderson and Harris, 2000). The zone composed of the edges of adjacent ecosystems is the boundary.
Connectivity	The measure of how connected or spatially continuous a corridor, network, or matrix is. For example, a forested landscape (the matrix) with fewer gaps in forest cover (open patches) will have higher connectivity.
Corridors	Have important functions as strips of a landscape differing from adjacent land on both sides. Habitat, ecosystems or undeveloped areas that physically connect habitat patches. Smaller, intervening patches of surviving habitat can also serve as "steppingstones" that link fragmented ecosystems by ensuring that certain ecological processes are maintained within and between groups of habitat fragments.
Critically Endangered (CR)	A category on the IUCN Red List of Threatened Species which indicates a taxon is considered to be facing an extremely high risk of extinction in the wild (*IUCN*).
Cultural Ecosystem Services	The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g., knowledge systems, social relations, and aesthetic values (Millennium Ecosystem Assessment).
Cumulative Impacts	The total impact arising from the project (under the control of the developer), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project's impact is therefore one part of the total cumulative impact on the environment. The analysis of a project's incremental impacts combined with the effects of other projects can often give a

	more accurate understanding of the likely results of the project's presence than just considering its impacts in isolation (BBOP).
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat(IUCN).
Degraded Habitat/Land	Land that has been impacted upon by human activities (including introduction of invasive alien plants, light to moderate overgrazing, accelerated soil erosion, dumping of waste), but still retains a degree of its original structure and species composition (although some species loss would have occurred) and where ecological processes still occur (albeit in an altered way). Degraded land is capable of being restored to a near-natural state with appropriate ecological management.
Disturbance	An event that significantly alters the pattern of variation in the structure or function of a system, while fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Disturbance is generally considered a natural process.
Ecological Processes	Ecological processes typically only function well where natural vegetation remains, and where the remaining vegetation is well-connected with other nearby patches of natural vegetation. Loss and fragmentation of natural habitat severely threatens the integrity of ecological processes. Where basic processes are intact, ecosystems are likely to recover more easily from disturbances or inappropriate actions if the actions themselves are not permanent. Conversely, the more interference there has been with basic processes, the greater the severity (and longevity) of effects. Natural processes are complex and interdependent, and it is not possible to predict all the consequences of loss of biodiversity or ecosystem integrity. When a region's natural or historic level of diversity and integrity is maintained, higher levels of system productivity are supported in the long run and the overall effects of disturbances may be dampened.
Ecology	Ecology (from Greek: οἶκος, "house" and -λογία, "study of") is the study of the relationships between living organisms, including humans, and their physical environment. Ecology considers organisms at the individual, population, community, ecosystems, and biosphere level. Ecology overlaps with the closely related sciences of biogeography, evolutionary biology, genetics, ethology and natural history. Ecology is a branch of biology, and it is not synonymous with environmentalism.
Ecosystem Status	Ecosystem status of terrestrial ecosystems is based on the degree of habitat loss that has occurred in each ecosystem, relative to two thresholds: one for maintaining healthy ecosystem functioning, and one for conserving the majority of species associated with the ecosystem. As natural habitat is lost in an ecosystem, its functioning is increasingly compromised, leading eventually to the collapse of the ecosystem and to loss of species associated with that ecosystem (Millennium Ecosystem Assessment).
Ecosystem Services	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. Supporting Ecosystem services are those that are necessary for the maintenance of all other ecosystem services. Some examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.
Ecosystem	All the organisms of a habitat, such as a lake or forest, together with the physical environment in which they live. A dynamic complex of plant, animal and micro-

	organism communities and their non-living environment interacting as a functional unit.
Ecotone	The transitional zone between two communities. Ecotones can arise naturally, such as a lakeshore, or can be human created, such as a cleared agricultural field from a forest. The ecotonal community retains characteristics of each bordering community and often contains species not found in the adjacent communities. Classic examples of ecotones include fencerows; forest to marshlands transitions; forest to grassland transitions; or land-water interfaces such as riparian zones in forests. Characteristics of ecotones include vegetational sharpness, physiognomic change, and occurrence of a spatial community mosaic, many exotic species, ecotonal species, spatial mass effect, and species richness higher or lower than either side of the ecotone.
Edge	The portion of an ecosystem near its perimeter, where influences of the adjacent patches can cause an environmental difference between the interior of the patch and its edge. This edge effect includes a distinctive species composition or abundance in the outer part of the landscape patch. For example, when a landscape is a mosaic of perceptibly different types, such as a forest adjacent to a grassland, the edge is the location where the two types adjoin. In a continuous landscape, such as a forest giving way to open woodland, the exact edge location is fuzzy and is sometimes determined by a local gradient exceeding a threshold, as an example, the point where the tree cover falls below thirty-five percent.
Emergent Tree	Trees that grow above the top of the canopy
Endangered (En)	Endangered terrestrial ecosystems have lost significant amounts (more than 60 % lost) of their original natural habitat, so their functioning is compromised. A taxon (species) is Endangered when the best available evidence indicates that it meets any of the criteria for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild (*IUCN*).
Endemic	A plant or animal species, or a vegetation type, which is naturally restricted to a defined region or limited geographical area. Many endemic species have widespread distributions and are common and thus are not considered to be under any threat. They are however noted to be unique to a region, which can include South Africa, a specific province or a bioregion, vegetation type, or a localised area. In cases where it is highly localised or known only from a few or a few localities, and is under threat, it may be red listed either in terms of the South Africa Threatened Species Programme, NEMBA Threatened or Protected Species (ToPS) or the IUCN Red List of Threated Species.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Exotic	Non-indigenous; introduced from elsewhere, may also be a *weed* or alien *invasive* species. Exotic species may be invasive or non-invasive.
Ecological Structure	The composition, or configuration, and the proportion of different patches across the landscape. Relates to species diversity, the greater the diversity, the more complex the structure. A description of the organisms and physical features of environment including nutrients and climatic conditions.
Ecological Function	How each of the elements in the landscape interacts based on its life cycle events [Producers, Consumers, Decomposers Transformers]. Includes the capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly.
Ecological Pattern	The contents and internal order of the landscape, or its spatial (and temporal) components. May be homogenous or heterogenous. Result from the ecological processes that produce them.

Ecological Process	Includes *Physical processes* [Climate (precipitation, insolation), hydrology, geomorphology]; *Biological processes* [Photosynthesis, respiration, reproduction]; *Ecological processes* [Competition, predator-prey interactions, environmental gradients, life histories]
Fragmentation (Habitat Fragmentation)	The 'breaking apart' of continuous habitat into distinct pieces. Causes land transformation, an important current process in landscapes as more and more development occurs.
Habitat Banking	A market where credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time (IEEP).
Habitat	The home of a plant or animal species. Generally, those features of an area inhabited by animal or plant which are essential to its survival.
IFC PS6	International Finance Corporation Performance Standard 6 – A standard guiding biodiversity conservation and sustainable management of living natural resources for projects financed by the International Finance Corporation (IFC)
Indicator	Information based on measured data used to represent an attribute, characteristic, or property of a system.
Indicator species	A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition.
Indigenous	Native; occurring naturally in a defined area.
Indigenous Species (Native species)	A species that has been observed in the form of a naturally occurring and self-sustaining population in historical times (*Bern Convention 1979*). A species or lower taxon living within its natural range (past or present) including the area which it can reach and occupy using its natural dispersal systems (*modified after the Convention on Biological Diversity*)
Indirect Impact	Impacts triggered in response to the presence of a project, rather than being directly caused by the project's own operations (BBOP)
Intact Habitat / Vegetation	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Intrinsic Value	The inherent worth of something, independent of its value to anyone or anything else.
Keystone Species	Species whose influence on ecosystem function and diversity are disproportionate to their numerical abundance. Although all species interact, the interactions of some species are more profound and far-reaching than others, such that their elimination from an ecosystem often triggers cascades of direct and indirect changes on more than a single trophic level, leading eventually to losses of habitats and extirpation of other species in the food web.
Landscape	An area of land that contains a mosaic of ecosystems, including human-dominated ecosystems (Millennium Ecosystem Assessment).
Landscape Approach	Dealing with large-scale processes in an integrated and multidisciplinary manner, combining natural resources management with environmental and livelihood considerations (FAO).
Landscape connectivity	The degree to which the landscape facilitates or impedes movement among resource patches.
Least threatened / Least Concern (LC)	These ecosystems have lost only a small proportion (more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).

	A taxon (species) is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category (IUCN).
Matrix	The "*background ecological system*" of a landscape with a high degree of connectivity.
Natural Forest (Indigenous Forest)	The definition of "*natural forest*" in the National Forests Act of 1998 (NFA) Section 2(1)(xx) is as follows: 'A natural forest means a group of indigenous trees • whose crowns are largely contiguous • or which have been declared by the Minister to be a natural forest under section 7(2) This definition should be read in conjunction with Section 2(1)(x) which states that 'Forest' includes: • A natural forest, a woodland, and a plantation • The forest-produce in it; and • The ecosystems which it makes up. The legal definition must be supported by a technical definition, as demonstrated by a court case in the Umzimkulu magisterial district, relating to the illegal felling of Yellowwood (Podocarpus latifolius) and other species in the Gonqogonqo forest. From scientific definitions (also see Appendix B) we can define natural forest as: • A generally multi-layered vegetation unit • Dominated by trees that are largely evergreen or semi-deciduous • The combined tree strata have overlapping crowns, and crown cover is >75% • Grasses in the herbaceous stratum (if present) are generally rare • Fire does not normally play a major role in forest function and dynamics except at the fringes • The species of all plant growth forms must be typical of natural forest (check for indicator species) • The forest must be one of the national forest types
Near Threatened (NT)	A taxon (species) is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future (IUCN).
Patch	A term fundamental to landscape ecology, is defined as a relatively homogeneous area that differs from its surroundings. Patches are the basic unit of the landscape that change and fluctuate, a process called patch dynamics. Patches have a definite shape and spatial configuration and can be described compositionally by internal variables such as number of trees, number of tree species, height of trees, or other similar measurements.
Protected Area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.
Range restricted species	Species with a geographically restricted area of distribution. Note: Within the IFC PS6, restricted range refers to a limited extent of occurrence (EOO): • For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km2).
Refugia	A location which supports an isolated or relict population of a once more widespread species. This isolation can be due to climatic changes, geography, or human activities such as deforestation and overhunting.
Resilience	The capacity of a natural system to recover from disturbance (OECD).

Rehabilitation	Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure (BBOP).
Restoration	The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. An ecosystem has recovered when it contains sufficient biotic and abiotic resources to continue its development without further assistance or subsidy. It would sustain itself structurally and functionally, demonstrate resilience to normal ranges of environmental stress and disturbance, and interact with contiguous ecosystems in terms of biotic and abiotic flows and cultural interactions (IFC).
Riparian	Pertaining to, situated on or associated with the banks of a watercourse, usually a river or stream.
River Corridors	River corridors perform several ecological functions such as modulating stream flow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. These corridors also have vegetation and soil characteristics distinctly different from surrounding uplands and support higher levels of species diversity, species densities, and rates of biological productivity than most other landscape elements. Rivers provide for migration and exchange between inland and coastal biotas.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED).
Terrestrial	Occurring on, or inhabiting, land.
Threatened Species	Umbrella term for any species categorised as Critically Endangered, Endangered or Vulnerable by the IUCN Red List of Threatened Species (*IUCN*). Any species that is likely to become extinct within the foreseeable future throughout all or part of its range and whose survival is unlikely if the factors causing numerical decline or habitat degradation continue to operate (EU).
Traditional Ecological Knowledge	Knowledge, innovations and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, and forestry (CBD).
Transformation	In ecology, transformation refers to adverse changes to biodiversity, typically habitats or ecosystems, through processes such as cultivation, forestry, drainage of wetlands, urban development or invasion by alien plants or animals. Transformation results in habitat fragmentation – the breaking up of a continuous habitat, ecosystem, or land-use type into smaller fragments.
Transformed Habitat/Land	Land that has been significantly impacted upon as a result of human interferences/disturbances (such as cultivation, urban development, mining, landscaping, severe overgrazing), and where the original structure, species composition and functioning of ecological processes have been irreversibly altered. Transformed habitats are not capable of being restored to their original states.
Tributary	A small stream or river flowing into a larger one.

Untransformed Habitat/Land	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Vulnerable (Vu)	Vulnerable terrestrial ecosystems have lost some (more than 60 % remains) of their original natural habitat and their functioning will be compromised if they continue to lose natural habitat. A taxon (species) is Vulnerable when the best available evidence indicates that it meets any of the criteria for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild (*IUCN*).
Watercourse	Natural or man-made channel through or along which water may flow. A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows. and a reference to a watercourse includes, where relevant, its bed and banks;
Weed	An indigenous or non-indigenous plant that grows and reproduces aggressively, usually a ruderal pioneer of disturbed areas. Weeds may be unwanted because they are unsightly, or they limit the growth of other plants by blocking light or using up nutrients from the soil. They can also harbour and spread plant pathogens. Weeds are generally known to proliferate through the production of large quantities of seed.
Wetlands	A collective term used to describe lands that are sometimes or always covered by shallow water or have saturated soils, and where plants adapted for life in wet conditions usually grow.
Catchment	In relation to a watercourse or watercourses or part of a watercourse, means the area from which any rainfall will drain into the watercourse or watercourses or part of a watercourse, through surface flow to a common point or common points.
Estuary	a partially or fully enclosed body of water - (a) which is open to the sea permanently or periodically; and (b) within which the sea water can be diluted, to an extent that is measurable, with fresh water drained from land.
Instream habitat	Includes the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse;
Riparian Habitat	Includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

8.3 Appendix C: Systematic Planning Frameworks

8.3.1 Vegetation of Southern Africa

A general description of the vegetation units is provided below (as per Mucina & Rutherford, 2006, as amended) as a reference point for the baseline vegetation composition.

Dwaalboom Thornveld (SVcb 1)

VT 13 Other Turf Thornveld (58%) (Acocks 1953). LR 14 Clay Thorn Bushveld (48%), LR 18 Mixed Bushveld (43%) (Low & Rebelo 1996).

Distribution Limpopo and North-West Provinces: Flats north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area but including a patch around Sentrum. South of the ridges it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area. Altitude 900–1 200 m.

Vegetation & Landscape Features Plains with layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. *Acacia tortilis* and *A. nilotica* dominate on the medium clays (at least 21% clay in the upper soil horizon but high in the lower horizons; Figure 9.10). On particularly heavy clays (>55% clay in all horizons) most other woody plants are excluded and the diminutive *A. tenuispina* dominates at a height of less than 1 m above ground. On the sandy clay loam soils (with not more than 35% clay in the upper horizon but high in the lower horizons) *A. erubescens* is the most prominent tree (Pauw 1988). The alternation of these substrate types creates a mozaic of patches typically 1–5 km across, for example in the unit west of Thabazimbi.

Geology & Soils Vertic black ultramafic clays which developed from norite and gabbro, also locally in small depressions along streams. Some areas have less clay. Some with high base status and eutrophic red soils. Underlying geology is an Archaean granite-gneiss terrane of the Swazian Erathem that is covered in parts by the mainly clastic as well as chemical sediments and volcanics of the Rayton and Silverton Formation, both of the Pretoria Group (Transvaal Supergroup). Mafic intrusive rocks of the Rustenburg Layered Suite, Bushveld Igneous Complex (Late Vaalian) are present in the east and include the Bierkraal Manetite Gabbro. Bronzite, harzburgite, norite and anorthosite are the major mafic rocks of the Rustenburg Suite. Land types mainly Ea and Ae.

Climate Summer rainfall with very dry winters. MAP ranges from about 500–600 mm. This unit has the highest mean annual potential evaporation of savanna vegetation units outside the two Kalahari bioregions. Frost is fairly frequent in winter. See also climate diagram for SVcb 1 Dwaalboom Thornveld.

Important Taxa Tall Tree: *Acacia erioloba*. Small Trees: *Acacia erubescens* (d), *A. nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *A. fleckii*, *A. mellifera* subsp. *detinens*, *Combretum imberbe*, *Rhus lancea*, *Ziziphus mucronata*. Tall Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Combretum hereroense*, *Diospyros lycioides* subsp. *lycioides*, *Euclea undulata*, *Grewia flava*, *Tarchonanthus camphoratus*. Low Shrubs: *Acacia tenuispina* (d), *Abutilon austro-africanum*, *Aptosimum elongatum*, *Hirpicium bechuanense*, *Pavonia burchellii*, *Solanum delagoense*. Succulent Shrubs: *Kalanchoe rotundifolia*, *Talinum caffrum*. Herbaceous Climber: *Rhynchosia minima*. Graminoids: *Aristida bipartita* (d), *Bothriochloa insculpta* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Ischaemum afrum* (d), *Panicum maximum* (d), *Cymbopogon pospischilii*, *Eragrostis curvula*, *Sehima galpinii*, *Setaria incrassata*. Herbs: *Heliotropium ciliatum*, *Kohautia caespitosa* subsp. *brachyloba*, *Nidorella hottentotica*.

