

Terrestrial Biodiversity Assessment

PROPOSED PAULPUTS SOUTH WEF GRID CONNECTION &
ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE PROVINCE

Date: 20/07/2021
Version: Draft
Author: J. Pote

Terrestrial Biodiversity Assessment

PROPOSED PAULPUTS SOUTH WEF GRID CONNECTION & ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE PROVINCE

Compiled by: Jamie Pote (Pr. Sci. Nat.)

Postnet Suite 57, Private Bag X13130, Humewood, Port Elizabeth, 6013, South Africa
jamiepote@live.co.za +27 (0)76 888 9890

Compiled for: Arcus Consulting

Date of report: 20/07/2021

Draft Report

This Report has been prepared with all reasonable skill, care and diligence within the scope of appointment by Mr Jamie Pote, with consideration to the resources devoted to it by agreement with the client, incorporating our Standard Terms and Conditions of Business.

This Report is prepared exclusively for use by the client, and the author disclaims any liability in respect of its use by any party other than the client and for the purpose for which it was written. The Report is subject to all the copyright and intellectual property laws and practices of South Africa and contains intellectual property and proprietary information that is protected by such copyright in favour of the author. No person, other than the client, may reproduce, distribute to any third party, or rely on the content of any portion of this report, without the prior written consent of the author.

The author accepts no responsibility of whatsoever nature to third parties to whom this Report, or any part thereof, is made known. Any such persons or parties rely on the report at their own risk.

Revisions

Report/Revision Version	Date:	Approved by:
First Draft	30/06/2021	Jamie Pote
Revisions/Comments	20/07/2021	Ashleigh von der Heyden
Final Draft	20/07/2021	Jamie Pote
IAP comments		
Final Version		

Table of Contents

Revisions	ii
Table of Contents	i
List of Figures	iii
List of Tables	iv
Abbreviations	v
Glossary.....	vi
1 Introduction & Background	1
1.1 Background.....	1
1.2 Purpose of Report	1
1.2.1 Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes	1
1.3 Project Description.....	2
1.3.1 Activity Location and Description.....	2
1.3.2 Aspects of the project that could potentially have Biodiversity related Impacts	2
1.4 Methodology and Approach.....	3
1.4.1 Site visit	4
1.4.2 Data sources and references	4
1.4.3 Assumptions, Uncertainties and Gaps in Knowledge.....	5
2 Policy	5
2.1 Company Policy	5
2.2 Legislation Framework.....	5
2.3 Systematic Planning Frameworks	7
2.3.1 National Environmental Screening Tool.....	9
2.3.2 Sustainable Development Goals	10
2.3.3 Vegetation of Southern Africa.....	11
2.3.4 National Biodiversity Assessment	17
2.3.5 Northern Cape Critical Biodiversity Areas (2016).....	17
2.3.6 Namakwa Biodiversity Sector Plan (2008).....	20
2.3.7 Succulent Karoo Ecosystem Plan (SKEP)	23
2.3.8 Other Biodiversity Sector Plans	23
2.3.9 Protected Areas.....	23
2.3.10 Strategic Water Source Areas.....	25
2.3.11 Rivers and Wetlands.....	26
2.3.12 Freshwater Ecosystem Priority Areas	27
2.3.13 Regional Hotspots and Centres of Endemism	29
2.3.14 Key Biodiversity Areas.....	29
2.4 Ecological Processes and Corridors.....	30
2.4.1 Critical Biodiversity Areas.....	30
2.4.2 Ecosystem Services	31
2.4.3 Ecosystem Processes and Function.....	33
2.4.4 Ecological Support Areas	33
2.4.5 Critical/Important Terrestrial Habitats	34

3	Biodiversity Risk Identification and Assessment	36
3.1	Baseline Biodiversity Description	36
3.1.1	Site Locality.....	36
3.1.2	Topography and Drainage	36
3.1.3	Climate	36
3.1.4	Terrestrial Landscape Features (Habitat)	36
3.1.5	Aquatic Habitat.....	47
3.2	Present Ecological State	49
3.3	Critical Habitat	52
4	Plant and Animal Species (Flora and Fauna) Assessment.....	52
4.1	Overview	52
4.2	Regional characteristics	52
4.3	Flora	53
4.4	Fauna.....	53
4.5	Species of Conservation Concern.....	55
4.5.1	Red Listed, Endemic and Protected Flora	55
4.5.2	Red Listed and Protected Fauna	57
4.5.3	Alien Invasive Species.....	58
4.5.4	Permitting Requirements.....	60
4.6	Terrestrial Plant and Animal Species Sensitivity Assessment	61
4.6.1	Site Ecological Importance Criteria	61
5	Terrestrial Biodiversity and Sensitivity Assessment	64
5.1	Vegetation Sensitivity	64
5.2	Intactness.....	64
5.3	Alien Invasion.....	64
5.4	Degradation	64
5.5	Overall Sensitivity score	65
5.6	No-Go Areas	69
5.7	Potential Development Footprints.....	69
6	Terrestrial Biodiversity and Species Risk and Impact Assessment	70
6.1	Summary of actions, activities, or processes that require mitigation.....	70
6.2	Potential Terrestrial Biodiversity Impacts (Direct).....	70
6.3	Potential Terrestrial Biodiversity Impacts (Indirect)	71
6.4	Potential Terrestrial Biodiversity Impacts (Cumulative)	71
6.5	Assessment of Risks and Impacts to Biodiversity	71
6.5.1	Criteria of assigning significance to potential impacts.....	71
6.5.2	Significance Rating	72
6.5.3	Assessment of Terrestrial Biodiversity Impacts.....	73
6.5.4	Terrestrial Biodiversity Impact Reversibility	74
6.5.5	Impacts and Risks to Irreplaceable Biodiversity Resources.....	74
6.5.6	Residual Risks and Uncertainties.....	74
6.6	Findings, Outcomes and Recommendations	74
6.6.1	Summary of Findings.....	75

6.6.2	Recommendations	76
7	Management Programs	76
7.1	Site Preparation and Vegetation Clearing Plan.....	77
7.2	Rehabilitation and Landscaping Plan	79
7.3	Open Space Management/Conservation Plan	79
7.4	Maintenance Management Plan	79
8	Organizational Capacity and Competency	79
9	Emergency Preparedness and Response.....	79
10	Stakeholder Engagement	79
11	Monitoring and Review.....	80
12	Annexures.....	81
12.1	Annexure A: References	81
12.2	Annexure B: Flora and Fauna Species Lists.....	85
12.2.1	Flora.....	85
12.2.2	Fauna.....	88
12.3	Annexure C: Site Photographic Record.....	93
12.4	Annexure D: Biodiversity Environmental Management Plan.....	109
12.4.1	Protection of Flora and Fauna	109
12.4.2	Alien and Invasive Plan Management Plan	110
12.4.3	Fires	110
12.4.4	Soil Aspects.....	111
12.4.5	Dust	111
12.4.6	Infrastructural Requirements	111
12.4.7	Rehabilitation Plan	113
12.4.8	Monitoring and Reporting	114
12.4.9	Closure objectives and extent of alignment to pre-construction environment	114
12.5	Annexure E: General Impact Rating Scale.....	115
12.5.1	The Severity/ Beneficial Scale	115
12.5.2	Spatial and Temporal Scales	116
12.5.3	The Degree of Certainty and the Likelihood Scale	116
12.5.4	The Environmental Significance Scale.....	117
12.5.5	Absence of Data	118
12.6	Annexure F: Declaration, Specialist Profile and Registration	119
12.7	Annexure G: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity	135

List of Figures

Figure 1:Terrestrial Biodiversity Sensitivity.	9
Figure 2:Plant Species Sensitivity	9
Figure 3: Animal Species Sensitivity.....	9
Figure 4: Aquatic Sensitivity.....	9
Figure 5: National Vegetation Map (NVM, 2018) and Conservation Status (NBA, 2019).....	12
Figure 6: Northern Cape Critical Biodiversity Areas.	19

Figure 7: Namakwa Bioregional Plan.....	22
Figure 8: Protected Areas in the vicinity of the site.	24
Figure 9: South Africa Water Source Areas [Source: Nel, et al, 2013]	25
Figure 10: Rivers and Wetlands.....	28
Figure 11: Mapped Vegetation (north section).	38
Figure 12: Mapped Vegetation (central section).....	39
Figure 13: Mapped Vegetation (southern section).....	40
Figure 14: Overview of Open Plains vegetation (sandy).	41
Figure 15: Typical Open Plains vegetation (sandy).	42
Figure 16: Typical Open Plains vegetation (gravel).....	42
Figure 17: Typical Open Plains vegetation (gravel).....	43
Figure 18 Overview of Dune vegetation.....	44
Figure 19 Typical Dune vegetation.....	44
Figure 20 Overview of Rocky Hills vegetation.	45
Figure 21 Typical Rocky Hills vegetation.....	46
Figure 22 Quartzitic gravel hill.	46
Figure 23 Typical transformed areas (Eskom substation and gravel road towards Onseepkans).	47
Figure 24 Typical Alluvial Wash and Watercourse Vegetation downstream from crossing point facing north-west. Note denser shrub cover within alluvial area.....	48
Figure 25 <i>Small dam along non-perennial watercourse, upstream of proposed crossing site.</i>	48
Figure 26 Typical Alluvial Wash and Watercourse Vegetation.....	49
Figure 27 Terrestrial Biodiversity Sensitivity (northern section).	66
Figure 28 Terrestrial Biodiversity Sensitivity (central section).	67
Figure 29 Terrestrial Biodiversity Sensitivity (southern section).....	68

List of Tables

Table 1: Summary of Regional Planning Biodiversity features.....	7
Table 2: Coverage and protection levels of vegetation units	17
Table 3: Northern Cape CBA coverage.	20
Table 4: List of Protected Areas in vicinity	23
Table 5: Summary of Key Biodiversity and Ecological Indicators	49
Table 6: Flora Species of Conservation Concern.	55
Table 7: Fauna Species of Conservation Concern	57
Table 8: Alien (exotic) invasive and other weed species and status.	58
Table 9: Legislation regarding invasive alien species.	58
Table 10: Sensitivity Summary for the site.	65
Table 11: Potential Impacts to Terrestrial Biodiversity.....	70
Table 12 : Construction Phase Impact Assessment.....	73
Table 13: Operational Phase Impact Assessment for Option 1.....	73
Table 14: Specific Mitigation Measures and Recommendations	76

Abbreviations

AOO	Area of Occupancy (the area within its 'extent of occurrence' which is occupied)
CARA	Conservation of Agricultural Resources Act, Act 43 of 1983
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs (now DFFE, see below)
DENC	Northern Cape Department of Environmental Affairs and Nature Conservation
DFFE	The Department of Environmental Affairs (DEA) was renamed the <u>Department of Forestry and Fisheries and the Environment</u> (DFFE), incorporating the forestry and fisheries functions from the previous Department of Agriculture, Forestry and Fisheries.
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
EOO	Extent of Occurrence (the spatial spread of the areas currently occupied)
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
PNCO	Provincial Nature and Environment Conservation Ordinance (No. 19 of 1974).
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 (NEM:BA)
ToR	Terms of Reference
+ve	Positive
-ve	Negative

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).
Area of Occupancy	Area of Occupancy is the area within its ‘extent of occurrence’ which is occupied. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may contain unsuitable or unoccupied habitats.
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.
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.
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 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 <i>Physical processes</i> [Climate (precipitation, insolation), hydrology, geomorphology]; <i>Biological processes</i> [Photosynthesis, respiration, reproduction]; <i>Ecological processes</i> [Competition, predator-prey interactions, environmental gradients, life histories]
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.
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.
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.
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 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).
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)	<u>Endangered terrestrial ecosystems</u> have lost significant amounts (more than 60 % lost) of their original natural habitat, so their functioning is compromised. A <u>taxon (species)</u> 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 <u>very high risk</u> 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 Threatened 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.
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.
Evolutionary Processes	The process by which genetic changes have taken place and continue to take place in populations of plants and animals over successive generations in response to environmental changes. Evolutionary Processes includes the mechanisms that produce the biodiversity of life and include Mutation and Migration (Gene Flow), Genetic Drift, Natural Selection, Common Descent, Speciation, Sexual Selection, and Biogeography. Disruptions to evolutionary processes can prevent ecosystems and species from adapting to environmental change over time. Significant fragmentation is considered to be an important disrupter of evolutionary processes.
Exotic	Non-indigenous; introduced from elsewhere, may also be a <i>weed</i> or alien <i>invasive</i> species. Exotic species may be invasive or non-invasive.
Extent of Occurrence	Extent of Occurrence is the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence.
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	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.
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).
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 (<i>Bern Convention 1979</i>). A species or lower taxon living within its natural range (past or present) including the area which it can reach and occupy <u>using its natural dispersal systems</u> (<i>modified after the Convention on Biological Diversity</i>)
Indirect Impact	Impacts triggered in response to the presence of a project, rather than being directly caused by the project’s own operations (BBOP)
Instream habitat	Includes the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse;
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 <u>ecosystems</u> 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 <u>taxon (species)</u> 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 <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 (<i>Podocarpus latifolius</i>) and other species in the Gonqogonqo forest. From scientific definitions (also see Appendix B) we can define natural forest as: <ul style="list-style-type: none"> • 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 <u>taxon (species)</u> 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 (<i>IUCN</i>).
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 <i>extent of occurrence</i> (EOO). For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km ²).
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.
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 (<i>BBOP</i>).
Resilience	The capacity of a natural system to recover from disturbance (<i>OECD</i>).
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 (<i>IFC</i>).
Riparian	Pertaining to, situated on or associated with the banks of a watercourse, usually a river or stream.
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.
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 (<i>WCED</i>).
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 (<i>IUCN</i>). 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)	<u>Vulnerable terrestrial ecosystems</u> 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 <u>taxon (species)</u> 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.

1 Introduction & Background

1.1 Background

The Applicant, Paulputs Wind Energy Facility South (RE) (Pty) Ltd ('Paulputs South'¹), intends to apply for Environmental Authorisation for the construction and operation of the Paulputs South WEF Grid Connection and associated infrastructure - which includes a substation yard and BESS (hereon referred to as the 'proposed development'). The purpose of this report is to assess the sensitivity of the site relating to terrestrial biodiversity, in terms of its ecological status, as well the requirements in terms of the relevant Environmental Legislation. The proposed 132 kV line traverses several farm portions from the proposed WEF in the south, to the Eskom Substation north of the site, situated near Pofadder, Northern Cape.

1.2 Purpose of Report

The purpose of this terrestrial biodiversity assessment report is to assess the suitability and risk to terrestrial biodiversity (including flora and fauna) posed by the proposed powerline and associated infrastructure (including roads and substations). As such areas have ultimately been assessed in terms of high moderate and low sensitivity but has not sought to ground truth-individual pylon footprints, since at the planning stage, the exact footprints are as yet undetermined. Once the environmental authorisation is issued, the next step would be to compile a detailed design of the layout which would include pylon footprints and the specific road footprint. This would then be followed by a specialist walkdown in order to verify each pylon footprint and make recommendations accordingly regarding micro-siting. As will be indicated in the concluding sections of the report, areas having an elevated sensitivity should be avoided as far as possible, and if not possible, then mitigation measures would be implemented to minimise impact. Additional information collected during such a walkdown would also serve to collect further information pertaining to any permit applications. Perhaps the appropriate DENC permitting officials can be invited to such walkdown.

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

The report will be compiled to fulfil the requirement for a **Terrestrial Biodiversity Assessment** as per the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA (GNR 320), **as gazetted on 20 March 2020**. This report is undertaken as supporting information as part of a greater environmental application process and is compliant in terms of the requirements in the above regulations in terms of Terrestrial Biodiversity. In terms of the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted **on 30 October 2020**, relating to requirements relating specifically to the **Terrestrial Plant and Animal (species) themes**, this report includes these requirements.

¹ Paulputs Wind Energy Facility (RE) (Pty) Ltd has given permission to Paulputs Wind Energy Facility South (RE) (Pty) Ltd to submit an application for the proposed development. Three separate Part II amendment applications are being undertaken in parallel with this application to split and amend the Paulputs WEF EA into Paulputs North WEF, Paulputs North WEF Grid Connection Paulputs South WEF respectively.

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.

1.3 Project Description

1.3.1 Activity Location and Description

Paulputs Wind Energy Facility (RF) (Pty) Ltd ('PWEF'), a wholly owned subsidiary of WKN-WindCurrent (Pty) Ltd, was granted environmental authorisation for the 300 MW (75 Turbine) Paulputs Wind Energy Facility (WEF) and its associated 132 kV grid connection on 11 December 2019 by the Department of Forestry, Fisheries and the Environment (DFFE) (Reference No. 14/12/16/3/3/2/1120)

As part of the original Environmental Impact Assessment (EIA), three alternative Grid Connection options (A, B and C) and three alternative on-site substation options (A, B and C) were assessed. The Competent Authority (CA), DFFE, chose to only issue a favourable authorisation for the preferred Grid Connection option 'C' and on-site substation option 'A'.

In effect of the above, Paulputs South (the Applicant) intend to apply for Environmental Authorisation for the construction and operation of the proposed development, which includes:

- A 132 kV, double circuit, loop-in/loop-out Grid Connection (approximately 26 km in length); and a
- A 4.4 ha substation yard comprising: 1.2 ha on-site substation, 1 ha for offices, 1.2 ha battery energy storage systems (BESS), and 1 ha permanent laydown area.

Both the Grid Connection and substation above were assessed as part of the approved Paulputs WEF (Reference No. 14/12/16/3/3/2/1160), and as such, this BAR assessment will serve to validate the information contained within the approved EIA report (Arcus, 2019) for the Paulputs WEF:

- The proposed Grid Connection route was originally referred to as the Grid Connection Option A; and
- The Proposed On-site Substation area was originally referred to as the Substation Option C.

In terms of Regulation 11 of the NEMA EIA Regulations, 2014 (as amended), the Applicant ('Paulputs South') requested that the Department consider issuing two separate Environmental Authorisations as the Grid Connection will eventually be taken over by Eskom. This approach has been approved by the DFFE on 08 September 2020 and one combined Basic Assessment Report and Application will be submitted for consideration.

This Terrestrial Biodiversity Assessment is for the Paulputs South WEF Grid Connection and associated infrastructure.

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

The proposed layout plan for the infrastructure is indicated in **Error! Reference source not found.** above. The proposed plan will require some clearing of vegetation at powerline pylon footprints as well as some clearing of vegetation for an access road. Blanket clearing of vegetation will only be required for the substation components.

The key components of the project and their respective impacts upon the terrestrial vegetation and faunal environment are as follows:

Component	Potential Biodiversity and Ecological Impacts
Powerline	

Component	Potential Biodiversity and Ecological Impacts
The construction of the proposed facility will require selective clearing for pylon construction.	The terrestrial environment will permanently be impacted where vegetation clearing is required to construct the pylons and will be limited to a minimal area where the pylon foundations will be constructed as well as a limited work area surrounding this.
Access roads	
The construction of the proposed facility will require selective clearing of vegetation along the access roads that will run parallel, usually underneath, the powerline.	An access road will be required in order to access the powerline route 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. It is likely that a 2-track type 'farm' road will suffice, as is the norm for powerlines rather than a specifically constructed road.
Substations	
The construction of the proposed facility will require limited blanket clearing of the substation sites.	The terrestrial environment will permanently be impacted where vegetation clearing is required to construct the various substation facilities. The area will be limited to the specific substation footprint area.

1.4 Methodology and Approach

The proposed methodology and approach are outlined below:

- Conduct a comprehensive desktop study and identify potential risks relating to vegetation and flora of the site and surrounding area, for a Terrestrial Biodiversity Assessment Report. This will include the relevant Regional Planning and legislated frameworks, which will also be represented in a series of associated maps.
- Conduct a detailed site visit to assess the following:
 - Detailed field survey of vegetation, flora and habitats present.
 - Comprehensive species list, highlighting species that are of special concern, threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and the Northern Cape Nature Conservation Act (Act no. 9 of 2009).
 - Detailed mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and Species of Conservation Concern, the outcome being a detailed sensitivity map ranked into high, medium or low classes.
- Reporting will be comprised of a preliminary summary, with identification of anticipated impacts and risks for the Scoping Report, a draft detailed Assessment Report (for public review and comment) and a Final Assessment Report for submission. The draft and final detailed reports will address the following:
 - Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
 - A detailed species list highlighting the various Species of Conservation Concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds).
 - 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.
 - Assessment of Impacts and Mitigation Measure, as well as specific measure that may be required for alternative development plans.
 - A comprehensive EMPr for inclusion in the reports and EMP with specific management actions for construction and Operation.

- A habitat sensitivity map will be compiled, indicating the sensitivities as described above.
- A map indicating buffers (if required) to accommodate Regional Planning and other requirements.

This terrestrial biodiversity assessment and report 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).

1.4.1 Site visit

A site visit was conducted on 01 & 02 June 2021, during early winter months. The site falls within a summer rainfall area, which was evident during the site visit. For the purposes of this report, the site sampling strategy, within the context of the proposed limited footprint activity, is deemed to be adequate. Additionally, the findings of this assessment are supplemented by findings of previous specialist assessments conducted in the same area during late spring 2018, late summer 2019, late autumn 2019 and winter 2019. The site visit broadly assessed the layout within the proposed servitude. Additional species may occur that were not observed during the sampling period; however, due to the limited footprint of the proposed activity, as well as the extensive coverage and low conservation status of the specific vegetation units the risk is deemed to be low. Furthermore, the final pylon footprint positions are likely to be ground-truthed in a final walkdown before final plans are approved and construction commences.

1.4.2 Data sources and references

A comprehensive list of references, including data sources is provided in Section 12.1. 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.
- Critical Biodiversity Areas of the Northern Cape (2016) – Bioregional Plan.
- Namakwa District Biodiversity Sector Plan (2008) – Bioregional Plan.
- Succulent Karoo Ecosystem Planning (SKEP, 2002).
- 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.

1.4.3 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.
- Any botanical 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 composition of fire adapted vegetation may vary depending on level of maturity or time since last burn. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.

2 Policy

2.1 Company Policy

No company policy is applicable to this assessment.

2.2 Legislation Framework

In terms of NEMA EIA Regulations (07 April 2014, as amended), the following specific listing notices have bearing on this report²:

Listing Notice 1 (GNR):

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.

Although unlikely, activities within the watercourses may result in the infill or excavation of greater than 10 cubic meters, hence, triggers a basic assessment.

27. The clearance of an area of 1 hectares 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

The clearing of vegetation for substation and BESS and other infrastructure requirements will exceed the clearance of 1 Ha, but less than 20 Ha of indigenous vegetation, hence triggers a basic assessment. The powerline, being a linear activity, will not specifically trigger the listed activity.

Listing Notice 2 (GNR):

None are applicable.

Listing Notice 3 (GNR):

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.

(g) Northern Cape

² The listed activities itemized are only those with Biodiversity relevance to this report and is not a comprehensive list.

- ~~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 estuary, 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.~~
- It is possible that the development will require clearing of more than 300 square metres within designated Critical Biodiversity Area 1 and 2 as well as Ecological Support Areas (NC CBA, 2019), for construction of the powerline and associated infrastructure. The final footprint cleared will depend on the number of pylons and the area that is cleared at each pylon. In general monopole pylons have a low footprint.*

Implications:

- The proposed activity will trigger LN1, activity 27, exceeding the clearance of greater than 1 Ha of indigenous vegetation for the substations. The powerline is a linear activity and it thus not a triggering activity.
- No Endangered and Critically Endangered vegetation units are present; however, portions of the route do traverse CBA 1 & 2 and ESA patches, hence additional triggers will be affected (LN1, activity 12).
- Construction (including a road crossing), although unlikely, may result in the excavation or infill of more than 10 cubic metres from a watercourse, hence LN1, Activity 19 may be triggered.

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 considered when the administrative discretion to grant or refuse the licence is made.
- 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’.

- Northern Cape Nature Conservation Act (Act no. 9 of 2009): Lists Protected species, requiring permits for removal (Northern Cape Department of Environmental Affairs and Nature Conservation).
- Water Use Authorisations: the National Water Act (No. 36 of 1998): Requires that provision be 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 (refer to Table 9).

2.3 Systematic Planning Frameworks

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

- Critically Endangered and Endangered Ecosystems
- Critical Biodiversity Areas
- Ecological Support Areas
- Vulnerable Ecosystems
- River, Estuarine and Wetland Freshwater Ecosystem Priority Areas (FEPAs) and buffers
- Protected Areas (and buffers) and NPAES
- Critical Habitat for Red Listed, Endemic or Protected Species.

Table 1: Summary of Regional Planning Biodiversity features.

FEATURE	DESCRIPTION	IMPLICATIONS/COMMENT
National Environmental Screening Tool (Terrestrial Biodiversity)	Low & Very High Terrestrial Biodiversity Medium Animal Species Medium & Low Plant Species Very High & Low Aquatic Sensitivity	CBA 1 & 2, ESA, FEPA quinary catchments Animal & Plant species potentially present (refer species assessment section). Wetland features potentially present.
National Vegetation Map (NVM, 2018) & National Biodiversity Assessment (2018)	Bushmanland Arid Grassland (Nkb 3) Lower Gariiep Broken Veld (Nkb 1) Bushmanland Sandy Grassland (N kb 4)	Least Concern Least Concern Least Concern
Critically Endangered and Endangered Ecosystems (NBA, 2018)	None	None
Vulnerable Ecosystems (NBA, 2018)	None	None
Northern Cape Conservation Plan (2016)	Mostly Other Natural Areas (ONA). Ecological Support Area along central watercourse, CBA 1 at south end and CBA 2 along western side.	Terrestrial and aquatic connectivity as well as ecological function to be maintained.
Regional Planning: Succulent Karoo Ecosystem Planning (SKEP, 2002)	Outside of planning domain	None
Namakwa CBA	None affected	None

FEATURE	DESCRIPTION	IMPLICATIONS/COMMENT
Protected Areas (SAPAD, 2020)	None directly affected, Augrabies Falls National Park in proximity (50 km) to the north-east.	These protected areas nor any ecological processes associated with them are affected by the proposed development.
NPAES (2018)	None directly affected but are in proximity (> 10 km) to the north-west and south.	No NPAES or ecological processes within are likely affected.
Regional Hotspots & Regions of Endemism	Site falls on the southern boundary of the Gariiep Centre of Endemism.	Several endemic species, as well as species having a limited distribution are known from the wider surrounding area and will be assessed accordingly in the respective species assessment section.
Important Bird Areas (IBA's)	The site is adjacent to the Mattheus-Gat Conservation Area IBA and the northern portion of the route overlaps with the designated conservation area.	The specific activity will overlap with a designated IBA's. Avifaunal specific impacts will be assessed as a separate Avifaunal Assessment.
Designated Heritage Sites	The site is not located within any Heritage Sites.	None
Key Biodiversity Areas (KBA's)	None	None
Marine/Coastal areas	None	None
RAMSAR sites	None	None
Strategic Water Source Areas (SWSA)	Not situated within any designated SWSA	None
Freshwater Ecosystem Priority Areas (FEPA's)	The powerline will traverse an unnamed non-perennial watercourse (CLASS B: LARGELY NATURAL), flowing northwards into the Orange River. Situated within D81E & D81F quaternary catchments.	The specific activity is unlikely to pose any significant risk to watercourses as the pylons are unlikely to be placed within any watercourse. Any access roads should use existing tracks.
Within 32 m of Watercourses	Pylons may be within 32m of non-perennial watercourses. The area is relatively free of non-perennial watercourses but it drained via a network of non-perennial watercourses situated to the east and west of the site.	Terrestrial impact to any non-perennial watercourse will be negligible associated with construction of the proposed facility, which will most likely avoid such areas.
Within 100 m of Rivers	The route will not traverse any perennial watercourses.	None. Closest perennial watercourse is the Orange River (CLASS B: LARGELY NATURAL) situated 21 km to the north-west.
Within 500 m of Wetlands	Several man-made dams are present in the surrounding area as well as wetlands are present within as per the National Wetland Map. A single non-perennial pan is indicated as being situated along the route, however it is confirmed to not be a pan but rather a quartzite hill.	Most of the site is outside of functional zones of these features, which, may provide habitat for several species including birds and amphibians. The proposed activity is not anticipated to have any direct or indirect impact of significance. Closest natural pan is situated 1.3 km north-east of the proposed BESS at the southern end of the powerline route.
Estuaries	The site is outside of any estuarine functional zone.	None
Forest	None directly affected.	No forest pockets nor any ecological processes associated with them are affected by the proposed agricultural project.
Surrounding Land Uses	Mostly agriculture (grazing) with PV facilities to the north in vicinity of the substation.	Low to Moderate levels of disturbance are present in surrounding landscape associated agriculture but with extensive areas of intact vegetation. High levels of transformation are not prevalent as indicated by the low conservation status of the vegetation units.
Critical Habitat for listed endemic/protected species	Several endemic or other protected species are known from the broader area including populations of threatened species. There are a number of red listed species in the surrounding area and vegetation units that are known to have limited distributions, refer to Sections 4.5 & 3.3 for species assessment.	

Implications:

- No vegetation units affected have an elevated conservation status.
- The route does pass through designated Critical Biodiversity Area and Ecological Support Areas.
- The site is adjacent to the Mattheus-Gat Conservation Area IBA and a portion of the route will traverse the conservation area. Avifaunal impacts will not be assessed in this report, as they are addressed in a separate Avifaunal report.

2.3.1 National Environmental Screening Tool

The DFFE Screening Tool indicates the following:

- Terrestrial Biodiversity is Low & Very High (Figure 1).
- Plant species sensitivity is Medium (Figure 2).
- Animal Species sensitivity is Medium & High (Figure 3).
- Aquatic Sensitivity is Low & Very High (Figure 4).

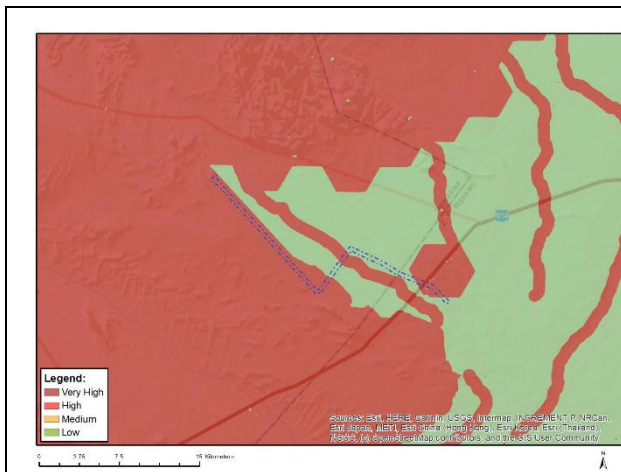


Figure 1: Terrestrial Biodiversity Sensitivity.

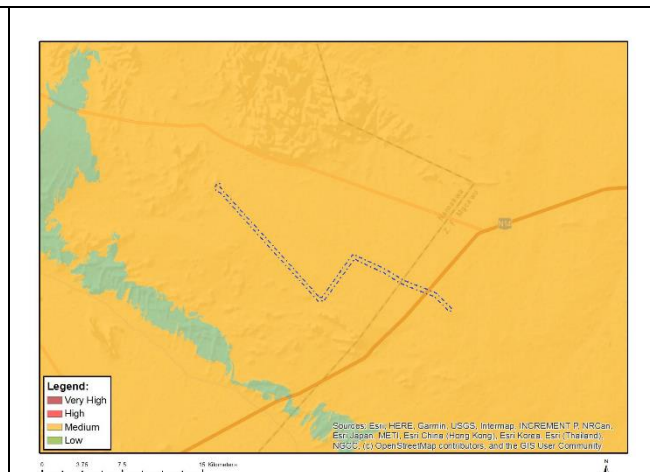


Figure 2: Plant Species Sensitivity

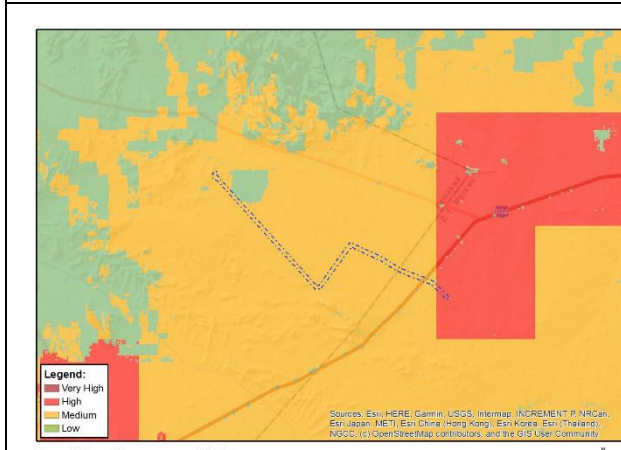


Figure 3: Animal Species Sensitivity

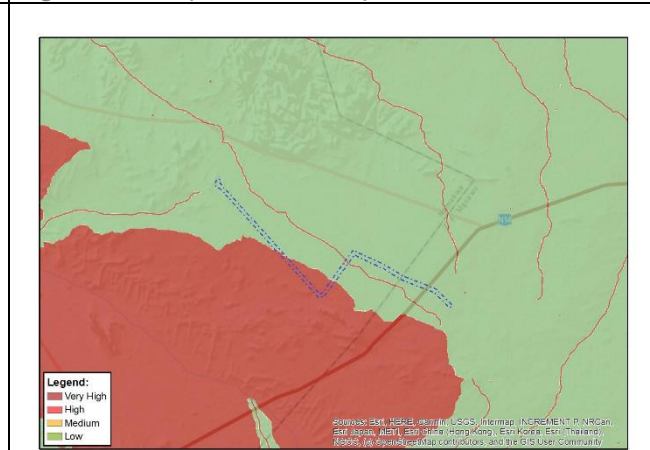


Figure 4: Aquatic Sensitivity

Sensitivity	Feature(s) in proximity
Terrestrial Biodiversity Sensitivity	
Very High	Critical Biodiversity Area 1 & 2, Ecological Support Area, FEPA quinary catchments.
High	None
Medium	None

Sensitivity	Feature(s) in proximity
Low	Present
Plant (Flora) Sensitivity	
Very High	None
High	None
Medium	<i>Crotalaria pearsonii</i> , Sensitive species 144
Low	None
Animal (Fauna) Sensitivity	
Very High	None
High	<i>Neotis ludwigii</i>
Medium	<i>Neotis ludwigii</i>
Low	Present
Aquatic Sensitivity	
Very High	Rivers, Wetlands, FEPA quinary catchments.
High	None
Medium	None
Low	Present

The following is deduced from the DFFE National Environmental Screening Tool:

1. Terrestrial Biodiversity Theme is Very High, with Critical Biodiversity Area 1 & 2, Ecological Support Area and FEPA quinary catchments indicated as being present.
2. Plant Species Theme is Medium with two flora species conservation concern (*Crotalaria pearsonii* & sensitive species 144) indicated as possibly occurring in the vicinity of the site.
3. Animal Species Theme is Medium/High with possibly species including a single bird, *Neotis ludwigii* (refer to Avifaunal assessment).
4. The Aquatic Theme indicates the possible presence of Rivers, Wetlands, FEPA quinary catchments (Very High).