Conservation Least Concern. Target 19%. Some 6% statutorily conserved, mostly within the Madikwe Game Reserve in the west. About 14% transformed mainly by cultivation. Erosion is very low to low. Main use is extensive cattle grazing.

Remarks Contains some very clayey soils that swell when wet and shrink when dry. On the clays, woody plant biomass is generally low, and productivity of woody plants is usually lower than that of herbaceous

plants. These areas with ultramafic soils are, contrary to Sekhukhuneland, low in species diversity and in endemic species.

References Coetzee (1971), Morris (1972), Van der Meulen (1979), Van der Meulen & Westfall (1980), Pauw (1988), Rutherford (1993), Winterbach (1998).

8.3.2 National Biodiversity Assessment

The NBA is the primary tool for monitoring and reporting on the state of biodiversity in South Africa and informs policies, strategic objectives, and activities for managing and conserving biodiversity more effectively. The NBA is especially important for informing the National Biodiversity Strategy and Action Plan (NBSAP), the National Biodiversity Framework (NBF) and the National Protected Area Expansion Strategy (NPAES) and also informs other national strategies and frameworks across a range of sectors, such as the National Spatial Development Framework, the National Water and Sanitation Master Plan and the National Biodiversity Economy Strategy. Ecosystem protection level is an indicator that tracks how well represented an ecosystem type is in the protected area network. It has been used as a headline indicator in national reporting in South Africa since 2005. It is computed by intersecting maps of ecosystem types and ecological condition with the map of protected areas. Ecosystem types are then categorised based on the proportion of the biodiversity target for each ecosystem type that is included in one or more protected areas. For terrestrial ecosystems, biodiversity targets are set for each ecosystem type using established species–area accumulation curves (ranging between 16 % and 34%). The status categorisation is based on a complex set of criteria, but for the purposes of this reporting, can be summarised as follows (NBA, 2019; IUCN RLE, 2017):

STATUS	DESCRIPTION
Least Concern	These ecosystems have lost only a small proportion (~more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).
Vulnerable	Vulnerable terrestrial ecosystems have lost some (~more than 60 % remains) of their original natural habitat and their functioning will be compromised if they continue to lose natural habitat.
Endangered	Endangered terrestrial ecosystems have lost significant amounts (~less than 40 % remains) of their original natural habitat, so their functioning is compromised.
Critically Endangered	Critically Endangered terrestrial ecosystems have lost significant amounts (~less than 20 % remains) of their original natural habitat and therefore considered to have an extremely high risk of collapse.

8.3.3 Limpopo Conservation Plan (LCP, 2018)

Critical Biodiversity Areas within the bioregion are the portfolio of sites that are required to meet the region's biodiversity targets and need to be maintained in the appropriate condition for their category. A map of CBAs for Limpopo was produced as part of this plan and sites were assigned to CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes (*Table 12*, *Figure 60*).

Based on the Limpopo Conservation Plan (*Table 12*, *Figure 60*), 40% of the province is designated as Critical Biodiversity Area. These CBAs have been split into CBA 1 and CBA 2 on the basis of selection frequency and the underlying characteristics of the biodiversity features which are being protected (i.e. location fixed features such as sites for CR species and flexible ones such as Least Cost Corridors). Most of the CBAs in the province are CBA 1 (22 %), which can be considered "irreplaceable" in that there is little choice in terms of areas available to meet targets. If CBA 1 areas are not maintained in a natural state, then

targets cannot be achieved. CBA 2's are considered "optimal" as there is significant design involved in their identification, make up 18 % of the province. CBA 2's represent areas where there are spatial options for achieving targets and the selected sites are the ones that best achieve targets within the landscape design objectives of the plan. In general conservation targets for vegetation units are between 19 and 30 %, the combined CBA 1 & 2 designation alone for the province this exceeds conservation targets.

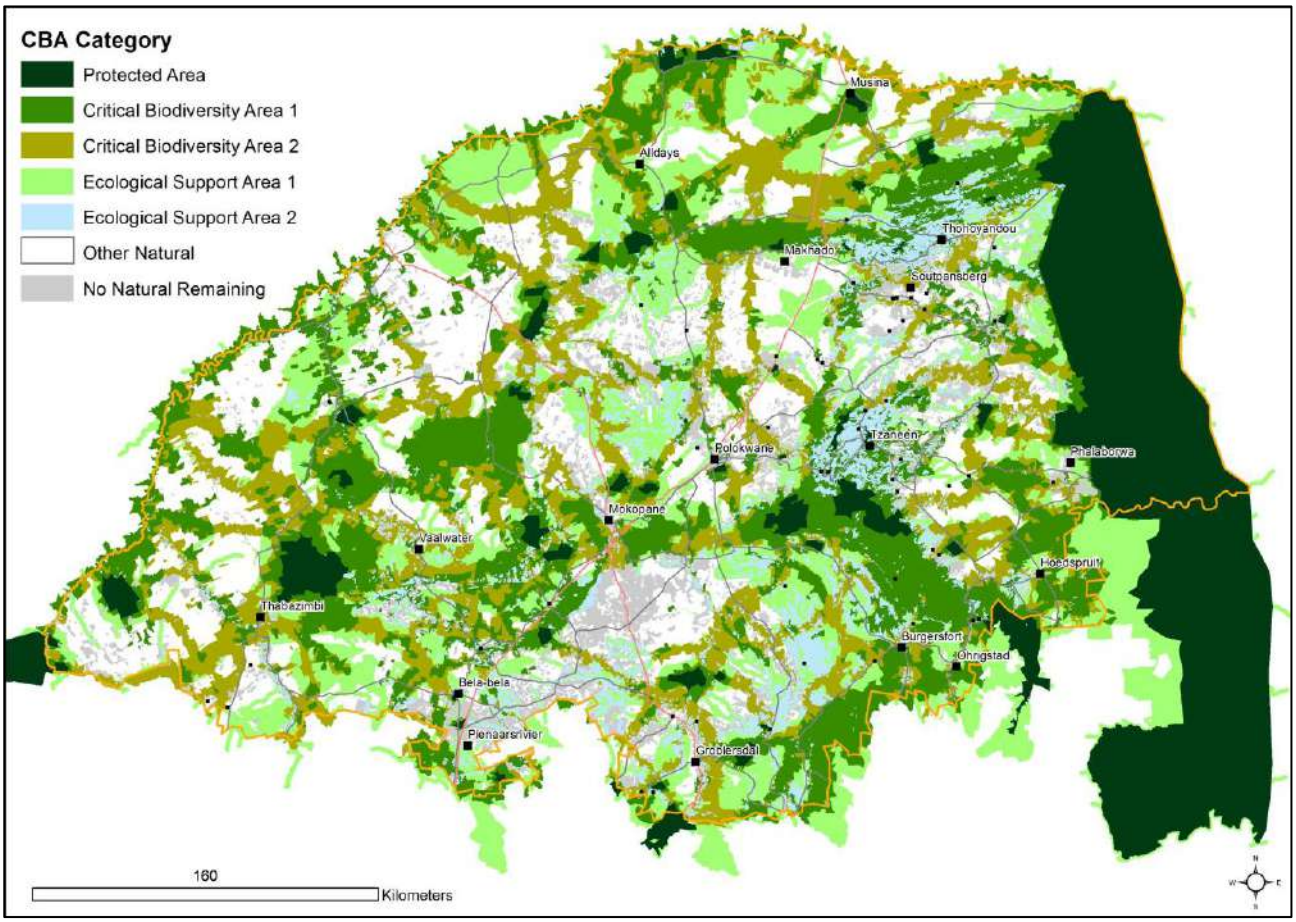


Figure 60: Limpopo Province Bioregional Plan, CBA & ESA Areas (LCP, 2018)

An additional 23% of the province is designated as Ecological Support Area. This category has also been split on the basis of land-cover into ESA 1 (16%) and ESA 2 (7%), with ESA 1 being in a largely natural state while ESA 2 areas are no longer intact but potentially retain significant importance from a process perspective (e.g. maintaining landscape connectivity).

Other Natural Areas make up 20% of the province and just over 11% is designated as formal Protected Area (*Table 12*, *Figure 60*). The relatively high portion of remaining natural habitats which have been designated in one of the priority categories is a function of the fully integrated terrestrial and freshwater assessment (i.e. unlike many provinces there is not a second additional map of freshwater priorities), the comprehensive corridor and climate change adaptation features, and the relatively poor overlap of features (i.e. priority areas for one taxa do not spatially correlate well with those of other taxa in most of the savanna areas). The remaining 26 % of the province area would be considered transformed, be it urban development, agriculture, mining, or other transformed land-uses.

Table 10: General description of CBA Map categories and associated land management objectives.

CBA MAP CATEGORY	DESCRIPTION	LAND MANAGEMENT OBJECTIVE	LAND MANAGEMENT RECOMMENDATIONS	COMPATIBLE LAND-USE	INCOMPATIBLE LAND-USE
Protected Areas	Formal Protected Areas and Protected Areas pending declaration under NEMPAA.	Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state and manage for no further degradation. Development subject to Protected Area objectives and zoning in a NEMPAA compliant and approved management plan.	Maintain or obtain formal conservation protection.	Conservation and associated activities (e.g. eco-tourism operations) and required support infrastructure.	All other land-uses.
Critical Biodiversity Areas (1)	Irreplaceable Sites. Areas required to meet biodiversity pattern and/or ecological processes targets. No alternative sites are available to meet targets.	Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state and manage for no further degradation.	Obtain formal conservation protection where possible. Implement appropriate zoning to avoid net loss of intact habitat or intensification of land use.	Conservation and associated activities. Extensive game farming and eco-tourism operations with strict control on environmental impacts and carrying capacities, where the overall there is a net biodiversity gain. Extensive Livestock Production with strict control on environmental impacts and carrying capacities. Required support infrastructure for the above activities. Urban Open Space Systems	Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines). Intensive Animal Production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). Arable Agriculture (forestry, dry land & irrigated cropping). Small holdings
Critical Biodiversity Area (2)	Best Design Selected Sites. Areas selected to meet biodiversity	Maintain in a natural state with limited or no biodiversity loss. Maintain current	Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or	Current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and	Urban land--uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads,

CBA MAP CATEGORY	DESCRIPTION	LAND MANAGEMENT OBJECTIVE	LAND MANAGEMENT RECOMMENDATIONS	COMPATIBLE LAND-USE	INCOMPATIBLE LAND-USE
	pattern and/or ecological process targets. Alternative sites may be available to meet targets.	agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species.	ecological processes.	ecotourism operations, so long as these are managed in a way to ensure populations of threatened species are maintained and the ecological processes which support them are not impacted. Any activities compatible with CBA 1.	power lines, pipelines). More intensive agricultural production than currently undertaken on site. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to CBA 2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets.
Ecological Support Areas (1)	Natural, near natural and degraded areas supporting CBAs by maintaining ecological processes.	Maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern	Implement appropriate zoning and land management guidelines to avoid impacting ecological processes. Avoid intensification of land use. Avoid fragmentation of natural landscape	Conservation and associated activities. Extensive game farming and eco-tourism operations. Extensive Livestock Production. Urban Open Space Systems. Low density rural residential, smallholdings or resorts where development design and overall development densities allow maintenance of ecological functioning.	Urban land---uses including Residential (including golf estates), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines). Intensive Animal Production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). Arable Agriculture (forestry, dry land & irrigated cropping). Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to maintain overall ecological functioning of ESAs.
Ecological Support Areas (2)	Areas with no natural habitat that is important for supporting ecological processes.	Avoid additional / new impacts on ecological processes.	Maintain current land- use. Avoid intensification of land use, which may result in additional impact on ecological processes.	Existing activities (e.g. arable agriculture) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favoured.	Any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas (e.g. Change of floodplain from arable agriculture to urban land use or

CBA MAP CATEGORY	DESCRIPTION	LAND MANAGEMENT OBJECTIVE	LAND MANAGEMENT RECOMMENDATIONS	COMPATIBLE LAND-USE	INCOMPATIBLE LAND-USE
					from recreational fields and parks to urban).
Other Natural Areas	Natural and intact but not required to meet targets, or identified as CBA or ESA	No management objectives, land management recommendations or land-use guidelines are prescribed. These areas are nevertheless subject to all applicable town and regional planning guidelines and policy. Where possible existing Not Natural areas should be favoured for development before "Other natural areas" as before "Other natural areas" may later be required either due to the identification of previously unknown important biodiversity features on these sites, or alternatively where the loss of CBA has resulted in the need to identify alternative sites.			
No natural habitat remaining	Areas with no significant direct biodiversity value.	Not Natural or degraded natural areas that are not required as ESA, including intensive agriculture, urban, industry; and human infrastructure.			

Table 11: Recommended land management guidelines for Critical Biodiversity Areas and Ecological Support Areas.

CRITICAL BIODIVERSITY AREAS ONE (CBA 1)
Keep in a **NATURAL STATE**
General Recommendations
• No further loss of natural habitat should occur i.e. land in this category should be maintained as natural vegetation cover as far as possible. • These areas of land can act as possible biodiversity offset receiving areas. • Prioritise CBAs for land care projects, Working for Water (WfW) and NGOs to direct their conservation projects, programmes and activities. • An Ecological Management Plan should be compiled where required for CBAs. EMP to include alien plant control, fire management etc. • Control of illegal activities (such a hunting and dumping), which impact biodiversity should be prioritized in CBA areas.
Protection
• CBAs not formally protected should be rezoned where possible to conservation or appropriate open space zoning, and where possible declared in terms of NEM: Protected Areas Act. • The Stewardship program should prioritise privately owned erven in CBAs to be incorporated into the protected area network through Stewardship Agreements and incentives (e.g. rates rebates).
Rehabilitation
• Degraded or disturbed CBAs should be prioritized for rehabilitation through programmes such as Working for Water, Working for Wetlands.
Development Guidelines
Where infrastructure is proposed, the following guidelines should be implemented ---
• Rezoning of properties to afford additional land-use rights that will result in increased biodiversity loss should not be granted.

- Permission to increase the permitted number of units per erf or per ha should not be granted.
- Developments should be limited to existing developed / degraded footprints, if present.
- Units carefully dispersed or clumped to achieve least impact, particularly with regard to habitat loss and fragmentation.
- The installation of infrastructure in CBAs is not desirable and should only be considered if all alternative alignment and design options have been assessed and found to be non-viable. Under such conditions, at least a Basic Assessment (BA) should be undertaken, and if approved, a comprehensive EMP must be developed and best-practice restoration efforts strictly implemented.
- Ecological Specialist to conduct the ecological assessment.

Where development proposals other than the preferred biodiversity-compatible land-uses:

- A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site.
- If the site is verified as a CBA, developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied in full.
- If the application is pursued, they should be informed by a specialist biodiversity assessment.

CRITICAL BIODIVERSITY AREA TWO (CBA 2)

Keep in a **NATURAL STATE**

General Recommendations

- Loss of natural habitat should be minimized i.e. land in this category should be maintained as natural vegetation cover as far as possible.
- These areas of land can act as possible biodiversity offset receiving areas.
- Control of illegal activities (such a hunting and dumping), which impact biodiversity should be prioritized in CBA areas.

Protection

- CBAs not formally protected should be rezoned where possible to conservation or appropriate open space zoning, and where possible declared in terms of NEM: Protected Areas Act.
- The Stewardship program should prioritise privately owned erven in CBAs to be incorporated into the protected area network through Stewardship Agreements and incentives (e.g. rates rebates).

Rehabilitation

- Degraded or disturbed CBAs should be prioritized for rehabilitation through programmes such as Working for Water, Working for Wetlands.

Development Guidelines

Where infrastructure is proposed, the following guidelines should be implemented ---

- Rezoning of properties to afford additional land-use rights that will result in increased biodiversity loss through conversion of land from agriculture should not be granted.
- Permission to increase the permitted number of units per erf or per ha should not be granted.
- Developments should be limited to existing footprints, if present, and should avoid encroaching on natural or agricultural landscapes.

- Should additional infrastructure be required, the requirements of threatened species should be taken into account. At least a Basic Assessment (BA) should be undertaken for any development which results in the intensification of land use, and if intensification of land use is approved, a comprehensive EMP or must be developed to minimize impacts on threatened species.
- Ecological Specialist to conduct the ecological assessment.

Where development proposals other than the preferred biodiversity-compatible land-uses (see table above are submitted in terms of the NEMA: EIA regulations or Land Use Planning Ordinance (LUPO):

- A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site.
- If the site is verified as a CBA, developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied in full.
- If the application is pursued, they should be informed by a specialist biodiversity assessment.

ECOLOGICAL SUPPORT AREAS ONE (ESA 1)

Maintain in an **ECOLOGICAL FUNCTIONAL STATE**.

General Recommendations

- Maintain in a functional state, avoid intensification of land-uses, and rehabilitate to a natural or semi-natural state where possible. In transformed areas which are important for maintaining ecological processes, current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated.
- No further loss of natural habitat should be allowed, and land in this category currently in a degraded state should be rehabilitated or restored to a natural or semi-natural state once the current land-use has ceased.
- Maintain current land uses where these play a role in supporting ecological processes.
- Ensure land use changes do not impact negatively on ecological processes.
  The maintenance of connectivity between CBAs, continued ecosystem functioning within the CBA corridors, and the prevention of degradation of adjacent Critical Biodiversity Areas must be achieved.
- After the CBA 1's, ESA 1's should be prioritised for land care projects, Working for Water (WfW) and NGOs to direct their conservation projects, programmes and activities.
- An Ecological Management Plan should be compiled where required for ESAs. EMP to include alien plant control, fire management etc.

Development Guidelines

Where infrastructure is proposed, the following guidelines should be implemented ---

- Rezoning of properties to afford additional land-use rights that will result in increased impact on ecological processes should not be granted, unless significant net conservation gains can be achieved, ecosystem functioning and connectivity of Ecosystem Support Areas (ESAs) will not be compromised, and biodiversity impacts with regard to species and habitats are of at an acceptable significance and mitigated where possible.
- Developments should be limited to existing developed / degraded footprints, where possible.

- Units carefully dispersed or clumped to achieve least impact, particularly with regard to impacts on ecological processes.
- Ecological Specialist to conduct the ecological assessment.

Where development proposals other than the preferred biodiversity-compatible land-uses are submitted in terms of the NEMA: EIA regulations or Land Use Planning Ordinance (LUPO) for areas which remain intact:

- A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site.
- If the site is verified as an ESA, developments other than the preferred biodiversity-compatible land-uses should be carefully screened to ensure that developments are planned, and activities undertaken in a way that minimizes impact on ecological processes. Impacts should be mitigated.
- If the application is pursued, they should be informed by a specialist biodiversity assessment.

In transformed areas which are still important for supporting ecological processes, the following guidelines should be implemented ---

- Current land uses should be maintained, intensification of use (e.g. a transition from extensive agriculture to urban) should be avoided, and where possible areas should be rehabilitated.
- Developments should be screened to ensure that they do not have an unacceptable impact on ecological processes.

	ECOLOGICAL SUPPORT AREAS TWO (ESA 2)
	Maintain existing and restore **ECOLOGICAL FUNCTIONING**

General Recommendations

- Additional impacts on ecological processes should be avoided. In transformed areas, which are important for maintaining ecological processes, current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated.
- The maintenance of connectivity between CBAs, continued ecosystem functioning within the CBA corridors, and the prevention of degradation of adjacent Critical Biodiversity Areas must be achieved.
- In some cases, the rehabilitation of ESA 2's may be the suitable for land care projects, Working for Water (WfW) and NGOs to direct their conservation projects, programmes and activities;

Development Guidelines

Where infrastructure is proposed, the following guidelines should be implemented ---

- Infrastructure should be designed to avoid additional impacts on ecological processes.

In transformed areas which are still important for supporting ecological processes, the following guidelines should be implemented ---

- Current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated.
- Developments should be screened to ensure that they do not have an unacceptable impact on ecological processes.

Table 12: The extent of Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) in the Limpopo Province.

CBA CATEGORY	EXTENT (HA)	EXTENT (KM²)	PERCENT
Protected Area	1 360 410	13 604	11 %
CBA 1	2 780 864	27 808	22 %
CBA 2	2 238 430	22 384	18 %
Total CBA	**5 019 294**	**50 192**	**40 %**
ESA 1	2 009 053	20 090	16 %
ESA 2	933 802	9 381	7 %
Total ESA	**2 942 855**	**29 471**	**23 %**
TOTAL	**9 322 559**	**93 225**	**74%**

Land-use guidelines provide guidance on what types of land-use activities are compatible with the biodiversity management objectives of each CBA map category. These guidelines do not grant or take away existing land-use rights or the statutory requirement for permits and environmental authorizations. It is however recommended that any planned activity within the identified sensitive conservation areas, even those not requiring specified permits or authorisations, comply with the Duty of Care obligations of Section 28 of the National Environmental Management Act No 107 of 1998. At a minimum such activities should undergo an environmental impact scoping process and the development of an Environmental Management Programme (EMP) to ensure mitigation and management of identified impacts. *Table 11* below provides a summary of recommended land management guidelines for Critical Biodiversity and Ecological Support Areas. These are based on standard principles that are generally uniform across provinces.

A general description of the land management objectives for Critical Biodiversity and Ecological Support Areas is provided in *Table 10*.

8.3.4 Species of Conservation Concern (Flora)

Sensitive species 1295

National Status and Criteria: Endangered [B1ab(iii)+2ab(iii)]

Sensitive species 1295 is a range-restricted flora species (EOO 164 km²), occurring at two to three locations and declining due to ongoing habitat loss and degradation. Occurs in northern North West province and adjacent areas in Limpopo between Ramotswa and Dwaalboom in Dwaalboom Thornveld. Exact locations of these known populations are not indicated on the Screening Tool but are assumed to be to the west of the site near Ramotswa and to the east near Dwaalboom. It possibly also occurs in adjacent areas in Botswana. Found on Stoney slopes and sandy soils in grassland and open savanna. This species is known from only a few collections and was last recorded in 1995. There are two disjunct subpopulations, and it is possible that others may exist in the area in between, which is remote and botanically poorly explored. Surveys of the type locality failed to relocate the subpopulation (Hahn 2013). The habitat is very degraded, and it may be locally extinct in this area.

Threats: Field observations at the type locality indicate that the habitat is severely degraded due to overgrazing, erosion and bush encroachment (Hahn 2013). In Limpopo Province it is threatened by ongoing habitat loss to crop cultivation.

8.3.5 Species of Conservation Concern (Fauna)

Sensitive Species 5

Sensitive Species 5 is assessed as Vulnerable under criterion A4b based on a population size reduction of 37 % (21–51%) over three generations (approximately 15 years) between 2017 and 2032 (A4b) and

criterion C1 based on a global population size (tentatively estimated at 6,500 mature individuals) and a projected averaged continuing decline (C1).

In southern Africa the species is known to occur in 22% of their historical range (1,325,000 km²) and possibly occur in another 424,000 km² (IUCN/SSC 2015), across a wide range of habitats and ecoregions, ranging from dry forest and thick scrub through to grassland and hyperarid deserts, such as the Sahara. Most of the individual surviving in this region are in a single transboundary population stretching across Namibia, Botswana, southern Angola, northern South Africa, south-western Mozambique and southern Zambia.

Further information is excluded as this is a designated Sensitive Species.

African Wild Dog (Lycaon pictus)

National Status and Criteria: Endangered [C2a(i)]

African Wild Dogs (*Lycaon pictus*) have disappeared from much of their former range. Their population is currently estimated at approximately 6,600 adults in 39 subpopulations, of which only 1,400 are mature individuals. African Wild Dogs show morphological and genetic variation in different parts of their geographic range (Girman et al. 1993, Marsden et al. 2012). These regions are geographical separated by areas of unoccupied range and/or major geographical barriers, and with no expectation of recovering connectivity. Population size is continuing to decline as a result of ongoing habitat fragmentation, conflict with human activities, and infectious disease. Given uncertainty surrounding population estimates, and the species' tendency to population fluctuations, the largest subpopulations might well number <250 mature individuals, thereby warranting listing as Endangered under criterion C2a(i). Historical data indicate that African Wild Dogs were formerly distributed throughout sub-Saharan Africa, from desert (Lhotse 1946) to mountain summits (Thesiger 1970), and probably were absent only from lowland rainforest and the driest desert (Schaller 1972). They have disappeared from much of their former range. The species is virtually eradicated from North and West Africa and greatly reduced in Central Africa and North-east Africa. The largest populations remain in southern Africa (especially northern Botswana, western Zimbabwe, eastern Namibia, and western Zambia) and the southern part of East Africa (especially Tanzania and northern Mozambique).

Threats

The causes of African Wild Dogs' decline are reasonably well understood and include extreme sensitivity to habitat fragmentation as a consequence of wide-ranging behaviour, conflict with livestock and game farmers, accidental killing by people in snares and road accidents, and infectious disease. All of these causes are associated with human encroachment on African Wild Dog habitat and, as such, have not ceased and are unlikely to be reversible across the majority of the species' historical range. The principal threat to African Wild Dogs is habitat fragmentation, which increases their contact with people and domestic animals, resulting in human-wildlife conflict and transmission of infectious disease. The important role played by human-induced mortality has two long-term implications. First, it makes it likely that, outside protected areas, African Wild Dogs may be unable to coexist with increasing human populations unless land use plans and other conservation actions are implemented. Second, African Wild Dog ranging behaviour leads to a very substantial "edge effect", even in large reserves. Simple geometry dictates that a reserve of 5,000 km² contains no point more than 40 km from its borders – a distance well within the range of distances travelled by a pack of African Wild Dogs in their usual ranging behaviour. Thus, from an African Wild Dog's perspective, a reserve of this size (fairly large by most standards) would be all edge. As human populations rise around reserve borders, the risks to African Wild Dogs venturing outside are also likely to increase. Under these conditions, only

the very largest unfenced reserves will be able to provide any level of protection for African Wild Dogs. In South Africa, "predator proof" fencing around small reserves has proved reasonably effective at keeping dogs confined to the reserve, but such fencing is not 100% effective (Davies-Mostert *et al*. 2009) and is unlikely to be long-term beneficial for wildlife communities. Even in large, well-protected reserves, or in stable populations remaining largely independent of protected areas (as in northern Botswana), African Wild Dogs live at low population densities. Predation by Lions, and perhaps competition with Spotted Hyaenas, contribute to keeping African Wild Dog numbers below the level that their prey base could support. Such low population density brings its own problems. The largest areas contain only relatively small wild dog populations; for example, the Selous Game Reserve, with an area of 43,000 km² (about the size of Switzerland), is estimated to contain about 800 African Wild Dogs. Most reserves, and probably most African Wild Dog populations, are smaller. For example, the population in Niokolo-Koba National Park and buffer zones (about 25,000 km²) is likely to be not more than 50–100 dogs. Such small populations are vulnerable to extinction. "Catastrophic" events such as outbreaks of epidemic disease may drive them to extinction when larger populations have a greater probability of recovery – such an event seems to have led to the local extinction of the small African Wild Dog population in the Serengeti ecosystem on the Kenya-Tanzania border. Problems of small population size will be exacerbated if, as seems likely, small populations occur in small reserves or habitat patches. As discussed above, animals inhabiting such areas suffer a strong "edge effect". Thus, small populations might be expected to suffer disproportionately high mortality as a result of their contact with humans and human activity.

8.4 Appendix D: Species List

8.4.1 Flora Species List

8.4.2 Fauna Species List

SCIENTIFIC NAME	COMMON NAME	STATUS[15]	COMMENT/PRESENCE
Mammals			

15 **PNCO** - Provincial Nature Conservation Ordinance (1974); ToPS – Threatened or Protected Species, **IUCN:** Cr - Critically - Endangered, En - Endangered, Vu - Vulnerable; LC - Least Concern.

8.5 Appendix E: Site Photos

8.6 Appendix F: Comments and Responses

COMMENT	RESPONSE
2. <u>The Application for EA in a sensitive environment is fatally flawed for the reasons below:</u>	
2.1 *The proposed development is due to occur in a CBA and ESA:*	
2.1.1 The DSR describes the property intended to be used for the proposed development as "*sparsely developed and considered rural in character. Various farmsteads/homesteads and agricultural field are located throughout the proposed development properties with associated fences and access roads.*" This is misleading as the site of the proposed development is situated within a CBA and ESA. This is confirmed on page 91 of the DSR where it is acknowledged that the entire development area is located within a CBA 2 and ESA 2. On page 92 of the DSR, it is stated that "*the specialist confirmed the "Very High" sensitivity with CBA 2 and ESA 2 being present.*"	The Limpopo Conservation Plan v2, 2013 (referred to as the LCPv2, 2013) stipulates the following: "*Incomplete biodiversity datasets and generally coarse mapping of biodiversity features impose limitations on this plan, which although they do not restrict the application of the plan, need to be recognized and appropriately accommodated when it is used.* 1. *<u>The conservation plan does not replace the need for site assessments, particularly for Environmental Impact Assessments</u>. Although it is based on a systematic conservation plan using best available data, <u>this does not remove the need for on-site verification of the identified Critical Biodiversity Areas</u>. Further, due to incomplete knowledge of the distribution of biodiversity features, it is likely that additional or alternative areas will need to be identified in the future as we gain a better understanding of rare, threatened, cryptic and understudied species.* 2. *This conservation plan is designed to be used at a scale of approximately 1:50 000. Although it can be used at a finer scale, <u>this requires specialist interpretation</u> of the specific biodiversity features identified in the systematic biodiversity plan;*" Regarding areas designated as CBA 2, the LCPv2 (2013) Development Guidelines stipulates "*Where development proposals other than the preferred biodiversity---compatible land---uses (see table above are submitted in terms of the NEMA: EIA regulations or Land Use Planning Ordinance (LUPO):*
2.1.2 The extent of the proposed development area is classified as a CBA 2 and ESA 2 in terms of the Limpopo Conservation Plan v2, 2013 ("**LCPv2**"). The LCPv2 is the current systematic biodiversity plan for the Limpopo Province and has been undertaken by the Limpopo Department of Economic Development, Environment and Tourism. The purpose of the LCPv2 is to develop the spatial component of a bioregional plan (i.e. a map of CBAs and associated land-use guidelines), while bioregional plans themselves are used to facilitate biodiversity conservation in priority areas outside the protected area network.	
2.1.3 Areas designated as CBA 2 must be maintained in a natural or near-natural state that maximises the retention of biodiversity patterns and ecological processes. This includes: • Ecosystems and species that are fully or largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of meeting biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve biodiversity targets, although loss of these sites would require alternative sites to be added to the portfolio of CBAs; and • Biodiversity features within a CBA2 that are impacted but are not fully degraded.	
2.1.4 Areas designated as ESA 2 are areas that are currently in severely modified ecological condition (e.g. cultivated areas in riparian zones) but that nevertheless retain sufficient ecological functioning to fulfil the purpose for which the ESA was selected. The objective is to prevent further deterioration in ecological condition and includes: • Areas with no natural habitat and which are important for supporting ecological processes (i.e. maintaining landscape connectivity). • Areas where additional impacts on ecological processes should be avoided. In transformed areas, which are important for maintaining ecological processes, current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated. • The maintenance of connectivity between CBAs, continued ecosystem functioning within the CBA corridors, and the prevention of degradation of adjacent CBAs must be achieved; and • In some cases, the rehabilitation of ESA 2s may be suitable for land care initiatives to direct their conservation projects, programmes and activities.	
2.1.5 Furthermore, the LCPv2: Technical Report, September 2013 ("**Technical Report**"), sets out the land management	