The site assessment will physically screen for the presence of these, 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. Avifaunal species are not specifically assessed as they are addressed in the separate Avifaunal report by the appropriate specialist.

2.3.2 Sustainable Development Goals

The concept of National Sustainable Development Strategy (NSDS) was proposed in 1992 in Agenda 21 (§ 8.7) where countries were called upon to integrate economic, social, and environmental objectives into one strategically focused blueprint for action at the national level. The NSDS “should be developed through the widest possible participation”. And it “should be based on a thorough assessment of the current situation and initiatives”. In the Programme for the Future Implementation of Agenda 21 adopted at the 19th Special Session of the General Assembly (23-28 June 1997), member States reaffirmed the importance of NSDS and set a target of 2002 for the formulation and elaboration of NSDS that reflect the contributions and responsibilities of all interested parties.

However, by 2002, based on national reports received from governments, only about 85 countries had developed some form of national strategies and the nature and effectiveness of these strategies varied considerably from country to country. The Johannesburg Plan of Implementation (JPOI) adopted at the 2002 World Summit on Sustainable Development (WSSD), through paragraph 162 b, recommitted member States to “take immediate steps to make progress in the formulation and elaboration of national strategies for sustainable development and to begin their implementation by 2005.”

During the preparatory process for the 2002 WSSD, the International Forum on NSDS was held in Accra, Ghana in 2001, which led to the launch of the Guidance in Preparing a National Sustainable Development Strategy. It defined National Sustainable Development Strategy (NSDS) as “a coordinated, participatory and iterative process of thoughts and actions to achieve economic, environmental and social objectives in a balanced and integrative manner”. Most importantly, NSDS is a call for an institutional change. It aims at a transition from the traditional static putting-a-plan-on-paper exercise towards the establishment of an adaptive system that can continuously improve. It should be a process which “encompasses situation analysis, formulation of policies and action plans, implementation, monitoring and regular review. It is a cyclical and interactive process of planning, participation and action in which the emphasis is on managing progress towards sustainability goals rather than producing a ‘plan’ as an end product.”

Every country needs to determine, for itself, how best to approach the preparation and implementation of its national sustainable development strategy depending upon the prevailing political, historical cultural, ecological circumstances. A "blueprint" approach for national sustainable development strategies is neither possible nor desirable. The particular label applied to a national sustainable development strategy is not important, as long as the underlying principles characterizing a national sustainable development strategy are adhered to and that economic, social, and environmental objectives are balanced and integrated.

Today, when incorporating the 2030 Agenda for sustainable development and its 17 SDGs into national context, although countries do not necessarily label them as “national sustainable development strategies”, all the underlying core principles are deeply embedded in the national implementation of SDGs worldwide. As seen at the Voluntary National Reviews at the High-Level Political Forum on Sustainable Development, issues such as country ownership and strong political commitment, the integration of economic, social, and environmental objectives across sectors, territories, and generations; broad participation and effective partnerships, the development of capacity and enabling environment, as well as the mobilization of means of implementations remain at the centre of policy debates at all levels.

Source: National Sustainable Development Strategies (NSDS): <https://sdgs.un.org/topics/national-sustainable-development-strategies>

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 directly in line with this sustainable development goal.

2.3.3 Vegetation of Southern Africa

A single vegetation unit (Table 1, Figure 5) is traversed by the proposed powerline (National Vegetation Map, 2018), namely Bushmanland Arid Grassland (Least Concern). In proximity to the site is Lower Gariep Broken Veld in higher lying rocky hills and Bushmanland Sandy Grassland in lower lying areas (both least Concern). Due to proximity, these will be considered as there may be some commonalities with these units where there are biophysical affinities (i.e. rocky hills and/or lower lying (possibly alluvial) areas). A general description of the vegetation unit is provided below (as per Mucina & Rutherford, 2018) as a reference point for the baseline vegetation composition.

Project : Paulputs South WEF Grid Connection Layout - Vegetation and Status (National)

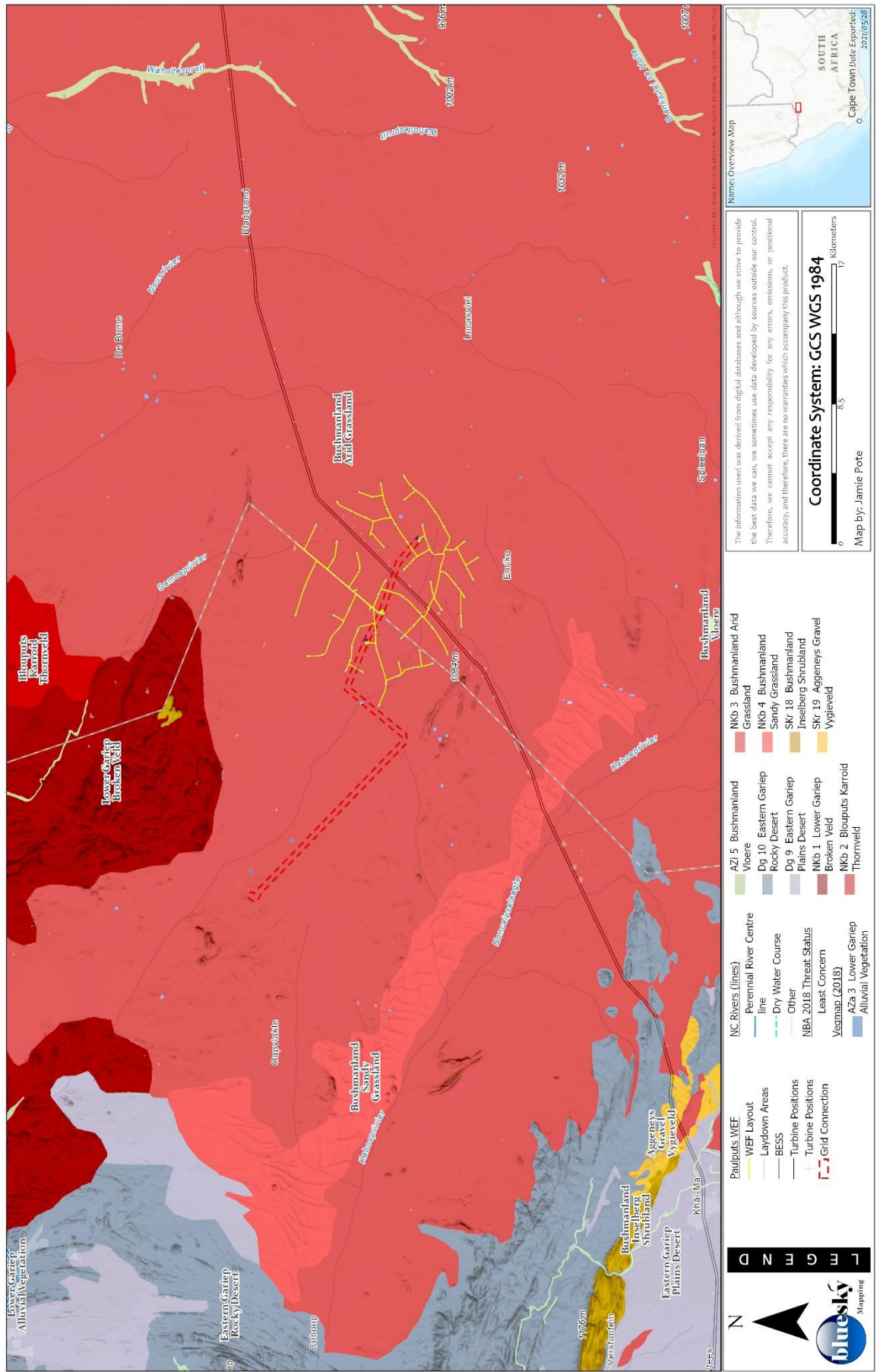


Figure 5: National Vegetation Map (NVM, 2018) and Conservation Status (NBA, 2019).

Bushmanland Arid Grassland (NKb 3)

VT 29 Arid Karoo and Desert False Grassveld (36%), VT 32 Orange River Broken Veld (36%) (Acoccks 1953). LR 51 Orange River Nama Karoo (51%) (Low & Rebelo 1996).

Distribution Northern Cape Province: Spanning about one degree of latitude from around Aggeneys in the west to Prieska in the east. The southern border of the unit is formed by edges of the Bushmanland Basin while in the northwest this vegetation unit borders on desert vegetation (northwest of Aggeneys and Pofadder). The northern border (in the vicinity of Upington) and the eastern border (between Upington and Prieska) are formed with often intermingling units of Lower Gariiep Broken Veld, Kalahari Karroid Shrubland and Gordonia Duneveld. Most of the western border is formed by the edge of the Namaqualand hills. Altitude varies mostly from 600–1 200 m.

Vegetation & Landscape Features Extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland dominated by white grasses (*Stipagrostis* species) giving this vegetation type the character of semidesert 'steppe'. In places low shrubs of *Salsola* change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

Geology & Soils A third of the area is covered by recent (Quaternary) alluvium and calcrete. Superficial deposits of the Kalahari Group are also present in the east. The extensive Palaeozoic diamictites of the Dwyka Group also outcrop in the area as do gneisses and metasediments of Mokolian age. The soils of most of the area are red-yellow apedal soils, freely drained, with a high base status and <300 mm deep, with about one fifth of the area deeper than 300 mm, typical of Ag and Ae land types.

Climate Rainfall largely in late summer/early autumn (major peak) and very variable from year to year. MAP ranges from about 70 mm in the west to 200 mm in the east. Mean maximum and minimum monthly temperatures for Kenhardt are 40.6°C and -3.7°C for January and July respectively. Corresponding values for Pofadder are 38.3°C and -0.6°C. Frost incidence ranges from around 10 frost days per year in the northwest to about 35 days in the east. Whirl winds (dust devils) are common on hot summer days.

Important Taxa (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type; ^WWestern and ^EEastern regions of the unit only).

Growth form	Species*
Grasses	<i>Aristida adscensionis</i> (d), <i>A. congesta</i> (d), <i>Enneapogon desvauxii</i> (d), <i>Eragrostis nindensis</i> (d), <i>Schmidtia kalahariensis</i> (d), <i>Stipagrostis ciliata</i> (d), <i>S. obtusa</i> (d), <i>Cenchrus ciliaris</i> , <i>Enneapogon scaber</i> , <i>Eragrostis annulata</i> ^E , <i>E. porosa</i> ^E , <i>E. procumbens</i> , <i>Panicum lanipes</i> ^E , <i>Setaria verticillata</i> ^E , <i>Sporobolus nervosus</i> , <i>Stipagrostis brevifolia</i> ^W , <i>S. uniplumis</i> , <i>Tragus berteronianus</i> , <i>T. racemosus</i> ^E .
Small trees	<i>Acacia mellifera</i> subsp. <i>detinens</i> ^E , <i>Boscia foetida</i> subsp. <i>foetida</i> .
Tall shrubs	<i>Lycium cinereum</i> (d), <i>Rhigozum trichotomum</i> (d), <i>Cadaba aphylla</i> , <i>Parkinsonia africana</i> .
Low Shrubs	<i>Aptosimum spinescens</i> (d), <i>Hermannia spinosa</i> (d), <i>Pentzia spinescens</i> (d), <i>Aizoon asbestinum</i> ^E , <i>A. schellenbergii</i> ^E , <i>Aptosimum elongatum</i> , <i>A. lineare</i> ^E , <i>A. marlothii</i> ^E , <i>Barleria rigida</i> , <i>Berkheya annectens</i> , <i>Blepharis mitrata</i> , <i>Eriocephalus ambiguus</i> , <i>E. spinescens</i> , <i>Limeum aethiopicum</i> , <i>Lophiocarpus polystachyus</i> , <i>Monechma incanum</i> , <i>M. spartioides</i> , <i>Pentzia pinnatisecta</i> , <i>Phaeoptilum spinosum</i> ^E , <i>Polygala seminuda</i> , <i>Pteronia leucoclada</i> , <i>P. mucronata</i> , <i>P. sordida</i> , <i>Rosenia humilis</i> , <i>Senecio niveus</i> , <i>Sericocoma avolans</i> , <i>Solanum capense</i> , <i>Talinum arnotii</i> ^E , <i>Tetragonia arbuscula</i> , <i>Zygophyllum microphyllum</i> . Succulent Shrubs: <i>Kleinia longiflora</i> , <i>Lycium bosciifolium</i> , <i>Salsola tuberculata</i> , <i>S. glabrescens</i>
Herbs	<i>Acanthopsis hoffmannseggiana</i> , <i>Aizoon canariense</i> , <i>Amaranthus praetermissus</i> , <i>Barleria lichtensteiniana</i> ^E , <i>Chamaesyce inaequilatera</i> , <i>Dicoma capensis</i> , <i>Indigastrum argyraeum</i> , <i>Lotononis platycarpa</i> , <i>Sesamum capense</i> , <i>Tribulus pterophorus</i> , <i>T. terrestris</i> , <i>Vahlia capensis</i> .
Succulent herbs	<i>Gisekia pharnacioides</i> ^E , <i>Psilocaulon coriarium</i> , <i>Trianthema parvifolia</i> .
Geophytic herbs	<i>Moraea venenata</i> .

Growth form	Species*
Biogeographically Important Taxa	(Bushmanland endemic) Succulent Herb: <i>Tridentea dwequensis</i> .
Endemic Taxa	<u>Succulent Shrubs</u> : <i>Dinteranthus pole-evansii</i> , <i>Larryleachia dinteri</i> , <i>L. marlothii</i> , <i>Ruschia kenhardtensis</i> . <u>Herbs</u> : <i>Lotononis oligocephala</i> , <i>Nemesia maxii</i> .
Conservation	Least Concern
Conservation Target	21 %
Conserved in	Only small patches statutorily conserved in Augrabies Falls National Park and Goegab Nature Reserve.
Conserved	0.5 %
Threat activities	Very little of the area has been transformed. Erosion is very low (60%) and low (33%).
Protection Level	Poorly Protected

References Acocks (1953, 1988), Du Toit (1996), L. Mucina (unpubl. data).

Lower Gariiep Broken Veld (NKb 1)

VT 32 Orange River Broken Veld (70%) (Acocks 1953). LR 51 Orange River Nama Karoo (95%) (Low & Rebelo 1996).

Distribution Northern Cape Province: Hardeveld along the Orange River from Onseepkans in the west, including the canyon below the Augrabies Falls and parts of Riemvasmaak and adjacent areas to Keimoes resuming from the Boegoeberg to around Prieska in the east. A series of inselbergs and koppies occurring between Keimoes and around Kakamas, and the ridge running west of Groblershoop from Karos in the north to around Marydale in the south. The unit also occurs in neighbouring Namibia. Most of the area varies from 400–1 200 m in altitude.

Vegetation & Landscape Features Hills and low mountains, slightly irregular plains but with some rugged terrain (e.g., downstream of the Augrabies Falls) with sparse vegetation dominated by shrubs and dwarf shrubs, with annuals conspicuous, especially in spring, and perennial grasses and herbs. Groups of widely scattered low trees such as *Aloe dichotoma* var. *dichotoma* and *Acacia mellifera* subsp. *detinens* occur on slopes of koppies and on sandy soils of foot slopes respectively.

Geology & Soils The region has a complicate geology: banded iron formation and amphibolites of the Asbestos Hills Subgroup are Vaalian and the carbonates and cherts of the Campbell Group are of the same Era. Metamorphic rocks of the Mokolian Erathem include quartzites and gneisses of the Korannaland Supergroup as well as the Riemvasmaak gneiss. Metamorphosed clastic sediments of the Uitdraai Formation are also Mokolian. The remaining half of the area is composed of many other stratigraphies, metamorphosed sediments and outcrops of the ultrametamorphic rocks of the Namaqualand Metamorphic Complex. The soils are shallow and skeletal (dominant soil forms are Mispah and Glenrosa), typical mainly of Ib and Ic land types, and to a lesser extent also of Fb land type.

Climate MAP ranges from about 70 mm in the west to 240 mm in the east. Mean maximum and minimum monthly temperatures for Kakamas are 41.3°C and –2°C for January and July respectively. Corresponding values for Prieska (near the eastern extremity) are 39.7°C and –4.1°C. Frost incidence varies from less than 10 days of frost per annum in the west to around 30 days in the east. See also climate diagram for NKb 1 Lower Gariiep Broken Veld (Figure 7.2).

Important Taxa (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type; ^WWestern and ^EEastern regions of the unit only).

Growth form	Species*
Succulent trees	<i>Aloe dichotoma</i> var. <i>dichotoma</i>
Small trees	<i>Acacia mellifera</i> subsp. <i>detinens</i> (d), <i>Commiphora gracilifrons</i> ^W , <i>Ficus cordata</i> , <i>Pappea capensis</i> ^W , <i>Rhus populifolia</i> ^W , <i>Ziziphus mucronata</i> subsp. <i>mucronata</i> .

Growth form	Species*
Tall Shrubs	<i>Rhigozum trichotomum</i> (d), <i>Adenolobus garipensis</i> ^W , <i>Antherothamnus pearsonii</i> ^W , <i>Cadaba aphylla</i> , <i>Caesalpinia bracteata</i> , <i>Ehretia rigida</i> subsp. <i>rigida</i> , <i>Nymania capensis</i> , <i>Rhigozum obovatum</i> ^E , <i>Rhus burchellii</i> .
Semiparasitic Shrub	<i>Tapinanthus oleifolius</i>
Succulent Shrubs	<i>Ceraria namaquensis</i> , <i>Cryptolepis decidua</i> ^W , <i>Euphorbia avasmontana</i> , <i>E. gregaria</i> ^W , <i>Kleinia longiflora</i> , <i>Lycium bosciifolium</i> , <i>Zygophyllum dregeanum</i> .
Woody Succulent Climber	<i>Sarcostemma viminale</i>
Low Shrubs	<i>Blepharis mitrata</i> (d), <i>Aizoon schellenbergii</i> , <i>Aptosimum albomarginatum</i> , <i>A. lineare</i> , <i>A. marlothii</i> , <i>Barleria rigida</i> , <i>Berkheya spinosissima</i> subsp. <i>namaensis</i> , <i>Dyerophytum africanum</i> , <i>Hermannia spinosa</i> , <i>H. vestita</i> , <i>Hibiscus elliotiae</i> , <i>Indigofera heterotricha</i> , <i>Limeum aethiopicum</i> , <i>Lophiocarpus polystachyus</i> , <i>Monechma spartioides</i> , <i>Phaeoptilum spinosum</i> , <i>Phyllanthus maderaspatensis</i> , <i>Polygala seminuda</i> , <i>Ptycholobium biflorum</i> subsp. <i>biflorum</i> , <i>Sericocoma avolans</i> , <i>Solanum capense</i> , <i>Stachys burchelliana</i> , <i>Talinum arnotii</i> , <i>Tetragonia arbuscula</i> , <i>Zygophyllum rigidum</i> .
Semiparasitic Shrub	<i>Thesium lineatum</i>
Graminoids	<i>Aristida adscensionis</i> (d), <i>Enneapogon desvauxii</i> (d), <i>E. scaber</i> (d), <i>Eragrostis nindensis</i> (d), <i>Stipagrostis obtusa</i> (d), <i>S. uniplumis</i> (d), <i>Aristida congesta</i> , <i>A. engleri</i> , <i>Cenchrus ciliaris</i> , <i>Digitaria eriantha</i> , <i>Enneapogon cenchroides</i> , <i>Eragrostis annulata</i> , <i>E. lehmanniana</i> , <i>E. porosa</i> , <i>Schmidtia kalahariensis</i> , <i>Setaria verticillata</i> , <i>Sporobolus fimbriatus</i> ^E , <i>Stipagrostis anomala</i> , <i>S. ciliata</i> , <i>Tragus berteronianus</i> , <i>Triraphis ramosissima</i> ^W .
Herbs	<i>Forsskaolea candida</i> (d), <i>Acanthopsis hoffmannseggiana</i> , <i>Barleria lichtensteiniana</i> , <i>Chamaesyce glanduligera</i> , <i>Chascanum garipense</i> , <i>Cleome angustifolia</i> subsp. <i>diandra</i> , <i>Codon royenii</i> , <i>Dicoma capensis</i> , <i>Garuleum schinzii</i> ^E , <i>Rogeria longiflora</i> , <i>Sesamum capense</i> , <i>Tribulus zeyheri</i> , <i>Trichodesma africanum</i> . Succulent Herbs: <i>Orbea lutea</i> subsp. <i>lutea</i> , <i>Stapelia flavopurpurea</i> .
Biogeographically Important Taxa	None
Endemic Taxa	Succulent Shrub: <i>Ruschia pungens</i> .
Conservation	Least Concern
Conservation Target	21 %
Conserved in	Statutorily conserved in Augrabies Falls National Park (3.4 %).
Conserved	Only small patches statutorily conserved in Augrabies Falls National Park and Goegab Nature Reserve.
Threat activities	Only a very small part is transformed. Erosion is low (58%), very low (27%) and moderate (14%).
Protection Level	Poorly Protected

References Acocks (1953, 1988), Werger & Coetzee (1977), Bezuidenhout (1996), Zietsman & Bezuidenhout (1999).

Bushmanland Sandy Grassland (NKb 4)

VT 29 Arid Karoo and Desert False Grassveld (80%) (Acocks 1953). LR 49 Bushmanland Nama Karoo (71%) (Low & Rebelo 1996).

Distribution Northern Cape Province: Surrounds of Aggeneys (northern Bushmanland) and a few isolated patches south of Copperton on the eastern edge of the Bushmanland Basin suggesting the course of the paleoriverine system of the Orange River and its tributaries. The largest continuous patch of this vegetation type fills the shallow valley of the intermittent Koa River southeast and west of Aggeneys. Altitude varies mostly from 500–1 200 m.

Vegetation & Landscape Features Dense, sandy grassland plains with dominating white grasses (*Stipagrostis*, *Schmidtia*) and abundant drought-resistant shrubs. After rainy winters rich displays of ephemeral spring flora (*Grielum humifusum*, *Gazania lichtensteinii*) can occur.

Geology & Soils Mostly Quaternary sediments (sand, calcrete) with some contribution of the pre-Pleistocene Kalahari Group sediments in the east. Typically, the surface is covered by red sands >300 mm deep, forming dunes in places. Af land type dominates.

Climate Major rainfall peak between February and April and a minor peak in November. MAP ranges from about 70–110 mm. See also climate diagram for NKB 4 Bushmanland Sandy Grassland (Figure 7.2).

Important Taxa (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type).

Growth form	Species*
Grasses	<i>Schmidtia kalahariensis</i> (d), <i>Stipagrostis brevifolia</i> (d), <i>S. ciliata</i> (d), <i>S. obtusa</i> (d), <i>Aristida adscensionis</i> , <i>A. congesta</i> , <i>Centropodia glauca</i> , <i>Enneapogon desvauxii</i> , <i>Stipagrostis anomala</i> .
Herbs	<i>Gazania lichtensteinii</i> (d), <i>Grielum humifusum</i> (d), <i>Tribulus zeyheri</i> (d), <i>Dicoma capensis</i> , <i>Hirpicium echinus</i> , <i>Manulea nervosa</i> , <i>Requienia sphaerosperma</i> , <i>Sesamum capense</i> .
Succulent herbs	<i>Crassula muscosa</i> .
Tall shrubs	<i>Rhizozum trichotomum</i> , <i>Sisyndite spartea</i> .
Low Shrubs	<i>Zygophyllum microphyllum</i> (d), <i>Barleria rigida</i> , <i>Berkheya spinosissima</i> subsp. <i>namaensis</i> , <i>Eriocephalus microphyllus</i> var. <i>pubescens</i> , <i>E. pauperrimus</i> , <i>Galenia fruticosa</i> , <i>Hermannia spinosa</i> , <i>Monechma incanum</i> , <i>Peliostomum leucorrhizum</i> , <i>Pentzia spinescens</i> , <i>Plinthus karooicus</i> , <i>Pteronia mucronata</i> , <i>P. sordida</i> , <i>Rosenia humilis</i> , <i>Tetragonia arbuscula</i> .
Succulent Shrubs	<i>Aridaria noctiflora</i> subsp. <i>straminea</i> , <i>Lycium bosciifolium</i> , <i>Ruschia robusta</i> , <i>Salsola tuberculata</i> , <i>Senecio cotyledonis</i> , <i>Zygophyllum flexuosum</i> , <i>Z. foetidum</i> .
Woody Succulent Climber	<i>Sarcostemma viminale</i>
Biogeographically Important Taxa	None
Endemic Taxa	None
Conservation	Least Concern
Conservation Target	21%
Conserved in	None conserved in statutory conservation areas (0.0%).
Conserved	
Threat activities	Very little of the area has been transformed. The alien shrub <i>Prosopis</i> sp. can be seen as a threat. Erosion is very low (82%) or moderate (17%).
Remarks	This is a poorly known vegetation unit, separable from the surrounding units by its deep sands, often with red sand dunes. The occurrence of elements such as <i>Acacia erioloba</i> , <i>Schmidtia kalahariensis</i> and <i>Tribulus zeyheri</i> suggests similarity to southern Kalahari Duneveld flora.
Protection Level	Poorly Protected

References Anderson & Van Heerden (2000), L. Mucina (unpubl. data).

Implications:

- Several South Africa and Northern Cape endemic species, as well as red listed species are recorded from the vegetation units, some have localised distributions and others being widespread. Refer to Sections 4.5 and 12.2.

2.3.4 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 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 outcome of the most recent National Biodiversity Assessment (2018) indicates that all affected vegetation units have a Least Concern Conservation Status (Table 1). This indicates that more than 60 % of the unit is intact, and that ecosystem functioning is not under any threat resulting from loss of natural habitat. The Area of Occupancy (AOO) and the Extent of Occurrence (EOO) is indicated in Table 2 below. All units are currently Poorly Protected, despite being some of the most extensive vegetation units in terms of coverage area. There is a low level of utilization and transformation of these units due to minimal transformation in the broader, predominantly rural and very arid area. The coverage of **Bushmanland Arid Grassland** is within the 10 most extensive units of a total of 458 recognised vegetation units in South Africa.

Table 2: Coverage and protection levels of vegetation units

Vegetation Unit	Cons Target	AOO	EOO	Protection Level (%)
Bushmanland Arid Grassland (Nkb 3)	21 %	682	114 261.6	Not Protected (0.5 %)
Bushmanland Sandy Grassland (N kb 4)	21 %	99	39 572.9	Not Protected (0.0 %)
Lower Gariep Broken Veld (Nkb 1)	21 %	227	54 561.2	Poorly Protected (3.4 %)

Implications:

- The vegetation units are all categorised as having a *Least Concern* Conservation Status and are not under threat, with more than 60 % considered to be natural. The conservation targets are 21 % and are poorly protected, despite being some of the most extensive units.
- Conservation importance at a regional level for the site is Low and the site does not fall within any areas currently considered for protected area expansion.
- The proposed activity (powerline and associated infrastructure including access road, substations and BESS) are unlikely to significantly affect conservation of the vegetation unit, due to the small footprint, and it will not result in a significant cumulative loss.

2.3.5 Northern Cape Critical Biodiversity Areas (2016)

The identification and designation of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated. Priorities from existing plans such as the Namakwa District Biodiversity Plan (Desmet and Marsh, 2008), the Succulent Karoo Ecosystem Plan (Driver et al., 2003),

national estuary priorities (Turpie et al., 2012), and the National Freshwater Ecosystem Priority Areas (Nel et al., 2011) were incorporated.

Targets for terrestrial ecosystems were based on established national targets (Driver et al., 2012), while targets used for other features were aligned with those used in other provincial planning processes. The required representation of biodiversity features was achieved in a spatially efficient manner which avoided incompatible land uses and activities where possible. The assessment approach and map categories are designed to be compatible with the Guideline Regarding the Determination of Bioregions and the Preparation and Publication of Bioregional Plans (DEAT, 2009). Where possible, all targets were met in the identified set of CBAs. Targets ranged from 16% to 36% of original area for particular vegetation types (with most targets being in the range 19-24%), up to 100% of known habitat for key threatened species (especially for Critically Endangered and Endangered species with small known distributions). The target setting process, which is aligned with the processes used in other South African systematic plans. Targets for vegetation types were those used in the National Biodiversity Assessment (NBA) (Driver, et al., 2012). Some additional targets were set for rare and threatened habitat types (Holness & Oosthuizen, 2016) based on additional expert defined criteria. These include the following, none of which are within or near the assessment area.

- Ecosystem Threat status: The standard National Biodiversity Assessment (Driver, et al., 2012) method for evaluating threat status was used. The following ecosystem types triggered CBA status on this basis:
 - Alexander Bay Coastal Duneveld – Critically Endangered
 - Namib Seashore Vegetation – Endangered
 - Lower Gariep Alluvial Vegetation – Endangered with known under-mapped degradation and transformation.
- Rarity (under 5 000 Ha in the province and not widely distributed elsewhere):
 - Cape Vernal Pools
 - Vanrhynsdorp Shale Renosterveld
- Extreme rarity and endemism (rare types with under 5000 Ha originally or remaining often at a single site which are not widely distributed outside the province):
 - Arid Estuarine Salt Marshes
 - Kamiesberg Granite Fynbos
 - Kobee Succulent Shrubland
 - Namaqualand Seashore Vegetation
 - Namib Lichen Fields
 - Vyftienmyl se Berge Succulent Shrubland
- Ecosystem process importance or high biodiversity value with significant loss underway:
 - *Upper Gariep Alluvial Vegetation* – evidence gathered by DENC suggests that degradation of this vegetation type is just as intense as the Lower Gariep Alluvial. Further, it has significant process value for maintenance of hydrological processes.
 - *Richtersveld Coastal Duneveld* – critical for coastal processes and evidence of significant loss with approximately 30% of complete loss already recorded with significant additional fragmentation issues.
 - *Nieuwoudtville Shale Renosterveld* – a vulnerable type with extremely high biodiversity value and limited extent within the province.

The Northern Cape Province covers approximately 37.3 million hectares. The CBA designation (NC CBA, 2016) is indicted in Table 3 and Figure 6.