	objectives applicable to each type of CBA and ESA map category. Specifically, on page 52 of the Technical Report, CBA 2 areas are to be maintained "*in a natural state with limited or no biodiversity loss. Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species*". It also provides that CBA 2 areas must "*avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes*". On page 54 of the Technical Report, additional / new impacts on ecological processes must be avoided on ESA 2 areas. Additionally, efforts must be made to maintain current land use and avoid intensification of land use which may result in additional impacts on ecological processes.	
2.1.6	The Technical Report further provides for compatible and incompatible land- uses for CBA 2 and ESA 2. In the case of compatible land-uses for CBA 2, "*current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and ecotourism operations*" are permitted. However, in the case of incompatible land-uses, "*urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines)*" do not fall within the land-uses intended on areas designated as CBA 2. In terms of ESA 2, existing activities (e.g. arable agriculture or game farming) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favoured. Additionally, "*any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas (e.g. Change of floodplain from arable agriculture to an urban land use or from recreational fields and parks to urban)*" is incompatible with ESA 2.	
2.1.7	Therefore, it would contravene the recommendations of the LCPv2 to allow for the proposed development to occur on the site concerned as any such activities in the area would cause devastating and irreversible impacts and damage to the natural environment, which, in its current state, is not deemed irreversibly modified or heavily degraded. Furthermore, any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas, is incompatible. The proposed development is naturally more intensive than the current land uses and any development of this nature will result in additional impacts on the ecological functioning of the site.	
2.1.8	In this regard, the EAP has, from the available information, not truly considered the surface rights land use in the DSR, nor has the EAP truly considered the impact of the proposed development on the site. This is perhaps because the EAP has at this stage not yet adequately engaged with the surface rights owners of the Farm Napoleon 216 KP and adjacent landowners (including our Clients), either to understand the true land use or to properly study the impacts of proposed prospecting activities on adjacent and other landowners situated in close proximity to the proposed development.	
2.1.9	Our clients undertake a variety of agricultural-based activities on their respective properties. Specifically, these activities comprise farming and game breeding, as well as the operation of trophy hunting and game lodges. These activities are not only carried out as businesses and a source of income for our clients but are also responsible for the much-needed employment of numerous members of the local communities in the area.	
2.2	*Biodiversity Impacts have not been properly considered as required by the 2014 EIA Regulations:*	
2.2.1	The following represents the results of the screening for environmental sensitivity of the proposed site for various relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the National Web based Environmental Screening Tool ("**the Screening Tool**") are comprehensive and complete for the proposed development. The majority of the environmental sensitivity themes for	• *A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site.* • *If the site is verified as a CBA, developments other than the preferred biodiversity---compatible land---uses should be investigated in detail and the mitigation hierarchy applied in full.* • *If the application is pursued, they should be informed by a specialist biodiversity assessment."* • *And for ESA 2 areas, "* *Where infrastructure is proposed, the following guidelines should be implemented:* • *Infrastructure should be designed to avoid additional impacts on ecological processes.* *In transformed areas which are still important for supporting ecological processes, the following guidelines should be implemented---* • *Current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated.* • *Developments should be screened to ensure that they do not have an unacceptable impact on ecological processes. "* The purpose of the Scoping Phase of the EIA process is to identify the potential risks pertaining to a specific field (i.e. terrestrial biodiversity) and determine the respective approach required in order to investigate. These are then assessed in the next phase of the application, the Assessment Phase which will follow the Scoping Phase in due course.

the proposed development are regarded as "Very High" according to the Screening Tool.	The LCPv2, 2013 is very clear as indicated above, that specialist input and analysis is required where activities are proposed that do not align with the plan. As part of this environmental application process the respective terrestrial biodiversity specialist will be assessing all of the comments raised in the correspondence of Gunn Attorneys dated 29 July 2025, as would anyway be the norm for the respective specialist's assessment.
2.2.2 The Screening Tool identifies the Terrestrial Biodiversity sensitivity theme for the proposed development site as "Very High" sensitivity, as indicated in the image below, found on page 21 of the DSR:	
2.2.2.1 The designation of "Very High" Terrestrial Biodiversity sensitivity theme is due to the entire development area being within a CBA 2 and ESA 2. This is noted and confirmed by the relevant specialist on page 92 of the DSR. Furthermore, as can be seen from the image above, the "Very High" designated portions of land stretch into the adjacent Madikwe Game Reserve, which further signifies the critical and sensitive environment of the site, both in terms of its own ecological value as well as to the greater surrounding area.	

8.7 Appendix G: Declaration, Specialist Profile and Registration

forestry, fisheries & the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE
WKN Benya PV & Grid Connection

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with *'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 the act, when applying for environmental authorisation - GN 320/2020)'*, where applicable.

1. SPECIALIST INFORMATION

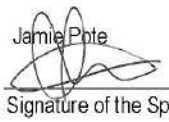
Title of Specialist Assessment	Terrestrial Biodiversity Assessment
Specialist Company Name	
Specialist Name	Jamie Pote
Specialist Identity Number	740515 5152 089
Specialist Qualifications:	BSc (Hons)
Professional affiliation/registration:	SACNASP (115233)
Physical address:	
Postal address:	Postnet Suite 57, P Bag X13130, Humewood
Postal address	Port Elizabeth
Telephone	
Cell phone	076 888 9890
E-mail	jamiepote@gmail.com

SPECIALIST DECLARATION FORM – AUGUST 2023

2. DECLARATION BY THE SPECIALIST

I, Jamie Pote declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- 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 48 and is punishable in terms of section 24F of the NEMA Act.



Signature of the Specialist

N/A

Name of Company:

12 Apr 2025

Date

SPECIALIST DECLARATION FORM – AUGUST 2023

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ Mr Jamie Pote _____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

N/A

Name of Company

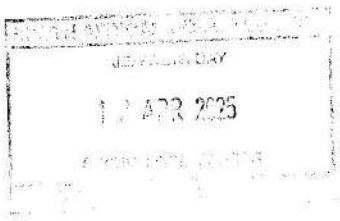
12/04/2025

Date

Signature of the Commissioner of Oaths

2025-04-12

Date



Jamie Pote

BIODIVERSITY ADVISOR, ECOLOGIST AND ENVIRONMENTAL SCIENTIST

CONTACT

(+27) 76 888 9890
jamiepote@live.co.za
Port Elizabeth, South Africa
Linkedin.com
Jamiepote
Bluesky-SA

ABOUT ME

20 years broad professional experience in Terrestrial Biodiversity, Ecological and Vegetation Assessments on over 350 projects in southern, western and central Africa. Environmental Assessment Practitioner on over 50 projects in the mining, infrastructure, housing and agricultural sectors. Environmental monitoring and auditing on over 50 civil infrastructure and construction projects. Have managed all aspects of projects from inception through to implementation. Advanced GIS mapping and analysis.

EDUCATION

Bachelor of Science
Rhodes University
2002 (Botany & Environmental Science)

Bachelor of Science (Honours)
Rhodes University
2003 (Botany)

Professional Natural Scientist
SACNASP: 2016 (Ecological Science)

SERVICES

Terrestrial Biodiversity Specialist Assessments
IFC PS6 Biodiversity & Critical Habitat Assessments
Terrestrial Biodiversity Compliance Statements
Geographic Information Systems
Environmental Management Plans & Programmes
Environmental Compliance & Monitoring
Independent Environmental & Ecological reviews
Bioremediation, Restoration & Rehabilitation Plans
Permit and License applications (Flora & Fauna)
Flora Search & Rescue Plans & Relocations
Invasive Alien Plant Control & Management Plans
Environmental & Mining Applications

EXPERIENCE AND CLIENTS

Key Sectors

- *Wind, Solar Energy Facilities*
- *Infrastructure and Housing*
- *Agriculture and Forestry*
- *Mining and Industrial*

Key Projects

- *Over 350 independent Biodiversity/Ecological Assessments throughout southern, western and central Africa across all sectors.*
- *Basic Assessments, Mining applications and compliance monitoring on over 50 projects for various clients including the Eastern Cape Department of Roads and Public Works, Department of Transport and the South African National Roads Agency (SANRAL) throughout the Eastern Cape, including over 300 individual borrow pits.*
- *Environmental applications, construction monitoring and auditing for a wide range of projects, including infrastructure and housing clients.*
- *Various agricultural expansion and infrastructure projects.*
- *Various wind and solar energy and associated infrastructure projects.*
- *Numerous infrastructure projects including electrical, water and roads.*
- *Environmental Screening and Risk Assessments for several projects, including Wind Energy and Solar.*
- *Various Environmental Management and Rehabilitation Plans.*

25/01/2023

SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Jamie Robert Claude Pote

Registration Number: 115233

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Ecological Science (Professional Natural Scientist)

Effective **20 July 2016** Expires **31 March 2026**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

Mr Jamie Pote (BSc (Hons) PR. Sci. Nat.

PROJECT EXPERIENCE

ENERGY PROJECTS (WIND FARM AND PHOTOVOLTAIC INFRASTRUCTURE)

- Terrestrial Biodiversity Screening for proposed WEF, Beaufort West, Western Cape (ZA) 2023
- Terrestrial Biodiversity Walkdown for Koup 1 & 2 WEF, Beaufort West, Western Cape (ZA) 2023
- Terrestrial Biodiversity Assessment for Harmony Kalgold PV, Mahikeng, North West (ZA) 2022
- Terrestrial Biodiversity Assessment for Bonsmara PV, Kroonstad, Free State (ZA) 2023
- Terrestrial Biodiversity Screening for proposed WEF, Springbok, Northern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for Harmony Chemwes PV, Klerksdorp, North West (ZA) 2022
- Terrestrial Biodiversity Assessment for Harmony Target PV, Welkom, Free State (ZA) 2022
- Terrestrial Biodiversity Assessment for MTN Mast, Louterwater, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for MTN Mast, Mount Stewart, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for MTN Mast, Pearston, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for MTN Mast, Roussouw, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Screening for proposed PV & WEF, Beaufort West, Western Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for WKN Soutrivier WEF, Victoria West, Northern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for WKN Taaibos WEF, Victoria West, Northern Cape (ZA) 2022
- Terrestrial Biodiversity Screening for proposed PV, Beaufort West, Western Cape (ZA) 2022
- Terrestrial Biodiversity Screening for proposed WEF & PV, Secunda, Mpumalanga (ZA) 2022
- Terrestrial Biodiversity Screening for proposed WEF, Standerton, Mpumalanga (ZA) 2022
- Terrestrial Biodiversity Walkdown for Phezukomoya WEF, Noupoort, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Walkdown for San Kraal WEF, Noupoort, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Walkdown for Hartebeeshoek WEF, Noupoort, Eastern Cape (ZA) 2023
- Terrestrial Biodiversity Amendment for Banna ba Pifhu WEF, Humansdorp, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for Seekoei PV, Middleburg, Northern Cape (ZA) 2022
- Terrestrial Biodiversity Screening for proposed PV, Kroonstad, Free State (ZA) 2022
- Terrestrial Biodiversity Assessment for Paulputs WEF, Pofadder, NC (ZA) 2021
- Terrestrial Biodiversity Assessment for Komas WEF, Kleinsee, NC (ZA) 2021
- Preliminary Biodiversity Screening and GIS mapping for Balekani Photovoltaic Solar Project (SZ) 2020
- Preliminary Biodiversity Screening and GIS mapping for Sihhoye Photovoltaic Solar Project (SZ) 2020
- Preliminary Biodiversity Screening and GIS mapping Mpaka Photovoltaic Solar Project (SZ) 2020
- Preliminary Biodiversity Screening and GIS mapping for Chiwelwa Hydroelectric project (ZM) 2020
- Ecological Assessment for Vermaak Boerdery Hydro Turbine (Cookhouse), Eastern Cape 2020
- Ecological Assessment for Windcurrent Wind Farm, Eastern Cape 2012
- Ecological Assessment for Universal Windfarm, NMB (ZA) 2011
- Ecological Assessment for Inca Energy Windfarm, Northern Cape 2011
- Ecological Assessment for Broadlands Photovoltaic Farm, Eastern Cape 2011
- Botanical Assessment for Electrawinds Windfarm Coega, NMB 2010

TERRESTRIAL BIODIVERSITY ASSESSMENTS AND COMPLIANCE STATEMENTS

- Terrestrial Biodiversity Assessment for Glen Ewan Private School, Komani (ZA) 2023
- Terrestrial Biodiversity Assessment for Hard Rock Agriculture, Addo, EC (ZA) 2022
- Terrestrial Biodiversity Assessment for Coegakammakloof Chicken Houses, Addo, EC (ZA) 2022
- Terrestrial Biodiversity Assessment for Umziwabantu Agriculture, Addo, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Compliance Statement for Middledrift PV, Addo, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Compliance Statement for Disco PV, Addo, Eastern Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for Mbashe AmaXhosa Royal House, Mbashe, Eastern Cape 2022
- Terrestrial Biodiversity Assessment for Nordex Roggeveld CTF, Western Cape (ZA) 2022
- Terrestrial Biodiversity Assessment for Erf 805 Amsterdamhoek, Eastern Cape (ZA) 2022

• Terrestrial Biodiversity Assessment for Addo Fuel Depot, Addo, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Tsomo WTW, CHDM, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Beacon Bay Memorial Park, Buffalo City, Eastern Cape	2022
• Terrestrial Biodiversity Assessment for Ph 5 Nxamagele Reservoir & Pipeline, CHDM, EC (ZA)	2022
• Terrestrial Biodiversity Assessment for Ph 9 Water Pipeline to Sada WTW, Hewu, Eastern Cape	2022
• Terrestrial Biodiversity Assessment for Erf 5707 Beacon Bay, Buffalo City, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Erf 8077 Uitenhage Fuel Station, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Farm 3/599 Buffalo City, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Sontule Citrus expansion, Addo, Eastern Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Kurland WTW and Pipeline, Western Cape (ZA)	2022
• Terrestrial Biodiversity Assessment for Addo Offices, Addo, Eastern Cape (ZA)	2021
• Terrestrial Biodiversity Assessment for Blaauwater Farms, Eastern Cape	2021
• Terrestrial Biodiversity Assessment for Buffelshoek Farm, Loerie, Eastern Cape	2021
• Terrestrial Biodiversity & Aquatic Assessment & Review, Falcon Ridge Dam, Addo, EC	2021
• Terrestrial Biodiversity Assessment for Gubenxa Valley Deciduous Fruit, Eastern Cape	2021
• Terrestrial Biodiversity Assessment (Little Chelsea Mixed-use)	2021
• Terrestrial Biodiversity Compliance Statement (Maidenhead Farm)	2021
• Terrestrial Biodiversity Review, Mulilo Total Hydra Storage Project Grid Interconnection	2021
• Terrestrial Biodiversity Compliance Statement (Lahlangubo River Bridge)	2021
• Terrestrial Biodiversity Assessment (Mbashe access roads - 3 sites)	2021
• Terrestrial Biodiversity Assessment for Burlington Farm Citrus Development, Cookhouse, EC	2020
• Terrestrial Biodiversity Compliance Statement: CHDM Cluster 9 Phase 3D Pipeline	2020
• Terrestrial Biodiversity Review, Mulilo Total Hydra Storage Project BESS	2020
• Terrestrial Biodiversity Assessment (Mbashe housing projects, Dutywa & Willowvale)	2020
• Terrestrial Biodiversity Assessment (Helpmekaar Dam, Tarkastad)	2020
• Terrestrial Biodiversity Assessment (Herbertsdale pipeline, Mossel Bay)	2020
• Terrestrial Biodiversity Assessment (Keurbooms Erf 155, Keurboomstrand)	2020
• Terrestrial Biodiversity Assessment (Lowmar Hydroelectric Project, Cradock)	2020
• Terrestrial Biodiversity Assessment (Mossel Bay Gas Power Plant)	2020
• Terrestrial Biodiversity Assessment (Erf 1820, Mthatha)	2020
• Terrestrial Biodiversity Assessment (Newlyn Manganese Terminal, Coega SEZ)	2020
• Terrestrial Biodiversity Assessment Thornhill Phase 2 Sanitation Link	2020
• Botanical Assessment and Open Space Management Plan for Mainstream WEF Phase 2, Eastern Cape	2010

PERFORMANCE STANDARD BIODIVERSITY AND CRITICAL HABITAT ASSESSMENTS (IFC PS6)

• DBSA Environmental & Social Safeguards Standards 9: Biodiversity Conservation and Sustainable Management Assessment: The Ilitha Fibre Project, Ethekwini	2021
• Critical Habitat & Biodiversity Assessment - KruiseVallei Hydroelectrical Energy Project	2020
• Critical Habitat & Biodiversity Assessment & Walkdown- Brandvallei WEF, Northern Cape	2021
• Critical Habitat & Biodiversity Assessment & Walkdown- Rietkloof WEF, Northern Cape	2021
• Critical Habitat & Biodiversity Assessment & Walkdown- Karreebosch Grid Connection, NC	2021
• Critical Habitat & Biodiversity Assessment & Walkdown- Karreebosch WEF, Northern Cape	2021
• Critical Habitat & Biodiversity Assessment - Roggeveld Wind Energy Project	2020
• Biodiversity Assessment for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo	2008

SPECIALISED ECOLOGICAL REPORTS AND REVIEWS

• Section 24G Assessment and Rehabilitation Plan for Burlington Farm, Cookhouse, Eastern Cape	2022
• Alien Invasive Plant (AIP) Compliance Screening, Astron Depot, Cape Town, Western Cape (ZA)	2022
• Alien Invasive Plant (AIP) Compliance Screening, Astron Depot, Buffalo City, Eastern Cape (ZA)	2022

- Alien Invasive Plant (AIP) Compliance Screening, Astron Depot, Gqeberha, Eastern Cape (ZA) 2022
- Rebels Vlei Riparian delineation, Kirkwood, Eastern Cape 2021
- Buck Kraal Dam Rehabilitation Plan Review, Addo, Eastern Cape 2020
- Rehabilitation Plan for Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- Green Star Rating Ecological Assessment for SANRAL office, Bay West City, NMB 2015
- Section 24G Assessment and Rehabilitation Plan for Bingo Farm, Eastern Cape 2014
- Mapping and Ecological services for Congo Agriculture, Republic of Congo 2013
- Rehabilitation Plan for Nieu Bethesda, Eastern Cape 2011
- Mapping of pipeline for Kenton Water Board, Eastern Cape 2010
- Rehabilitation Plan for N2 Upgrade - Coega to Colchester, NMB 2010
- Representative for landowner group for Seaview burial Park, NMB 2010
- Botanical Sensitivity Analysis for LSDF, Greenbushes-Hunters Retreat, NMB 2008
- Forestry Rehabilitation Assessment Report for Amahlathi Forest Rehabilitation, Eastern Cape 2007
- Botanical & Riparian Assessment for Orange River Weirs-Boegoeberg, Douglas Dam and Sendelingsdrif, Northern Cape 2006
- Botanical Assessment for State of the Environment Report for Chris Hani District Municipality SoER, Eastern Cape 2003

ROAD AND RAILWAY INFRASTRUCTURE PROJECTS

- Terrestrial Biodiversity Amendment for Transnet/Portnet CDC SEZ Mn Terminal 2023
- Terrestrial Biodiversity Assessment for Machani to Taleni SPS Access Road (SPM) 2022
- Terrestrial Biodiversity Assessment for Matonga to Mantlaneni Access Road (SPM) 2022
- Terrestrial Biodiversity Assessment for Newlyn Mn Terminal & conveyor (CDC IDZ), NMB 2021
- Ecological Assessment for CDC IDZ Mn Terminal, conveyor and railway line, NMB 2013
- Ecological Assessment Review for Penhoek Road widening, Eastern Cape 2012
- Ecological Assessment for R61 road widening, Eastern Cape 2012
- Botanical Assessment for Chelsea RD - Walker Drive Ext., NMB 2010
- Botanical Assessment for Motherwell - Blue Water Bay Road, NMB 2010
- Ecological Assessment for Port St John Road, Eastern Cape 2010
- Botanical Basic Assessment for Bholani Village Rd, Port St Johns, Eastern Cape 2009
- Botanical Report, EMP and Rehab Plan for Coega-Colchester N2 Upgrade, NMB 2009
- Botanical Assessment for Manganese Conveyor Screening Report, NMB 2008
- Ecological Assessment for Road Layout for Whiskey Creek- Kenton, Eastern Cape 2006

MINING PROJECTS

- Ecological Assessment for Bochum Borrow Pits, Limpopo 2013
- Ecological Assessment and Mining and Rehabilitation Plan for Greater Soutpansberg Mining Project, Limpopo (3 proposed Mines) 2013
- Ecological Assessment for Thulwe Road Borrow Pits, Limpopo 2013
- Ecological Assessment and Mining and Rehabilitation Plan for Baghana Mining, Ghana 2010
- Botanical Assessment for Zwartenbosch Quarry, Eastern Cape 2008
- Botanical description & map production for Quarry - Rudman Quarry, Eastern Cape 2008
- Botanical Basic Assessment, Rehab Plan & Maps for Borrow Pit - Rocklands/Patensie, Eastern Cape 2008
- Botanical Assessment & Maps for Sandman Sand Gravel Mine, Eastern Cape 2008
- Botanical Assessment & GIS maps for Shamwari Borrow Pit, Eastern Cape 2008
- Detailed Botanical Assessment, EMP and Rehab Plan for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo 2008
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit Humansdorp/Oyster Bay, Eastern Cape 2008

- Botanical Assessment, Rehab Plan & Maps for AWRM - Cala, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Camdeboo, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Somerset East, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Nkonkobe, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Ndlambe, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Blue Crane Route, Eastern Cape 2008
- Botanical Assessment, EMP and Rehabilitation Plan for AWRM - Cathcart, Eastern Cape 2008
- Botanical Assessment, GIS maps and Rehab Plan for Mthatha Prospecting, Eastern Cape 2008
- Regional Botanical Map for mining prospecting permit, Welkom 2008
- Botanical Assessment for Scoping Report and Detailed Botanical Assessment and Rehab Plan for Elitheni Coal Mine, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Oyster Bay, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Bathurst/GHT, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit – Jeffreys Bay, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Storms River/Kareedouw, Eastern Cape 2007
- Biophysical Assessment for Humansdorp Quarry, Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry-Cathcart & Somerset East, Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry - Despatch Quarry, NMB 2006
- GIS Mapping & Botanical Assessment and Rehab Plan for Quarry - JBay Crushers, Eastern Cape 2006
- Botanical Assessment, EMP and Rehabilitation Plan for Polokwane Silicon Smelter, Limpopo 2006
- Application for Mining Permit for Bruce Howarth Quarry, Eastern Cape 2006

POWERLINE INFRASTRUCTURE PROJECTS

- Terrestrial Biodiversity Assessment for Paulputs WEF Grid connection, Pofadder, NC (ZA) 2021
- Terrestrial Biodiversity Assessment for Komas WEF Grid connection, Kleinsee, NC (ZA) 2021
- Ecological Assessment: Dieprivier-Karreedouw 132kV Powerline realignment, Kouga LM 2016
- Eskom Ecological Walkdown: Dieprivier-Karreedouw 132 kV Powerline, Kouga LM 2016
- Eskom Solar one Ecological Walkdown: Nieuwehoop 400 kV powerline, NC 2015
- Rehabilitation Plan and Auditing for Grassridge-Poseidon Powerline Rehab, Eastern Cape 2013
- Ecological Assessment for Dieprivier Karreedouw 132kV Powerline, EC 2012
- Flora and Fauna search and Rescue plan for Van Stadens Windfarm Powerline, NMB 2012
- Botanical Assessment for Dedisa-Grassridge Powerline, EC 2010
- Ecological Assessment for Grahamstown-Kowie Powerline, EC 2010
- Species of Special Concern Mapping Transmission Line for San Souci to Nivens Drift 132kV powerline, NMB 2009
- Botanical Assessment for Eskom Powerline - Albany-Kowie, EC 2009
- Botanical Assessment for Eskom 132 kV Dedisa Grassridge Power line-Coega, NMB 2006
- Botanical Assessment for Eskom Power line – Tyalara-Wilo, Eastern Cape 2006
- Botanical Assessment for Steynsburg - Teebus 132 kV powerline, Eastern Cape 2004

PIPELINE INFRASTRUCTURE PROJECTS

- Terrestrial Biodiversity Assessment for Hewu Phase 9 Raw Water Pipeline to Sada WTW 2022
- Terrestrial Biodiversity Assessment for CHDM Ph 5 Nxamagele Reservoir & Pipeline (ZA) 2022
- Terrestrial Biodiversity Assessment for Thornhill Phase 2 Sanitation Link, Ndlambe, Eastern Cape 2020
- Botanical Assessment for Ngqamakhwe Regional Water Supply Scheme (Phase 3) 2018
- Ecological Assessment for Butterworth Emergency Bulk Water Supply Scheme 2017
- Ecological Assessment for Karringmelkspruit Emergency Bulk Water Supply (Lady Grey) 2017
- Ecological Assessment for Wanhoop-Willowmore Bulk Water Supply, Eastern Cape 2016

- Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 4) 2013
- Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5) 2013
- Detailed Ecological Assessment for Suikerbos Pipeline, Gauteng 2012
- Basic Botanical Assessment for Wanhoop farm pipeline, Eastern Cape 2010
- Basic Botanical Assessment for Chatty Sewer, NMB 2010
- Species of Special Concern Mapping for Seaview Pipeline, NMB 2009
- Species of Special Concern Mapping for Chelsea Bulk Water Pipeline, NMB 2009
- Map Production for Russell Rd Stormwater, NMB 2008
- Basic Botanical Assessment for Albany Pipeline, Eastern Cape 2008
- Environmental Risk Assessment for Elands River pipeline, Eastern Cape 2007
- Detailed Botanical Assessment for Motherwell Pipeline, NMB 2007
- Detailed Botanical Assessment, GIS maps for Erasmuskloof Pipeline, Eastern Cape 2007
- Botanical & Floristic Report for Hankey pipeline, Eastern Cape 2006
- Detailed Botanical Assessment for Port Alfred water pipeline, Eastern Cape 2004

GENERAL INFRASTRUCTURE DEVELOPMENT PROJECTS

- Ecological Assessment for Amalinda crossing, BCM, Eastern Cape 2019
- Ecological Assessment for Cookhouse Bridge rehabilitation and temporary deviation, Eastern Cape 2019
- Ecological Assessment for Nelson Mandela University Access Road, NMB 2019
- Botanical Assessment for Zachtevlei Dam (Lady Grey), Eastern Cape 2017
- Botanical Assessment for Gcebula River bridge (Peddie), Eastern Cape 2017
- Botanical Assessment for Kouga Dam wall upgrade, Eastern Cape 2012
- Botanical Assessment for Jansenville Cemetery, Eastern Cape 2009
- Botanical Assessment for Radar Mast construction for South African Weather Service – BCM & NMB 2008
- Botanical Assessment and GIS mapping for golf course realignment for East London Golf Course, BCM, Eastern Cape 2007
- Botanical Assessment for PE Airport Extention, NMB 2006
- Botanical Assessment for Kidd's Beach Desalination Plant, BCM, Eastern Cape 2006

HOUSING DEVELOPMENT PROJECTS

- Terrestrial Biodiversity Assessment for Erf 1820 Mthatha, KSDM, Eastern Cape 2020
- Ecological Assessment for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay 2019
- Ecological Assessment Portion 21-23 and 41 of Farm 807, Gonubie, Buffalo City 2019
- Ecological Assessment for Emerald Sky Housing Project, BCMM 2019
- Ecological Assessment for Erf 14, Kabega, Port Elizabeth 2017
- Ecological Assessment for Fairwest Rental Housing, Port Elizabeth 2017
- Ecological Assessment for Hankey Housing, Kouga District Municipality 2015
- Ecological Assessment for Lebowakgoma Housing, Limpopo 2013
- Ecological Assessment for Giyani Development, Limpopo 2013
- Ecological Assessment for Palmietfontein Development, Limpopo 2013
- Ecological Assessment for Seshego Development, Limpopo 2013
- Botanical Assessment for Sheerness Road, BCM, Eastern Cape 2013
- Ecological Assessment for Ethembeni Housing, NMB 2012
- Ecological Assessment for Pelana Housing, Limpopo 2012
- Flora Search and Rescue Plan for Kwanobuhle Housing, Western Cape 2011
- Botanical Assessment for The Crags 288/03, Western Cape 2010
- Ecological Assessment Revision Report for Fairview Housing, NMB 2010

- Botanical Assessment, EMP and Open Space Management Plan for Hornlee Housing Development, Western Cape 2010
- Botanical Assessment for Little Ladywood, Western Cape 2010
- Botanical Assessment and Open Space Management Plan for Motherwell NU31, NMB 2010
- Botanical Assessment and Open Space Management Plan for Plett 443/07, Western Cape 2010
- Botanical Assessment for Willow Tree Farm, NMB 2010
- Botanical Assessment for Kouga RDP Housing, Eastern Cape 2009
- Botanical Assessment for Fairview Erf 1226 (Wonderwonings), NMB 2009
- Species List Compilation for Zeekoerivier Humansdorp, Eastern Cape 2009
- Botanical Assessment for Woodlands Golf Estate (Farm 858), BCM, Eastern Cape 2009
- Botanical Assessment for Plettenberg Bay - 438/4, Western Cape 2009
- Vegetation Assessment for Kwanokuthula RDP housing project, Western Cape 2008
- Site screening assessment for Greenbushes Site screening, NMB 2008
- Botanical Assessment for Fairfax development, Eastern Cape 2008
- Botanical Assessment for Plettenberg Bay Brakkloof 50&51, Western Cape 2008
- Botanical Assessment, GIS mapping for Theescombe Erf 325, NMB 2008
- Site Screening for Mount Road, NMB 2008
- Botanical Assessment for Greenbushes Farm 40 Swinburne 404, NMB 2008
- Botanical Assessment for Greenbushes 130, NMB 2008
- Botanical Assessment for Greenbushes Kuyga no. 10, NMB 2008
- Botanical Assessment for Plettenberg Bay - 438/24, Western Cape 2007
- Botanical Assessment for Plettenberg Bay - Olive Hills 438/7, Western Cape 2007
- Botanical Assessment for Gonubie Portion 809/9, BCM, Eastern Cape 2006
- Botanical Assessment for Glengariff Farm 723, BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/10, BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/4 & 5, BCM, Eastern Cape 2006
- Botanical Assessment for Plettenberg bay - Ladywood 438/1&3, Western Cape 2006
- Botanical Assessment and Rehab Plan for Winterstrand Desalination Plant, BCM 2006
- Botanical Assessment for Bosch Hoogte, NMB 2006
- Botanical Assessment for Plettenberg bay Farm 444/38, Western Cape 2006
- Botanical Assessment for Plettenberg Bay - 444/27, Western Cape 2006
- Botanical Assessment for Leisure Homes, BCM, Eastern Cape 2006
- Botanical Basic Assessment for Trailees Wetland Assessment, Eastern Cape 2005
- Botanical Assessment and Rehab Plan for Arlington Racecourse - PE, NMB 2005
- Botanical Assessment for Smart Stone, NMB 2005
- Botanical Assessment for Peninsular Farm (Port Alfred), Eastern Cape 2005
- Botanical Assessment for Mount Pleasant - Bathurst, Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Erven 1617 & 1618 (Riverside), NMB 2005
- Basic Botanical Assessment for Parsonsvlei 3/4, Eastern Cape 2005
- Botanical Assessment for Bridgemead – Malabar PE, NMB 2004

AGRICULTURAL PROJECTS

- Preliminary Biodiversity Screening for Chrisdelina Ranch Agricultural Project, Kizenga District • 2020
- Ecological Assessment for Vermaak Boerdery Hydro Turbine (Cookhouse)2020 2020
- Thornhill Eggland Specialist Ecological Assessment 2020
- Ecological Assessment for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015
- Ecological Assessment for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery) 2014
- Ecological Assessment for Doornkraal Pivot (Hankey), Eastern Cape 2014
- Ecological Assessment for Tzaneen Chicken Farm, Limpopo 2013
- Botanical Assessment and Open Space Management Plan for Kudukloof, NMB 2010

- Botanical Assessment and Open Space Management Plan for Landros Veeplaats, NMB 2010
- Botanical Assessment and Flora Relocation Plan for Wildemans Plaas, NMB 2006

GOLF ESTATE AND RESORT DEVELOPMENT PROJECTS

- Species List& Comments Report for Kidds Beach Golf Course, BCM, Eastern Cape 2009
- Botanical Assessment for Plettenberg Bay -Farm 288/03, Western Cape 2009
- Botanical Assessment for Rockcliff Golf Course, BCM, Eastern Cape 2008
- Botanical Assessment for Rockcliff Resort Development, BCM, Eastern Cape 2007
- Botanical Assessment, EMP and Rehabilitation Plan for Tiffendel Ski Resort, Eastern Cape 2006

MIXED USE DEVELOPMENT PROJECTS

- Ecological Assessment for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018
- Botanical Assessment, EMP and Open Space Management Plan for Bay West City, NMB 2010
- Botanical Assessment, GIS maps, Open Space and Rehab Plans for Fairview Erf 1082, NMB 2009
- Botanical Assessment and GIS maps for Utopia Estate PE, NMB 2008
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Basic Assessment for Cuyler Manor (Farm 320), Uitenhage, NMB 2007