Project : Paulputs South WEF Grid Connection

Layout - Northern Cape Critical Biodiversity Areas

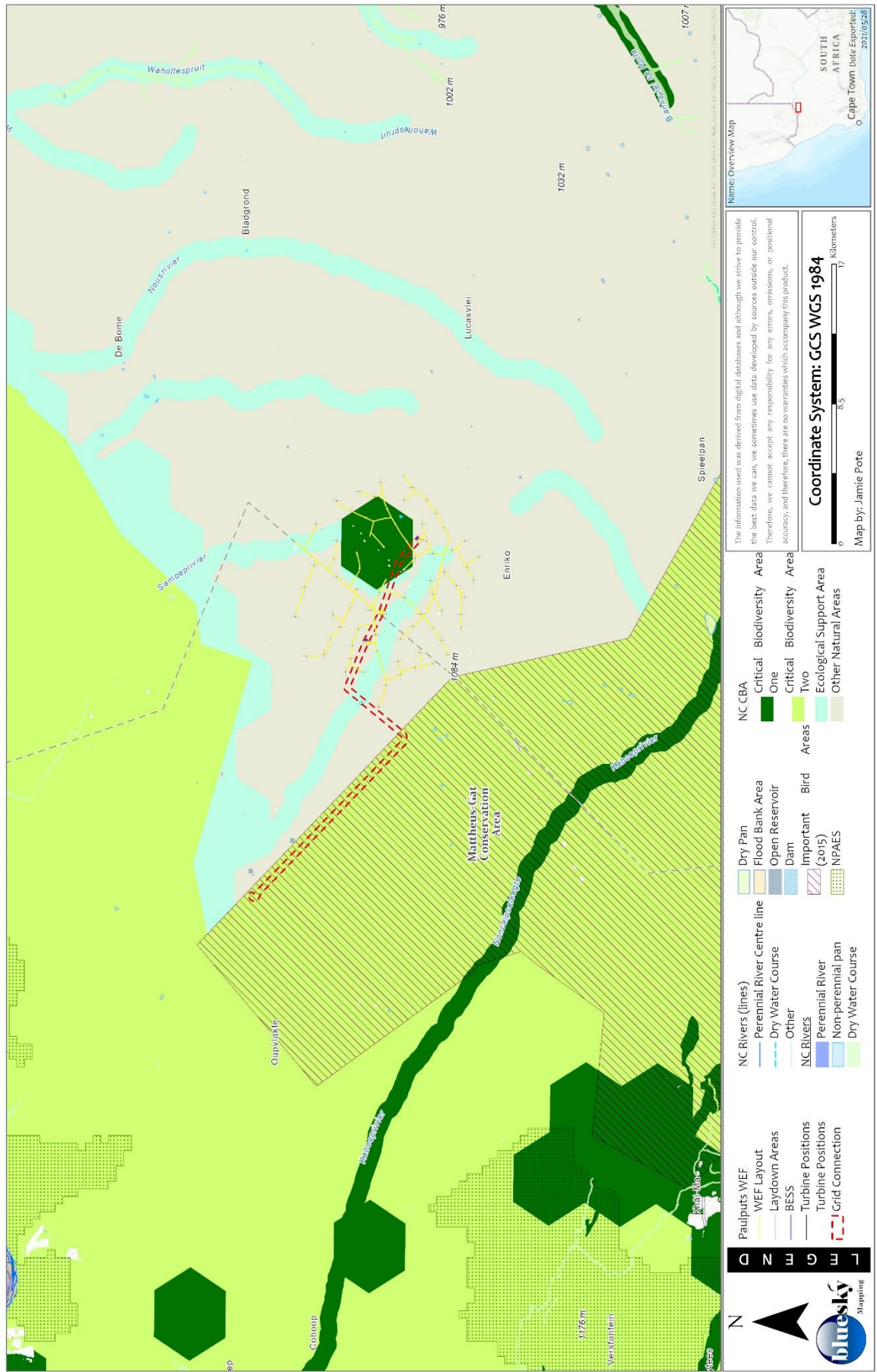


Figure 6: Northern Cape Critical Biodiversity Areas.

Table 3: Northern Cape CBA coverage.

CBA Category	Area (km ²)	Percent
Protected Area	18 139.9 km ²	4.9 %
Critical Biodiversity Area 1	30 627.4 km ²	8.2 %
Critical Biodiversity Area 2	75 777.5 km ²	20.3 %
Ecological Support Area	52 631.0 km ²	14.1 %
Other Natural Area	191 618.2 km ²	51.4 %
Not designated (including transformed and any undesignated)	4 206.0	1.1 %
TOTAL	373 000 km²	100.0

Based on the above, it is noted that land-based protected areas currently contribute less than 5 % of the Northern Cape landcover. An additional 28.5 % constitutes Critical Biodiversity Area with 14.1 % Ecological Support Area. Over 50 % is designated Other Natural Area, being most suited to development.

The proposed 132kV powerline is largely situated within an area designated Other Natural Area for the south and central portion of the route with Critical Biodiversity Areas 1 limited to a short section of powerline near the Paulputs South BESS and substation and Critical Biodiversity Area 2 along the northern stretch where it falls within the Mattheus-Gat Conservation Area IBA. Ecological Support Areas include a narrow band surrounding the non-perennial watercourse that runs parallel to but outside of the powerline corridor other than where a crossing from the east to the west side is required. Due to the Arid nature of the area, watercourses are likely to serve as important ecological corridors.

The proposed powerline will have a limited footprint, limited to most likely a two-track access road, 132 kV pylon footprints, substations at either end as well as the BESS (mostly ± 1 Ha). The proposed activity will not result in any significant loss of area designated as Critical Biodiversity Area and the small areas that do overlap with Ecological Support Areas will be minimal. In terms of recommended land uses for the various CBA classes, powerlines and other linear infrastructure, are generally considered to be compatible with Ecological Support Areas and importantly it is unlikely to result in any significant disruptions to ecological processes, being the primary objective of Ecological Support Areas. The BESS is situated outside of the CBA 1 area and the small footprints of the pylons will not significantly affect the CBA coverage.

Implications:

- The powerline is falls within designated CBA 1 & 2, ESA and Other Natural Areas.
- The proposed powerline is unlikely to affect terrestrial ecological processes significantly, being the primary objective of designated ESA areas.
- The total footprint of the pylon within designated CBA 1 in particular as well as within the CBA 2 area will be negligible, but is likely to exceed 300m² in total, hence triggering the respective listed activity (NEMA EIA Regulations, 2014 as amended).

2.3.6 Namakwa Biodiversity Sector Plan (2008)

Located within the Succulent Karoo - one of only two semi-arid biodiversity hotspots in the world and exhibiting by far the highest plant diversity of any arid ecosystem - the Namakwa District Municipality (NDM) is located in the Northwest of South Africa. It covers both Succulent Karoo (winter rainfall) and Nama Karoo (summer rainfall) arid systems as well as a small part of the Mediterranean-climate Fynbos in the extreme SW of the District. Having both summer and winter rainfall arid zones in the DM means that it is an area containing an exceptional variety of biodiversity. The specific site is located in the Succulent Karoo (winter rainfall) region. Namaqualand contains about 3500 plant species in 135 families and 724 genera, with about 25% of this flora endemic to the region. It is also home to an exceptionally

high level of insect and reptile endemism, with new species still being discovered. This remarkable diversity is not distributed evenly throughout the region but is concentrated in many local centres of endemism.

The scarcity of water resources is a defining feature of this arid environment. The two main river systems – the Orange River on the northern boundary, and the Oliphant's/Doring River system that flows in a northwesterly direction through the Hantam and Karoo Hoogland Municipalities – are both under pressure from the clearing of land for agriculture and the encroachment of alien vegetation along riverbanks. Similarly, the high yielding water catchment areas of the high mountain areas – some of which provide a significant amount of fresh water to surrounding towns – are also demonstrating lower yields because of a lack of efficient water management strategies. In order to maintain ecosystem health and thereby ensure the sustainability of existing towns and land use practices it is critical for each municipality to safeguard these areas. Effective water resource management is essential for all municipalities in the Northern Cape, especially since it is an extremely water limited area.

Land Use

Land use in the majority of the NDM is defined by livestock grazing and mining – the two major economic drivers in the region. Some agriculture in the form of wheat and grape cultivation occurs in areas under irrigation and dryland rooibos tea production occurs on the Bokkeveld Escarpment. Another significant economic factor for the NDM's economy is “flower” tourism that is based on Namaqualand's fantastic annual wildflower displays that cover regions in a kaleidoscope of colour each spring. This is a distinctly seasonal aspect of the economy, lasting only eight to ten weeks, and being highly dependent on the timing and duration of the previous winter rains. However, there are indications that in recent years the regional ecotourism industry is diversifying (e.g., 4x4 and nature tourism) with greater numbers of tourists arriving throughout the year. River rafting is also a big industry on the Orange and Doring Rivers. On a good weekend the Orange can have upwards of 3000 paddlers per day on the river (NDM, 2008). Approximately 90% of NDM is used for livestock grazing and production, with the remainder comprising of mining, agriculture and urban development.

Although livestock grazing is, in theory, a viable and biodiversity friendly land use in the region, in practice this is often not the case. Over grazing, especially considering the effects of climate change, constitutes the biggest threat to biodiversity within the NDM as a whole, mostly by virtue of it being the most widely practiced land use activity in the region. Effective veld management plans and practices (especially around catchment areas) is critical for sustainable land use in the NDM. Goat and sheep farming is a major land use, and thus should be monitored in order to ensure that stock numbers do not exceed the environments' carrying capacity – which could render large areas unable to support its ecosystem functions. The resultant erosion and reduction in vegetation cover would not only affect the productivity of the land, but also affect water quality and wetland health – thus having a direct impact upon human wellbeing.

Mining practices within the NDM has had multiple impacts upon both the economy and the landscape. The remnants of mining activities can be seen in each local municipality, in the form of mine dumps and excavations. Although copper is no longer mined in the district, the effect that granite mining has on natural landscapes is a good example of the transformative effect of the industry upon the region. Other mining activities in the region include Wollastonite, diamonds, base metals, salt and gypsum. Specifically in the vicinity of the site, historical diamond mining has been prevalent.

Critical Biodiversity and Ecological Process Areas

The Namakwa Bioregional Plan identifies an ecological corridor to the north of the powerline route (Figure 7), as indicated in Figure 7. It will however fall outside of the designated corridor. In line with the objectives for ecological process areas, the proposed powerline is unlikely to compromise ecological connectivity associated with the corridor.

Project : Paulputs South WEF Grid Connection

Layout - Namakwa CBA

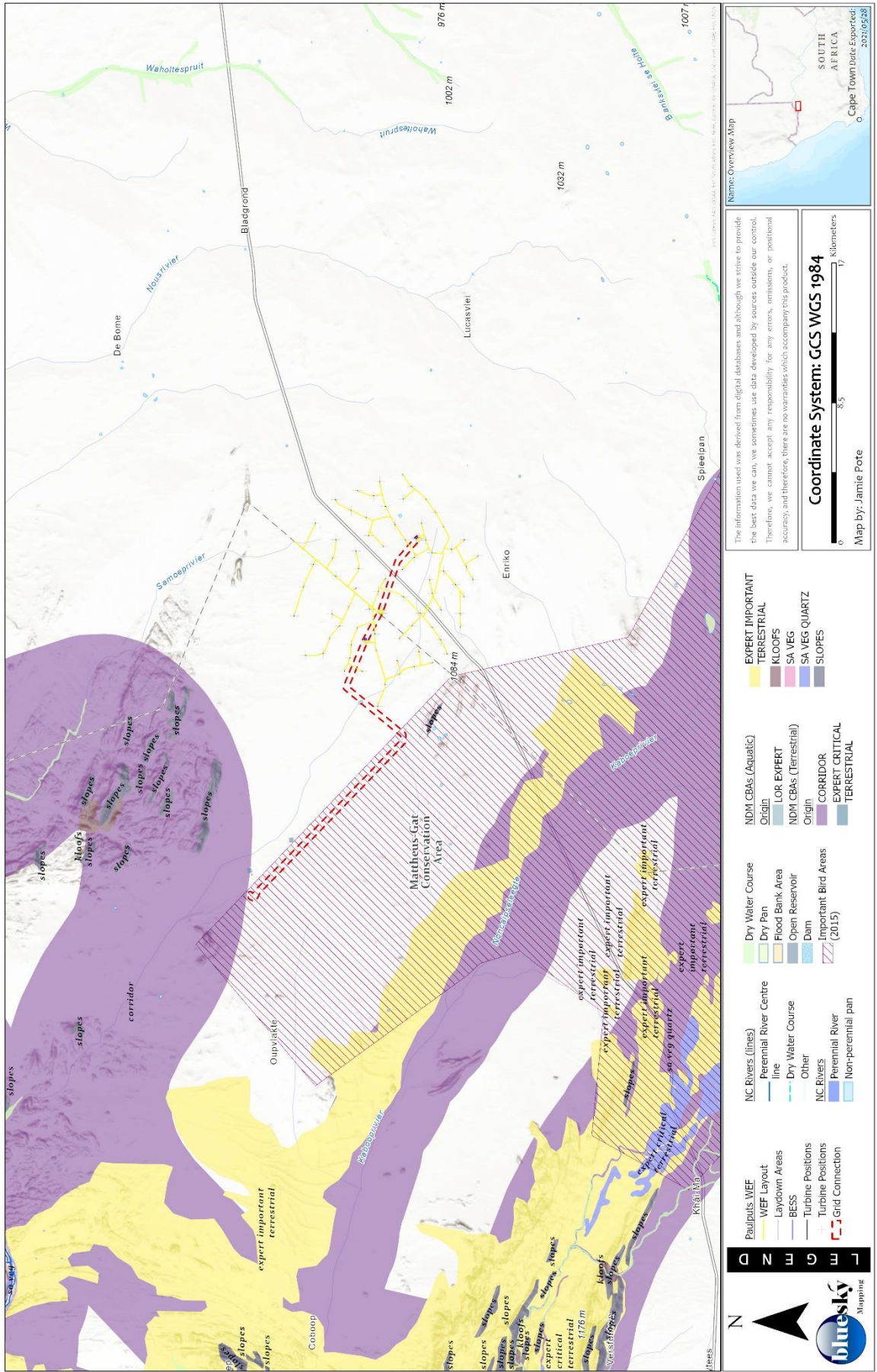


Figure 7: Namakwa Bioregional Plan.

The illegal collection of unique plant species – especially from areas such as quartz patches that are located near to roads- is a major threat to biodiversity in the Succulent Karoo. The use of certain plants for medicinal usage has long been practiced in the area, and it is important to ensure that these resources are harvested in a sustainable manner. This issue, which extends into the proliferation of bioprospecting in the region, is pertinent not only to the local biodiversity, but also to cultural heritage, as respect for indigenous knowledge systems is here linked to the utilization of local plants. A good example of the effect of bioprospecting on local inhabitants and plant life is the uptake of Hoodia – a plant traditionally used by San hunters to stave off hunger on long trips – into the mainstream weight loss market. In this example, acknowledgement was not given to the local cultural heritage that enabled the product to be generated until a much later stage, when royalties were eventually awarded to local San communities after an international outcry.

Implications:

- A band of corridor is indicated to the north of the powerline, which is outside of the project footprint.
- The proposed powerline is unlikely to affect ecological processes significantly, being the primary objective of Ecological Support Areas and/or corridor areas.

2.3.7 Succulent Karoo Ecosystem Plan (SKEP)

The Paulputs South WEF Grid Connection site is outside of the Succulent Karoo Ecosystem Planning Domain.

2.3.8 Other Biodiversity Sector Plans

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

2.3.9 Protected Areas

The South Africa Protected Areas Database (SAPAD) database, a comprehensive database of various protected area categories, is updated on a quarterly basis, and provides a comprehensive source of all national and private nature reserves, world heritage sites and other formal legally protected conservation areas situated within South Africa (Table 4, Figure 8). The Augrabies Falls National Park is closest, situated 50 km to the north-east and the site is situated within vegetation units that are represented in the National Park. Other nearby protected areas are greater than 50 km away. Several designated Important Bird Areas (IBA's) are present in the vicinity, these are however not declared protected areas. Of these IBA areas, the powerline route will traverse the eastern edge of the Mattheus-Gat Conservation Area IBA. Other IBA's are greater than 50 km from the powerline route.

Table 4: List of Protected Areas in vicinity

NAME	Category	DISTANCE
Augrabies Falls National Park	SAPAD	50 km NE
Mattheus-Gat Conservation Area IBA	IBA	0 km west
Haramoep & Black Mountain Mine Nature Reserve IBA	IBA	85 km W
Bitterputs Conservation Area IBA	IBA	82 km SW
Karas Nature Reserve	SAPAD	130 km SW
Marietjie van Niekerk Nature Reserve	SAPAD	131 km SW
Smorgenskadu Nature Reserve	SAPAD	132 km SW

Project : Paulputs South WEF Grid Connection

Layout - Northern Cape Critical Biodiversity Areas

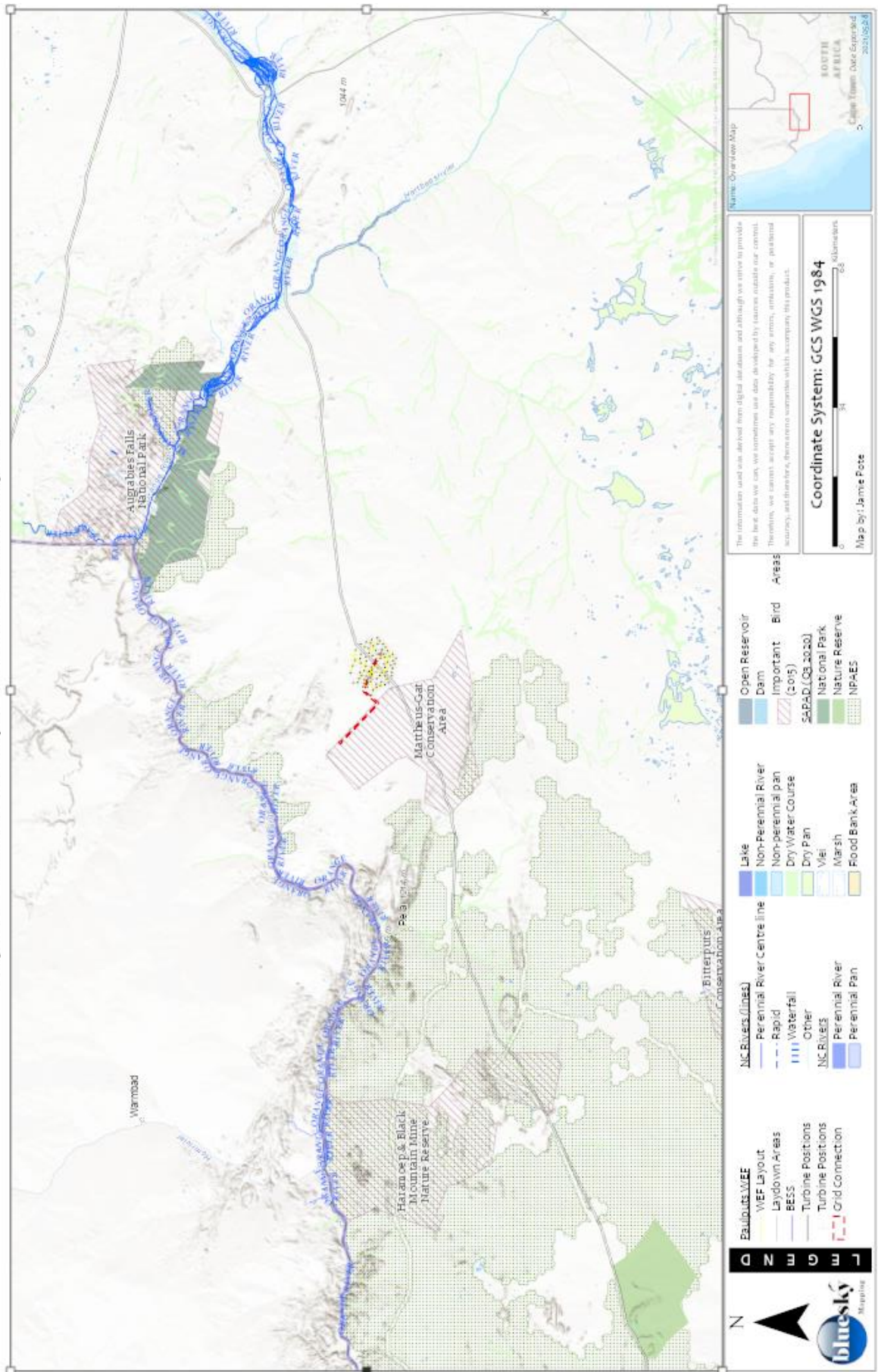


Figure 8: Protected Areas in the vicinity of the site.

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).

Neither these protected areas nor any ecological processes associated with them are likely to be affected by the proposed project. No RAMSAR sites are affected or situated within the Local municipal area and no Marine Protected Areas are directly affected. The site is also outside of any designated National Protected Areas Expansion Strategy (NPAES) areas. The avifaunal impacts associated with the IBA will not be assessed in this report, as they are relevant to the separate Avifaunal assessment. The Mattheus-Gat Conservation Area is not indicated as being a declared protected area in terms of the South Africa Protected Areas Database (SAPAD) database, although it is designated CBA 2 status and is assessed accordingly in the respective section (Northern Cape Critical Biodiversity Areas).

Implications:

- The activity will have no direct, indirect or cumulative impact on any protected environment.

2.3.10 Strategic Water Source Areas

Strategic water source areas (Figure 9) are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy. Strategic water source areas are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy.

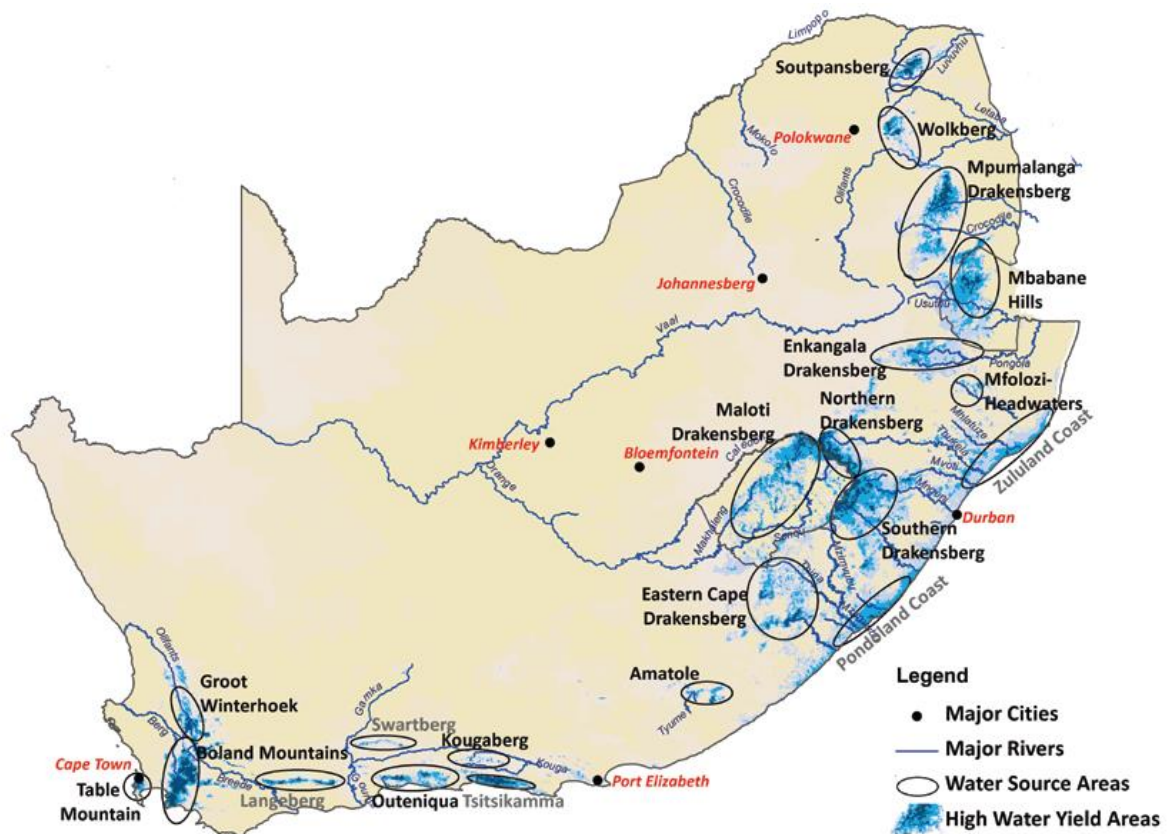


Figure 9: South Africa Water Source Areas [Source: Nel, et al, 2013]

Strategic water source areas can be regarded as natural "water factories", supporting growth and development needs that are often far away. Deterioration of water quality and quantity in these areas can have a disproportionately large negative effect on the functioning of downstream ecosystems and the overall sustainability of growth and development in the regions they support. Appropriate management of these areas, which often occupy only a small fraction of the land surface area, can greatly support downstream sustainability of water quality and quantity.

In South Africa, such management is particularly important for enhancing downstream water quality and quantity. Not only are the country's surface water resources extremely limited – South Africa is considered to be one of the driest countries (per capita), with 98 per cent of its surface water already developed – but the country also has a growing water quality problem.

Overloading with nutrients and other pollutants from urban, agricultural and industrial waste has resulted in many dams shifting to an algae-dominated, or eutrophic, state. Sixty-five per cent of the country's dams are now estimated to be eutrophic or borderline eutrophic, with most of these algal blooms containing cyanobacteria (blue-green algae) that is toxic to human health. This renders water of high quality unavailable if not treated, which coupled with failing water infrastructure, represents a major challenge to water security in the near future. Water managers are inevitably faced with finding new and innovative ways of improving both water quality and quantity to meet the increasing water demands of the country. Managing strategic water source areas is one way to meet this challenge.

The site is NOT situated within a Strategic Water Source Area and the specific activity (powerline) is unlikely to have an impact on any downstream water resources, as it is unlikely to alter water flows.

Implications:

- The site is outside of any SWSA, and it is furthermore unlikely to be any significant impacts to any critical water supply to downstream economies and urban centres as a result of development of this site, which is small in size and will not significantly affect water flow or catchment runoff.

2.3.11 Rivers and Wetlands

Ecologically speaking, the area being an arid environment, any temporary water sources including non-perennial watercourses, drainage lines, wetlands and pans will form an integral part of the terrestrial landscape as they will extend the availability of water to particularly faunal species for a longer time period than what is provided by direct rainfall. Such areas that are wetter for extended periods often also support a slightly more prolific vegetation compared to the surrounding areas. There are likely also several faunal species assemblages that are dependant on this sporadic water availability. It is imperative that no impacts to the functioning of these systems occur.

Rivers

The proposed powerline route will traverse a watercourse in the central portion (Figure 10). The watercourse is non-perennial and most likely supports a limited and seasonal riparian vegetation, which could not be differentiated during the dry season, other than a slightly denser concentration of small shrubs and herbs, typical of arid areas. Due to the arid nature of the region, watercourses are expected to serve as critical ecological corridors (Figure 10). It is likely tha the powerline will span the river and any associated impacts will be minimal.

Wetlands

The National Biodiversity Assessment (NBA, 2018) identifies indicated as being situated along the route (Figure 10), slightly to the south-west of the non-perennial watercourse where the powerline crosses. It was however verified in the site visit that it is in fact not be a pan but rather a quartzite hill, which will be assessed further in the respective terrestrial assessment section of this report. Detailed assessment of aquatic features is largely outside of the scope of this terrestrial biodiversity report and will be addressed in a separate aquatic assessment report if necessary.

Implications:

- The proposed route will traverse a non-perennial watercourse at the central-northern end.
- An NBA designated wetland along the route was found to in fact be a quartzitic hill rather than a wetland.
- Assessment of aquatic features is outside the scope of this report, however flora and faunal habitat as well as associated ecological processes will be assessed further in the assessment section of this report.

2.3.12 Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) project responds to the high levels of threat prevalent in river, wetland and estuary ecosystems of South Africa. It provides strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources. These strategic spatial priorities are known as Freshwater Ecosystem Priority Areas, or 'FEPAs'. Biodiversity targets set minimum, quantitative requirements for biodiversity conservation. They reflect scientific best judgement and will need to be refined as knowledge evolves. Quantitative biodiversity targets were set for fish species, river ecosystem types, wetland ecosystem types, priority estuaries, wetland clusters and free-flowing rivers:

1. Threatened and near-threatened freshwater fish species – all populations (100%) of considered to be critically endangered or endangered species, and at least ten populations of species that are in the International Union for Conservation of Nature (IUCN) vulnerable or near threatened categories and some populations of special concern (e.g., very restricted distributions in South Africa)
2. River ecosystem types – 20% of total length per type
3. Wetland ecosystem types – 20% of total area per type
4. Wetland clusters – 20% of total area per wetland vegetation group
5. Free-flowing rivers – 20% of total length per ecoregion group
6. Priority estuaries – 100% of all priority estuaries, which already considered biodiversity targets of 20% for estuary ecosystem types and habitat, 50% of the populations of threatened species; 40% of the populations of exploited estuarine species; 30% of the populations of all other estuarine species.

Terrestrial and aquatic resources are interdependent, with one affecting the other. For example, to ensure the healthy functioning of rivers, wetlands and estuaries, it is essential to protect mountain catchment areas where the water originates, and to safeguard riverside vegetation because these plants prevent soil erosion, sedimentation and water pollution (Vromans et al., 2012). The health of a river ecosystem is largely dependent on the presence of natural vegetation or "riparian habitat" along its banks, including good vegetative cover within the surrounding landscape (catchment area). Riparian bank vegetation filters pollutants, helps maintain water temperatures, supplies organic matter ('food') in support of aquatic life (fish, insects etc.) and acts as a buffer to adjacent land-uses. The roots of the riparian plants also reduce the effects of floods, by binding riverbanks and thus preventing erosion. Furthermore, bank storage is increased by slowing run off during floods. For these reasons, it is essential that new developments are separated from a river and its "riparian habitat" by a buffer area.

Project : Paulputs South WEF Grid Connection

Layout - Rivers and Wetlands

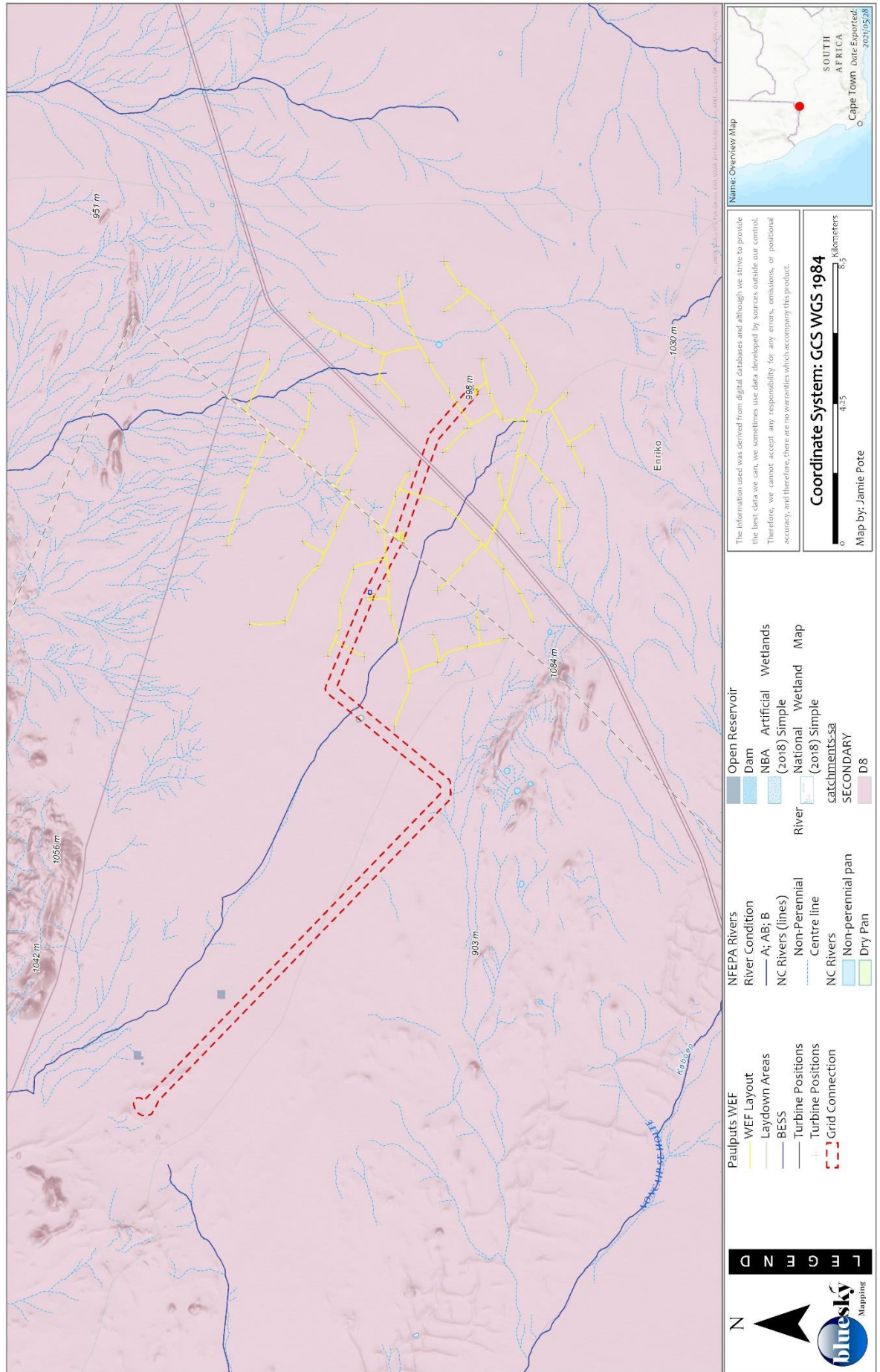


Figure 10: Rivers and Wetlands.

Concerning terrestrial fauna and flora components associated with Freshwater Ecosystem Priority Areas, the powerline route will traverse natural aquatic features or aquatic functional zones. A non-perennial watercourse flows through the site in a north-westerly direction (Figure 10), with the powerline running on either side and will cross over at a single point. The watercourse is classified under NFEPA as CLASS B: LARGELY NATURAL. Several smaller ephemeral non-perennial watercourses are also in proximity to the western most bend of the powerline. It is unlikely to be affected significantly as a result of the development of the powerline, as the line will most likely span the watercourse and any impacts to the drainage lines are likely to be localised and negligible. Since the region is arid, these watercourses are considered to be critical ecological corridors, in particular for faunal species, but due to the limited pylon and access road footprints within the watercourse corridor, the impact is likely to be negligible.

2.3.13 Regional Hotspots and Centres of Endemism

The site is situated to the south of the Gariap Centre of Endemism. The location of the proposed activity in proximity to the centre of Endemism and biodiversity rich areas to the north and west, suggests that the screening for possible endemic species should be undertaken. Additional screening of endemic species has thus been undertaken and is provided in Section 4.5.

Implications:

- Several endemic species could possibly occur within the wider area, which will be assessed further in the species assessment section of this report. Due to the limited and localised footprint associated with a powerline and the extensive extent of the vegetation units, it is likely that these risks will be minimal.

2.3.14 Key Biodiversity Areas

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. By conserving IBA's, we look after all the ecosystem goods and services they provide, which means in effect that we support a meaningful component of the South African economy (such as water management and agriculture). Since the late 1970s, more than 12 000 IBA's have been identified in virtually all of the world's countries and territories, both on land and at sea. In 1998, 122 South African IBA's were identified and listed in Barnes (1998). This inventory was revised to 112 IBA's in 2015. IBA's have also had considerable and increasing relevance when responses have been developed to several wider environmental issues, such as habitat loss, ecosystem degradation, climate change and the sustainable use of resources. The core aims of the IBA Programme are:

- To identify, monitor and conserve the sites and habitats that support South Africa's priority bird species.
- To develop a network of partners, from grassroots to national level, who collaborate to conserve IBA's.
- To gather new data regularly and monitor IBA's in order to track status and trends across the network and so that up-to-date information can be passed on to decision-makers, enabling them to take appropriate conservation action.
- To confirm periodically that existing IBA's continue to meet the selection criteria and to identify other critical sites that may qualify for recognition as IBA's as new information becomes available.

- To build capacity in the IBA Programme by sourcing funding, and to acquire and develop appropriate skills in staff and volunteers so that these objectives can be implemented at a regional scale.

The extension of the IBA approach to several other wildlife groups has led to the identification of Important Plant Areas, Prime Butterfly Areas, Important Mammal Areas and Key Biodiversity Areas for Freshwater Biodiversity. South Africa is also the first mega diverse country to practically test the Key Biodiversity Areas (KBA's) standards across a full range of species groups and ecosystems but is not yet published.

The site is situated to the east of the Mattheus-Gat Conservation Area IBA and the northern portion of the powerline route overlaps with the designated conservation area.

Implications:

- Development of the sites is unlikely to pose any significant risk to terrestrial habitat within the IBA due to the limited footprint.
- Specific Avifaunal related risks and impacts are outside of the scope of this report and are addressed in a separate Avifaunal specialist report.

2.4 Ecological Processes and Corridors

2.4.1 Critical Biodiversity Areas

Given that the objective of CBAs is to identify biodiversity priority areas which should be maintained in a natural to near natural state, in order to meet conservation target, development within these areas is not encouraged. The following issues need to be considered when considering development within a CBA:

- Are there alternative areas within the site but outside of the CBA that could be developed?
- Does the project undermine the overall ecological functioning of the broad CBA area?
- Can mitigation measures reduce the impact of the development on ecological processes?

The proposed 132kV powerline is situated within an area designated Other Natural Area for the south and central portion of the route with Critical Biodiversity Areas 1 limited to a short section of powerline near the Paulputs South WEF BESS and substation and Critical Biodiversity Area 2 along the northern stretch where it falls within the Mattheus-Gat Conservation Area IBA. The powerline footprint will be limited to pylon footprints and the access track and will thus not result in any significant loss of area designated as Critical Biodiversity Area 1 or 2. The BESS is situated outside of the CBA 1 area and the small footprints of the pylons will not significantly affect the CBA coverage.

Implications:

- Portions of the powerline does fall within designated CBA 1 & 2.
- The total footprint of the pylon within designated CBA 1 in particular as well as within the CBA 2 area will be negligible, but is likely to exceed 300 m² in total, hence triggering the respective listed activity (NEMA EIA Regulations, 2014 as amended).
- Due to the limited footprint size, a biodiversity offset for this footprint is unlikely to provide any conservation benefit.

2.4.2 Ecosystem Services

“Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services, recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling”. (Millennium Ecosystem Assessment (MEA), 2005)

Terrestrial (or land) ecosystems provide valuable ecosystem services that contribute to human well-being. They can provide³:

- buffers against natural hazards such as fire and floods^(e)
- carbon sequestration (storage), important for reducing the impacts of climate change^(e)
- regulation of water supply^(e)
- grazing for wild animals and livestock^(e)
- natural spaces for recreation & tourism^(e)
- the air we breathe^(e)
- spiritual, ritual and ceremonies^(e)
- horticultural & wildflower industries
- natural heritage^(e)
- food, timber, fibre and medicinal plants^(e)

Rivers are central to human welfare and economic development. They provide:

- water for agricultural, industrial and domestic uses^(e)
- flood attenuation and regulation^(e)
- food and medicinal plants^(e)
- transport and/or purification of biodegradable wastes^(e)
- tourism, recreational and cultural use^(e)
- enhanced property values

Estuaries, together with an associated buffer of natural vegetation, perform several valuable functions, especially in relation to:

- subsistence fishing
- commercial fisheries (as they provide a refuge for commercial fishes when they are young)
- wildlife habitat e.g., nursery and refuge (providing habitat for amphibians, birds, fish and mammals for all or portions of their life cycles)
- tourism, recreational, cultural use and craft materials
- enhanced property values

³ Within the study area, terrestrial ecosystem services are marked ^(e).

Ecological corridors provide valuable ecosystem services that are often impossible or very costly to replicate or offset. For example, they:

- support the migration (movement) and long-term survival of plant and animal species and their ecological processes (e.g., fire, pollination, seed dispersal), in response to global climate change.
- are important areas for storing carbon to reduce the impacts of global climate change?
- are important areas for regulating water supply (e.g., filtering and storing drinking water, keeping excess nutrients out of wetlands and rivers, ensuring a high-water yield from mountain catchments)
- supply good quality water from mountain catchment areas, both surface and groundwater.
- the supply of water quality and quantity is not only for human consumption but for ensuring the survival of downstream estuaries, wetlands (vleis) and streams (which in turn provide us with other ecosystem services).
- are of important scenic value, contributing to tourism and the ‘sense of place’.^(e)

Coastal & marine areas

- Subsistence & commercial fishing (food)
- Medicinal & Cosmetic resources e.g., kelp & microscopic plants for the feed, food, cosmetics, & pharmaceutical industries.
- Mining (sand and heavy mineral)
- Recreational value (sport and fishing)
- Retail value (market-value of housing)^(e)

Net Primary production^(e): This critical ecological process involves the process of photosynthesis – which translates into the amount of carbon plants can fix on an annual basis. This is important for each LM within the district as the amount of carbon fixed translates directly into the amount of forage produced and thus made available for grazing. Consequently, livestock management directly impacts upon forage production as overgrazing reduces the vegetations’ ability to maintain this ecosystem process. This ecological process is especially significant for the ORT, as the main land use comprises of livestock grazing. Therefore, this factor has a direct bearing on both the amount of food available for livestock, and the amount of plant material available regarding reducing runoff in wetland areas.

Water production: In more arid areas, many municipalities and towns rely on groundwater or local water resources to supply to town with drinking water. Thus, the higher rainfall areas are key recharge zones for these groundwater resources. Consequently, land use management of these catchment areas are critical for the maintenance of the quality and quantity of water sourced from each area. For example, water courses and wetlands that have been cleared for agricultural purposes, or overgrazed, will not only cause soil erosion, but most importantly cause increased water runoff, thus reducing the amount of water that feeds back into the water table for consumption. Groundwater is also a critical resource for agriculture and food production.

Species movement corridors and climatic refuges: Global climate change is undoubtedly a threat in the coming decades. A key action to mitigate its effects is the maintenance of species’ ability to migrate to new locations as the climatic conditions which they require move across the landscape. These corridor and refuge migration strategies occur on both a micro and macro level. On the macro scale corridors provide for species movement at landscape scales. This entails the ability of fauna and flora to undertake large scale movements towards areas which continue to provide the conditions required by a species for growth and reproduction. Movements could entail migrations of up to hundreds of kilometres, and corridors of mostly natural or near natural vegetation across the landscape are needed to permit this to occur. Climatic refuges can be localized areas that have moderated climates – such as mountain kloofs and south facing slopes. These areas provide cooler habitats where species under threat from changing climates can colonise or species and vegetation not widely found in surrounding area.

Within the site, the most important ecosystem services are the provision of habitat for faunal species (foraging) and potentially livestock/game farming, as well as several mineral resources (mining). There is minimal change to ecosystem services from pre-development conditions because of surrounding historical rural development and historical agricultural use of the site.

Implications:

- The rural communities are generally highly dependent on local ecosystem services for a range of resources. These will however not be significantly affected by the proposed activity.
- The contribution of the site to any ecosystem services of an ecological or biodiversity nature is low to moderate at a regional scale.
- The proposed activity will not significantly affect ecosystem services as described above.

2.4.3 Ecosystem Processes and Function

In the Succulent Karoo, distinct processes have been associated with surface geology and soils, climate, topography, drainage systems, and the make-up of the remaining native vegetation. These features could be missed or only partly incorporated into land use plans unless they are specifically identified and targeted. Ideally, areas maintaining adaptive diversification (e.g., environmental gradients) or containing historically isolated populations should be identified and protected. The spatial aspect of ecological processes also needs to be determined and such insights incorporated in conservation planning. Finally, connectivity within these areas should be ensured to maintain species migration and gene flow.

The proposed 132kV powerline is unlikely to pose any significant risk to terrestrial ecosystem processes and functions.

2.4.4 Ecological Support Areas

These include supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature. ESA's are generally extensions to the CBA area incorporating small areas that are perhaps no longer natural, or are comprised of secondary vegetation, generally following the drainage line ecological corridors within the wider surrounding landscape that will improve connectivity.

Land-use guidelines generally recommend the following for Ecological Support Areas (ESA):

- Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained.

For areas classified as ESA 1, the following objectives apply:

- These areas are **not required** to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience.
- These systems may vary in condition and maintaining function is the main objective, therefore:
 - Ecosystems still in natural, near natural state should be maintained.
 - Ecosystems that are moderately disturbed/degraded should be restored.

The following issues need to be considered when considering development within a CBA:

- Are there alternative areas within the site but outside of the CBA that could be developed?
- Does the project undermine the overall ecological functioning of the broad CBA area?
- Can mitigation measures reduce the impact of the development on ecological processes?

Ecological Support Areas generally include:

- **Biodiversity Corridors:** Whole landscape-level biodiversity corridor network aimed at retaining connectivity between all geographic areas in the district and nationally. Corridor network identified based on existing corridor networks and following alignment guidelines laid out in the NSBA such as upland-lowland, climatic and latitudinal gradients.
- **Wetland Buffer Areas:** The buffer zone around wetlands and rivers where land-use activities can impact the ecological functioning and integrity these features. Criteria:
 - 500 m radius buffer around all pans and estuaries
 - 100 m radius buffer around all wetlands and rivers
 - All farm dams.

Limited areas area available for agricultural expansion that are not excluded due to slope and/or soil suitability. It would be feasible to investigate options where ecological functioning and connectivity can still be maintained within the local and broader landscape. This could include mitigation measures that will support maintain ecological function and connectivity.

The proposed 132kV powerline will traverse a narrow band of Ecological Support Areas surrounding the non-perennial watercourse that runs parallel to but outside of the powerline corridor other than where a crossing from the east to the west side is required. Due to the arid nature of the area, watercourses are likely to serve as important ecological corridors. In terms of recommended land uses for the various CBA classes, powerlines and other linear infrastructure, are generally considered to be compatible with Ecological Support Areas and importantly the aerial powerline and access track are unlikely to result in any significant disruptions or barriers to terrestrial ecological processes, being the primary objective of Ecological Support Areas.

Implications:

- The powerline will traverse a narrow ESA band associated with the non-perennial watercourse.
- The proposed powerline is unlikely to affect terrestrial ecological processes significantly, being the primary objective of designated ESA areas.

2.4.5 Critical/Important Terrestrial Habitats

Special Habitats include areas that are rare within a region, or which support important species, ecosystems or ecological processes. Species of Conservation Concern refers to red data species and important habitats include the locations where these species are known to occur. Red data species are plant, animal or other organisms (e.g., reptiles, insects etc) that have been assessed and classified according to their potential for extinction in the near future. All known species are listed in the Red Data Book and classified as Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened or Least Concern. Red Data species are those species classified as Extinct, Critically Endangered, Endangered or Vulnerable. Some of the red data species are listed within the NEMBA Threatened or Protected Species (TOPS), and some are protected by provincial ordinances. Critical habitats include those areas that are known locations for such Red-data species that are under threat of extinction.

Important Terrestrial Habitats

- **Experts Areas:** Areas in the terrestrial environments identified by experts as being most critical or important for biodiversity. **None in area.**
- **Quartz Patches:** Vegetation with quartz or other types of gravel patches, which can be refuges for a wide range of succulent species. **A quartz patch which is incorrectly delineated as a wetland**

(NBA, 2019), is present to the west of the non-perennial watercourse where the powerline crosses. This patch has been designated a high sensitivity and should be avoided.

- **South-facing Slopes:** All areas with steep south-facing mountain slopes larger than 25 Ha in extent. These represent an important climate change refugia for biodiversity. No steep south facing slopes are present on site.
- **Kloofs:** All kloofs larger than 50 Ha in extent. These represent a keystone resource for biodiversity (e.g., presence of springs) and important climate change refugia for biodiversity. None in area.
- **Dunes:** These can represent an important refuge for faunal species. Dune areas are present and should be avoided as they are more sensitive to disturbance than the surrounding landscape.
- **Riverine Rabbit:** Modelled Riverine Rabbit habitat based on observed records. None in area.
- **Rocky Outcrops:** Rocky outcrops can provide habitat for geophytic species that often have limited distributions. Several rocky hills are present within the powerline servitudes. These will be assessed in more detail in the assessment section of this report and have been delineated as having a high sensitivity to be avoided, including pylons and the access track.
- **Wetland habitat:** Wetlands are special habitats as they provide a refuge for birds and other organism, such as frogs and insects. They are important hydrological process areas that are linked to ground or surface water flows. Natural wetlands are all considered to be Critical Biodiversity Areas. Wetlands are protected by the National Water Act and the Conservation of Agricultural Resources Act. No wetland habitat has been identified, but this aspect is be dealt with in a separate aquatic assessment (Refer to separate aquatic specialist assessment). Where observational comments in this report contradict any made in aquatic assessment report, the aquatic specialist will supersede those made in this report. None are deemed to have any significant flora, and any fauna is unlikely to be affected by the proposed activity. Wetlands or Estuaries are protected by various pieces of legislation, such as:
 - The *National Water Act* (NWA) 36 of 1998, which stipulates that reserve determination studies need to be undertaken to identify the ecological reserve requirements of a wetland.
 - The *NEMA* in terms of principle (r) and the listed activities (Section 24).
 - The *Conservation of Agricultural Resources Act* (CARA) 43 of 1983; in which no activities are allowed within the flood area or within 10 meters horizontally outside the flood area.
 - The *Integrated Coastal Management Act* (ICMA) 24 of 2008 requires the preparation of Estuary Management Plans by municipalities, unless managed by another Authority e.g., SANParks.

Being an arid area, water resources would be considered to be important habitat and should be avoided.

- **Priority Estuaries:** No Estuaries are affected by the proposed activity.
- **Forest:** No Forest is present.
- **Fynbos:** No Fynbos is present.
- **Colonies or Populations of Threatened or Protected Species:** No colonies of threatened fauna or flora species are recorded that are directly affected or likely to be indirectly affected.

Implications:

- Several potential important terrestrial habitats that could be considered to be critical habitat do fall within the proposed powerline servitude that could be affected directly by the proposed activity were identified. These specialised habitats tend to be small and localised, and it would be feasible to avoid them during construction of the powerline. No related infrastructure is sited within such areas. These habitats will be assessed, and appropriate mitigation measures recommended in the habitat and impact assessment sections of this report.

3 Biodiversity Risk Identification and Assessment

3.1 Baseline Biodiversity Description

3.1.1 Site Locality

The site is situated 38 km to the east of Pofadder along the N14 national road, within the Northern Cape and traverses several farm portions from the proposed WEF in the south of the N14 road, to the Eskom Substation north of the site (**Error! Reference source not found.**) in the direction of the town of Onseepkans on the Orange River.

3.1.2 Topography and Drainage

The site falls within an area characterised by extensive sandy plains on a slightly sloping plateau sparsely vegetated by a typically white grasses (*Stipagrostis* species) grassland giving this vegetation type the character of semidesert 'steppe'.

3.1.3 Climate

The climate in the east of the NDM, or Nama Karoo parts, is characterised by minimal (50–400 mm/pa) late summer (February-April) rain as violent thunderstorms and can be highly variable when and where it falls.

3.1.4 Terrestrial Landscape Features (Habitat)

Overview

The project area is generally characterised by an extensive flat to gently undulating landscape with scattered rocky hills (koppies) and occasional dunes bisected by alluvial washes and watercourses in low lying areas. Soils are typically sandy, with underlying shallow gravelly soils exposed in places. The vegetation is generally speaking typical of Bushmanland Arid Grassland. It is noted that Bushmanland Arid Grassland shares numerous common species with the nearby Lower Gariep Broken Veld and Bushmanland Sandy Grassland, where Broken Veld is typically in rocky areas and having a dominant shrub and herb component and Sandy Grassland is typically of an alluvial nature with a dominant presence of grasses and annuals becoming prominent after rains.

Alien invasive species including trees and ephemeral weeds are generally absent or restricted to disturbed areas such as along road reserves and around dwellings or historical dwellings. The general area has overall low levels of utilization, primarily for grazing, with sheep and goats currently being favoured.

Variations in soils and substrate allow for some variation in composition and several distinct communities are present. The above vegetation offers habitat for a limited suite of animal species, mostly tolerant of the arid conditions, while the above variation also allow for a greater availability of microhabitats for a diverse range of flora and fauna different species, some of which may have habitat preferences, such as gravelly plains, sandy or dune areas, rocky hills and outcrops or alluvial areas including associations with the non-perennial aquatic habitat along watercourses and washes.

Mapped Vegetation

Typically, the National Vegetation Map (Mucina & Rutherford, 2008) differentiates vegetation units at quite a coarse scale, and often several distinct communities can be differentiated. Within the proposed powerline site, several such communities can be differentiated. For the most part, this may not serve a purpose, however in some cases, smaller, more specialised habitats and communities can be differentiated which may differ from the surrounding vegetation matrix. Such communities and micro-

habitats may also serve as faunal habitat for a suite of more specialised faunal species not common to the surrounding landscape. The flora and fauna species that are present in these areas may be different from the surrounding vegetation matrix, giving it a higher overall sensitivity.

Mapping of these communities has been undertaken, based on site confirmation and most recent available aerial photos. Mapping of smaller features is not exhaustive and may differentiate smaller features under 1 Ha that may be scattered within the broader mozaic of vegetation communities. Such areas will none the less be described and their sensitivity highlighted. Smaller sensitive areas would need to be confirmed during the final site walkdown, to micro-site the grid connection footprints. The following vegetation communities can be differentiated (Figure 11) within the broader landscape:

1. Arid Grassland: Open Plains
2. Arid Grassland: Low Hills
3. Arid Grassland: Dunes
4. Arid Grassland: Rocky Hills (Koppies)
5. Alluvial Vegetation
6. Transformed Areas

A short description of each is provided below with overview photographs of each (Figure 11 to Figure 13).

Project : Paulputs South WEF Grid Connection

Layout - Vegetation



Figure 11: Mapped Vegetation (north section).

Project : Paulputs South WEF Grid Connection

Layout - Vegetation

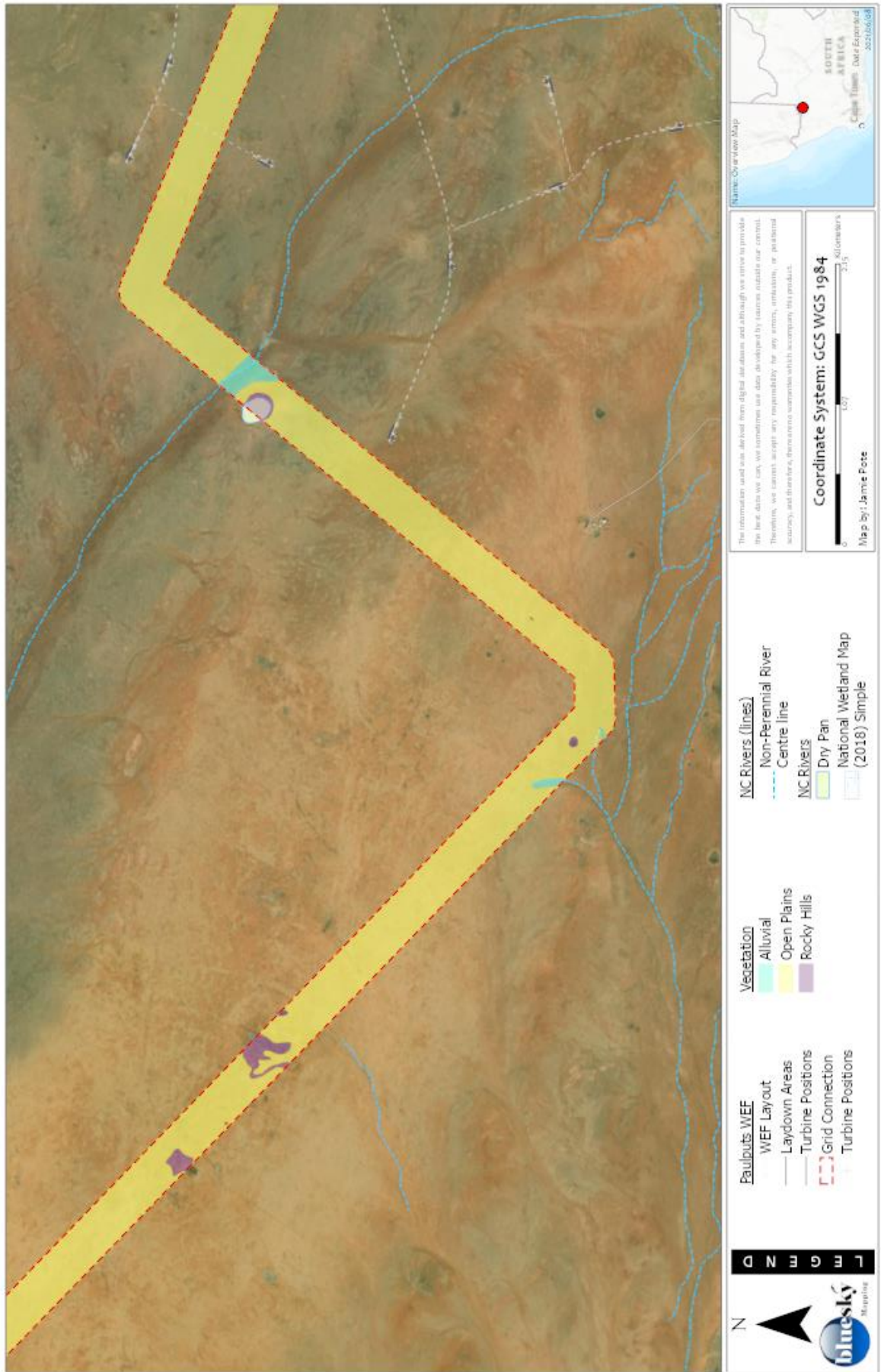


Figure 12: Mapped Vegetation (central section).

Project : Paulputs South WEF Grid Connection

Layout - Vegetation

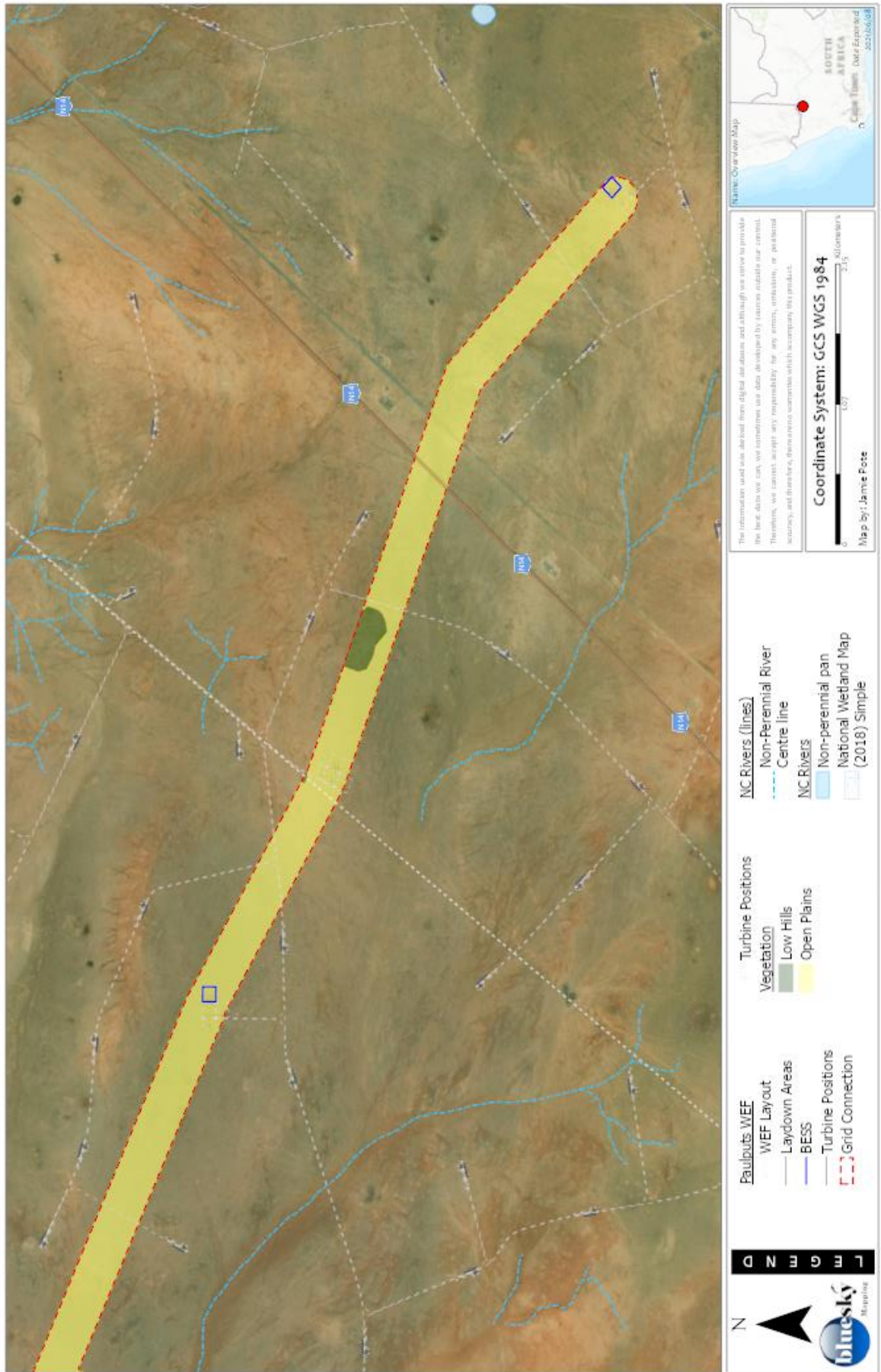


Figure 13: Mapped Vegetation (southern section).

Arid Grassland: Open Plains

Comprises most of the vegetation along the route and within the WEF facilities in general. These open grassy plains are dominated by *Stipagrostis* and other grass species with scattered shrubs, herbs and occasional small trees.

Within the open plains distinct substrates can be distinguished, a sandy soil (Figure 14 & Figure 15) and a gravelly substrate (Figure 16 & Figure 17). Generally speaking, the sandy soils have a higher grass cover than the gravel beds, which have more shrub and herbaceous cover.

Dominant and common species include grasses such as *Stipagrostis ciliata*, *Stipagrostis brevifolia*, *Stipagrostis anomala*, *Schmidtia kalahariensis* and *Enneapogon desvauxii*. Shrubs include *Rhigozum trichotomum*, *Lycium eonii*, *Phaeoptilum spinosum*, *Hermannia spinosa*, *Hermannia gariepina*, *Asparagus denudatus*, *Tetragonia arbuscula*, *Aptosimum marlothii*, *Aptosimum spinescens*, *Indigofera heterotricha* and *Eriocephalus microphyllus*. Small trees include *Boscia foetida* subsp. *foetida* and *Parkinsonia africana*. Herbaceous species include *Acanthopsis disperma*., *Aizoon canariense*, *Amaranthus praetermissus*, *Chamaesyce inaequilatera*, *Dicoma capensis* and *Lotononis platycarpa*. Occasional trees include *Boscia foetida* and *Vachellia (Acacia) mellifera*.

This vegetation community is considered to have an overall low sensitivity, since the conservation status is low, the vegetation unit is widespread and species abundance and diversity is also generally low. Although species such as Sensitive Species 144, *Boscia foetida* and *Hoodia gordonii* are present in the broader landscape, they are uncommon within the proposed powerline area and as such, this does not elevate the sensitivity. No *Vachellia (Acacia) erioloba* trees were observed within the site, the closest noted to the west, towards Pofadder along the N14 road, possibly originating from planted trees at road stops.



Figure 14: Overview of Open Plains vegetation (sandy).



Figure 15: Typical Open Plains vegetation (sandy).



Figure 16: Typical Open Plains vegetation (gravel).



Figure 17: Typical Open Plains vegetation (gravel).

Several habitats are present as islands within the sandy mozaic and are considered to have a somewhat higher sensitivity as they are less common and have characteristics that favour slightly more specialised fauna and flora. They also serve as stepping-stones for species that may not be common to the common mozaic grasslands.

Arid Grassland: Low Hills

Similar in composition to the Arid Grassland with minor topological and soil differences.

This vegetation community is considered to have an overall [moderate sensitivity](#).

Arid Grassland: Dunes

Similar in composition to the Arid Grassland, the dunes are comprised of mobile sands which are susceptible to disturbance and wind erosion when disturbed.

This vegetation community is considered to have an overall [high sensitivity](#).



Figure 18 Overview of Dune vegetation.



Figure 19 Typical Dune vegetation.

Arid Grassland: Rocky Hills

Rocky hills or koppies are rocky areas that emerge from the landscape and create small islands within the matrix. Grasses tend to be absent, having the occasional grass clump. Dominant flora species include various shrubs and herbs occurring in tufts between the rocks as well as small trees. Rocky hills in the area were also noted to have individuals as well as juveniles of Sensitive Species 144, which was locally less common in the open plains. These rocky hills appear to serve as nursery sites during less favourable rainfall periods. The abundance of rocky crevices provide habitat for a range of faunal species including reptiles and small mammals that may not occur in the surrounding open sandy or gravelly plains.

A single small hill having quartzitic gravels (Figure 22) is present along the route, to the west of the non-perennial watercourse crossing. This anomaly is likely similar to the quartzitic patches having Aggeney's Gravel Vygieveld which is more common the west. These quartzitic gravel patches are often known for having a diversity of succulent species including *Conophytum* species. Although none were noted at the time of the site visit, since the feature is unusual within the local landscape, it should be avoided.

This vegetation community is considered to have an overall high sensitivity.



Figure 20 Overview of Rocky Hills vegetation.



Figure 21 Typical Rocky Hills vegetation.



Figure 22 Quartzitic gravel hill.

Transformed Areas

Includes roads, dwellings, and other cleared areas (such as borrow pits), where vegetation is secondary.

These areas are considered to have an overall low sensitivity.



Figure 23 Typical transformed areas (Eskom substation and gravel road towards Onseepkans).

3.1.5 Aquatic Habitat

Aquatic systems do not function in isolation and in terms of ecological processes, the aquatic systems are very closely linked to the terrestrial system. Perennial, nonperennial watercourses and wetlands are present in the wider area. Several minor non-perennial watercourses would require clearing for construction of dams. Refer to separate aquatic assessment report for detailed assessment.

Alluvial Wash and watercourse Vegetation

Alluvial areas with alluvial vegetation are restricted to the beds of the non-perennial watercourses and drainage lines. Alluvial vegetation and drainage features are not very well developed but usually have a greater abundance of woody shrubs and small trees, usually somewhat taller than the surrounding landscape. Trees include *Vachellia (Acacia) mellifera*.

This vegetation community is considered to have an overall high sensitivity.



Figure 24 Typical Alluvial Wash and Watercourse Vegetation downstream from crossing point facing north-west. Note denser shrub cover within alluvial area.



Figure 25 Small dam along non-perennial watercourse, upstream of proposed crossing site.



Figure 26 Typical Alluvial Wash and Watercourse Vegetation.

Wetlands

No wetlands were identified within the affected area.

3.2 Present Ecological State

Table 5 provides a comprehensive description and assessment of biodiversity and ecological indicators for the site.