BUSINESS AND INDUSTRIAL DEVELOPMENT PROJECTS

- Ecological Assessment for Parsonsvlei Erf 984 & 1134 Parsonsvlei, NMB 2020
- Mthatha Retails and Service Center 2020
- Ecological Assessment for Walmer Erf 11667 - Bidfood Warehousing Development, NMB 2020
- Ecological Assessment for Portion 87 of the Farm Little Chelsea No 10, NMB 2020
- Ecological Assessment for Bay West City ENGEN Service Station, NMB 2015
- Ecological Assessment for Green Star grading for SANRAL, NMB 2014
- Ecological Assessment for OTGC Tank Farm, NMB 2012
- Botanical Assessment and Open Space Management Plan for Petro SA Refinery, Coega IDZ, NMB 2010
- Botanical Assessment for Bluewater Bay Erf 805, NMB 2009
- Ecological Assessment for Bay West City, NMB 2007
- Botanical Assessment for Kenton Petrol Station, Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Petrol Station, NMB 2005

ECO-ESTATE DEVELOPMENT PROJECTS

- Botanical Re-Assessment of Swanlake Eco Estate, Aston Bay, Eastern Cape 2018
- Detailed Botanical Assessment and Open Space Management Plan for Olive Hills, Western Cape 2010
- Botanical Assessment and EMP for Zwartenbosch Road, Eastern Cape 2010
- Botanical Assessment - Poultry Farm for Coega Kammaskloof Farm 191, NMB 2008
- Botanical Assessment - Housing development for Coega Ridge, NMB 2008
- Botanical Assessment, Rehabilitation Plan, EMP and GIS maps for Amanzi Estate, NMB, 2008
- Botanical Assessment for Roydon Game farm, Queenstown, Eastern Cape 2007
- Botanical Assessment for Winterstrand Estate (Farm 1008), BCM, Eastern Cape 2007
- Botanical Assessment for Homeleigh Farm 820, BCM, Eastern Cape 2007
- Botanical Basic Assessment, Rehab Plan & Maps for Candlewood, Tsitsikamma, Western Cape 2007
- Botanical Assessment, EMP and Rehab Plan for Carpe Diem Eco development, Eastern Cape 2007
- Botanical Assessment, EMP and Rehabilitation Plan for Seaview Eco-estate, NMB 2006

- Botanical Assessment for Kidd's Beach portion 1076, BCM, Eastern Cape 2006
- Botanical Assessment for Palm Springs, Kidds Beach East London, BCM, Eastern Cape 2006
- Botanical Assessment for Nahoon Farm 29082, BCM, Eastern Cape 2006
- Botanical Assessment for Rosehill Farm, Eastern Cape 2005
- Botanical Assessment for Resolution Game Farm, Eastern Cape 2005
- Botanical Assessment for Gonubie Portion 809/11, BCM, Eastern Cape 2005
- Botanical Assessment for Kidd's Beach portion 1075, BCM, Eastern Cape 2005

FLORA AND FAUNA RELOCATION PLANS, PERMITS AND IMPLEMENTATION

- Flora Search and Rescue for Nelson Mandela University Phase 2 & 3 Residences, Eastern Cape 2020
- Flora Search and Rescue for Fairwest Housing Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Utopia Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Citrus expansion on Boschkraal Citrus Farm, Sunland, Eastern Cape 2018
- Flora Search and Rescue for Wanhoop pipeline, Willowmore, Eastern Cape 2018
- Flora Search and Rescue for Wilgekloof pipeline, Willowmore, Eastern Cape 2018
- Flora Search and Rescue for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5) 2016
- Flora Search and Rescue for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery) 2016
- Flora Search and Rescue for Steytlerville Bulk Water Supply & WTW, Eastern Cape (Phase 4) 2015
- Flora and Fauna Search and Rescue for Riversbend Citrus Farm, NMB 2014
- Flora and Fauna Search and Rescue for Mainstream Windfarm, Eastern Cape 2013
- Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 1, 2 & 3) 2013
- Flora and Fauna Search and Rescue for OTGC Tank Farm, Coega IDZ, NMB 2013
- Flora and Fauna Search and Rescue for Jeffreys Bay School, Eastern Cape 2013
- Flora Search and Rescue Plan for Red Cap Wind Farm, Eastern Cape 2012
- Flora Relocation for Disco Poultry Farm, NMB 2010
- Flora Relocation for Mainstream Windfarm, Eastern Cape 2010

ENVIRONMENTAL MANAGEMENT PLANS

- Final Environmental Management Programme (EMPr) and Maintenance Management Plan for South End Precinct Mixed Use Zone, Nelson Mandala Bay Municipality 2020
- Final Environmental Management Programme (EMPr) for Coega Land-Based Aquaculture Development Zone (ADZ), Coega Industrial Development Zone (IDZ), Nelson Mandela Bay Municipality 2019
- Basic Botanical Assessment for Kromensee EMP (Jeffries Bay), Eastern Cape 2010
- Wetland Management Plan for NMB Portnet, NMB 2010
- Baseline Botanical Study, Vegetation mapping and EMP for Local Nature Reserve for Plettenberg Bay Lookout LNA, Western Cape 2009
- Biodiversity & Ecological Processes for Bathurst-Commonage, Eastern Cape 2006
- EMP for Kromensee EMP (Jeffries Bay), Eastern Cape 2006
- Floral Survey for Mbotyi Conservation Assessment, Eastern Cape 2005
- Identifying and Assessment on Aquatic Weeds for Pumba Private Game Reserve, Eastern Cape 2005

BASIC ASSESSMENT APPLICATION PROJECTS (DEDEAT)

- Basic Assessment Application for Parsonsvlei Erf 984 & 1134 Parsonsvlei 2020
- Construction of Deviation and Rehabilitation of Bridge along DR02481 road 2020
- Basic Assessment Application for Vermaak Boerdery Hydro Turbine (Cookhouse) 2020

- Basic Assessment Application for Walmer Erf 11667 Bidfood Warehousing Development 2020
- Basic Assessment Application for Portion 87 of the Farm Little Chelsea No 10 2020
- Basic Assessment Application for Nelson Mandela University Access Road, NMB 2019
- Basic Assessment, WULA and Borrow Pit/Quarry Mining Application, Clarkebury Rd, Idutywa 2019

- Basic Assessment Application for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay 2019
- Basic Assessment Application for Cookhouse Bridge rehabilitation and temporary deviation 2019
- Basic Assessment Application for Erf 14 Kabega, NMBM 2017
- Basic Assessment Application for Hankey Housing, Kouga District Municipality 2017
- Basic Assessment Application for Fairwest Rental Housing, Nelson Mandela Bay 2017
- Basic Assessment Application for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015
- Basic Assessment Application for Hankey Housing, Kouga District Municipality 2015
- Basic Assessment Application for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery) 2014
- Basic Assessment Application for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018

MINING PERMIT/ENVIRONMENTAL MANAGEMENT PROGRAMME APPLICATIONS (DMR)

- Mining BAR/EMP's for 24 Borrow Pits in 6 districts within the Eastern Cape– (SANRAL) 2019
- Mining BAR/EMP's for Ingquza Hill LM Borrow Pits – (SANRAL) 2018
- Mining BAR/EMP's for Baviaans LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Senqu LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Inkwanca (Enoch Mgijima) LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Sakhisizwe/Engcobo LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Raymond Mahlaba LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Camdeboo LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Elundini LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Emalahleni/Intsika Yethu LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Blue Crane Route & Camdeboo LM 12 Borrow Pits – (DoT) 2016
- Mining BAR/EMP's for Elundini LM 6 Borrow Pits (DoT) 2016
- Mining BAR/EMP's for Baviaans LM 6 Borrow Pits (DoT) 2016
- Mining BAR/EMP's for Kouga & Koukamma LM 12 Borrow Pits (DoT) 2016
- Mining BAR/EMP's for Sakhisizwe & Engcobo LM 12 Borrow Pits (DoT) 2016
- Mining BAR/EMP's for Senqu LM 12 Borrow Pits (DoT) 2016
- Mining BAR/EMP's for Nkonkobe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbhashe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbizana LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Senqu LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Elundini LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Ikwezi/Baviaans LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (Tarkastad) (DRPW) 2015
- Mining BAR/EMP's for Chris Hani DM Borrow Pits – Intsika Yethu and Emalahleni (DRPW) 2015
- Mining BAR/EMP's for Joe Gqabi DM Borrow Pits – Senqu (DRPW) 2015
- Mining BAR/EMP's for Makana/Ndlambe LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Amahlathi LM Borrow Pits – Amatole (DRPW) 2015
- Mining BAR/EMP's for Mbashe/Mqume LM Borrow Pits – Amatole (DRPW) 2015

- Mining BAR/EMP's for Sundays River Valley LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Kouga LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR02581 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08041, DR08247, DR08248 & DR08504 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08599, DR08601 & DR08570 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08235, DR08551 & DR08038 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08092, DR08093 & DR08649 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08090, DR08412, DR08425, DR08129, DR08109, DR08106, DR08104 & DR08099 – Matatiele (DRPW) 2014

ENVIRONMENTAL COMPLIANCE AUDITING

- Environmental Compliance Audit (Habata Boerdery) 2021
- Environmental Compliance Audit (Sontule Farm) 2021

ENVIRONMENTAL MANAGEMENT, AUDITING, COMPLIANCE AND MONITORING PROJECTS

- Environmental Auditing Services Construction (Intsomi Citrus) 2021
- Environmental Auditing Services Pre-construction and Construction (Rocky Coast Farm) 2021
- Environmental Auditing Services (Middledrift Breeder Facility) 2021
- Coega Aquaculture Development Zone Environmental Compliance and Monitoring for Construction (24 Months) 2020
- Construction of NMU West End Student Residences Phases 1 & 3 Environmental Control Office (30 Months) 2020
- Environmental Auditing and construction monitoring for construction of Phase 1 River Park (South End Precinct) 2020
- Waste Management License audit for Bedford Recycling project 2020
- Auditing for Construction of Fairwest Village Housing Project 2019
- Auditing for Construction of Utopia Estate monthly auditing 2019
- ECO for DRPW IRM Road Maintenance projects, Baviaans LM 2019
- ECO for DRPW IRM Road Maintenance projects, Senqu LM 2019
- ECO for DRPW IRM Road Maintenance projects, Kouga/Koukamma LM 2019
- ECO for DRPW IRM Road Maintenance projects, Sakhisizwe/Engcobo LM 2019
- ECO for DRPW IRM Road Maintenance projects, Elundini LM 2019
- ECO for DRPW IRM Road Maintenance projects, Emalahleni/Intsika Yethu LM 2019
- ECO for Construction of Fairwest Village Housing Project 2019
- ECO for Construction of Utopia Estate Mixed Use Project 2019
- ECO for Construction of NMU West End Student Residences Phases 1 & 3 2019
- ECO for Construction of Eco-Pullets pullet rearing facility, Paterson 2018
- ECO for DRPW IRM Road Maintenance projects, Raymond Mahlaba LM 2018
- ECO for DRPW IRM Road Maintenance projects, Inkwanca (Enoch Mgijima) LM 2018
- ECO for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery) 2017
- ECO for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- DEO for improvement of national route R67 section 5 from Whittlesea (km 0.00) to Swart Kei river (km 15.40) – Murray & Roberts 2017
- ECO for SANRAL RRP Road Maintenance projects, Mbizana LM 2017
- ECO and Botanical Specialist for the special maintenance of national route R61 Section 2 from Elinus Farm (km 42.2) to N10 (km 85.0) (SANRAL) 2016
- Environmental Control Officer (ECO): Construction of NSRI Slipway - Port Elizabeth Harbour 2016
- ECO for SANRAL RRP Road Maintenance projects, Mbashe LM 2016

- ECO for SANRAL RRP Road Maintenance projects, Nkonkobe LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Mbizana LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Senqu LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Elundini LM 2016
- ECO and Environmental Management for closure of Bushmans River Landfill site 2016
- ECO for DRPW IRM Road Maintenance projects, Amahlathi Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Makana/Ndlambe Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Mbashe/Mqume Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Port St Johns, Mbizana, Ingquza Hill LM's 2015
- ECO for Riversbend Citrus Farm, NMB 2014
- ECO for Alfred Nzo DM Road resurfacing - DR08071, DR08649, DR08092, DR08418, DR08452, DR08015, DR08085, DR08639 & DR08073, Eastern Cape - MSBA 2014
- ECO Audits for Koukamma Flood Damage Road Repairs – Hatch Goba 2014
- EMP and ECO for Utopia Estate, NMB 2013
- Final EMPr submission for Seaview Garden Estate, NMB 2012
- ECO audits for NMB Road surfacing, NMB (multiple contacts) 2011
- EMPr submission and ECO for Seaview Garden Estate, NMB 2010
- ECO for Mainstream Windfarm wind monitoring mast installation, Eastern Cape 2010
- EMP and ECO for Sinati Golf Estate EMP, BCM, Eastern Cape 2009
- Flora Relocation Plan and Permit application for Wildemans Plaas, NMB 2006

ENVIRONMENTAL SCREENING PROJECTS

- Somerset East Stormwater Environmental Screening Report 2021
- Woodlands Diary Road Upgrade Environmental Screening Report, Kouga LM 2021
- Risk Assessment and Screening for proposed Heatherbank access road, NMB 2020
- Environmental Screening Report for Proposed Life Hospital parking expansion, NMB 2019
- Environmental Screening Report for Erf 984 & 1134 development, Parsonsvlei, NMB 2019
- Environmental Screening Report for proposed Khayalethu School, Buffalo City 2018
- Environmental Screening Report for Proposed Housing Development of Erf 8700, Kabega Park, NMB 2017
- Environmental Screening Report for Proposed Housing Development of Erf 14, Kabega Park, NMB 2017
- Environmental Screening Report for Proposed Fairwest Social Housing project, Fairview, NMB 2016
- Environmental Screening Report for Development of Little Chelsea No 25, NMB 2016
- Terrestrial Vegetation Risk Assessment for proposed Skietnek Citrus Farm development (Kirkwood) 2015
- Preliminary Environmental Risk Assessment: NSRI Slipway Port Elizabeth 2015
- Environmental Screening Report for Proposed Development of a Dwelling on Erf 899, Theescombe 2015
- Environmental Screening Report for Proposed Development on Erf 559, Walmer, Port Elizabeth 2015
- Environmental Screening Report for Proposed Housing Scheme Development of Erf 8709, Wells Estate 2015
- Environmental Screening Report for Development of Portion 10 of Little Chelsea No 87, NMB 2015

SECTION 24G APPLICATIONS

- 12 000 ML Dam constructed on farm 960, Patensie (MGM Trust) 2015
- Illegal clearing of 20 Ha of lands on Hitgeheim Farm, Sunland, Eastern Cape 2015

CONFERENCES AND PUBLICATIONS

- Pote, J., Shackleton, C.M., Cocks, M. & Lubke, R. 2006. *Fuelwood harvesting and selection in Valley Thicket*, South Africa. Journal of Arid Environments, 67: 270-287.
- Pote, J., Cocks, M., Dold, T., Lubke, R.A. and Shackleton, C. 2004. *The homegarden cultivation of indigenous medicinal plants in the Eastern Cape*. Indigenous Plant Use Forum, 5 - 8 July 2004, Augsburg Agricultural School, Clanwilliam, Western Cape.
- Pote, J. & Lubke, R.A. 2003. *The selection of indigenous species suitable for use as fuelwood and building materials as a replacement of invasive species that are currently used by the under-privileged in the Grahamstown commonage*. Working for Water Inaugural Research Symposium 19 - 21 August 2003, Kirstenbosch. Poster presentation.
- Pote, J. & Lubke, R.A. 2003. *The screening of indigenous pioneer species for use as a substitute cover crop for rehabilitation after removal of woody alien species by WfW in the grassy fynbos biome in the Eastern Cape*. Working for Water Inaugural Research Symposium 19 - 21 August 2003, Kirstenbosch, South Africa.

OTHER RESEARCH EXPERIENCE

- Resource assessment of bark stripped trees in indigenous forests in Weza/Kokstad area (June 2000; Dr C. Geldenhuis & Mr. M. Kaplin).
- Working for Water research project for indigenous trees for woodlots (December 2000/January 2001; Prof R.A. Lubke, Rhodes University).
- Project coordinator and leader of the REFYN project – A BP conservation gold award: Conservation and Restoration of Grassy-Fynbos. A multidisciplinary project focusing on management, restoration and public awareness/education (2001 – 2002).
- Conservation Project Management Training Workshops: Royal Geographical Society, London 2001 – Fieldwork Techniques, Habitat Assessment, Biological Surveys, Project Planning, Public Relations and Communications, Risk Assessment, Conservation Education
- Selection and availability of wood in Crossroads village, Eastern Cape, South Africa. Honours Research Project 2002. Supervisors: Prof. R.A. Lubke & Prof. C. Shackleton.
- Floral Morphology, Pollination and Reproduction in Cyphia (LOBELIACEAE). Honours Research Project 2002. Supervisor: Mr. P. Phillipson.
- Forestry resource assessment of bark-stripped species in Amatola District (December 2002; Prof R.A. Lubke).
- Homegarden Cultivation of Medicinal Plants in the Amathole area. Postgraduate Research Project (2003-2005; Prof R.A. Lubke, Prof C.M. Shackleton and Ms C.M., Cocks).