Table 5: Summary of Key Biodiversity and Ecological Indicators

ASPECT	DESCRIPTION
LANDSCAPE AND COMMUNITY DESCRIPTION	
Aspect, Slope, Topography	Flat to gently undulating sandy/gravel plains with occasional rocky hills and dunes.
Substrate	Deep to shallow sandy soils
Vegetation units	Bushmanland Arid Grassland with elements of Bushmanland Sandy Grassland, Lower Gariep Broken Veld and Blouputs Karroid Thornveld
Total Ground Cover (%)	~ 50 %
Tree Height (m) – Median	Trees are generally sparse
Tree Cover (%) Aerial	< 1 %
Shrub Cover (%)	< 20 %
Herbaceous Cover (%)	
Grass Cover (%)	< 20 % (estimated)
Bare soil/rock (%) and disturbed	> 20 %
TERRESTRIAL LANDSCAPE FEATURES	

ASPECT	DESCRIPTION
Forest	No Forest is present.
Thicket	No Thicket is present.
Grassland	Arid grassland is dominant unit
Fynbos	No Fynbos elements are present.
Riparian	Riparian vegetation is limited, due to arid nature of the area.
Wetland	No natural wetlands are present.
Estuaries	No estuaries are directly affected.
Dunes/Coastal	Inland dune habitat is present
Rocky Outcrop Habitat	Rocky outcrops are present
Fauna Nesting Sites	No specific sites known. Larger trees and electrical poles often host sociable weaver nests.
Fauna Feeding Grounds	Faunal species utilise a range of habitats.
Ecotones	No Ecotones are present
Ecological Corridors	Ecological corridors are considered to be associated with watercourses, in particular due to the arid nature of the area.
Evolutionary Processes	None of significance within terrestrial environment.
Transformed (housing)	Several dwellings are present in the vicinity.
Transformed (other)	Transformation is low, consisting of a few isolated patches including dwellings and other disturbed areas associated with agriculture (grazing).
Degraded (modified)	Secondary vegetation is similar to intact vegetation in composition.
Secondary vegetation	
DISTURBANCES, CURRENT LAND USES AND SOURCES OF DEGRADATION	
Human disturbances	Human disturbance due to agricultural development is locally variable low to moderate and high in isolated patches where livestock aggregate.
Habitat fragmentation	Fragmentation is low locally.
Invasive Alien Plants	Invasive Alien species are not common.
Other degradation	Minimal, some roads and infrastructure.
Remaining intact habitat:	Most of the site can be considered to be intact (natural) to semi-intact (near natural).
Grazing (livestock)	Surrounding area is used extensively historically for livestock grazing, predominantly sheep and goats.
Hunting	Potentially present in the wider area.
Conservation (passive)	General area does contribute to passive conservation, comprising an extensive area of natural vegetation.
Recreational (sport)	None
Other	None
PATTERNS OF BIODIVERSITY	
Flora	Flora diversity is low to moderate.
Fauna	Fauna diversity is low to moderate.
Species of Conservation Concern	Several species are potentially found in the region, vegetation unit and broader landscape. Refer to species assessment section.
ECOLOGICAL PROCESSES	
Gene dispersal barriers	Roads, agricultural lands, fences, low in surrounding areas.
Gene dispersal corridors	Watercourses and Rivers are important corridors in the arid landscape.
Aeolian (dune) processes	Inland dunes are present.
Climatic gradients	None
Rivers and Drainage Lines (Riparian Vegetation)	Non- perennial watercourse and drainage lines are important features within the arid landscape.

ASPECT	DESCRIPTION
Refuges (outcrops/islands)	Rocky and other refuges are scattered around the area.
Fire	Fire is not an important component of the arid vegetation represented.
Ecotones/Tension zones	None
Erosion	Erosion is generally low within the site, being relatively flat and having low rainfall, however the sandy soils and low vegetation cover does make the area susceptible to erosion. Wind and resultant windblown sand are a far greater risk.
ECOLOGICAL SERVICES	
Carbon storage	Vegetation is considered a low carbon accumulator.
Provisioning Services	<u>Livestock grazing</u> : Grazing is likely to have been historically prevalent in the area, although having a low grazing capacity. <u>Timber (Building materials)</u> : None. <u>Fuelwood</u> : None. <u>Food</u> : None known <u>Fibre</u> : None known <u>Medicinal plants</u> : Several species are known from the surrounding area have medicinal properties and are most likely harvested informally.
Other (ornamentals)	Several succulent and geophytic species are present that are known to be or are potentially ornamentals.
CONSERVATION IMPORTANCE	
Current Distribution (extent)	Vegetation units have a widespread historical regional distribution covering an extensive area. More than 60 % is considered to be intact, all having a low regional conservation status (Least Concern).
Red Listed Species and other Species of Conservation Concern	Several species are potentially found in the region, vegetation unit and broader landscape. Refer to species assessment section.
Habitat for SCC	Several Species of Conservation Concern are known from the general area, as well as the vegetation unit that is present. The site is likely to provide habitat viable potential for any of the mostly mobile faunal species as well as several flora species.
Relative Conservation importance	The site has a low overall significance and is mostly not identified as priority conservation area in terms of the respective bioregional plans.
OTHER SENSITIVITIES	
Conservation importance	Low
Topography	Flat to gently undulating.
Wetlands	No natural wetlands directly affected.
Rehabilitation potential	Rehabilitation potential is moderate, however significant transformation does result in biophysical changes that generally preclude the rehabilitation of sites to pre-existing state. The vegetation is likely adapted to high disturbance levels due to arid and sandy (dune) conditions and areas outside of rocky outcrops will most likely rehabilitate effectively with minimal input. It is noted that many species produce, an adaptation to sandy and arid conditions, which would spread during windy conditions. Importantly, during rehabilitation, measures should be implemented that would trap such seeds.
Community structure	Community structure is relatively simple, with vegetation being primarily comprised of shrub, herb, succulent and geophytic elements, with a limited grassy component.

3.3 Critical Habitat

The following Critical Habitat features have been identified within the site:

1. Criterion 1: Habitat for Critically Endangered (CR) and/or Endangered (EN) species
 - No Endangered or Critically Endangered Flora species were recorded. Several species known from general area were screened to confirm that most likely localities do not overlap with the site.
 - No Endangered or Critically Endangered Mammals, Reptiles, Amphibians, or Invertebrates are known to be present on the site or are likely to directly be affected (other than temporary displacement during construction).
2. Criterion 2: Habitat for Endemic or restricted-range species
 - Several range restricted flora species are potentially present in the surrounding area and vegetation types. Refer to species assessment section for specific species assessments. Several endemic species are present, due to the specific arid vegetation units; however, these generally have a widespread distribution and would not be considered to be at risk by the localised activity.
 - Several range-restricted faunal species are known from the surrounding area but the site generally has a low diversity. These species are generally mobile and even though they were not observed during the site visit, the intact vegetation is suitable as a transient visitor.
3. Criterion 3: Habitat for Migratory or congregatory species
 - No such terrestrial habitat will be directly or indirectly affected.
4. Criterion 4: Habitat for Highly threatened and/or unique ecosystems
 - Vegetation units have a low conservation status and are currently not considered to be under threat.
5. Criterion 5: Habitat for Key evolutionary processes
 - No such terrestrial habitat will be directly or indirectly affected.

4 Plant and Animal Species (Flora and Fauna) Assessment

4.1 Overview

Biodiversity is the living component of the natural environment –and underpins both ecosystem processes and the provision of ecosystem services. Human wellbeing is intimately linked to these services especially where livestock production forms the basis of local culture and economies, and local water sources provide the bulk of domestic water needs.

Biodiversity is the basis for evolution and adaptation to changing environments and can be seen as ‘*life insurance for life itself*’. If we allow that biodiversity, and the capacity of ecosystems to deliver services, to deteriorate, people’s wellbeing will suffer sooner or later. Biodiversity depends on its ‘*pattern*’ and on ‘*process*’. To conserve biodiversity, it is important to represent the full variety of patterns of living organisms, and to ensure their persistence by maintaining the space necessary for ecological processes to continue functioning.

4.2 Regional characteristics

Namaqualand contains about 3500 plant species in 135 families and 724 genera, with about 25% of this flora endemic to the region. It is also home to an exceptionally high level of insect and reptile endemism,

with new species still being discovered. This remarkable diversity is not distributed evenly throughout the region but is concentrated in many local centres of endemism.

However, this pattern is likely to change, as the effects of global climate change lead scientists to the conclusion that the entire Succulent Karoo will most likely experience increased temperatures. It is projected that a 2°C increase in temperature in the area will lead to a 10% reduction in rainfall – a significant loss in an area that is already severely water restricted. This decrease in rainfall is projected to result in a 35% decrease in livestock carrying capacity over the coming 200 years. These projections point to the need for the development of alternative economic opportunities in the area, in order to successfully cope with the changes that are already underway.

4.3 Flora

Several endemic and range restricted species are known from the surrounding area. None listed as per the National Screening Tool were confirmed to be present, although it is possible that some individuals of these species could occur, since several similar species were noted to be present as isolated individuals and/or small scattered populations. Note, there is a residual very-low possibility that these species could be present, and cannot be discounted without extensive seasonal sampling, which is generally outside the scope of such an assessment, unless a specific risk is identified. Due to the localised nature of the impact, and the homogenous nature of the vegetation unit, the risk of a species suffering any significant loss is very low.

A flora search and rescue procedure is recommended before clearing commences, as several PNCO protected species are present.

4.4 Fauna

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. Site does provide habitat for a range of faunal species. Many borrows were noted across the site during the site visit, and burrowing animals are likely a substantial component of the local ecology. Minimising the clearing footprint for pylons and access roads will reduce the overall impact to faunal.

Mammals

Several mammal species are likely to be found in the wider area and common to the site. Other less common species may be transient to the site. Should they be present, they are likely to be mobile species that would move away from disturbance and with intact habitat available in the immediate surrounds would unlikely be negatively affected by the activity. Mammal species confirmed to be present during the site visit, in previous studies from the site and surrounding area include Cape Fox, Bat-eared Fox, Steenbok, Cape Hare, Aardwolf, South African Ground Squirrel, Hairy-footed Gerbil, Aardvark, Aardwolf, African Wild Cat, Cape Hare, Hewitts' Red Rock Rabbit, Yellow Mongoose, Cape Mongoose, Striped Polecat, Cape Fox, Bat-eared Fox, Black-backed Jackal, Small-spotted Genet, Springbok, Gemsbok and Meerkat. None of these species are likely to be affected other than minor displacement during construction of the powerline.

The only listed mammal which may occur at the site is the Black-footed cat *Felis nigripes*, which is listed as Vulnerable. Although the Black-footed Cat could potentially occur in the area as the habitat is favourable for this species, it is widely distributed across the arid and semi-arid areas of South Africa and the powerline impact to the species would be negligible in relation to the distribution of this species.

Mammals within the habitat, including small mammals are generally mobile and many are likely to be transient across the area. As with all construction sites there is a latent risk that there will be some accidental mortalities. Generally, these mammals are mobile and will vacate the area once construction commences. A latent risk of mortality due to vehicular activity is possible. 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.

Avifauna and Bats

Avifauna and bats are assessed in separate specialist reports and are not considered in this assessment report.

Reptiles

Species previously observed at the site and during previous studies in the vicinity include Namaqua Sand Lizard (*Pedioplanis namaquensis*), Ground Agama (*Agama aculeata*), Western Rock Skink (*Mabuya sulcata*), Namaqua Dwarf Legless Skink (*Acontias tristis*), Horned Adder (*Bitis caudalis*) and Karoo Sand Snake (*Psammophis notostriatus*). The only listed species known from the vicinity is the Black Spitting Cobra, (*Naja nigricollis woodi*). This species is likely to occur in the vicinity of the rocky hills and outcrops as well as other areas with sufficient cover. Although a regional endemic, this species is common within its range and the extent of habitat loss resulting from the powerline would be negligible. There are several endemic gecko species associated with the mountains of the Orange River valley, but since there is limited rocky habitat along the powerline route site, it is unlikely that any of these species are present.

For most species, the major impact of the development would be loss of habitat comparable to the footprint of the development. Since there are large tracts of land in the surrounding area, this loss is unlikely to be significant. Subterranean (burrowing) species associated with sandy substrates are present and would be vulnerable to habitat disruption and/or direct mortality during construction. However, overall, the impacts of the powerline on reptiles are likely to be low.

The rocky hills and outcrops are likely the most important reptile habitat for a variety of lizards, geckos, skinks and snakes. This habitat is limited in extent, and it is unlikely that to be affected. The predominant sandy open plain habitat has relatively low reptile diversity and the overall extent of habitat loss associated with the powerline is negligible. The overall impact on reptiles will thus be highly localised and not deemed to be significant.

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 undertaken before clearing commences at each pylon to check for presence of tortoises and less mobile reptiles, which can be moved into adjacent area. Should any reptiles be found during constructions, a reptile handler should also be called on.

Amphibians

The site is within the distribution range of several amphibian species, however since there is no perennial water in the area, risk is low for most species and diversity is low. Sand Frogs may be present in sandy areas. Other species are unlikely to be affected as no natural wetlands will be directly affected by the clearing of vegetation. Areas having standing water in rocky areas or crevices that have water after rain which could serve as breeding areas for tadpoles after rain for species such as toads and marbled rubber frogs. Earth dams, near water reservoirs and troughs and near drainage lines could also serve as occasional sites for amphibians. None of the more sensitive areas are likely to be affected by the proposed powerline.

Invertebrates

Baboon Spiders and Scorpions are more than likely present and should form part of the faunal search and rescue, being ToPS protected. No other invertebrate species of concern are noted to occur nor would be affected significantly by the proposed powerline.

4.5 Species of Conservation Concern

A number of endemic and range restricted species are known from the general surrounding area and there is a residual likelihood that they could be present, but cannot be discounted without comprehensive seasonal sampling, which is generally outside the scope of such an assessment, unless a specific risk is identified. Due to the localised nature of the impact, with vegetation clearing only required for site development, as well as the level of degradation, the risk of a species suffering any significant population loss is low. There is always a residual risk to species for any activity.

4.5.1 Red Listed, Endemic and Protected Flora

Listed species (Table 6) were flagged from various database sources as occurring in the region and having an elevated conservation status. All were cross-checked for distribution overlay and were actively screened for presence/absence on site. Other species may be endemic, but distribution range has been checked and are generally widespread. The site falls within the general distribution range of many endemic species and other species with a highly localised distribution, some of which are Critically Endangered, Endangered, Vulnerable, Near Threatened or Rare. Some of these species are also only from a single or a few populations. As per Table 6, no Endangered or Critically Endangered flora species were confirmed to be present nor are known to be present in the affected area. The remaining species, which could potentially be present, include two Vulnerable species, one of which being *Crotalaria pearsonii* appears to be recorded in rocky areas to the west and is unlikely to occur. It may be present on the rocky hills on the western side of the powerline route, but such areas will not be affected. Sensitive Species 144 is noted to be present in vicinity and can be locally common. It is not common within the wider WEF area and none were observed directly within the powerline corridor, other than associated with the rocky hills, which should be avoided. The species can be easily avoided during pylon construction, and it is unlikely that any will be affected by the proposed powerline. None were present within the proposed BESS site.

Several species not having an elevated conservation status but protected in terms of the Northern Cape Nature Conservation Act (NCA) are present. These species generally have a widespread distribution. Based on observations made during the site visit, several listed species are typically geophytic or succulent species and tend to be present as broadly scattered individuals or occur in small, localised clusters. The more specialised rocky habitats within the broader sand plains have been identified and indicated as being of higher sensitivity. These habitats are likely less resilient to disturbance compared to the vegetation communities present in the widespread sandy habitat and being localised, can be more easily avoided during placement of pylons, by spanning the affected areas, or minimising the number of pylons and access roads within such areas.

Due to the prevalence of many species belonging to various broadly protected groups, such as the Aizoaceae, Crassulaceae, Iridaceae, Asphodelaceae and Amarylidaceae, protected in terms of the Northern Cape Nature Conservation Act (Act 9 of 2009) being present, permits will be required as well as a pre-commencement flora search and rescue. A final site walkdown to undertake micro-siting of the pylon footprints during the appropriate season (early spring), will further reduce any risk.

Table 6: Flora Species of Conservation Concern.

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
<i>Aizoon asbestinum</i>	Aizoaceae	NCA	NKb3
<i>Aizoon canariense</i>	Aizoaceae	NCA	NKb3
<i>Aizoon schellenbergii</i>	Aizoaceae	NCA	NKb1, NKb3
<i>Aridaria noctiflora</i> subsp. <i>straminea</i>	Aizoaceae	NCA	NKb4
<i>Boscia albitrunca</i>	Capparaceae	NCA	NKb2
<i>Boscia foetida</i> subsp. <i>foetida</i>	Capparaceae	NCA	NKb2, NKb3
<i>Caesalpinia bracteata</i>	Fabaceae	NCA	NKb1, NKb2
<i>Crassula muscosa</i>	Crassulaceae	NCA	NKb4
<i>Crotalaria pearsonii</i>	Fabaceae	NEST (M), VU B1ab(iii,v), NCA	Outside of range (Southern Richtersveld to Aggeneys and Kenhardt.). May be present on rocky hills to the west.
<i>Cryptolepis decidua</i>	Apocynaceae	NCA	NKb1
<i>Dinteranthus pole-evansii</i>	Aizoaceae	End, NCA	NKb3
<i>Euphorbia avasmontana</i>	Euphorbiaceae	NCA	NKb1
<i>Euphorbia gregaria</i>	Euphorbiaceae	NCA	NKb1
<i>Galenia africana</i>	Aizoaceae	NCA	NKb2
<i>Galenia fruticosa</i>	Aizoaceae	NCA	NKb4
<i>Hoodia gordonii</i>	Apocynaceae	NCA	NKb2
<i>Larryleachia dinteri</i>	Apocynaceae	End, NCA	NKb3
<i>Larryleachia marlothii</i>	Apocynaceae	End, NCA	NKb3
<i>Lotononis oligocephala</i>	Fabaceae	End	NKb3
<i>Manulea nervosa</i>	Scrophulariaceae	NCA	NKb4
<i>Microloma incanum</i>	Apocynaceae	NCA	NKb2
<i>Moraea venenata</i>	Iridaceae	NCA	NKb3
<i>Nemesia maxii</i>	Scrophulariaceae	End, NCA	NKb3
<i>Nymania capensis</i>	Meliaceae	NCA	NKb1, NKb2
<i>Orbea lutea</i> subsp. <i>lutea</i>	Apocynaceae	NCA	NKb1
<i>Pergularia daemia</i> var. <i>leiocarpa</i>	Apocynaceae	NCA	NKb2
<i>Plinthus karoocicus</i>	Aizoaceae	NCA	NKb4
<i>Psilocalon coriarium</i>	Aizoaceae	NCA	NKb2, NKb3
<i>Ruschia kenhardtensis</i>	Aizoaceae	End, NCA	NKb3
<i>Ruschia pungens</i>	Aizoaceae	End, NCA	NKb1
<i>Ruschia robusta</i>	Aizoaceae	NCA	NKb4
<i>Sarcostemma viminale</i>	Apocynaceae	NCA	NKb1, NKb4
<i>Sensitive Species 144</i>		NCA	NKb1
<i>Sensitive species 144</i>		NEST (M), VU A3ce, NCA	Nieuwoudtville east to Olifantsfontein and northwards to the Brandberg in Namibia. Is present in vicinity and can be locally common, but scarce within site. Can be avoided for powerline. Not recorded within BESS area. NKb1
<i>Stapelia flavopurpurea</i>	Apocynaceae	NCA	NKb1
<i>Tetragonia arbuscula</i>	Aizoaceae	NCA	NKb1, NKb3, NKb4

⁴ NEST – National Environmental Screening Tool; NCA - Northern Cape Nature Conservation Act (Act no. 9 of 2009), Schedule 1 or 2; ToPS – Threatened or Protected Species [NEM:BA]; IUCN: Least Concern (LC), Near Threatened (NT), Critically Endangered (CR), Endangered (EN), Vulnerable (VU); CITIES - Conservation for International trade in Endangered Species.

⁵ **NKb1** - Lower Gariiep Broken Veld; **NKb2** – Blouputs Karroid Thornveld; **NKb3** - Bushmanland Arid Grassland; **NKb4** - Bushmanland Sandy Grassland.

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
<i>Trianthema parvifolia</i>	Aizoaceae	NCA	NKb2, NKb3
<i>Tridentea dwequensis</i>	Apocynaceae	BIT, NCA	NKb3
<i>Vachellia (Acacia) erioloba</i>	Fabaceae	NFA	NKb2, Noted to be scattered around the site. Not present within the BESS area and can be avoided by powerline.

A residual risk will be present, although all reasonable attempts have been made to locate any such species and a pre-construction walkdown to undertake micro-siting as well as a flora search and rescue will significantly reduce this risk.

4.5.2 Red Listed and Protected Fauna

The site falls within the general distribution range of a few faunal species as indicated in Table 7 below. Since the project footprint is surrounded by extensive outlying areas of natural habitat, any disturbance or displacement associated with increased activity or habitat destruction as a direct result of the activity is unlikely to pose a significant negative impact to faunal species of conservation concern.

No Endangered or Critically fauna species were confirmed to be present, but several are known to be present in proximity to the site.

A faunal search and rescue is recommended before commencement, to include reptiles such as snakes and tortoises which can be relocated into adjacent unaffected intact vegetation or nearby areas of similar intact habitat.

Table 7: Fauna Species of Conservation Concern

SCIENTIFIC NAME	COMMON NAME	STATUS ⁶	COMMENT/PRESENCE ⁷
Mammals			
<i>Felis nigripes</i>	Black-footed cat	VU	Possibly present, transient visitor, unlikely to be affected.
Birds			
<i>Neotis ludwigii</i>	Ludwig's bustard	NEST (H, M), EN (SA), EN (Global)	Likely, may be transient. Refer to Avifaunal Assessment.
Reptiles			
<i>Naja nigricollis woodi</i>	Black Spitting Cobra	Rare	Previously confirmed, unlikely to be affected.
Amphibians			
None			
Invertebrates			
<i>Baboon Spiders</i>	Baboon Spiders	ToPS, NCA	Various species likely present
<i>Scorpions</i>	Scorpions	ToPS, NCA	Various species likely present

National Environmental Screening Tool Listed Fauna (Animal) Species

No NEST listed animal species were confirmed to be present on the site or are likely to be present, other than as an occasional transient visitor. A single bird species is listed, however this will be addressed in a

⁶ NEST – National Environmental Screening Tool; NCA - Northern Cape Nature Conservation Act (Act no. 9 of 2009), Schedule 1 or 2; ToPS – Threatened or Protected Species [NEM:BA]; IUCN: Least Concern (LC), Near Threatened (NT), Critically Endangered (CR), Endangered (EN), Vulnerable (VU); CITIES - Conservation for International trade in Endangered Species.

⁷ Includes confirmed presence on site as per Todd (2019).

separate Avifaunal report for the proposed powerline. Retention of the intact vegetation will preserve any suitable habitat and a faunal search and rescue before commencement will minimise risk.

4.5.3 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.

Alien invasive and other weed species are generally not prevalent within the site. A list of species is included in Table 8. Several ruderal weed species are likely to proliferate in disturbed areas, although this will be limited by the arid nature of the area. A weed management programme, as part of the construction contract including an after-care period will be required.

Table 8: Alien (exotic) invasive and other weed species and status.

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS ⁸	PRESENCE
<i>Prosopis spp.</i>	Prosopis/Mesquite	Fabaceae	NEMBA 1	Sparse, occasional individuals

Eradication protocol

The act required the removal of these species, being the responsibility of the landowner, as described in Table 9 and below.

Table 9: Legislation regarding invasive alien species.

⁸ CARA - Conservation of Agricultural Resources Act (1993); National List of Invasive Species in Terms Sections 70(1), 71(3) and 71A (2016). Refer to Section 2.2 & Table 9 for detailed procedures and requirements.

The National Environmental Management Act: Alien and Invasive Species Act (18 September 2020) stipulates the following:

6. Control measures

(1) In order to achieve the objects of this Act the Minister may prescribe control measures which shall be complied with by land users to whom they apply.

(2) Such control measures may relate to –

(1) the control of weeds and invader plants.

(3) A control measure may –

(a) contain a prohibition or an obligation with regard to any matter referred to in subsection (2).

(5) Any land user who refuses or fails to comply with any control measure which is binding on him, shall be guilty of an offence.

In this regard, Government Notice R. 598 - National Environmental Management: Biodiversity Act (10/2004): Alien and Invasive Species Regulations, 2014 (Gazette number 37885), dated August 2014, further stipulates the following:

CHAPTER 2: CATEGORIES OF LISTED INVASIVE SPECIES

2. Category 1a: Listed Invasive Species

(1) Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combatted or eradicated.

(2) A person in control of a Category 1a Listed Invasive Species must-

(a) comply with the provisions of section 73(2) of the Act.

(b) immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of the Act; and

(c) allow an authorised official from the Department to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must combat or eradicate the listed invasive species in accordance with such programme.

3. Category 1b: Listed Invasive Species

(1) Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled.

(2) A person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act.

(3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

(4) A person contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

4. Category 2: Listed Invasive Species

(1) Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.

(2) Unless otherwise indicated in the Notice, no person may carry out a restricted activity in respect of a Category 2 Listed Invasive Species without a permit.

(3) A landowner on whose land a Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land, or the area specified in the Notice or permit.

(4) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

(5) Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1 b Listed Invasive Species and must be managed according to Regulation 3.

(6) Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in Government Gazette No. 37886, Notice 599 of 1 August 2014 (as amended), any

person or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

5. Category 3: Listed Invasive Species

(1) Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

(2) Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.

(3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

CHAPTER 7: ISSUING, AMENDMENT AND CANCELLATION OF PERMITS

29. Sale or transfer of alien and listed invasive species

(1) If a permit-holder sells a specimen of an alien or listed invasive species or sells the property on which a specimen of an alien or listed invasive species is under the permit-holder's control, the new owner of such specimen or such property must apply for a permit in terms of Chapter 7 of the Act.

(2) The new permit-holder contemplated in sub-regulation (1) will be subject to the same conditions as the permit-holder who has sold the specimen of an alien or listed invasive species, or the property on which a specimen of an alien or listed invasive species occurs, unless specific circumstances require all such permit conditions to be revised, in which case full reasons must be giving in writing by the issuing authority.

(3) The seller of any immovable property must, prior to the conclusion of the relevant sale agreement, notify the purchaser of that property in writing of the presence of listed invasive species on that property.

CHAPTER 9: COMPLIANCE AND ENFORCEMENT

35. Offences and penalties

(1) Any offence committed in terms of section 101 of the Act shall, upon conviction, carry the penalties referred to in section 102 of the Act.

(2) Any person who contravenes or fails to comply with a provision of these regulations is guilty of an offence and is liable, on conviction, to-

(a) a fine not exceeding five million rand, and in the case of a second or subsequent conviction, to a fine not exceeding R 10 million; or

(b) imprisonment for a period not exceeding 10 years; or

(c) to both such fine and imprisonment.

The seller of any immovable property must also, prior to the conclusion of the relevant sale agreement, notify the purchaser of that property in writing of the presence of listed IAPs on the property. Property sales agreements dated 1 October 2014 and onwards, should also incorporate a clause in terms of which the purchaser acknowledges that he has acquainted himself with the extent and the nature of the property he is buying and that he accepts the property as such, including the vegetation on the property.

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. All removed trees must either be removed from site or disposed of at a registered waste disposal facility. Alternatively, the plant material can be mulched using a woodchipper on site. And seed-bearing material is to be disposed of at a registered landfill.

4.5.4 Permitting Requirements

The following flora and fauna permits are likely to be required:

- NEM:BA Threatened or Protected Species (ToPS) species listed in terms of the ToPS regulations and including red-listed species.
- National Forests Act – no protected trees were recorded.
- Northern Cape Nature Conservation Act (Act no. 9 of 2009) - several species

4.6 Terrestrial Plant and Animal Species Sensitivity Assessment

4.6.1 Site Ecological Importance Criteria

Site Ecological Importance (SEI) is considered to be a function of the Biodiversity Importance (BI) of the receptor (e.g., species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (Receptor Resilience [RR]) as follows:

$SEI = BI + RR$ where $BI = CI + FI$

SEI	INTERPRETATION IN RELATION TO PROPOSED DEVELOPMENT ACTIVITIES
Very high	Avoidance mitigation – <u>no destructive development activities should be considered</u> . Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – <u>changes to project infrastructure design to limit the amount of habitat impacted</u> , limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – <u>development activities of medium impact acceptable</u> followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – <u>development activities of medium to high impact acceptable</u> followed by appropriate restoration activities.
Very Low	Minimisation mitigation – <u>development activities of medium to high impact acceptable</u> and restoration activities may not be required.

Conservation importance

Conservation importance (CI) is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and Key Biodiversity Areas (KBA; IUCN [2016]).

Conservation importance is defined here as *'The importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.'*

CI	FULFILLING CRITERIA
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent ²⁶) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.

CI	FULFILLING CRITERIA
	Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Functional Integrity

Functional integrity (FI) of the receptor (e.g., the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is 'A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.'

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

Biodiversity Importance

FUNCTIONAL INTEGRITY	CONSERVATION IMPORTANCE				
	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Very High	Very High	Very High	High	Medium	Low
High	Very High	High	Medium	Medium	Low
Medium	High	Medium	Medium	Low	Very Low
Low	Medium	Medium	Low	Low	Very Low
Very Low	Medium	Low	Very Low	Very Low	Very Low

Receptor resilience

Receptor resilience (RR) is defined here as ‘The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.’

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

RECEPTOR RESILIENCE	BIODIVERSITY IMPORTANCE				
	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Very High	Very High	Very High	High	Medium	Low
High	Very High	Very High	High	Medium	Very Low
Medium	Very High	High	Medium	Low	Very Low
Low	High	Medium	Low	Very Low	Very Low
Very Low	Medium	Low	Very Low	Very Low	Very Low

Site Ecological Importance (SEI)

Since no designated Species of Conservation Concern (i.e., Sensitive Species 144 and *Crotalaria pearsonii*) are likely to be impacted by the proposed powerline, as none were found within the powerline route, or should any Sensitive Species 144 be present, they can be easily avoided, as long as the sensitive areas (Rocky Hills, Alluvial washes and watercourses and Dunes) are avoided, the CI for the site would be calculated to be Low or Very Low. Thus the SEI would be Low or Very Low for the species relative to the specific proposed activity (132 kV powerline).

GENERAL COMMENT: The site is considered to have an overall Low Sensitivity due to the low (Least Concern) conservation status of the vegetation units represented as well as the very sparse and scattered distribution of Species of Conservation Concern. Specific niche areas, such as rocky hills, deemed to have an elevated sensitivity, are present and are mapped accordingly. It is feasible for the powerline pylons to avoid these areas.

5 Terrestrial Biodiversity and Sensitivity Assessment

5.1 Vegetation Sensitivity

An overall Biodiversity Sensitivity assessment, incorporating key vegetation and ecological indicators (summarised in Table 5) was undertaken and includes the following key criteria:

- relative levels of *intactness* i.t.o. overall loss of indigenous vegetation cover.
- presence, diversity and abundance of *Species of Conservation 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.

5.2 Intactness

Three basic classes are differentiated as follows:

- **Very Low:** original vegetation is removed, secondary (indigenous) or non-indigenous vegetation is present.
- **Low:** > 75 % of original vegetation has been removed or lost; and/or no Species of Conservation 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 Conservation Concern but not having high conservation status or high levels of endemism or highly localised distributions.
- **High:** < 25 % of original vegetation has been removed or lost; and/or presence of species with a highly endemism and or high conservation status (endangered or critically endangered).

Intactness for the site is generally *High*.

5.3 Alien Invasion

Three classes are differentiated as follows:

- **Low:** no or few scattered individuals.
- **Moderate:** individual clumps of invasives present but cover less than 25% of original area.
- **High:** dense, stands of invasives present, or cover 25 - 80 % of area with notable loss of ecological functioning. Rehabilitation will most likely require specialised techniques over an extended period (5 – 10 years).
- **Very High:** dense, impenetrable stands of invasives present stands of invasive present, or cover > 80 %, with significant loss of ecological functioning and associated biophysical changes that are likely to thwart rehabilitation without assisted techniques, over 10 years or unlikely to rehabilitate to natural state.

Alien invasion for the site is generally *Low* in intact areas but *high* to *very high* in densely invaded stands of wattle. These densely invaded areas have undergone significant biophysical changes as is evident on site.

5.4 Degradation

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

INTACTNESS	INVASION			
	LOW	MODERATE	HIGH	VERY HIGH
High	Pristine	Near Pristine	Degraded	-
Moderate	Near Pristine	Degraded	Severely Degraded	Severely Degraded
Low	Degraded	Severely Degraded	Transformed	Transformed
Very Low	Highly Degraded	Transformed	Transformed	Transformed

Degradation for the site is Low (Natural/Intact)

5.5 Overall Sensitivity score

Overall Biodiversity Sensitivity of the vegetation within the site is calculated according to the following matrix⁹ which combines degradation and overall conservation status of the vegetation units of the site.

DEGRADATION	CONSERVATION STATUS			
	LEAST THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED
Transformed	Very Low	Low	Low	Low
Severely degraded	Low	Low	Moderate	Moderate-High
Degraded	Low	Moderate	High	High-Very High
Ecologically Near Pristine or near Pristine (intact/semi-intact)	Moderate	Moderate - High	Very High	Very High (No-Go area)

Refer to Figure 27 for overall sensitivity map and Table 10 for summary of sensitivity. In general, Bushveld Grassland is deemed to have a low sensitivity. However, where communities are identified that differ from the normal Bushveld Grassland vegetation matrix, or have other sensitivities, including low resilience to disturbance (such as the dunes), a concentration of species of conservation concern and/or protected species (Rocky Hills), the status has been raised to moderate or high, as the specific communities are deemed to be more sensitive than the surrounding vegetation. These communities or landscape features generally have localised distributions and it should be feasible to minimise impacts within them by careful placement of pylons and associated infrastructure (such as the access road) to span such areas, or to minimise the footprints as far as is technically possible.

Table 10: Sensitivity Summary for the site.

SPECIES	INTACTNESS	ALIEN INVASION	SITE ECOLOGICAL IMPORTANCE		
			DEGRADATION	STATUS	OVERALL SENSITIVITY*
Arid Grassland: Open Plains	Moderate	Low	Near Pristine	LC	Low
Arid Grassland: Low Hills	High	Low	Pristine	LC	Moderate
Arid Grassland: Dunes	High	Low	Pristine	LC	High*
Arid Grassland: Rocky Hills (Koppies)	High	Low	Pristine	LC	High*
Alluvial Vegetation	High	Low	Pristine	LC	High*
Transformed Areas	Low	Low	Transformed	LC	Very Low

* Vegetation communities and niches that have a higher sensitivity than typical surrounding vegetation.

⁹ Based on the Terrestrial Biodiversity Assessment protocol.

Project : Paulputs South WEF Grid Connection

Layout - Vegetation & Sensitivity



Figure 27 Terrestrial Biodiversity Sensitivity (northern section).

Project : Paulputs South WEF Grid Connection

Layout - Vegetation & Sensitivity

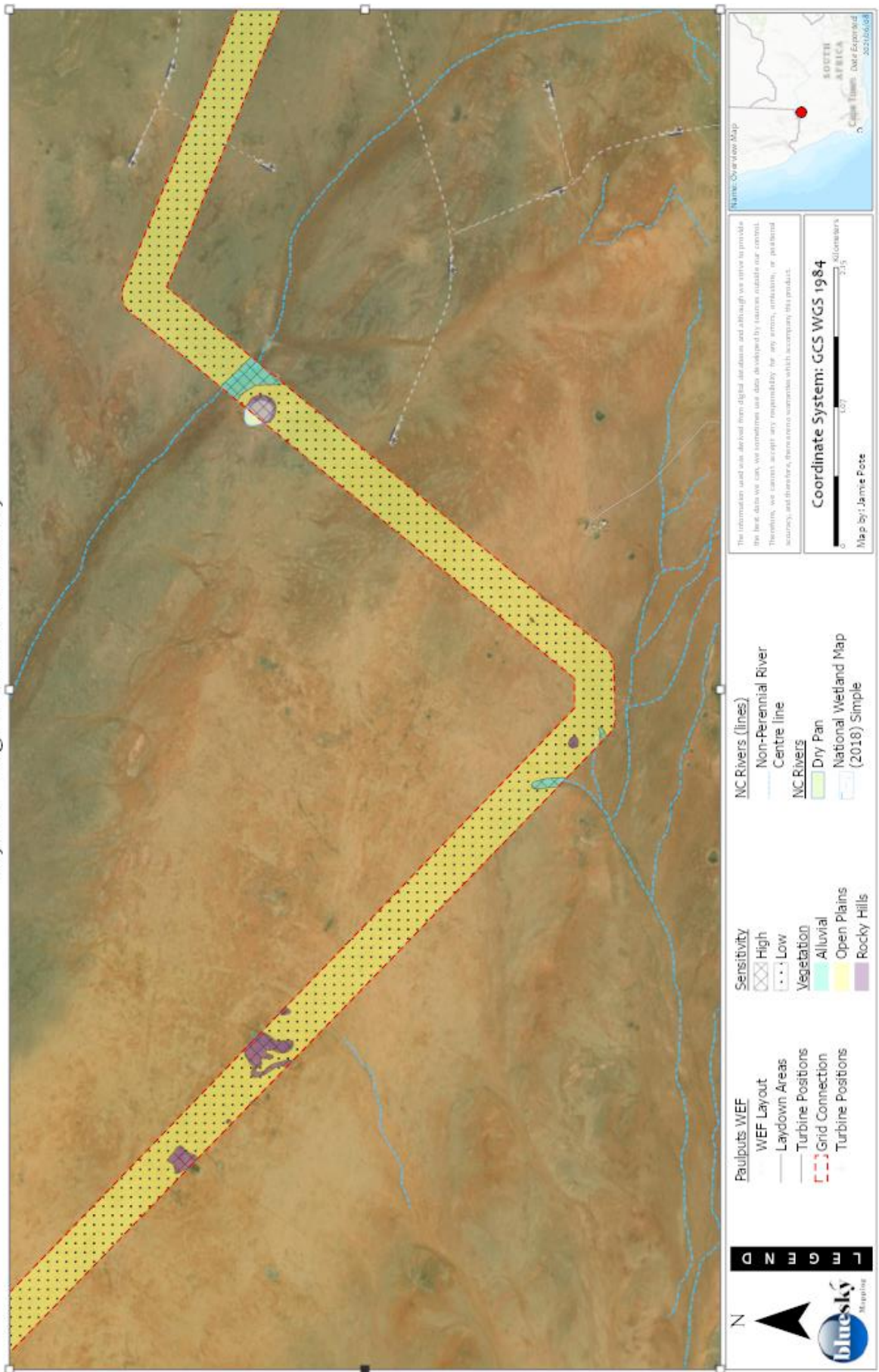


Figure 28 Terrestrial Biodiversity Sensitivity (central section).

Project : Paulputs South WEF Grid Connection

Layout - Vegetation & Sensitivity

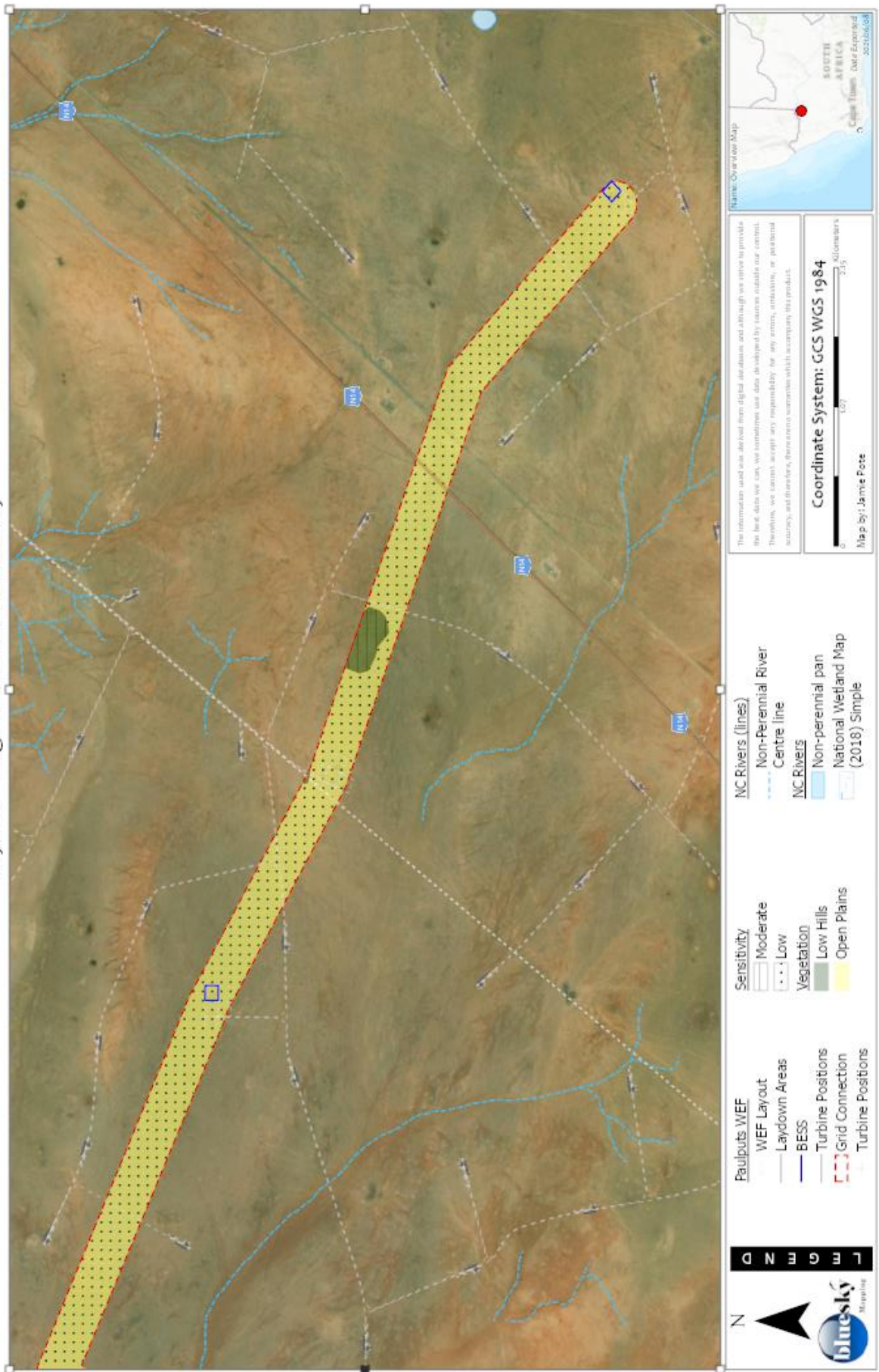


Figure 29 Terrestrial Biodiversity Sensitivity (southern section).

The overall site sensitivity can be categorised as follows:

- Areas scoring an overall **VERY LOW** Terrestrial Biodiversity Sensitivity include the portions of the site that are completely transformed or severely degraded, that have a low conservation status, or where there is very dense alien infestation resulting in irreversible biophysical changes. Loss of these areas will not significantly compromise the current conservation status of the vegetation unit at a regional level, nor is its loss likely to compromise the ecological functioning of surrounding areas. [Very Low Sensitivity areas are limited to the transformed areas having secondary natural or no natural vegetation.](#)
- Areas scoring an overall **LOW** Terrestrial Biodiversity Sensitivity include the portions of the site having natural or near natural vegetation of a type that is widespread and has a low conservation status. Loss of these areas will not significantly compromise the current conservation status of the vegetation unit at a regional level, nor is its loss likely to compromise the ecological functioning of surrounding areas. [The typical and widespread Bushmanland Grassland vegetation, having a Least Concern status is considered to have a Low Sensitivity.](#)
- Areas scoring an overall **MODERATE** Terrestrial Biodiversity Sensitivity include the portions of natural vegetation that is mostly intact, but not having specific biodiversity related issues of significance or where proposed activity will have limited overall impact and recovery will be good with minimal intervention. [Moderate Sensitivity areas include only the Low Hills, which is floristically similar to the sandy Bushmanland Grassland.](#)
- Areas scoring an overall **HIGH** Terrestrial Biodiversity Sensitivity include those areas deemed to have a sensitivity, are deemed to critical habitat for fauna and/or flora species that are considered to be vulnerable or will be more sensitive to disturbance and/or impacts are less likely to be reversibly. [High Sensitivity terrestrial areas on site includes the Rocky Hills, Alluvial washes and watercourses and Dunes having mobile sands and being more prone to wind erosion These areas tend to offer more specialised niche habitats for fauna and flora and often have a slightly different species composition to the surrounding Grassland matrix. Pylons and access roads should avoid these areas where possible, and if not, then the footprint within must be kept to the lowest technically possible.](#)
- Areas scoring an overall **VERY HIGH** Terrestrial Biodiversity Sensitivity (No-Go Areas) include natural/intact areas having a Critically Endangered or Endangered conservation status, or that are irreplaceable in terms of Critical Biodiversity Areas and/or are critical habitat (refer to [Section 3.3](#)) for any faunal or floral species that is Endangered or Critically Endangered. [No Very High sensitivity terrestrial areas have been identified.](#)

GENERAL COMMENT: The vegetation type and overall site is considered to have a [Low Sensitivity](#), due to the status of the vegetation type. Taking into consideration niche habitats, several localised areas are considered to have an elevated sensitivity and should be avoided, or footprints minimised as far as is technically possible.

5.6 No-Go Areas

No specific No-Go areas have been identified, but footprints in designated high sensitivity areas, including Rocky Hills, Alluvial washes and watercourses and Dunes, should be avoided or minimised as far as possible. Should any populations of Species of Conservation Concern be recorded during the final micro-siting walkdown, such areas should be considered to be no-go areas and pylons and access road positions should be shifted accordingly.

5.7 Potential Development Footprints

The proposed site provides a suitable footprint for the proposed activity, taking into consideration more sensitive patches which should be avoided. Access roads should use existing tracks as far as possible.

6 Terrestrial Biodiversity and Species Risk and Impact Assessment

6.1 Summary of actions, activities, or processes that require mitigation

The main impacts likely to result from the proposed activity include the following:

1. Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
2. Loss of flora Species of Conservation Concern during pre-construction site clearing activities. Numerous Species of Conservation Concern are potentially present within the affected area, which could be destroyed during site preparation.
3. Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
4. 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.
5. Disturbances to ecological processes. Activity may result in disturbances to ecological processes.
6. Aquatic and Riparian processes. Diversion and increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of riparian vegetation / aquatic habitat. Loss of Species of Conservation Concern.
7. Loss of Faunal Habitat: Activity will result in the loss of habitat for faunal species.
8. Loss of faunal SCC due to construction activities: Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

6.2 Potential Terrestrial Biodiversity Impacts (Direct)

Table 11: Potential Impacts to Terrestrial Biodiversity

IMPACT	Nature of Impact
Vegetation	<u>Permanent or temporary loss of indigenous vegetation cover because of site clearing.</u> Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
Flora Species	<u>Loss of flora Species of Conservation Concern during pre-construction site clearing activities.</u> Several special of concern are known from surrounding areas, which could be destroyed during site preparation.
Alien Invasive Species	<u>Susceptibility of post construction disturbed areas to invasion</u> 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	<u>Susceptibility of some areas to erosion</u> because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
Ecological Processes	<u>Disturbances to ecological processes:</u> Activity may result in disturbances to ecological processes.

IMPACT	Nature of Impact
Aquatic and Riparian processes	<u>Aquatic and Riparian processes</u> : None present/affected
Faunal Habitat	<u>Loss of Faunal Habitat</u> : Activity will result in the loss of habitat for faunal species.
Faunal Processes	Impacts to <u>faunal processes</u> because of the activity
Faunal Species	<u>Loss of faunal SCC</u> due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

6.3 Potential Terrestrial Biodiversity Impacts (Indirect)

No significant additional ancillary linear infrastructure, such as additional roads, conveyors, power lines, pipelines and railways, which can impact on biodiversity and ecosystem services are expected.

6.4 Potential Terrestrial Biodiversity Impacts (Cumulative)

Development of the entire site will result in some cumulative impacts; however, the vegetation unit, habitat and species are generally widespread.

6.5 Assessment of Risks and Impacts to Biodiversity

6.5.1 Criteria of assigning significance to potential impacts.

The following methodology is to be applied in the specialist studies for the assessment of potential impacts.

CRITERIA	EXPLANATION
Nature of impact	Review the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"
Extent	Indicate whether the impact will be: <ul style="list-style-type: none"> • (S) <i>local</i> and limited to the immediate area of development (the site). • (L) limited to within 5 km of the development: or • (R) whether the impact may be realized regionally, nationally or even internationally.
Duration	Review the lifetime of the impact, as being: <ul style="list-style-type: none"> • (V) very short term (0 - 1 years), • (S) <i>short term</i> (1 - 5 years), • (M) <i>medium</i> (5 - 15 years), • (L) <i>long term</i> (>15 years but where the impacts will cease after the operation of the site), or • (P) <i>permanent</i>.
Intensity	Establish whether the impact is destructive or innocuous and should be described as either: <ul style="list-style-type: none"> • (L) <i>low</i> (where no environmental functions and processes are affected) • (M) <i>medium</i> (where the environment continues to function but in a modified manner) or • (H) <i>high</i> (where environmental functions and processes are altered such that they temporarily or permanently cease), including loss of critical endangered ecosystem and or critically endangered species (population).
Probability	Consider the likelihood of the impact occurring and should be described as: <ul style="list-style-type: none"> • (I) <i>improbable</i> (low likelihood) • (P) <i>probable</i> (distinct possibility)

CRITERIA	EXPLANATION
	<ul style="list-style-type: none"> (H) highly probable (most likely) or (D) definite (impact will occur regardless of prevention measures).
Status of the impact	Description as to whether the impact will be positive (a benefit), negative (a cost), or neutral.
Degree of confidence	The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as high, medium or low.
Significance	<ul style="list-style-type: none"> (VL) Very Low: Considered to be negligible. (L) Low: Where the impact will not have an influence on the decision or require to be significantly accommodated in the project design (M) Medium: Where it could have an influence on the environment which will require modification of the project design or alternative mitigation. (H) High: Where it could have a 'no-go' implication for the project unless mitigation or re-design is practically achievable. (VH) Very High: Confirmed No-Go area, no mitigation feasible, redesign and avoidance are required, where activity will have a significant permanent and irreversible impact on a critically endangered ecosystem or species population.

6.5.2 Significance Rating

INTENSITY		DURATION				
		PERMANENT	LONG TERM	MEDIUM TERM	SHORT TERM	VERY SHORT TERM
HIGH INTENSITY						
EXTENT	National	Very High	Very High	High	High	Medium
	Regional	Very High ¹⁰	High	High	High	Medium
	Local	High	High	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Medium
MEDIUM INTENSITY						
EXTENT	National	High	High	High	Medium	Medium
	Regional	High	High	High	Medium	Medium
	Local	Medium	Medium	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Low
LOW INTENSITY						
EXTENT	National	Medium	Medium	Medium	Medium	Medium
	Regional	Medium	Medium	Medium	Medium	Low
	Local	Medium	Medium	Medium	Low	Very Low
	Site specific	Low	Low	Low	Very Low	Very Low

Furthermore, the following must be considered:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for both the construction, operation and decommissioning phases of the project, where relevant.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.

¹⁰ Considered a regional impact if activity will result in significant permanent and irreversible loss to a critically endangered species population or ecosystem (vegetation type)

4. Management actions: Where negative impacts are identified, specialists must specify practical mitigation objectives (i.e., ways of avoiding or reducing negative impacts). Where no mitigation is feasible, this should be stated, and the reasons given. Where positive impacts are identified, management actions to enhance the benefit must also be recommended.

6.5.3 Assessment of Terrestrial Biodiversity Impacts

Construction and operations can result in a range of negative impacts on terrestrial, marine and other aquatic ecosystems if not effectively managed. Table 11 describes impacts that may potentially occur in the site (as per DEA guidelines) as well indicating the relevant EMP section. The predicted significance of these during the construction phase are summarised in Table 12 and during the operational phase are summarised in Table 13. Refer to Sections 5.6.1 & 5.6.2 for methodology.

Table 12 : Construction Phase Impact Assessment.

Nature of impact	Extent	Duration	Intensity	Probability	Status of the impact	Degree of confidence	Significance (before mitigation)	Significance (after mitigation)
Vegetation	S	M	L	P	-ve	M	M	L
Flora Species	S	M	L	P	-ve	M	M	L
Alien Invasive Species	S	M	L	P	-ve	M	M	L
Erosion	S	M	L	P	-ve	M	M	L
Ecological Processes	S	M	L	P	-ve	M	M	L
Aquatic & Riparian Processes	S	M	L	P	-ve	M	M	L
Faunal Habitat	S	M	L	P	-ve	M	M	L
Faunal Processes	S	M	L	P	-ve	M	M	L
Faunal Species	S	M	L	P	-ve	M	M	L

Development of the entire site will result in **Construction impacts** of Medium Significance to Vegetation, Flora, Fauna and Ecological Processes which can be mitigated to Low Significance through careful siting of footprints, to avoid sensitive areas, and implementation of mitigation measures.

Table 13: Operational Phase Impact Assessment for Option 1.

Nature of impact	Extent	Duration	Intensity	Probability	Status of the impact	Degree of confidence	Significance (before mitigation)	Significance (after mitigation)
Vegetation	S	M	L	P	-ve	M	M	VL
Flora Species	S	M	L	P	-ve	M	M	VL
Alien Invasive Species	S	M	L	P	-ve	M	M	VL
Erosion	S	M	L	P	-ve	M	M	VL
Ecological Processes	S	M	L	P	-ve	M	M	VL
Aquatic & Riparian Processes	S	M	L	P	-ve	M	M	VL
Faunal Habitat	S	M	L	P	-ve	M	M	VL
Faunal Processes	S	M	L	P	-ve	M	M	VL

Development of the entire site will result in anticipated **Operational impacts** of Medium Significance to Vegetation, Flora, Fauna and Ecological Processes which can be mitigated to Very Low Significance through implementation of mitigation measures.

6.5.4 Terrestrial Biodiversity Impact Reversibility

In general, most direct impacts will have a moderate to high reversibility in the typical Bushveld Grassland habitat, as well as within the transformed or degraded areas. While it may be possible to re-instate a natural vegetation after disturbance to some extent, it is unlikely that the niche habitats such as Rocky Hills/Outcrops or Quartz patches can be re-instated or rehabilitated as effectively.

6.5.5 Impacts and Risks to Irreplaceable Biodiversity Resources

- Risks to Irreplaceable Biodiversity Resources are low.
- The Bushmanland Grassland vegetation is widespread, with some of the associated niche habitats and communities being less common spatially as islands or ecological stepping-stones. These areas have been highlighted and sensitivity increased accordingly.
- The area provides habitat for a range of faunal species, although it is unlikely that the proposed development would provide any direct or indirect impact of significance to any Species of Conservation Concern. Faunal species may undergo some localised temporary displacement during construction, but are likely to either move to adjacent areas, or in the medium term are likely to return after construction.
- The development of the site will result in the loss of intact vegetation having a low conservation status as well as habitat for numerous protected and possibly also red listed flora species. This impact will be limited to isolated pylon footprints, an access road (most likely a two-track type road) and the substation sites and BESS.
- The type of powerline (132 kV) will most likely be constructed using monopole and/or lattice pylons, which have a very small and localised impacts. The access road will also most likely not require the heavy vehicles that would be required for construction of a larger powerline; hence access road requirements will be minimal and most likely consist of a two-track type road, which is typical for powerlines.
- Several small niche habitats have been identified that generally have a more specialised flora and fauna composition compared to the broader Bushmanland Grassland Mosaic. These habitats have been identified and it is recommended that impacts in these areas should be minimised, which will further minimise loss of potentially irreplaceable biodiversity resources.

6.5.6 Residual Risks and Uncertainties

No significant additional ancillary linear infrastructure, such as additional roads, conveyors, power lines, pipelines and railways, which can impact on biodiversity and ecosystem services are expected.

6.6 Findings, Outcomes and Recommendations

In summary, the site is located approximately 38 km to the west of Pofadder, in the Northern Cape, surrounded by an area that comprises generally large commercial farms with increasing usage for wind and solar energy projects. Within the site, levels of transformation or degradation are generally low to medium and alien infestation is generally also low to negligible. Some degradation from grazing is evident. Vegetation is primarily Bushmanland Arid Grassland, with several communities being differentiated, having slight variation in biophysical conditions (underlying substrate and soils) and flora composition as well as habitat suitability for faunal species. The vegetation unit is widespread, being within the highest 10 vegetation units by area. The vegetation unit, although poorly protected, has a low conservation status and transformation levels are very low.

Numerous species of conservation concern are found in the broader area and could be present most likely as scattered individuals or small clumps/populations. Several range-restricted species of conservation concern that are known to occur in the surrounding area and the vegetation types. A single species, namely Sensitive Species 144, was recorded in the general area, although none were confirmed within the proposed powerline, substation and BESS footprints at the time of the site assessment. The site

assessment has physically screened for the presence of these, and other possible species not identified in the screening tool and is addressed in the respective species assessment section above.

The proposed development would result in the limited transformation and loss of some natural habitat, limited to the footprints for pylons, the substations and BESS and an access road along the route, typically consisting of a two-track road. This loss will be highly localised but will result in a negligible cumulative loss of the vegetation type and species.

Numerous flora and fauna species protected in terms of the Northern Cape Nature Conservation Act (Act 9 of 2009) are present or likely to be present and will require the appropriate permits before commencement. Flora and fauna search and rescue is recommended before commencement. It may be most feasible to undertake the search and rescue, in particular of fauna, in a phased manner slightly ahead of the clearing and construction phase., This will increase the likelihood of finding and relocating various species.

Due to the small size of the overall footprint, risks to faunal species are likely to be low. It is likely that the mammal species identified to be of conservation concern would likely be transient visitors. A search and rescue should be conducted before commencement to relocate any small mammals into a nearby area of similar suitable habitat. Several reptile species are present but are also likely transient. A search and rescue should be conducted before commencement to relocate any reptiles into a nearby area of similar suitable habitat. Amphibians are likely less common, being an arid area, with no perennial wetlands noted. The avifaunal assessment will provide more detailed assessment of birds, in particular species that are susceptible to powerline related risks.

The site does cross a non-perennial watercourse, with an associated alluvial wash. The watercourse and alluvial wash are designated as an Ecological Support Areas. The powerline route should span the watercourse as far as possible.

The northern section of the powerline route also intersects with a designated CBA (2) and the southern end with a designated CBA (1)¹, although there is no discernable difference between the habitat within the designated CBA's and surrounding areas. The footprint within these areas will be restricted to pylon footprints only and hence will be negligible in area.

Several more sensitive habitats, generally confined to small areas, within the broader homogenous Bushmanland Arid Grassland landscape were noted and have been mapped and designated a higher sensitivity. This is due to the prevalence of various protected species that are not common to the surrounding grassland mozaic. These habitats are also somewhat less resilient to disturbance and it is recommended that these patches be avoided as far as is technically possible.

6.6.1 Summary of Findings

- Very Low sensitivity areas include transformed areas.
- Low sensitivity areas include natural Bushmanland Arid Grassland.
- Several specific communities within the broader Grassland matrix have been identified, and due to various sensitivities have been designated a moderate or high sensitivity with additional mitigation and/or avoidance measures recommended.
- No Very High sensitivity areas were identified.
- No specific No-go areas have been designated. Watercourses, Alluvial washes, Rocky Hills and Dunes should be avoided as far as possible.

- Cumulative impacts because of the powerline, are regarded as being low due to the widespread nature of the vegetation unit and the low impact of the proposed activity which is unlikely to pose significant risk to potential localised populations of species of conservation concern.

6.6.2 Recommendations

- The specialised habitats, which may serve as local refuges, that are designated as having an elevated sensitivity should be avoided as far as is technically possible.
- A final walkdown to microsite the pylon and other infrastructure footprints should be undertaken in final planning and design and before construction commencement.
- A flora and fauna search and rescue should be undertaken before construction.

7 Management Programs

Table 14 lists specific mitigation measures that must be implemented and adhered to. These must be considered to be conditions of authorisation.

Table 14: Specific Mitigation Measures and Recommendations

IMPACT	MITIGATION MEASURES
Vegetation	<ul style="list-style-type: none"> • Blanket clearing of vegetation must be limited to a limited footprint. 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 laydown areas requiring clearing must be located within already disturbed areas away from watercourses or wetlands.
Flora Species	<ul style="list-style-type: none"> • A flora search and rescue is <u>likely</u> to be required, even in degraded areas. • Several Northern Cape Nature Conservation Act protected, but widespread species are present recorded, respective permit will be required for destruction and/or relocation.
Alien Invasive Species	<ul style="list-style-type: none"> • Alien and weed species must be removed from the site as per CARA/NEMBA requirements. • A suitable weed management strategy to be implemented in construction and operation phases. • 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	<ul style="list-style-type: none"> • 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.
Ecological Processes	<ul style="list-style-type: none"> • Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.

IMPACT	MITIGATION MEASURES
Aquatic and Riparian processes	<ul style="list-style-type: none"> • Pylon placement should span any aquatic and riparian features including the non-perennial watercourses and any wetlands/pans.
Faunal Habitat	<ul style="list-style-type: none"> • Blanket clearing of vegetation must be limited to the footprint. • It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
Faunal Processes	<ul style="list-style-type: none"> • 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 reptile 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.
Faunal Species	<ul style="list-style-type: none"> • A faunal search and rescue is <u>likely</u> to be required including particularly reptile species. • No animals are to be harmed or killed during the course of operations. • Workers are NOT allowed to snare any faunal species.

7.1 Site Preparation and Vegetation Clearing Plan

The following flora relocation plan is recommended for inclusion in the EMP and Flora removal permit applications:

- Once the final layout has been determined the ECO/botanist will be consulted in order to finalise the plan. Once the final site development plan has been determined the botanist will be consulted in order to finalise the plant relocation and vegetation clearing plan.
- Areas to be cleared of vegetation will be clearly demarcated before clearing commences.
- Flora search and rescue is to be conducted before vegetation clearing takes place.
- Plants to be rescued should include both Species of Conservation Concern requiring removal for relocation as well as species that would be suitable for use in rehabilitation and that are amenable to transplanting.

- Areas should only be stripped of vegetation as and when required and in particular once Species of Conservation Concern have been relocated for that area.
- Once site boundaries are demarcated, the area to be cleared of vegetation will be surveyed by the vegetation and plant search and rescue team clearing under the supervision of the botanist to identify and remove species suitable for rescue and commence removal of plants.
- Depending on growth form this material should be appropriately removed from its locality and immediately relocated where it may be required elsewhere or into adjacent areas of similar habitat that will not be disturbed by construction.
- Small trees and shrubs (<1 m in height), where possible will be rescued and planted temporarily in potting bags for later use.
- Wherever possible, any seed-bearing material will be collected immediately and stored for later use, particularly species that occur in low numbers or those that will be well-suited for rehabilitation.
- Protected plant species will be removed from the site prior to development taking place. A suitable timeframe must be allowed before construction commences (1 month) to undertake the plant rescue and relocation operation. Search and Rescue is best undertaken during Spring/Summer.
- Should site construction occur in a phased manner, then clearing activities should take place also in a phased manner, ahead of construction work.
- Rescued plants will be replanted directly into a suitable adjacent area and will include some non-protected succulent species that will help support the protected species.
- Succulent and geophytic species can be temporarily stored for at least 2 weeks in a suitable shaded area before replanting. The contractor will be responsible for periodic watering of the replanted flora until they become acclimatised, and/or some rain occurs.

The following fauna relocation plan is recommended for inclusion in the EMP and Fauna removal permit applications:

- An on-foot search, conducted by a professional reptile handler/team, is to be carried out to search for reptiles within every possible habitat.
- Once caught, each reptile will be placed into transport containers suited for that individual reptile.
- The transport containers must be kept cool to decrease stress for the reptiles.
- The reptiles will be relocated as soon as possible after they have been caught.
- Professional equipment will be used to ensure limited harm to the reptiles and to prevent the team members from being bitten by venomous snakes.
- Nooses should not be used as they cause injury to lizards.
- Safety procedures will be in place for the release of the reptiles.
- Amphibians should be caught by hand and net.
- Amphibians must be placed into transport containers with damp substrates to avoid dehydration.
- Tadpoles may be collected, placed into water containers and released as soon as possible, where required.
- During release, the tadpoles will be allowed to acclimatize to the new water in terms of temperature, pH etc.
- Small mammals will be caught with nets and by hand. They will then be transported in carry cages and released as soon as possible.
- No immobilizers or tranquilizers will be used on the mammals.

7.2 Rehabilitation and Landscaping Plan

- On completion of construction, the surface of any work areas, especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- The disturbed areas can be seeded with suitable grasses and local indigenous seed mix, if deemed to be required, however, vegetation is likely to re-establish without input.
- Excavations may not be used for the dumping of construction wastes.
- Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations and must be disposed of appropriately.
- Final rehabilitation must comply with the requirements mentioned in the Rehabilitation Plan.

7.3 Open Space Management/Conservation Plan

None are applicable for this project.

7.4 Maintenance Management Plan

Ongoing maintenance is likely to be required in the long-term, which could include re-excavation of portions of services for maintenance/replacement of defective components and leak repair. 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.

8 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.

9 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.

10 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.