8.8 Appendix H: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity

SCOPE

The protocol (*Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020)*) provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation.

The protocol (*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*), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.

These protocols replace the requirements of Appendix 6 of the Environmental Impact Assessment Regulation16.

The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (https://screening.environment.gov.za/screeningtool). The requirements for terrestrial biodiversity are for landscapes or sites which support various levels of biodiversity. The relevant terrestrial biodiversity data in the screening tool has been provided by the South African National Biodiversity Institute17.

SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking a site sensitivity verification.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken using:
   a. a desk top analysis, using satellite imagery,
   b. a preliminary on-site inspection; and
   c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
   a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.
   b. contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and
   c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

16 The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act 107 of 1998).

17 The biodiversity dataset has been provided by the South African National Biodiversity Institute (for details of the dataset, click on the options button to the right of the various biodiversity layers on ther screening tool).

TERRESTRIAL BIODIVERSITY SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being "very high sensitivity" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment.	✓
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being 'low sensitivity' for terrestrial biodiversity, must submit a Terrestrial Biodiversity Compliance Statement.	✓
1.3	However, where the information gathered from the site sensitivity verification differs from the designation of 'very high' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.	✓
1.4	Similarly, where the information gathered from the site sensitivity verification differs from that identified as having a 'low' terrestrial biodiversity sensitivity on the screening tool, a Terrestrial Biodiversity Specialist Assessment must be conducted.	✓
1.5	If any part of the proposed development footprint falls within an area of 'very high' sensitivity, the assessment and reporting requirements prescribed for the 'very high' sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.	✓
	VERY HIGH SENSITIVITY RATING for terrestrial biodiversity features	
2	Terrestrial Biodiversity Specialist Assessment	
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.	✓
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	✓
2.3	The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:	✓
2.3.1	a description of the ecological drivers or processes of the system and how the proposed development with impact these;	✓
2.3.2	ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	✓
2.3.3	the ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
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);	✓
2.3.5	a description of terrestrial biodiversity and ecosystems on the preferred site, including:	✓
(a)	main vegetation types;	✓
(b)	threatened ecosystems, including fisted ecosystems as well as locally important habitat types identified;	✓
(c)	ecological connectivity, habitat fragmentation, ecological processes and fine- scale habitats; and	✓
(d)	species, distribution, important habitats (e.g., feeding grounds, nesting sites, etc.) and movement patterns identified;	✓
2.3.6	the assessment must identify any alternative development footprints within the preferred site which would be of 'low' sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	✓
2.3.7	the assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:	✓
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 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;	✓
2.3.7.2	terrestrial ecological support areas (ESAs), including:	✓
(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;	✓
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;	✓
2.3.7.4	priority areas for protected area expansion, including-	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
(a)	the way in which in which the proposed development will compromise or contribute to the expansion of the protected area I network;	✓
2.3.7.5	Strategic Water Source Areas (SWSAs) including:	✓
(a)	the impact(s) on the terrestrial habitat of 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),	✓
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;	✓
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.	✓
2.4	The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report	✓
3	Terrestrial Biodiversity Specialist Assessment Report	
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:	✓
3.1.1	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
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,	✓
3.1.4	description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modeling used, where relevant;	✓
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;	✓
3.1.6	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	✓
3.1.7	additional environmental impacts expected from the proposed development;	✓
3.1.8	any direct, indirect, and cumulative impacts of the proposed development;	✓
3.1.9	the degree to which impacts, and risks can be mitigated;	✓
3.1.10	the degree to which the impacts and risks can be reversed;	✓
3.1.11	the degree to which the impacts and risks can cause loss of irreplaceable resources;	✓
3.1.12	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr),	✓
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,	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
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 a not; and	✓
3.1.15	any conditions to which this statement is subjected.	✓
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	✓
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
	LOW SENSITIVITY RATING – for terrestrial biodiversity features	
4	Terrestrial Biodiversity Compliance Statement	✓
4.1	The compliance statement must be prepared by a specialist registered with the SACNASP and having expertise in the field of ecological sciences.	✓
4.2	The compliance statement must:	✓
4.2.1	be applicable to the preferred site and proposed development footprint;	✓
4.2.2	confirm that the site is of 'low' sensitivity for terrestrial biodiversity; and	✓
4.2.3	indicate whether or not the proposed development will have any impact on the biodiversity feature.	✓
4.3	The compliance statement must contain, as a minimum, the following information:	✓
4.3.1	the contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
4.3.2	a signed statement of independence by the specialist;	✓
4.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
4.3.4	a baseline profile description of biodiversity and ecosystems of the site;	✓
4.3.5	the methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modeling used, where relevant;	✓
4.3.6	in the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures propped, the land can be returned to the current state within two years of completion of the construction phase;	✓
4.3.7	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	✓
4.3.8	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓
4.3.9	any conditions to which this statement is subjected.	✓
4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓

ANIMAL SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "very high" or "high" sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Specialist Assessment Report.	✓
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "medium sensitivity" for terrestrial animal species must submit either a Terrestrial Animal Species Specialist Assessment Report or a Terrestrial Animal Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4.	✓
1.3	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "low" sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Compliance Statement.	✓
1.4	Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" or "high", for terrestrial animal species sensitivity and it is found to be of a "low" sensitivity, then a Terrestrial Animal Species Compliance Statement must be submitted.	✓
1.5	Where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" terrestrial animal species sensitivity and it is found to be of a "very high" or "high" terrestrial animal species sensitivity, a Terrestrial Animal Species Specialist Assessment must be conducted.	✓
1.6	If any part of the development falls within an area of confirmed "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol means, the area on which the proposed development will take place and includes the area that will be disturbed or impacted.	✓
1.7	The Terrestrial Animal Species Specialist Assessment and the Terrestrial Animal Species Compliance Statement must be undertaken within the study area.	✓
1.8	Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.	✓
1.9	Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline18, and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial animal species	

18 Available at https://bgis.sanbi.org/

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
2	Terrestrial Animal Species Specialist Assessment	✓
	VERY HIGH SENSITIVITY RATING Critical habitat for range-restricted species19 of conservation concern, that have a global range of less than 10 km2. SCC listed on the IUCN Red List of Threatened Species20 or on South Africa's National Red List website21 as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare. Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable for SCC. **HIGH SENSITIVITY RATING** Confirmed habitat for SCC. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.	✓
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with a field of practical experience relevant to the taxonomic group ("taxa") for which the assessment is being undertaken.	✓
2.2	The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline22; and must:	✓
2.2.1	identify the SCC which were found, observed or are likely to occur within the study area;	✓
2.2.2	provide evidence (photographs or sound recordings) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility23, immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	✓
2.2.3	identify the distribution, location, viability24 and provide a detailed description of population size of the SCC, identified within the study area;	✓
2.2.4	identify the nature and the extent of the potential impact of the proposed development on the population of the SCC located within the study area;	✓
2.2.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national	✓

19 Species with a geographically restricted area of distribution.
20 https://www.iucnredlist.org/
21 This category includes the categories Extremely Rare, Critically Rare, and Rare
22 Available at https://bgis.sanbi.org/
23 The preferred platform is iNaturalist.org but any other national or international virtual museum.
24 the ability to survive and reproduce in the long term.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	and international databases, including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	
2.2.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area;	✓
2.2.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, include a motivation for the deviation;	✓
2.2.8	identify any dynamic ecological processes occurring within the broader landscape that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;	✓
2.2.9	identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;	✓
2.2.10	determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;	✓
2.2.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species25; or roosting and breeding or foraging areas used by migratory species where these species show significant congregations, occurring in the vicinity; and	✓
2.2.12	identify any alternative development footprints within the preferred site which would be of "low" or "medium" sensitivity as identified by the screening tool and verified through the site sensitivity verification.	✓
2.3	The findings of the assessment must be written up in a Terrestrial Animal Species Specialist Assessment Report.	✓
3	Terrestrial Animal Species Specialist Assessment Report	✓
3.1	This report must include as a minimum the following information:	✓
3.1.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
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;	✓
3.1.4	a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	✓
3.1.5	a description of the mean density of observations/number of sample sites per unit area26 and the site inspection observations;	✓

25 Undescribed species are to be assessed as "High Sensitivity".
26 Species Environmental Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓
3.1.7	details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported27;	✓
3.1.8	the online database name, hyperlink, and record accession numbers for disseminated evidence of SCC found within the study area;	✓
3.1.9	the location of areas not suitable for development and to be avoided during construction where relevant;	✓
3.1.10	a discussion on the cumulative impacts;	✓
3.1.11	impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✓
3.1.12	a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	✓
3.1.13	a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above that were identified as having "low" or "medium" terrestrial animal species sensitivity and were not considered appropriate.	✓
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
4	MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION	
	MEDIUM SENSITIVITY RATING – for terrestrial animal species: Suspected habitat for SCC based either on historical records (prior to 2002) or being a natural area included in a habitat suitability model for this species28. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	✓
4.1	Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 or is based on habitat suitability modelling.	✓
4.2	The presence or likely presence of the SCC identified by the screening tool must be investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.	✓
4.3	The assessment must be undertaken within the study area.	✓

27 The actual name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as a sensitive plant or animal and its IUCN extinction risk category should be included e.g., Critically Endangered sensitive plant or Endangered sensitive butterfly.
28 The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
4.4	The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guidelines.	✓
4.5	The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC identified within the site identified as "medium" sensitivity by the screening tool.	✓
4.6	Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Animal Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Animal Species Compliance Statement must be submitted.	✓
5	LOW SENSITIVITY RATING – for terrestrial animal species	
	Terrestrial Animal Species Compliance Statement Areas where no natural habitat remains. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of "low" sensitivity for terrestrial animal species; and	✓
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement29 must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	the mean density of observations/ number of samples sites per unit area.	✓
5.3.6	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.7	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓

29 An example of a what is contained in a Compliance Statement for Animal Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
6	A signed copy of the Terrestrial Animal Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✓

PLANT SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "very high" or "high" sensitivity for terrestrial plant species must submit a Terrestrial Plant Species Specialist Assessment Report.	✓
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "medium sensitivity" for terrestrial plant species must submit either a Terrestrial Plant Species Specialist Assessment Report or a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4.	✓
1.3	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "low" sensitivity for terrestrial plant species must submit a Terrestrial Plant Species Compliance Statement.	✓
1.4	Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" or "high", for terrestrial plant species sensitivity and it is found to be of a "low" sensitivity, then a Terrestrial Plant Species Compliance Statement must be submitted.	✓
1.5	Where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" terrestrial plant species sensitivity and it is found to be of a "very high" or "high" terrestrial plant species sensitivity, a Terrestrial Plant Species Specialist Assessment must be conducted.	✓
1.6	If any part of the development falls within an area of confirmed "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol means, the area on which the proposed development will take place and includes the area that will be disturbed or impacted.	✓
1.7	The Terrestrial Plant Species Specialist Assessment and the Terrestrial Plant Species Compliance Statement must be undertaken within the study area.	✓
1.8	Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.	✓
1.9	Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	Environmental Assessment Guideline30, and the study area must include the PAOI, as determined.	
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial plant species	
2	Terrestrial Plant Species Specialist Assessment	✓
	VERY HIGH SENSITIVITY RATING Critical habitat for range-restricted species31 of conservation concern, that have a global range of less than 10 km2. SCC listed on the IUCN Red List of Threatened Species32 or on South Africa's National Red List website33 as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare. Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable for SCC. **HIGH SENSITIVITY RATING** Confirmed habitat for SCC. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.	✓
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with a field of practical experience relevant to the taxonomic group ("taxa") for which the assessment is being undertaken.	✓
2.2	The assessment must be undertaken within the study area.	✓
2.3	The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline34; and must:	✓
2.3.1	Identify the SCC which were found, observed or are likely to occur within the study area;	✓
2.3.2	provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility35, immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	✓
2.3.3	identify the distribution, location, viability36 and provide a detailed description of population size of the SCC, identified within the study area;	✓

30 Available at https://bgis.sanbi.org/
31 Species with a geographically restricted area of distribution.
32 https://www.iucnredlist.org/
33 This category includes the categories Extremely Rare, Critically Rare, and Rare
34 Available at https://bgis.sanbi.org/
35 The preferred platform is iNaturalist.org but any other national or international virtual museum.
36 the ability to survive and reproduce in the long term.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
2.3.4	identify the nature and the extent of the potential impact of the proposed development on the population of the SCC located within the study area;	✓
2.3.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases, including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	✓
2.3.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area;	✓
2.3.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, include a motivation for the deviation;	✓
2.3.8	identify any dynamic ecological processes occurring within the broader landscape that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;	✓
2.3.9	identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;	✓
2.3.10	determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;	✓
2.3.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species37;	✓
2.3.12	identify any alternative development footprints within the preferred site which would be of "low" or "medium" sensitivity as identified by the screening tool and verified through the site sensitivity verification.	✓
2.4	The findings of the assessment must be written up in a Terrestrial Plant Species Specialist Assessment Report.	✓
3	Terrestrial Plant Species Specialist Assessment Report	✓
3.1	This report must include as a minimum the following information:	✓
3.1.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
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;	✓
3.1.4	a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	✓
3.1.5	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓

37 Undescribed species are to be assessed as "High Sensitivity".

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.6	a description of the mean density of observations/number of sample sites per unit area38 and the site inspection observations;	✓
3.1.7	details of all SCC found or suspected to occur on site, ensuring sensitive species39 are appropriately reported;	✓
3.1.8	the online database name, hyperlink, and record accession numbers for disseminated evidence of SCC found within the study area;	✓
3.1.9	the location of areas not suitable for development and to be avoided during construction where relevant;	✓
3.1.10	a discussion on the cumulative impacts;	✓
3.1.11	impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✓
3.1.12	a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	✓
3.1.13	a motivation must be provided if there were any development footprints identified as per paragraph 2.3.12 above that were identified as having "low" or "medium" terrestrial plant species sensitivity and were not considered appropriate.	✓
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
4	MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION	
	MEDIUM SENSITIVITY RATING – for terrestrial plant species: Suspected habitat for SCC based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat suitability model40. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	✓
4.1	Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 or is based on habitat suitability modelling.	✓
4.2	The presence or likely presence of the SCC identified by the screening tool must be investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.	✓

38 Species Environmental Assessment Guideline
39 The actual name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as a sensitive plant or animal and its IUCN extinction risk category should be included e.g., Critically Endangered sensitive plant or Endangered sensitive butterfly.
40 The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
4.3	The assessment must be undertaken within the study area.	✓
4.4	The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guidelines.	✓
4.5	The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC identified within the site identified as "medium" sensitivity by the screening tool.	✓
4.6	Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted.	✓
5	LOW SENSITIVITY RATING – for terrestrial plant species	
	Terrestrial Plant Species Compliance Statement Areas where no natural habitat remains. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of "low" sensitivity for terrestrial plant species; and	✓
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement41 must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓

41 An example of a what is contained in a Compliance Statement for Plant Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
5.3.7	the mean density of observations/ number of samples sites per unit area42; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓
6	A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✓

42 Refer to the Species Environmental Assessment Guideline

8.9 Appendix I: Site Sensitivity Verification Report

8.9.1 Purpose of Report

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 the Act, when applying for Environmental Authorisation*", as published on 20 March, 2020 in National Gazette, No. 43110 in terms of NEMA (Act 107 of 1998) sections 24(5)(a), (h) and 44, lists protocols and minimum report requirements for environmental impacts on terrestrial biodiversity and provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation. The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the National web based Environmental Screening Tool. Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a **site sensitivity verification**, which must include the following.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken through the use of:
    a. a desk top analysis, using satellite imagery.
    b. a preliminary on -site inspection; and
    c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
    a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool.
    b. contains a motivation and evidence of either the verified or different use of the land and environmental sensitivity; and
    c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The National Web Based Screening Tool was used to generate the potential environmental sensitivity of the site which has then been compared to various online and other databases and information sources in order to verify and confirm the validity of the screening tool findings. This was further supported with on-site observations and analysis of most recent aerial photography.