11 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.
 - b) Erosion to be addressed on ongoing basis

12 Annexures

12.1 Annexure A: References

General Reference Sources

- Acocks, J. P. H. 1988. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No 57. Botanical Research Institute, Department of Agriculture and Water Supply, South Africa.
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland. 2014. Edited by Michael F. Bates, William R. Branch, Aaron M. Bauer, Marius Burger, Johan Marais, Graham J. Alexander & Marianne S. de Villiers. SANBI, Pretoria.
- Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J. & Marianne S. de Villiers. (Eds). 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland*. SANBI, Pretoria.
- Bromilow, C. 2001. *Problem Plants of South Africa. A Guide to the Identification and Control of More than 300 Invasive Plants and Other Weeds*. Briza Publications. Pp 258
- Child M.F., Roxburgh L., Do Linh San E., Raimondo D., Davies-Mostert H.T. 2016. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.
- Council for Scientific and Industrial Research. NFEPA river FEPAs 2011 [vector geospatial dataset] 2011. Available from the Biodiversity GIS website, downloaded on 20 July 2020.
- Council for Scientific and Industrial Research. NFEPA rivers 2011 [vector geospatial dataset] 2011. Available from the Biodiversity GIS website, downloaded on 20 July 2020.
- Council for Scientific and Industrial Research. NFEPA wetland clusters 2011 [vector geospatial dataset] 2011. Available from the Biodiversity GIS website, downloaded on 20 July 2020.
- Council for Scientific and Industrial Research. NFEPA wetlands vegetation 2011 [vector geospatial dataset] 2011. Available from the Biodiversity GIS website, downloaded on 20 July 2020.
- Cowling, R.M., Richardson, D.M. & Pierce, S.M. 1997. *Vegetation of Southern Africa*. Cambridge University Press.
- Esler, K.J., Milton, S.J. & Dean, W.R.J. 2006. *Karoo Veld: Ecology and Management*. Briza Publications.
- Fitzpatrick Institute of African Ornithology (2020). MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP> on 2020-07-20.
- Fitzpatrick Institute of African Ornithology (2020). OrchidMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=OrchidMAP> on 2020-07-20.
- Fitzpatrick Institute of African Ornithology (2020). PHOWN Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=PHOWN> on 2020-07-20.
- FitzPatrick Institute of African Ornithology (2020). ScorpionMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ScorpionMAP> on 2020-07-20.
- Fitzpatrick Institute of African Ornithology (2020). SpiderMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=SpiderMAP> on 2020-07-20.
- Fuggle, R. F. & Rabie, M. A. 2003. *Environmental Management in South Africa*. Juta & Co, Johannesburg.
- Germishuizen, G. & Meyer, N.L. (eds). 2003. *Plants of southern Africa: An annotated checklist*. Strelitzia, 14. Pretoria: National Botanical Institute.
- Golding, J. (Ed.) 2002. *Southern African Plant Red Data Lists*. Southern African Botanical Diversity Network Report No 14.
- Henderson, L. 2001. *Alien Weeds and Invasive Plants*. Plant Protection Research Institute Handbook No 12. Agricultural Research Council. Pp 300.

- Hilton-Taylor, C. 1996. *Red Data List of Southern African Plants*. National Botanical Institute.
- Hockey PAR, Dean WRJ and Ryan PG 2005. Roberts - *Birds of southern Africa*, VIIth ed. The Trustees of the John Voelcker Bird Book Fund, Cape Town.
- International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*.
- Low, A.B. & Rebelo, A.G. 1998. *Vegetation of South Africa, Lesotho and Swaziland*. Pretoria: Department of Environmental Affairs and Tourism.
- Marnewick MD, Retief EF, Theron NT, Wright DR, Anderson TA. 2015. *Important Bird and Biodiversity Areas of South Africa*. Johannesburg: BirdLife South Africa.
- Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Hening, G.A., Krüger, M., Pringle, R.L., Terblanche, R.F. & Williams, M.C. (Eds). 2013. *Conservation assessment of butterflies of South Africa, Lesotho and Swaziland: Red List and atlas*. Saftronics (Pty) Ltd., Johannesburg and Animal Demography Unit, Cape Town.
- Minter LR, Burger M, Harrison JA, Braack HH, Bishop PJ & Kloepfer D (Eds). 2004. *Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland*. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- Minter LR, Burger M, Harrison JA, Braack HH, Bishop PJ & Kloepfer D (eds). 2004. *Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland*. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- Mucina, L. & Rutherford, M.C. (Eds). 2006. *The vegetation of South Africa, Lesotho and Swaziland*, in *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- Myers, N., Mittermeir, R.A., Mittermeir, C.G., De Fonseca, G.A.B. & Kent, J. 2000. *Biodiversity hotspots for conservation priorities*. *Nature*, 403: 853–858.
- Nel, J., Colvin, C., Le Maitre, D., Smith, J., Haines, I. 2013. *Defining South Africa's Water Source Areas*. WWF South Africa & Council for Scientific & Industrial Research (CSIR).
- Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux, D.J., Driver, A., Hill, L., van Deventer, H., Funke, N., Swart, E.R., Smith-Ado, L.B., Mbona, N., Downsborough, L. & Nienaber, S. 2011. *Technical Report for the National Freshwater Ecosystem Priority Areas project*. Report to the Water Research Commission, WRC Report No. 1801/2/11. ISBN 978-1-4312-0149-5.
- Pienaar, K. 2000. *The South African What Flower is That?* Struik Publishers (Pty) Ltd. Cape Town.
- Powrie, L.W. 2013. *A database of biodiversity taxon names in South Africa for copy-and-paste into reports or documents*. South African National Biodiversity Institute, Cape Town. Obtained from SANBI on 20 July 2020.
- Powrie, L.W. 2013. *A list of South African biodiversity terms and common names for spell checking*. South African National Biodiversity Institute, Cape Town. Downloaded from www.sanbi.org on 20 July 2020.
- Powrie, L.W. 2013. *A list of South African botanical names for spell checking*. South African National Biodiversity Institute, Cape Town. Downloaded from www.sanbi.org 18 July 2020.
- Powrie, L.W. 2013. *A list of South African physical feature names for spell checking*. South African National Biodiversity Institute, Cape Town. Downloaded from www.sanbi.org on 20 July 2020.
- Powrie, L.W. 2013. *A list of South African zoological and other (including fungi and lichen) names for spell checking*. South African National Biodiversity Institute, Cape Town. Downloaded from www.sanbi.org on 20 July 2020.
- Rouget, M., Reyers, B., Jonas, Z., Desmet, P., Driver, A., Maze, K., Egoh, B. & Cowling, R.M. 2004. *South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component*. Pretoria: South African National Biodiversity Institute.
- Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (Eds.). 2019. *South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm*. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20>.
- South African National Biodiversity Institute (SANBI). 2019. *National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report*. South African

- National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria. pp. 1–214.
- South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 1.2020.
 - Stirton, C. H. 1987. *Plant Invaders: Beautiful, but Dangerous*. The Department of Nature and Environmental Conservation of the Cape Province Administration. Galvin and Sales, Cape Town.
 - Taylor, M.R., Peacock, F., and Wanless, R.M. 2015. *Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*.
 - Taylor, P.B., Navarro, R.A., Wren-Sargent, M., Harrison, J.A. & Kieswetter, S.L. 1999. *Coordinated waterbird Counts in South Africa, 1992-1997*. Avian Demography Unit, Cape Town.
 - Turpie, J.K., Wilson, G. & Van Niekerk, L. 2012. *National Biodiversity Assessment 2011: National Estuary Biodiversity Plan for South Africa*. Anchor Environmental Consulting, Cape Town. Report produced for the Council for Scientific and Industrial Research and the South African National Biodiversity Institute.
 - UN Natural Value Initiative. 2009. *The Ecosystem Services Benchmark, 2009*.
 - Van Wyk, A.E. & Smith, G.F. 2001. *Regions of Floristic Endemism: A Review with Emphasis on Succulents*, Umdaus Press.
 - Weather Bureau. 1988. *Climate of South Africa – Climate statistics up to 1984 (WB40)*. Government Printer, Pretoria.
 - Young, D.J., Harrison, J.A, Navarro, R.A., Anderson, M.A., & Colahan, B.D. (Eds). 2003. *Big birds on farms: Mazda CAR Report 1993-2001*. Avian Demography Unit: Cape Town.

Northern Cape Reference Sources

- Council for Scientific and Industrial Research (CSIR). 2009. *Assessment and Evaluation of Ecosystem Services in the Succulent Karoo Biome*. Report prepared for the Succulent Karoo Ecosystem Programme (SKEP). Coordination Unit. Le Maitre, D., O'Farrell, P., Milton, S., Atkinson, D., De Lange, W., Egoh, B., Reyers, B., Colvin, C., Maherry, A., Blignaut, J.
- Desmet, P. & Marsh A. 2008. *Namakwa District Biodiversity Sector Plan*. Available from BGIS at <http://bgis.sanbi.org/namakwa/project.asp>
- Driver, A., Desmet, P. G., Rouget, M., Cowling, R. M., & Maze, K. 2003. *Succulent Karoo Ecosystem Plan: biodiversity component technical report*. Cape Conservation Unit Report No. CCU, 1(03).
- Holness, S., Oosthuisen, E. 2016. *Critical Biodiversity Areas of the Northern Cape: Technical Report*. Northern Cape Department of Environment and Nature Conservation.
- Namakwaland District Municipality (NDM). 2008. *Namakwa Biodiversity Sector Plan*.
- Northern Cape Department of Environment and Nature Conservation. 2010. *Namakwa Bioregional Plan*. Available at <http://bgis.sanbi.org>.
- Todd, S. 2020. *Terrestrial Biodiversity Specialist Study: Fauna and Flora*. Report compiled for Basic Assessment for the Proposed Paulputs Wind Energy Facility and Associated Grid Connection Infrastructure near Pofadder, Northern Cape Province. Compiled by 3 Foxes Biodiversity Solutions for Arcus Consulting (Pty) Ltd. August 2019.

Web Database Reference Sources

- Animal Demographic Unit: <http://vmus.adu.org.za>
- Bates, M.F. & Tolley, K. 2018. *Tetradactylus fitzsimonsi*. *The IUCN Red List of Threatened Species 2018*: e.T110221422A115680493. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T110221422A115680493.en>. Accessed on 09 June 2021.

- BirdLife International. 2016. *Tyto capensis*. *The IUCN Red List of Threatened Species 2016*: e.T22688514A93199287. <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22688514A93199287.en>. Accessed on 09 June 2021.
- Bronner, G. 2015. *Chlorotalpa duthieae*. *The IUCN Red List of Threatened Species 2015*: e.T4768A21285581. <https://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T4768A21285581.en>. Downloaded on 09 June 2021.
- Conservation International: <http://www.biodiversityhotspots.org>.
- GBIF.org. GBIF Occurrence (*Erica chloroloma*). <https://doi.org/10.15468/dl.kudtsz>. Downloaded. Accessed on 09 June 2021.
- Global Biodiversity Information Facility (GBIF): <http://gbif.org>.
- Hochkirch, A., Bazelet, C. & Danielczak, A. 2018. *Aneuryphymus montanus*. *The IUCN Red List of Threatened Species 2018*: e.T116114515A116116590. <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T116114515A116116590.en>. Accessed on 09 June 2021.
- International Union for Conservation of Nature (IUCN) Redlist: <http://iucnredlist.org>
- IUCN SSC Antelope Specialist Group. 2016. *Philantomba monticola*. *The IUCN Red List of Threatened Species 2016*: e.T4143A50183103. <https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T4143A50183103.en>. Downloaded on 09 June 2021.
- Millennium Ecosystem Assessment (MEA). 2005: <https://www.millenniumassessment.org>
- Plants of Southern Africa: <http://newposa.sanbi.org>
- South African Bird Atlas Project: <http://sabap2.birdmap.africa>
- South African National Biodiversity Institute (SANBI) Redlist: <http://redlist.sanbi.org>
- 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>

12.2 Annexure B: Flora and Fauna Species Lists

12.2.1 Flora

Marked species were flagged from various database sources, including but not limited to the National Environmental Screening Tool, as occurring in the region and having an elevated status. All were cross checked for distribution overlay and were actively screened for presence/absence on site.

SCIENTIFIC NAME	FAMILY	STATUS ¹¹	COMMENT ¹²
<i>Acanthopsis hoffmannseggiana</i>	Acanthaceae		NKb1, NKb3
<i>Adenolobus garipensis</i>	Fabaceae		NKb1, NKb2
<i>Aizoon asbestinum</i>	Aizoaceae	NCA	NKb3
<i>Aizoon canariense</i>	Aizoaceae	NCA	NKb3
<i>Aizoon schellenbergii</i>	Aizoaceae	NCA	NKb1, NKb3
<i>Amaranthus praetermissus</i>	Amaranthaceae		NKb2, NKb3
<i>Amaranthus sp.</i>	Amaranthaceae		NKb2
<i>Antherothamnus pearsonii</i>	Scrophulariaceae		NKb1
<i>Aptosimum albomarginatum</i>	Scrophulariaceae		NKb1
<i>Aptosimum elongatum</i>	Scrophulariaceae		NKb3
<i>Aptosimum lineare</i>	Scrophulariaceae		NKb1, NKb3
<i>Aptosimum marlothii</i>	Scrophulariaceae		NKb1, NKb2, NKb3
<i>Aptosimum spinescens</i>	Scrophulariaceae		NKb3
<i>Aridaria noctiflora subsp. straminea</i>	Aizoaceae	NCA	NKb4
<i>Aristida adscensionis</i>	Poaceae		NKb1, NKb2, NKb3, NKb4
<i>Aristida congesta</i>	Poaceae		NKb1, NKb2, NKb3, NKb4
<i>Aristida engleri</i>	Poaceae		NKb1
<i>Barleria lichtensteiniana</i>	Acanthaceae		NKb1, NKb3
<i>Barleria rigida</i>	Acanthaceae		NKb1, NKb3, NKb4
<i>Berkheya annectens</i>	Asteraceae		NKb3
<i>Berkheya spinosissima subsp. namaensis</i>	Asteraceae		NKb1, NKb2, NKb4
<i>Blepharis mitrata</i>	Acanthaceae		NKb1, NKb2, NKb3
<i>Boscia albitrunca</i>	Capparaceae	NCA	NKb2
<i>Boscia foetida subsp. foetida</i>	Capparaceae	NCA	NKb2, NKb3
<i>Cadaba aphylla</i>	Capparaceae		NKb1, NKb2, NKb3
<i>Caesalpinia bracteata</i>	Fabaceae	NCA	NKb1, NKb2
<i>Cenchrus ciliaris</i>	Poaceae		NKb1, NKb2, NKb3
<i>Centropodia glauca</i>	Poaceae		NKb4
<i>Ceraria namaquensis</i>	Portulacaceae		NKb1
<i>Chamaesyce glanduligera</i>	Euphorbiaceae		NKb1
<i>Chamaesyce inaequilatera</i>	Euphorbiaceae		NKb3
<i>Chascanum garipense</i>	Verbenaceae		NKb1, NKb2

¹¹ NEST – National Environmental Screening Tool; NCA - Northern Cape Nature Conservation Act (Act no. 9 of 2009), Schedule 1 or 2; ToPS – Threatened or Protected Species [NEM:BA]; IUCN: Least Concern (LC), Near Threatened (NT), Critically Endangered (CR), Endangered (EN), Vulnerable (VU); CITIES - Conservation for International trade in Endangered Species; BIT – Biogeographically Important Taxa; End – Endemic.

¹² **NKb1** - Lower Gariep Broken Veld; **NKb2** – Blouputs Karroid Thornveld; **NKb3** - Bushmanland Arid Grassland; **NKb4** - Bushmanland Sandy Grassland.

SCIENTIFIC NAME	FAMILY	STATUS ¹¹	COMMENT ¹²
<i>Cleome angustifolia</i> subsp. <i>diandra</i>	Capparaceae		NKb1
<i>Coccinia rehmannii</i>	Cucurbitaceae		NKb2
<i>Codon royenii</i>	Boraginaceae		NKb1
<i>Commiphora gracilifrons</i>	Burseraceae		NKb1
<i>Crassula muscosa</i>	Crassulaceae	NCA	NKb4
<i>Crotalaria pearsonii</i>	Fabaceae	NEST (M), VU B1ab(iii,v), NCA	Outside of range (Southern Richtersveld to Aggeney and Kenhardt.). May be present on rocky hills to the west.
<i>Cryptolepis decidua</i>	Apocynaceae	NCA	NKb1
<i>Dicoma capensis</i>	Asteraceae		NKb1, NKb2, NKb3, NKb4
<i>Digitaria eriantha</i>	Poaceae		NKb1
<i>Dinteranthus pole-evansii</i>	Aizoaceae	End, NCA	NKb3
<i>Dyerophytum africanum</i>	Plumbaginaceae		NKb1
<i>Ehretia rigida</i> subsp. <i>rigida</i>	Boraginaceae		NKb1, NKb2
<i>Enneapogon cenchroides</i>	Poaceae		NKb1, NKb2
<i>Enneapogon desvauxii</i>	Poaceae		NKb1, NKb2, NKb3, NKb4
<i>Enneapogon scaber</i>	Poaceae		NKb1, NKb2, NKb3
<i>Eragrostis annulata</i>	Poaceae		NKb1, NKb2, NKb3
<i>Eragrostis lehmanniana</i>	Poaceae		NKb1
<i>Eragrostis nindensis</i>	Poaceae		NKb1, NKb3
<i>Eragrostis porosa</i>	Poaceae		NKb1, NKb3
<i>Eragrostis procumbens</i>	Poaceae		NKb3
<i>Eriocephalus ambiguus</i>	Asteraceae		NKb3
<i>Eriocephalus microphyllus</i> var. <i>pubescens</i>	Asteraceae		NKb2, NKb4
<i>Eriocephalus pauperrimus</i>	Asteraceae		NKb4
<i>Eriocephalus spinescens</i>	Asteraceae		NKb3
<i>Euphorbia avasmontana</i>	Euphorbiaceae	NCA	NKb1
<i>Euphorbia gregaria</i>	Euphorbiaceae	NCA	NKb1
<i>Ficus cordata</i>	Moraceae		NKb1
<i>Forsskaolea candida</i>	Urticaceae		NKb1, NKb2
<i>Galenia africana</i>	Aizoaceae	NCA	NKb2
<i>Galenia fruticosa</i>	Aizoaceae	NCA	NKb4
<i>Garuleum schinzii</i>	Asteraceae		NKb1
<i>Gazania lichtensteinii</i>	Asteraceae		NKb4
<i>Gisekia pharnacioides</i>	Gisekiaceae		NKb2, NKb3
<i>Grielum humifusum</i>	Neuradaceae		NKb4
<i>Hermannia gariepina</i>	Malvaceae		NKb2
<i>Hermannia spinosa</i>	Malvaceae		NKb1, NKb2, NKb3, NKb4
<i>Hermannia stricta</i>	Malvaceae		NKb2
<i>Hermannia vestita</i>	Malvaceae		NKb1
<i>Hibiscus elliottiae</i>	Malvaceae		NKb1
<i>Hirpicium echinus</i>	Asteraceae		NKb4
<i>Hoodia gordonii</i>	Apocynaceae	NCA	NKb2
<i>Indigastrum argyraeum</i>	Fabaceae		NKb3
<i>Indigofera heterotricha</i>	Fabaceae		NKb1
<i>Indigofera pechuellii</i>	Fabaceae		NKb2
<i>Kleinia longiflora</i>	Asteraceae		NKb1, NKb2, NKb3
<i>Larryleachia dinteri</i>	Apocynaceae	End, NCA	NKb3
<i>Larryleachia marlothii</i>	Apocynaceae	End, NCA	NKb3
<i>Leucophrys mesocoma</i>	Poaceae		NKb2
<i>Limeum aethiopicum</i>	Molluginaceae		NKb1, NKb2, NKb3
<i>Limeum myosotis</i> var. <i>confusum</i>	Molluginaceae		NKb2
<i>Lophiocarpus polystachyus</i>	Phytolaccaceae		NKb1, NKb2, NKb3

SCIENTIFIC NAME	FAMILY	STATUS ¹¹	COMMENT ¹²
<i>Lotononis oligocephala</i>	Fabaceae	End	NKb3
<i>Lotononis platycarpa</i>	Fabaceae		NKb3
<i>Lycium bosciifolium</i>	Solanaceae		NKb1, NKb2, NKb3, NKb4
<i>Lycium cinereum</i>	Solanaceae		NKb3
<i>Maerua gilgii</i>	Capparaceae		NKb2
<i>Manulea nervosa</i>	Scrophulariaceae	NCA	NKb4
<i>Microlooma incanum</i>	Apocynaceae	NCA	NKb2
<i>Mollugo cerviana</i>	Molluginaceae		NKb2
<i>Monechma incanum</i>	Acanthaceae		NKb3, NKb4
<i>Monechma spartioides</i>	Acanthaceae		NKb1, NKb3
<i>Moraea venenata</i>	Iridaceae	NCA	NKb3
<i>Nemesia maxii</i>	Scrophulariaceae	End, NCA	NKb3
<i>Nymania capensis</i>	Meliaceae	NCA	NKb1, NKb2
<i>Orbea lutea subsp. lutea</i>	Apocynaceae	NCA	NKb1
<i>Panicum lanipes</i>	Poaceae		NKb3
<i>Pappea capensis</i>	Sapindaceae		NKb1
<i>Parkinsonia africana</i>	Fabaceae		NKb2, NKb3
<i>Peliostomum leucorrhizum</i>	Scrophulariaceae		NKb4
<i>Pentzia pinnatisecta</i>	Asteraceae		NKb3
<i>Pentzia spinescens</i>	Asteraceae		NKb3, NKb4
<i>Pergularia daemia var. leiocarpa</i>	Apocynaceae	NCA	NKb2
<i>Phaeoptilum spinosum</i>	Nyctaginaceae		NKb1, NKb2, NKb3
<i>Phyllanthus maderaspatensis</i>	Phyllanthaceae		NKb1
<i>Plinthus karooicus</i>	Aizoaceae	NCA	NKb4
<i>Polygala seminuda</i>	Polygalaceae		NKb1, NKb3
<i>Psilocaulon coriarium</i>	Aizoaceae	NCA	NKb2, NKb3
<i>Pteronia leucoclada</i>	Asteraceae		NKb3
<i>Pteronia mucronata</i>	Asteraceae		NKb3, NKb4
<i>Pteronia sordida</i>	Asteraceae		NKb3, NKb4
<i>Ptychlobium biflorum subsp. biflorum</i>	Fabaceae		NKb1
<i>Requienia sphaerosperma</i>	Fabaceae		NKb4
<i>Rhigozum obovatum</i>	Bignoniaceae		NKb1
<i>Rhigozum trichotomum</i>	Bignoniaceae		NKb1, NKb2, NKb3, NKb4
<i>Rhus burchellii</i>	Anacardiaceae		NKb1
<i>Rhus populifolia</i>	Anacardiaceae		NKb1
<i>Rogeria longiflora</i>	Pedaliaceae		NKb1
<i>Rosenia humilis</i>	Asteraceae		NKb3, NKb4
<i>Ruschia kenhardtensis</i>	Aizoaceae	End, NCA	NKb3
<i>Ruschia pungens</i>	Aizoaceae	End, NCA	NKb1
<i>Ruschia robusta</i>	Aizoaceae	NCA	NKb4
<i>Salsola glabrescens</i>	Chenopodiaceae		NKb3
<i>Salsola rabieana</i>	Chenopodiaceae		NKb2
<i>Salsola tuberculata</i>	Chenopodiaceae		NKb3, NKb4
<i>Sarcostemma viminale</i>	Apocynaceae	NCA	NKb1, NKb4
<i>Schmidtia kalahariensis</i>	Poaceae		NKb1, NKb2, NKb3, NKb4
<i>Senecio cotyledonis</i>	Asteraceae		NKb4
<i>Senecio niveus</i>	Asteraceae		NKb3
<i>Sensitive Species 144</i>		NCA	NKb1
Sensitive species 144		NEST (M), VU A3ce, NCA	Nieuwoudtville east to Olifantsfontein and northwards to the Brandberg in Namibia. Is present in vicinity and can be locally common, but scarce within site.

SCIENTIFIC NAME	FAMILY	STATUS ¹¹	COMMENT ¹²
			Can be avoided for powerline. Not recorded within BESS area. NKB1
<i>Sericocoma avolans</i>	Amaranthaceae		NKB1, NKB3
<i>Sesamum capense</i>	Pedaliaceae		NKB1, NKB2, NKB3, NKB4
<i>Setaria verticillata</i>	Poaceae		NKB1, NKB2, NKB3
<i>Sisyndite spartea</i>	Zygophyllaceae		NKB4
<i>Solanum capense</i>	Solanaceae		NKB1, NKB2, NKB3
<i>Sporobolus fimbriatus</i>	Poaceae		NKB1
<i>Sporobolus nervosus</i>	Poaceae		NKB3
<i>Stachys burchelliana</i>	Lamiaceae		NKB1
<i>Stapelia flavopurpurea</i>	Apocynaceae	NCA	NKB1
<i>Stipagrostis anomala</i>	Poaceae		NKB1, NKB4
<i>Stipagrostis brevifolia</i>	Poaceae		NKB3, NKB4
<i>Stipagrostis ciliata</i>	Poaceae		NKB1, NKB2, NKB3, NKB4
<i>Stipagrostis hochstetteriana</i>	Poaceae		NKB2
<i>Stipagrostis obtusa</i>	Poaceae		NKB1, NKB2, NKB3, NKB4
<i>Stipagrostis uniplumis</i>	Poaceae		NKB1, NKB2, NKB3
<i>Talinum arnotii</i>	Portulacaceae		NKB1, NKB3
<i>Tapinanthus oleifolius</i>	Loranthaceae		NKB1, NKB2
<i>Tephrosia dregeana</i>	Fabaceae		NKB2
<i>Tetragonia arbuscula</i>	Aizoaceae	NCA	NKB1, NKB3, NKB4
<i>Thesium lineatum</i>	Santalaceae		NKB1, NKB2
<i>Tragus berteronianus</i>	Poaceae		NKB1, NKB3
<i>Tragus racemosus</i>	Poaceae		NKB2, NKB3
<i>Trianthema parvifolia</i>	Aizoaceae	NCA	NKB2, NKB3
<i>Tribulus cristatus</i>	Zygophyllaceae		NKB2
<i>Tribulus pterophorus</i>	Zygophyllaceae		NKB2, NKB3
<i>Tribulus terrestris</i>	Zygophyllaceae		NKB3
<i>Tribulus zeyheri</i>	Zygophyllaceae		NKB1, NKB4
<i>Trichodesma africanum</i>	Boraginaceae		NKB1
<i>Tridentea dwequensis</i>	Apocynaceae	BIT, NCA	NKB3
<i>Triraphis ramosissima</i>	Poaceae		NKB1
<i>Vachellia (Acacia) erioloba</i>	Fabaceae	NFA	NKB2, Noted to be scattered around the site. Not present within the BESS area and can be avoided by powerline.
<i>Vachellia (Acacia) mellifera subsp. detinens</i>	Fabaceae		NKB1, NKB2, NKB3
<i>Vahlia capensis</i>	Vahliaceae		NKB3
<i>Ziziphus mucronata subsp. mucronata</i>	Rhamnaceae		NKB1
<i>Zygophyllum dregeanum</i>	Zygophyllaceae		NKB1
<i>Zygophyllum flexuosum</i>	Zygophyllaceae		NKB4
<i>Zygophyllum foetidum</i>	Zygophyllaceae		NKB4
<i>Zygophyllum microphyllum</i>	Zygophyllaceae		NKB3, NKB4
<i>Zygophyllum rigidum</i>	Zygophyllaceae		NKB1, NKB2

12.2.2 Fauna

Marked species were flagged from various database sources, including but not limited to the National Environmental Screening Tool, online databases and other studies, occurring in the region and having an elevated status. All were cross checked for distribution overlay and were actively screened for presence/absence on site as far as possible.

SCIENTIFIC NAME	COMMON NAME	STATUS ¹³	COMMENT/PRESENCE ¹⁴
MAMMALS			
<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	LC	Previously confirmed
<i>Antidorcas marsupialis</i>	Springbok	LC	Previously confirmed
<i>Canis mesomelas</i>	Black-backed Jackal	LC	Previously confirmed
<i>Caracal caracal</i>	Caracal	LC	Likely, may be transient
<i>Crocidura cyanea</i>	Reddish-Grey Musk Shrew	LC	Unlikely
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	Previously confirmed
<i>Desmodillus auricularis</i>	Cape Short-tailed Gerbil	LC	Likely, may be transient
<i>Elephantulus rupestris</i>	Western Rock Elephant Shrew	LC	Likely, may be transient
<i>Felis nigripes</i>	Black-footed cat	VU	Possibly present, transient visitor
<i>Felis silvestris</i>	African Wild Cat	LC	Likely, may be transient
<i>Genetta felina</i>	Southern Small-spotted Genet	LC	Possibly present, transient visitor
<i>Genetta genetta</i>	Small-spotted genet	LC	Previously confirmed
<i>Gerbilliscus brantsii</i>	Highveld Gerbil	LC	Possibly present, transient visitor
<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil	LC	Possibly present, transient visitor
<i>Gerbillurus paeba</i>	Hairy-footed Gerbil	LC	Previously confirmed
<i>Gerbillurus tytonis</i>	Dune Hairy-footed Gerbil	LC	Likely, may be transient
<i>Graphiurus ocellatus</i>	Spectacled Dormouse	LC	Unlikely
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	Previously confirmed
<i>Ictonyx striatus</i>	Striped Polecat	LC	Previously confirmed
<i>Lepus capensis</i>	Cape Hare	LC	Previously confirmed
<i>Lepus saxatilis</i>	Scrub Hare	LC	Possibly present, transient visitor
<i>Macroscelides proboscideus</i>	Round-eared Elephant Shrew	LC	Likely, may be transient
<i>Malacothrix typica</i>	Gerbil Mouse	LC	Likely, may be transient
<i>Mellivora capensis</i>	Honey Badger	LC	Possibly present, transient visitor
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC	Possibly present, transient visitor
<i>Oreotragus oreotragus</i>	Klipspringer	LC	Possibly present, transient visitor
<i>Orycteropus afer</i>	Aardvark	LC	Previously confirmed
<i>Oryx gazella</i>	Gemsbok	LC	Previously confirmed
<i>Otocyon megalotis</i>	Southern Bat-eared Fox	LC	Previously confirmed
<i>Papio ursinus</i>	Chacma Baboon	LC	Likely, may be transient
<i>Parotomys brantsii</i>	Brants' Whistling Rat	LC	Likely, may be transient
<i>Parotomys littledalei</i>	Littledale's Whistling Rat	LC	Likely, may be transient
<i>Pedetes capensis</i>	Springhare	LC	Previously confirmed
<i>Petromus typicus</i>	Dassie Rat	LC	Likely, may be transient
<i>Petromyscus collinus</i>	Pygmy Rock Mouse	LC	Likely, may be transient
<i>Procavia capensis</i>	Rock Hyrax	LC	Previously confirmed
<i>Pronologus saunersiae</i>	Hewitt's Red Rock Rabbit	LC	Previously confirmed
<i>Proteles cristata</i>	Aardwolf	LC	Previously confirmed

¹³ NEST – National Environmental Screening Tool; NCA - Northern Cape Nature Conservation Act (Act no. 9 of 2009), Schedule 1 or 2; ToPS – Threatened or Protected Species [NEM:BA]; IUCN: Least Concern (LC), Near Threatened (NT), Critically Endangered (CR), Endangered (EN), Vulnerable (VU); CITIES - Conservation for International trade in Endangered Species.

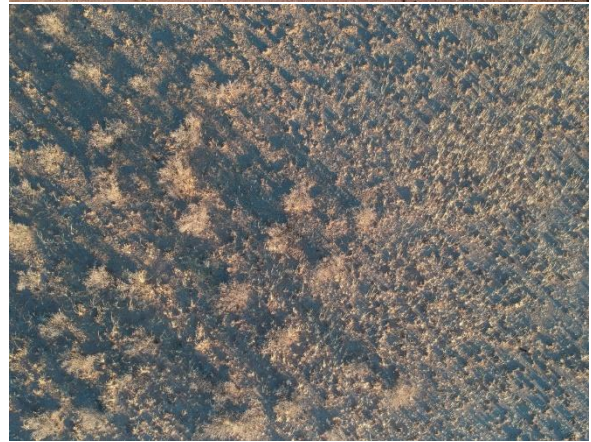
¹⁴ Includes confirmed presence on site as per Todd (2019).