This terrestrial biodiversity site verification has been undertaken as per the requirements 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 the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

8.9.2 Data sources and references

Data sources that were utilised for this report include the following:

- National (DFFE) Web Based Screening Tool – to generate the sites potential environmental sensitivity.
- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019) – description of vegetation types, species (including endemic) and vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinance (P.N.C.O). NEM:BA Threatened or Protected Species (ToPS).
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI.)
- International Union for Conservation of Nature (IUCN) - Red List of Threatened Species.
- Animal Demography Unit Virtual Museum (VM) – potential faunal species.

- Global Biodiversity Information Facility (GBIF) – potential faunal species.
- Southern African Bird Atlas Project 2 (SABAP2) – for bird species records.
- National Red Books and Lists - mammals, reptiles, frogs, dragonflies & butterflies.
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) - important catchments.
- National Protected Areas Expansion Strategy (NPAES, 2018) and South Africa Protected Area database (2020) – protected area information.
- Bioregional Planning: Northwest Biodiversity Sector Plan (2015).
- Critical Biodiversity Areas of the Northern Cape (2016) – Bioregional Plan.
- SANBI BGIS – All other biodiversity GIS datasets.
- Aerial Imagery – Google Earth, ESRI, Chief Surveyor General (http://csg.dla.gov.za).
- Cadastral and other topographical country data - Chief Surveyor General (http://csg.dla.gov.za).
- Other sources include peer-reviewed journals, regional and local assessments, and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

8.9.3 Site visit

A preliminary site visit for screening and site verification was conducted on 22 March 2024, during autumn/late summer. A follow up mid-summer and late summer site visit is proposed for the assessment phase and for the purposes of this application, the site visit programme is deemed to be adequate. The site visit and assessment were undertaken by Mr Jamie Pote, SACNASP registered ecological scientist with a BSc (Hons) degree in Botany and a BSc degree in Botany and environmental Science.

8.9.4 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- No assessment has been made of aquatic aspects relating to any wetlands, pans and rivers/seeps and/or estuaries outside of the scope of a terrestrial biodiversity report and have been undertaken by an aquatic specialist.
- Any flora & fauna surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times.
- As far as possible, site collected data has been supplemented with desktop and database-centred distribution data as well as previous studies undertaken in the area.

8.9.5 Site and Activity Description

The proposed project consists of an area comprised of a single farm portion of about 860 Ha in extent, with additional farm portions associated with the proposed grid connection options. The site is situated in a flat to gently undulating arid landscape, supporting a dry Thornveld vegetation, typical and widespread in the area. The broader landscape is bisected by occasional non-perennial watercourses. Stock farming with some cultivation is prevalent in the surrounding area, and levels of transformation relating to this are low to moderate. The PV area includes an area of approximately 860 Ha, which will be utilised for the proposed PV facility, with additional adjacent farm portions potentially being traversed by grid connection infrastructure. The proposed PV facility will be situated within intact and degraded Thornveld, as well as cleared areas and existing or old lands.

8.9.6 National Environmental Screening Tool

National Environmental Screening Tool (NEST) flagged sensitivities are summarised below and assessed in more detail in the report.

- Terrestrial Biodiversity is Very High across the entire site (Figure 61).
- Plant species sensitivity is Medium & Low (Figure 62).
- Animal Species sensitivity is Medium (Figure 63).
- Aquatic Sensitivity is Low & Very High (Figure 64).

Figure 61: Terrestrial Biodiversity Sensitivity.

Figure 62: Plant Species Sensitivity.

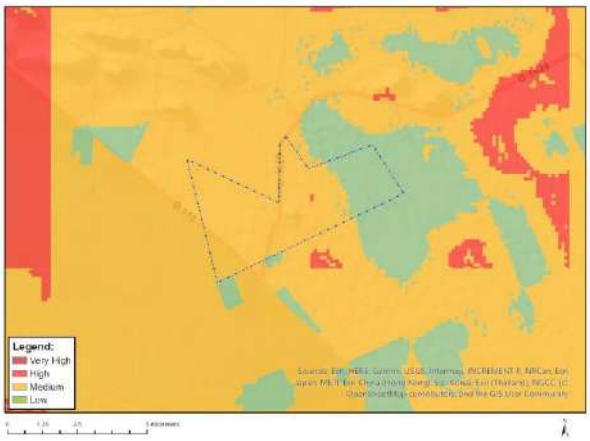


Figure 63: Animal Species Sensitivity.

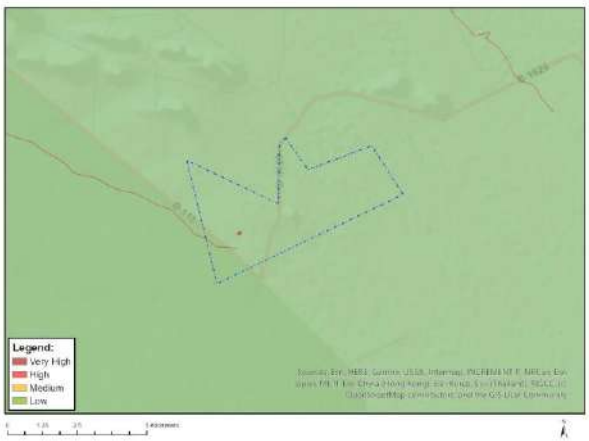


Figure 64: Aquatic Sensitivity.

Table 13: Summary of Screening Tool flagged sensitivities.

SENSITIVITY	FEATURE(S) IN PROXIMITY
Terrestrial Sensitivity	
Very High	CBA 2, ESA 2
High	None
Medium	None
Plant Sensitivity	
Very High	None
High	None
Medium	Sensitive species 1259
Low	Present
Animal Sensitivity	
Very High	None
High	*Polemaetus bellicosus*

SENSITIVITY	FEATURE(S) IN PROXIMITY
Medium	*Aquila rapax* (bird), *Sensitive species 5, Lycaon pictus* (Mammals)
Aquatic Sensitivity	
Very High	Rivers (C), Wetlands (Central Bushveld Bioregion, Depression))
High	None
Medium	None
Low	Present

- Elevated sensitivity biodiversity indicators and designations including CBA 2 for most of the site, with ESA 2 in transformed/degraded areas.
- Flagged sensitive species limited to a two faunal species (Sensitive Species 5 & African Wild Dog) flagged most likely due to confirmed presence in the broader surrounding area.
- Limited aquatic features also present, designated as very high sensitivity. These are generally localised along watercourses and wetlands (probably farm dams).

NOTE: as per point 1.5 of the Terrestrial Biodiversity Specialist Assessment and Minimum Report Content Requirements:
'If any part of the proposed development footprint falls within an area of 'very high' sensitivity, the assessment and reporting requirements prescribed for the 'very high' sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.'

The site assessment will physically screen for the presence of the listed, and other possible species or sensitivities that are not identified in the screening tool. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

8.9.7 Findings, Outcomes and Recommendations

Terrestrial Biodiversity

Terrestrial Biodiversity sensitivities are summarised in Table 14 and depicted in Figure 65. Designated Critical Biodiversity Area and/or Ecological Support Areas intersect with the site or project area, to be assessed during the assessment phase.

Table 14: Terrestrial Biodiversity Features.

Feature		COMMENT
Critical Biodiversity Area	Present	Present (CBA 2) but not deemed irreplaceable as vegetation unit is widespread and not under threat.
Ecological Support Area	Present	Small area present (ESA 2) but not deemed irreplaceable as vegetation unit is widespread and not under threat.

Plant Species (Flora)

National Environmental Screening Tool flagged a single flora species. Further assessment will be conducted during the assessment phase, but no species that was not flagged were observed during the site verification.

A single Flora Species of Conservation Concern (SCC) is flagged, Sensitive species 1259, having an Endangered status. Preliminary investigations and the site verification did not identify the species however, seasonal timing will play a significant role in visibility of this species and will be subject to more detailed seasonal survey. The site falls within the distribution range of this species, which occurs within *Dwaalboom Thornveld* in a limited area between Ramotswa in the west and Dwaalboom in the east, although it may extend into Botswana. Preliminary distribution records indicate that there are two sub populations, one near Dwaalboom and the other near Ramotswa, but it is unknown whether it is present in the area between without comprehensive survey. A detailed flora survey, likely comprising multi season sampling would be required to confirm presence/absence of this species, but there is a likelihood that it will occur. The current Endangered status is based on a very limited distribution, if it was found to occur and be common on the site, this would in principle mean that the species would potentially have a lower status than currently designated. Original collection record indicates known only from the type locality found *near Lekker-lach in the Marico district of Transvaal in 1940 (described in 1943)' on a stony mountain slope in grassveld.* There does appear to be some discrepancy regarding exact locality. Species within this group are notoriously difficult to locate and are often highly seasonal.

The risk of flora species is thus not likely to be significant. No additional flora species are flagged or were identified.

Table 15: Summary of flora species status and potential risk.

Sensitivity	Species	Common Name	Status	Comment/Habitat
Medium	Sensitive species 1259	Apocynaceae	Endangered	The site falls within the distribution range of this species, which occurs within Dwaalboom Thornveld in a limited range between Ramotswa in the west and Dwaalboom in the east, although it may extend into Botswana. Site visit undertaken during December 2024 was unable to locate any of the species on site.

Animal Species (Fauna)

Two mammal species are also flagged, the Sensitive Species 5 and the African Wild Dog. (see Table 16 & Figure 65 for distribution map). The sensitive species flags for these two mammal species are likely due to records in the broader area. Sensitive Species 5 may be a transient visitor, but habitat is plentiful, and they would generally require extensive habitat in a natural setting African Wild Dog is unlikely to be present, being generally confirmed to protected areas and surrounds. Based on distribution records, it would appear that the species are generally isolated to protected areas, and while the site is potentially within the home range of the species, the likelihood of occurrence and any populations is low due to conflict with livestock farming and also urban settlement to the east. Nearest known records for this species in the vegetation unit (or other records) are more than 30 km to the west and east of the site. There are thus no records of the species within 30 km of the site, which does not necessarily preclude it potentially being present as a transient visitor but does suggest that the risk is low. Avifaunal species (*Aquila rapax* –Tawny Eagle & *Polemaetus bellicosus* - Martial Eagle) are subject to a separate assessment.

Table 16: Summary of fauna species status and potential risk.

Sensitivity	Species	Common Name	Status	Comment/Habitat
Medium	*Aquila rapax (bird)*	Tawny eagle	En (SA) LC (Intl)	Widespread occurrence, distribution records presence in the area. Refer to Avifaunal assessment.
Medium	Sensitive species 5		Vulnerable	Within distribution range. Likely to have occasional transient visits from adjacent areas, as the site will be within the foraging range of this species. The species would in any event be in conflict with current land use for livestock breeding. Site development not likely to significantly affect the species as suitable habitat is plentiful in the surrounding area including several nature reserves.
Medium	*Lycaon pictus*	African Wild Dog	Endangered	Within distribution range. Landowner indicated it is not present; however, the site is in principle within the foraging range of current distribution, however it is not likely to occur as in any event it would be in conflict with current land use (stock farming).

The risk of faunal species is thus not likely to be significant. No additional fauna species are flagged or were identified.

Aquatic

Wetland and River features are present in the broader area, and flagged sensitivities overlap with the site. To be assessed by separate aquatic specialist assessment, habitat will likely be avoided and risk to terrestrial biodiversity related aspects of aquatic features is negligible.

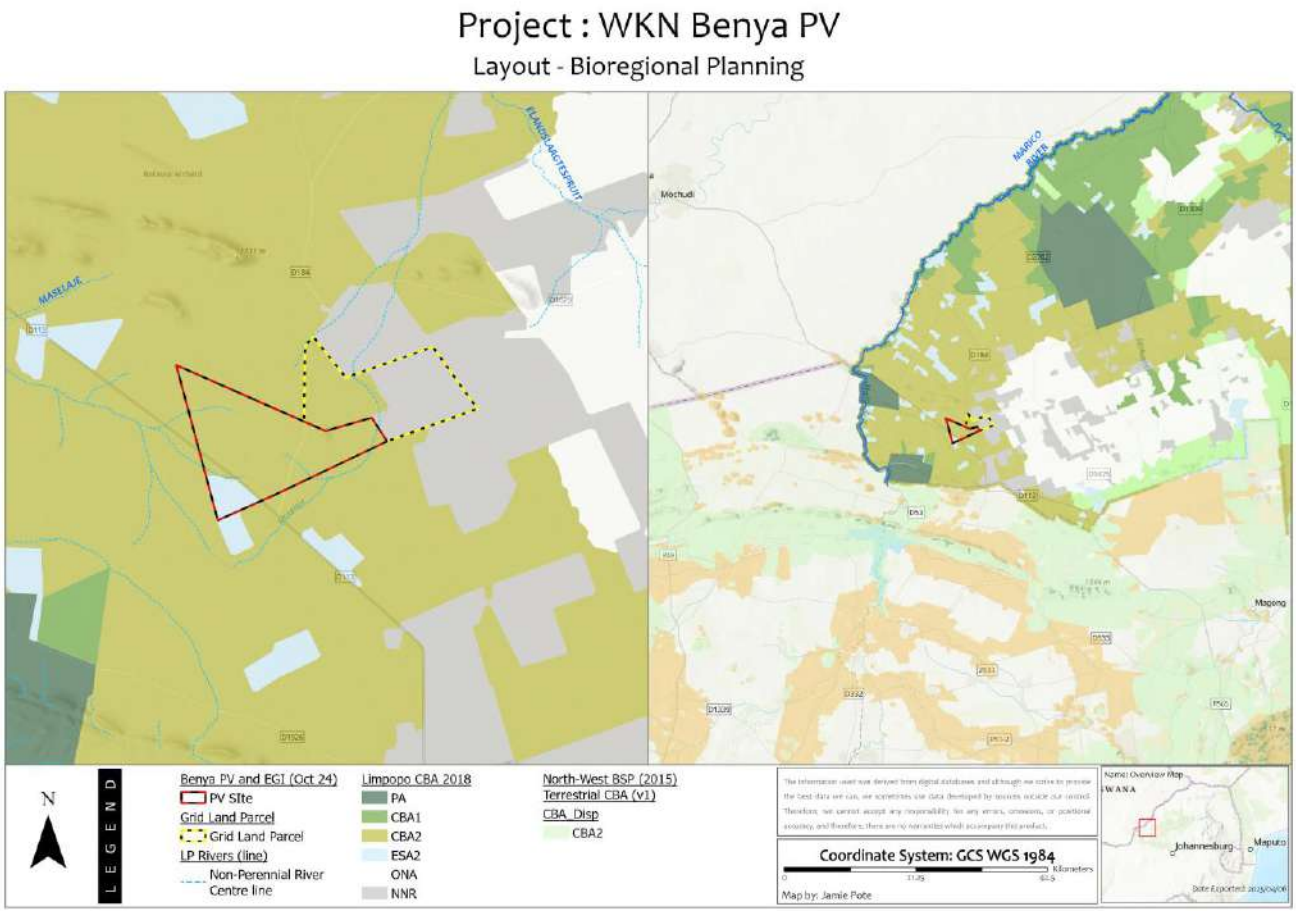


Figure 65: Map indicating North-West Conservation Plan (NW BSP, 2015) and Rivers and Wetlands.

8.9.8 Conclusions

The site verification confirms that the site is designated terrestrial biodiversity Critical Biodiversity 2 and Ecological Support Area 2, associated with broader landscape level ecological processes and conservation priorities of the affected vegetation units. However, since the represented vegetation unit is not under threat and substantial similar and suitable habitat occurs in the region which could equally serve to meet CBA and ESA targets, the screening tool designated Very High sensitivity is disputed. The specialist thus disputes the very high terrestrial biodiversity sensitivity and designates a low sensitivity.

The site verification confirms that no flagged plant species are likely to pose any significant risk as the flagged species was not found to occur during preliminary investigations and surveys. The specialist thus disputes the very high plant species sensitivity and designates a low sensitivity.

The site verification confirms that no flagged animal species are likely to pose any significant risk as while it is feasible that species may occasionally visit the area, due to being away from populations of the species (i.e. protected areas and habitat in close proximity), and extensive suitable habitat in the broader area the overall risk is low. The specialist thus disputes the very high animal species sensitivity and designates a low sensitivity.

The assessment will include both the PV and grid infrastructure (powerline plus substation).

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