SCIENTIFIC NAME	COMMON NAME	STATUS ¹³	COMMENT/PRESENCE ¹⁴
<i>Raphicerus campestris</i>	Steenbok	LC	Previously confirmed
<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	LC	Likely, may be transient
<i>Saccostomus campestris</i>	Southern African Pouched Mouse	LC	Possibly present, transient visitor
<i>Suricata suricatta</i>	Meerkat	LC	Previously confirmed
<i>Sylvicapra grimmia</i>	Common Duiker	LC	Likely, may be transient
<i>Thallomys paedulus</i>	Acacia Thallomys	LC	Unlikely
<i>Vulpes chama</i>	Cape Fox	LC	Previously confirmed
<i>Xerus inauris</i>	South African Ground Squirrel	LC	Previously confirmed
BIRDS			
<i>Certhilauda subcoronata</i>	Karoo Long-billed Lark (split)	LC	Likely, may be transient
<i>Chersomanes albofasciata</i>	Spike-heeled Lark	LC	Likely, may be transient
<i>Neotis ludwigii</i>	Ludwig's bustard	NEST (H, M), EN (SA), EN (Global)	Likely, may be transient
<i>Philetairus socius</i>	Sociable Weaver	LC	Likely, may be transient
<i>Streptopelia capicola</i>	Cape Turtle (Ring-necked) Dove	LC	Likely, may be transient
REPTILES			
<i>Acontias lineatus</i>	Striped Legless Skink	LC	Possibly present, transient visitor
<i>Acontias tristis</i>	Namaqua Dwarf Legless Skink	LC	Previously confirmed
<i>Agama aculeata</i>	Common Ground Agama	LC	Previously confirmed
<i>Agama anchietae</i>	Anchieta's Agama	LC	Likely, may be transient
<i>Agama atra</i>	Southern Rock Agama	LC	Possibly present, transient visitor
<i>Agama knobeli</i>	Knobel's Rock Agama	LC	Unlikely
<i>Aspidelaps lubricus</i>	Coral Shield Cobra	LC	Likely, may be transient
<i>Bitis arietans</i>	Puff Adder	LC	Likely, may be transient
<i>Bitis caudalis</i>	Horned Adder	LC	Previously confirmed
<i>Bitis xeropaga</i>	Desert Mountain Adder	LC	Possibly present, transient visitor
<i>Boaedon capensis</i>	Brown House Snake	LC	Possibly present, transient visitor
<i>Chamaeleo namaquensis</i>	Namaqua Chameleon	LC	Likely, may be transient
<i>Chondrodactylus angulifer</i>	Common Giant Ground Gecko	LC	Likely, may be transient
<i>Chondrodactylus bibronii</i>	Bibron's Gecko	LC	Likely, may be transient
<i>Cordylus polyzonus</i>	Karoo Girdled Lizard	LC	Likely, may be transient
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	Likely, may be transient
<i>Dipsina multimaculata</i>	Dwarf Beaked Snake	LC	Likely, may be transient
<i>Hemidactylus mabouia</i>	Tropical House Gecko	LC	Unlikely
<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	LC	Possibly present, transient visitor
<i>Lamprophis capensis</i>	Brown House Snake	LC	Likely, may be transient
<i>Leptotyphlops occidentalis</i>	Western Thread Snake	LC	Likely, may be transient
<i>Lygodactylus bradfieldi</i>	Bradfield's Dwarf Gecko	LC	Likely, may be transient
<i>Mabuya capensis</i>	Cape Skink	LC	Likely, may be transient
<i>Mabuya occidentalis</i>	Western Three-Striped Skink	LC	Likely, may be transient
<i>Mabuya spilogaster</i>	Kalahari Tree Skink	LC	Likely, may be transient
<i>Mabuya striata</i>	Striped Skink	LC	Possibly present, transient visitor

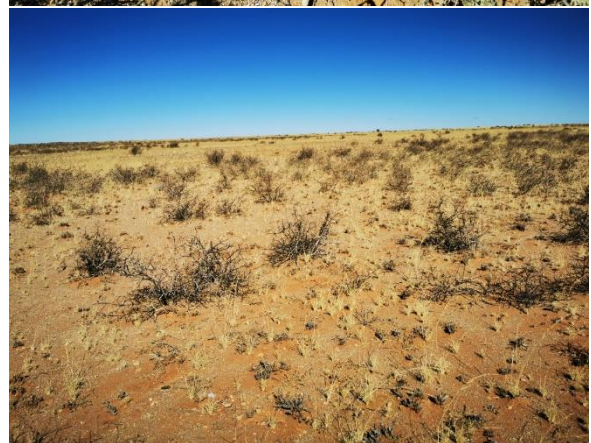
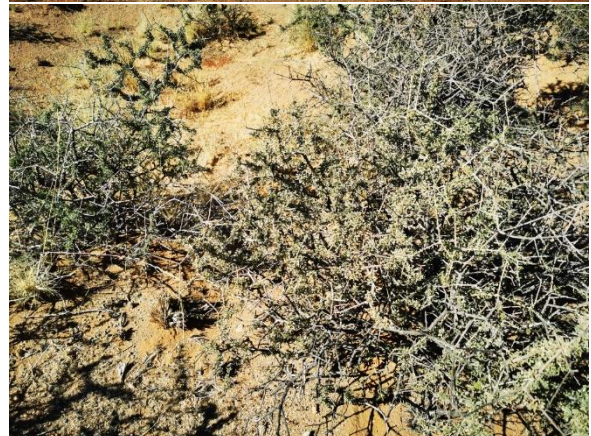
SCIENTIFIC NAME	COMMON NAME	STATUS ¹³	COMMENT/PRESENCE ¹⁴
<i>Mabuya sulcata</i>	Western Rock Skink	LC	Previously confirmed
<i>Mabuya variegata</i>	Variiegated Skink	LC	Possibly present, transient visitor
<i>Meroles suborbitalis</i>	Spotted Desert Lizard	LC	Likely, may be transient
<i>Monopeltis infuscata</i>	Dusky Spade-snouted Worm Lizard	LC	Unlikely
<i>Naja nigricollis woodi</i>	Black Spitting Cobra	Rare	Previously confirmed
<i>Naja nivea</i>	Cape Cobra	LC	Likely, may be transient
<i>Nucras tessellata tessellata</i>	Striped Sandveld Lizard	LC	Likely, may be transient
<i>Pachydactylus atorquatus</i>	Augrabies Gecko	LC	Likely, may be transient
<i>Pachydactylus carinatus</i>	Western Spotted Thick-toed Gecko	LC	Possibly present, transient visitor
<i>Pachydactylus haackei</i>	Haacke's Thick-toed gecko	LC	Possibly present, transient visitor
<i>Pachydactylus latirostris</i>	Quartz Gecko	LC	Possibly present, transient visitor
<i>Pachydactylus montanus</i>	Namaqua Mountain Gecko	LC	Possibly present, transient visitor
<i>Pachydactylus purcelli</i>	Purcell's Gecko	LC	Possibly present, transient visitor
<i>Pachydactylus rugosus</i>	Common Rough Gecko	LC	Likely, may be transient
<i>Pachydactylus serval</i>	Western Spotted Gecko	LC	Likely, may be transient
<i>Pachydactylus turneri</i>	Turner's Thick-toed Gecko	LC	Possibly present, transient visitor
<i>Pachydactylus haackei</i>	Haacke's Thick-toed Gecko	LC	Possibly present, transient visitor
<i>Pedioplanis inornata</i>	Plain Sand Lizard	LC	Likely, may be transient
<i>Pedioplanis laticeps</i>	Cape Sand Lizard	LC	Unlikely
<i>Pedioplanis lineoocellata</i>	Common Sand Lizard	LC	Likely, may be transient
<i>Pedioplanis namaquensis</i>	Namaqua Sand Lizard	LC	Likely, may be transient
<i>Pedioplanis undata</i>	Western Sand Lizard	LC	Likely, may be transient
<i>Platysaurus broadleyi</i>	Broadley's Flat Lizard	LC	Unlikely
<i>Prosymna bivittata</i>	Two-striped Shovel-snout	LC	Unlikely
<i>Psammobates tentorius</i>	Northern tent tortoise	LC	Previously confirmed
<i>Psammophis leightoni</i>	Cape Whip Snake	LC	Likely, may be transient
<i>Psammophis notostictus</i>	Karoo Sand Snake	LC	Previously confirmed
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	LC	Possibly present, transient visitor
<i>Pseudaspis cana</i>	Mole Snake	LC	Likely, may be transient
<i>Ptenopus garrulus</i>	Common Barking Gecko	LC	Likely, may be transient
<i>Ptenopus garrulus maculatus</i>	Spotted Barking Gecko	LC	Possibly present, transient visitor
<i>Rhinotyphlops schinzi</i>	Schinz's Beaked Blind Snake	LC	Likely, may be transient
<i>Telescopus beetzii</i>	Namib Tiger Snake	LC	Likely, may be transient
<i>Telescopus semiannulatus</i>	Eastern Tiger Snake	LC	Possibly present, transient visitor
<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	Possibly present, transient visitor
<i>Trachylepis sparsa</i>	Karasburg Tree Skink	LC	Likely, may be transient
<i>Trachylepis sulcata</i>	Western Rock Skink	LC	Likely, may be transient
Amphibians			
<i>Cacosternum boettgeri</i>	Common Caco	LC	Possibly present, transient
<i>Phrynomantis annectens</i>	Marbled Rubber Frog	LC	Previously confirmed
<i>Tomopterna tandyi</i>	Tandy's Sand Frog	LC	Possibly present, transient

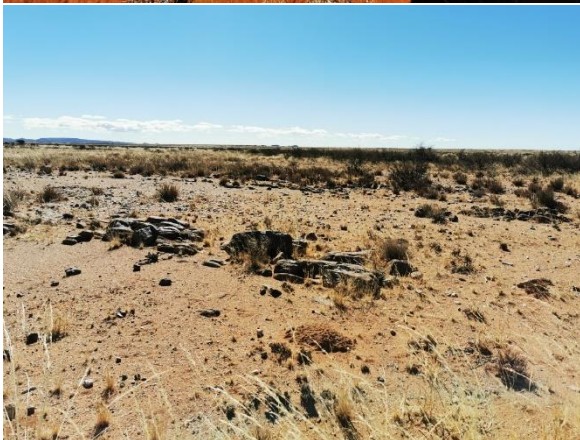
SCIENTIFIC NAME	COMMON NAME	STATUS ¹³	COMMENT/PRESENCE ¹⁴
<i>Vandijkophrynus gariensis</i>	Karoo Toad	LC	Possibly present, transient
<i>Vandijkophrynus robinsoni</i>	Paradise Toad	LC	Possibly present, transient
<i>Xenopus laevis</i>	Common Platanna	LC	Possibly present, transient
INVERTEBRATES			
LEPIDOPTERA (BUTTERFLIES)			
<i>Aloeides damarensis</i>	Damara russet	LC	Possibly present, transient
<i>Acraea trimeni</i>	Kalahari acraea	LC	Possibly present, transient
<i>Vanessa cardui</i>	Painted lady	LC	Possibly present, transient
<i>Papilio demodocus</i>	Citrus swallowtail	LC	Possibly present, transient
<i>Belenois aurota</i>	Pioneer caper white	LC	Possibly present, transient
<i>Teracolus agoye bowkeri</i>	Speckled sulphur tip	LC	Possibly present, transient
OTHER INSECTS			
<i>Anacridium moestum</i>	Tree Locust		Possibly present
<i>Brachythemis leucosticta</i>	Banded Groundling		Possibly present
<i>Hypolixus flavicornis</i>			Possibly present
<i>Oligotoma saundersii</i>	Saunders' Webspinner		Possibly present
<i>Paragomphus genei</i>	Common Hooktail		Possibly present
<i>Tetramorium signatum</i>	Feigning Garden Ant		Possibly present
<i>Trithemis annulata</i>	Violet Dropwing		Possibly present
BABOON SPIDERS & SCORPIONS			
<i>Hadogenes zumpti</i>	Richtersveld Rock Scorpion	ToPS	Possibly present
<i>Hottentotta arenaceus</i>	Scorpion	ToPS	Possibly present
<i>Opisthophthalmus haackei</i>	Scorpion	ToPS	Possibly present
<i>Opisthophthalmus longicauda</i>	Scorpion	ToPS	Possibly present
<i>Opisthophthalmus lornae</i>	Scorpion	ToPS	Possibly present
<i>Opisthophthalmus wahlbergii</i>	Scorpion	ToPS	Possibly present
<i>Parabuthus villosus</i>	Black hairy thick-tailed scorpion	ToPS	Possibly present
<i>Uroplectes schlechteri</i>	Scorpion	ToPS	Possibly present
All Baboon Spiders		ToPS	Possibly present

12.3 Annexure C: Site Photographic Record



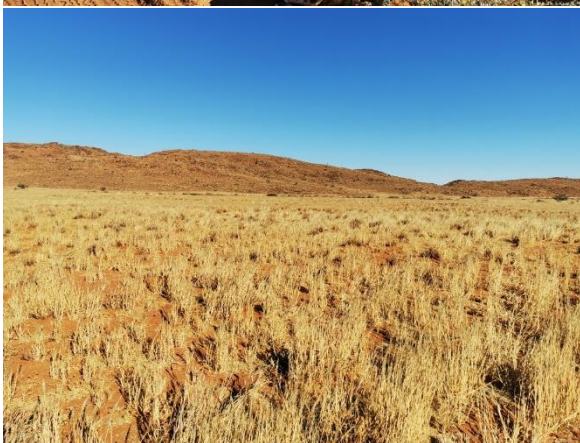


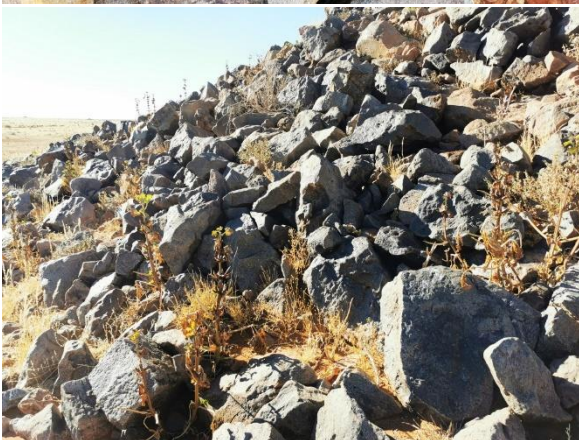


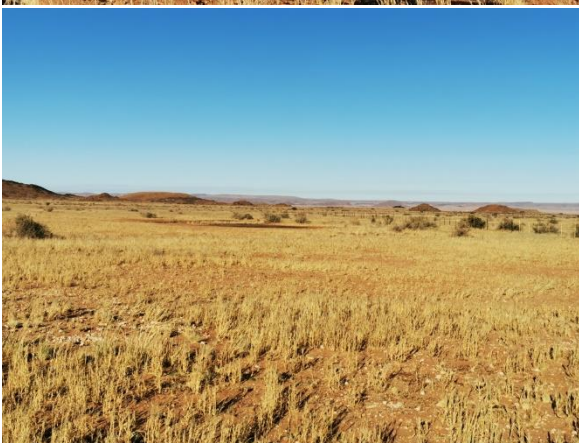


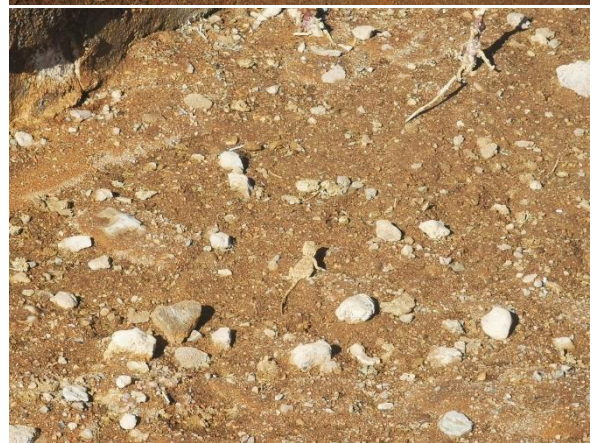




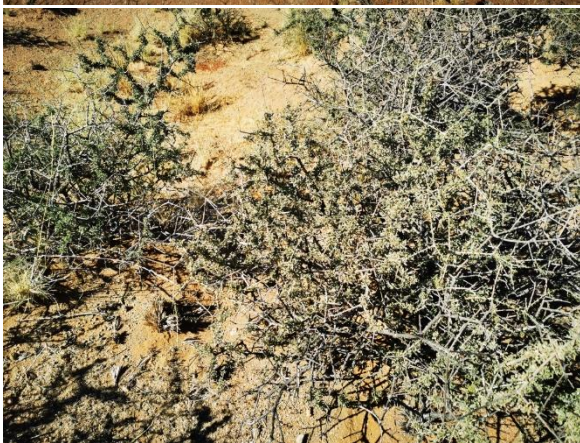




















12.4 Annexure D: Biodiversity Environmental Management Plan

Specific measures relating to management of Biodiversity Impacts that must be included in the project Environmental Management Programme (EMPr). This Environmental Management Plan (EMP) contains guidelines, operating procedures and rehabilitation control requirements, which will be binding on the holder of the environmental authorisation after approval of the EMP. The impacts identified and listed in 6.5 will be managed / controlled as set out under mitigating measures (6.5) and as detailed in this section for the more significant impacts during the operational phase.

12.4.1 Protection of Flora and Fauna

The following actions must be implemented at construction phase.

- Search and rescue operations for Species of Conservation Concern must be undertaken before the commencement of site clearing activities.
- Indigenous vegetation encountered on the sites that are to be conserved and left intact.
- It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
- Stripped vegetation should be temporarily stored during operations and to be used later to stabilise slopes. This excludes exotic invasive species.
- No animals are to be harmed or killed during the course of operations.
- Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna remain the property of the landowner and must not be disturbed, upset or used without their expressed consent.
- It is the responsibility of the Contractor to provide sufficient fuel for cooking and heated as needed by the staff.
- No domestic animals are permitted on the sites.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO.
- Rehabilitation of vegetation of the site must be done as described in the Rehabilitation Plans.

Flora Search and Rescue

The following flora relocation plan is recommended:

- Once the final layout has been determined the botanist will be consulted in order to finalise the plant relocation and vegetation clearing plan.
- Respective permits to be obtained.
- Flora search and rescue is to be conducted before vegetation clearing takes place.
- Areas should only be stripped of vegetation as and when required and once Species of Conservation Concern have been relocated for that area.
- Once site clearing is to commence, the area to be cleared of vegetation will be surveyed by the vegetation and plant search and rescue team clearing under the supervision of the botanist to identify and remove species suitable for rescue and commence removal of plants.
- These species are to be replanted immediately in a suitable area of similar vegetation, where future development is unlikely to occur, or within a nearby protected area.

Fauna Search and Rescue

The following fauna relocation plan is recommended for inclusion in the EMP and Fauna removal permit applications:

- An on-foot search, conducted by a professional reptile handler/team, is to be carried out to search for reptiles within every possible habitat.
- Once caught, each reptile will be placed into transport containers suited for that individual reptile.

- The transport containers must be kept cool to decrease stress for the reptiles.
- The reptiles will be relocated as soon as possible after they have been caught.
- Professional equipment will be used to ensure limited harm to the reptiles and to prevent the team members from being bitten by venomous snakes.
- Nooses should not be used as they cause injury to lizards.
- Safety procedures will be in place for the release of the reptiles.
- Amphibians should be caught by hand and net.
- Amphibians must be placed into transport containers with damp substrates to avoid dehydration.
- Tadpoles may be collected, placed into water containers and released as soon as possible, where required.
- During release, the tadpoles will be allowed to acclimatize to the new water in terms of temperature, pH etc.
- Small mammals will be caught with nets and by hand. They will then be transported in carry cages and released as soon as possible.
- No immobilizers or tranquilizers will be used on the mammals.

12.4.2 Alien and Invasive Plan Management Plan

The following mitigation measures have been identified in order to ensure that the introduction and spread of alien invasive vegetation is minimised:

- Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements.
- A suitable weed management strategy must be implemented in the construction phase and carried through the operational phase.
- Weeds and alien species must be cleared by hand before the rehabilitation phase of the areas. Removal of alien plants are to be done according to the Working for Water Guidelines.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary). Areas within the confines of the site are to be included.
- All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free?
- After clearing is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner.

12.4.3 Fires

- The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers should also be informed or otherwise involved.
- Enclosed areas for food preparation should be provided and the Contractor must strictly prohibit the use of open fires for cooking and heating purposes.
- The use of branches of trees and shrubs for fire-making must be strictly prohibited.
- The Contractor should take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO.
- The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services.
- The Contractor must supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment.
- Fires and “hot work” must be restricted to demarcated areas.

- A braai facility may be considered at the discretion of the Contractor and in consultation with the ECO. The area must be away from flammable stores. All events must be under management's supervision and a fire extinguisher will be immediately available. "Low-smoke" fuels must be used (e.g., charcoal) and smoke control regulations, if applicable, must be considered.
- The Contractor must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.

12.4.4 Soil Aspects

- Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas.
- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the site footprint outside the 1:50 flood level within demarcated areas.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.

12.4.5 Dust

- To manage complaints relation to impacts on the nearby communities, a dust register will be developed.
- If required, water spray vehicles will be used to control wind cause by strong winds during activities on the works.
- No over-watering of the site or road surfaces.
- Wind screens should be used to reduce wind and dust in open areas.

12.4.6 Infrastructural Requirements

Topsoil

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the footprint outside the 1:50 flood level within demarcated areas (Appendix 1)
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The use of a suitable grass seed/runner mix will facilitate soil protection and minimise weeds/weed growth.

Stormwater and Erosion Control

- Stormwater Management Plans must be developed for the site and should include the following:
 - The management of stormwater during construction.
 - The installation of stormwater and erosion control infrastructure.
 - The management of infrastructure after completion of construction.

- Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into river systems in proximity to the site. Stormwater must be prevented from entering or running off site.
- To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes should be profiled at a maximum 1:3 gradient.
- Diversion channels should be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.
- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place).
- Existing vegetation must be retained as far as possible to minimise erosion problems.
- It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion.
- Visual inspections will be done on a regular basis with regard to the stability of water control structure, erosion and siltation.
- Sediment-laden runoff from cleared areas must be prevented from entering rivers and streams.
- No river or surface water may be affected by silt emanating from the site.

Site Office / Camp Sites

- No site offices or camp sites will be constructed on the site under current operating conditions, existing structures will be used.

Operating Procedures in the Site

- Construction shall only take place within the approved demarcated site.
- Construction may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the environmental authorisation shall ensure that operations take place only in the demarcated areas as described in this report.
- Watering to minimise the effect of dust generation should be carried out as frequently as necessary. Noise should also be kept within reason.
- No workers will be allowed to damage or collect any indigenous plant or snare any animal.
- Grass and vegetation of the immediate environment or adapted grass / vegetation will be re-established on completion of construction activities, where applicable.
- No firewood to be collected on site and the lighting of fires must be prohibited.
- Cognisance is to be taken of the potential for endangered species occurring in the area. It is considered unlikely, however, that these species will be affected by the proposed activity.

Excavations

Whenever any excavation is undertaken, the following procedures shall be adhered to:

- Topsoil shall be handled as described in this EMP.
- Excavations shall take place only within the approved demarcated site.
- Excavations must follow the contour lines where possible.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- The excavated area must serve as a final depositing area for waste rock and overburden during the rehabilitation process.
- Once excavations have been filled with overburden, rocks and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area.
- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally occurring flora.

Rehabilitation of Processing and Excavation Areas

- On completion of construction, the surface of the processing areas especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with suitable grasses and local indigenous seed mix.
- Excavations may be used for the dumping of construction wastes. This *shall* be done in such a way as to aid rehabilitation.
- Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the activity, be corrected and the area be seeded with a vegetation seed mix to his or her satisfaction. This *must* be done in conjunction with the ECO.
- Final rehabilitation *must* comply with the requirements mention in the Rehabilitation Plan.

12.4.7 Rehabilitation Plan

Rehabilitation Objective

The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the property. Significant aspects to be borne in mind in this regard is, revegetation of undeveloped footprint and stability and environmental risk. The depression and immediate area of the working must also be free of alien vegetation. Additional broad rehabilitation strategies / objectives include the following:

- Rehabilitating the worked-out areas to take place concurrently within prescribed framework established in the EMP.
- All infrastructure, equipment, plant and other items used during the construction period will be removed from the site.
- Waste material of any description, including scrap, rubble and tyres, will be removed entirely from the site and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

Topsoil and Subsoil Replacement

Topsoil and subsoil will be stripped and stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contract to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.

Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.

The topsoil and overburden will be keyed into the reprofiled surfaces to ensure that they are not eroded or washed away. The topsoiled surface will be left fairly rough to enhance seedling establishment, reduce water runoff and increase infiltration.

Revegetation

Any prepared surfaces requiring revegetation to be seeded with suitable local indigenous grass species to provide an initial ground cover and stabilize the soil surface. The overall revegetation plan will, therefore, be as follows:

- Ameliorate the aesthetic impact of the site.
- Stabilise disturbed soil and rock faces.
- Minimize surface erosion and consequent siltation of natural water course located on site.
- Control wind-blown dust problems
- Enhance the physical properties of the soil.
- Re-establish nutrient cycling.
- Re-establish a stable ecological system.

Every effort must be made to avoid unnecessary disturbance of the natural vegetation during operations.

Drainage and Erosion Control

To control the drainage and erosion at site the following procedures will be adopted:

- Areas where construction is completed should be rehabilitated immediately.
- Areas to be disturbed in future activities will be kept as small as possible (i.e., conducting the operations in phases), thereby limiting the scale of erosion.
- Slopes will be profiled to ensure that they are not subjected to excessive erosion but capable of drainage runoff with minimum risk of scour (maximum 1:3 gradient).
- All existing disturbed areas will be re-vegetated to control erosion and sedimentation.
- Existing vegetation will be retained as far as possible to minimize erosion problems.

Visual Impacts Amelioration

The overall visual impact of the proposed activities will be minimised by the following mitigating measures:

- Confining the footprint to an area as small as possible
- Re-topsoiling and vegetating all disturbed areas.

12.4.8 Monitoring and Reporting

Adequate management, maintenance and monitoring will be carried out annually by the applicant to ensure successful rehabilitation of the property until a closure certificate is obtained.

To minimise adverse environmental impacts associated with operations it is intended to adopt a progressive rehabilitation programme, which will entail carrying out the proposed rehabilitation procedures concurrently with activity.

12.4.9 Closure objectives and extent of alignment to pre-construction environment

Closure Objectives

The closure of the site will involve removal of all debris and rehabilitation of areas disturbed during the construction phase of the project. This will comprise the scarification of compacted areas, reshaping of areas, topsoiling and rehabilitating all prepared surfaces.

12.5 Annexure E: General Impact Rating Scale

To ensure a direct comparison between various specialist studies, six standard rating scales are defined and used to assess and quantify the identified impacts. This is necessary since impacts have several parameters that need to be assessed.

These scales are:

1. The Severity/ Benefit Scale, which assesses the importance of the impact from a purely technical perspective.
2. The Spatial Impact Scale, which assesses the extent or magnitude of the impact (the area that will be affected by the impact).
3. The Temporal Impact Scale, which assesses how long the impact will be felt. Some impacts are of a short duration, whereas others are permanent.
4. The Degree of Certainty Scale, which provides a measure of how confident the author feels about their prediction.
5. The Likelihood Scale, which provides an indication of the risk or chance of an impact taking place.
6. The Environmental Significance Scale, which assesses the importance of the impact in the overall context of the affected system or party.

To ensure integration of social and ecological impacts, to facilitate specialist assessment of impact significance, and to reduce reliance on value judgments, the severity of the impact within the scientific field in which it takes place (e.g., vegetation, fauna etc.) was assessed first. Thereafter, each impact was assessed within the context of time and space, and the probability of the impact occurring was quantified using the degree of certainty scale.

The impact was then assessed in the context of the whole environment to establish the “environmental significance” of the impact to the flora and vegetation.

The scales are described in detail below.

12.5.1 The Severity/ Beneficial Scale

The *severity scale* was used to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on an affected system (for ecological impacts) or an affected party. This methodology attempts to remove any value judgments from the assessment, although it relies on the professional judgment of the specialist.

NEGATIVE IMPACT	POSITIVE IMPACT
<p><u>Very severe</u> An irreversible and permanent change to the affected system(s) which cannot be mitigated. For example, change in topography resulting from a quarry.</p>	<p><u>Very Beneficiary</u> A permanent and very substantial benefit to the affected system(s) with no alternative to achieve this benefit.</p>
<p><u>Severe</u> Long-term impacts on the affected system(s) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.</p>	<p><u>Beneficial</u> A long-term impact and substantial benefit to the affected system(s). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.</p>
<p><u>Moderately severe</u> Medium- to long-term impact on the affected system(s) that could be mitigated.</p>	<p><u>Moderately beneficial</u> A medium- to long-term impact of real benefit to the affected system(s) Other ways of optimising are equally difficult, expensive and time</p>

NEGATIVE IMPACT	POSITIVE IMPACT
	consuming (or a combination of these), as achieving them in this way.
<u>Slight</u> Medium- to short term impacts on the affected system(s) Mitigation is very easy, cheap, less time consuming or not necessary.	<u>Slightly beneficial</u> A short- to medium-term impact and negligible benefit to the affected system(s) Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
<u>No effect</u> The system(s) is not affected by the proposed development.	<u>Do not know/Cannot know</u> In certain cases, it may not be possible to determine the severity of the impact.

The severity of impacts can be evaluated with and without mitigation order to demonstrate how serious the impact is when nothing is done about it. For beneficial impacts, optimisation means anything that can enhance the benefits. However, mitigation or optimisation must be practical, technically feasible and economically viable.

12.5.2 Spatial and Temporal Scales

Two additional factors were considered when assessing the impacts, namely the relationship of the impact to Spatial and Temporal Scales.

The *spatial scale* (shown in italics) defines the impact at the following scales.

SPATIAL SCALE	EXPLANATION
Localised	at a localised scale (i.e., few hectares in extent). The specific area to which this scale refers is defined for the impact to which it refers.
Study Area	the site, some effects to surrounding area (~10 km)
District	the site, some effects to wider surrounding area (~100 km)
Regional	the site, some effects to surrounding area (+250 km)
National	Impacts will affect at a country level
International	Impacts extend beyond country boundary

The *temporal scale* (shown in italics) defines the impact at the following scales.

TEMPORAL SCALE	EXPLANATION
Short Term	Less than 5 years. Many construction phase impacts will be of a short duration
Medium Term	Between 5 and 20 years
Long Term	Between 20 and 40 years, and from a human perspective essentially permanent.
Permanent	Over 40 years and resulting in a permanent and lasting change.

12.5.3 The Degree of Certainty and the Likelihood Scale

It is also for each specialist to state the degree of certainty, or the confidence attached to their prediction of significance. For this reason, a 'degree of certainty' scale (shown in bold) must be used.

DEGREE	DESCRIPTION
Definite:	More than 90% sure of fact. To use this one will need to substantial supportive data.
Probable:	Between 70% and 90% sure of fact.
Possible:	Between 40% and 70% sure of fact.
Unsure:	Less than 40% sure of fact.

The risk or likelihood (shown in normal font) of impacts being manifested differs. There is no doubt that some impacts would occur, but certain other (usually secondary data) impacts are not as likely and may or may not result. Although these impacts maybe severe, the likelihood of them occurring may affect their overall significance and must therefore be considered. It is therefore necessary for the author to state his estimate of the likelihood of an impact occurring, using the following likelihood scale:

DEGREE	DESCRIPTION
Very unlikely	The chance of these impacts occurring is extremely slim, e.g., natural forces destroying a dam wall.
Unlikely	The risk of these impacts occurring is slight.
May occur	The risk of these impacts is more likely, although it is not definite.
Very Likely	Slight chance that this impact will not occur.
Definite	There is no chance that this impact will not occur.

12.5.4 The Environmental Significance Scale

The environmental significance scale is an attempt to evaluate the significance of an impact, the severity or benefit of which has already been assessed. This evaluation needs to be assessed in the relevant context, as an impact can either be ecological or social, or both. Since the severity of impacts with and without mitigation will already have been assessed, significance was only evaluated after mitigation. In many cases, this mitigation will take place, as it has been incorporated into project design. A six-point significance scale is applied as follows:

SIGNIFICANCE	DESCRIPTION
Very High (6)	Impacts considered to have a major and permanent change to natural environment and are rate as VERY HIGH, usually resulting to severe or very severe/ beneficial to highly beneficial effects.
High (5)	Long term change and are rated as HIGH resulting to severe or moderately severe effects/ beneficial to moderately beneficial.
Moderate (4)	Medium to long-term effects. Impacts are rated as MODERATE with moderately severe or moderately beneficial effects.
Low (3)	Medium to short term effects. Impacts are rated as MODERATE resulting in moderately severe or moderately beneficial effects.
Insignificant (2)	Short term effects are present. Impacts are rated as SLIGHT resulting in SLIGHTLY BENEFICIAL effects. Residual effects are present but are of no consequence.
No Significance (1)	No primary or secondary effects, resulting in NO SIGNIFICANT impact.
Do not Know (0)	Not possible to determine the significance of impacts

12.5.5 Absence of Data

In certain instances, an assessment must be produced in the absence of all the relevant and necessary data, due to paucity or lack of scientific information on the study area. It is more important to identify all the likely environmental impacts than to precisely evaluate the more obvious impacts. It is important to be on the conservative side in reporting likely environmental impacts. Because assessing impacts with a lack of data is more dependent on scientific judgment, the rating on the certainty scale cannot be too high. It is for these reasons that a degree of certainty scale has been provided, as well as the categories DON'T KNOW or CAN'T KNOW.

12.6 Annexure F: Declaration, Specialist Profile and Registration



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

File Reference Number:	(For official use only)
NEAS Reference Number:	DEA/EIA/
Date Received:	

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)

PROJECT TITLE

Paulputs Wind Energy Facility: Terrestrial Biodiversity

Kindly note the following:

1. This form must always be used for 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 01 September 2018. 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.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	None		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition
			100 %
Specialist name:	Jamie Pote		
Specialist Qualifications:	BSc (Hons)		
Professional affiliation/registration:	SACNASP (115233)		
Physical address:			
Postal address:	Postnet Suite 13130, P.Bag X13130		
Postal code:	6013	Cell:	076 888 9890
Telephone:		Fax:	
E-mail:			

2. DECLARATION BY THE SPECIALIST

I, Mr Jamie Pote _____, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

N/A

Name of Company:

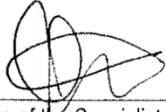
15 June 2021

Date

Details of Specialist, Declaration and Undertaking Under Oath

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.



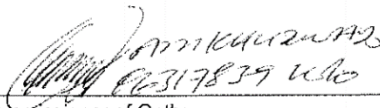
Signature of the Specialist

N/A

Name of Company

15 June 2021

Date



2021-06-15

Signature of the Commissioner of Oaths

2021-06-15

Date











Jamie Pote

BIODIVERSITY ADVISOR, ECOLOGIST AND ENVIRONMENTAL SCIENTIST

CONTACT

-  (+27) 76 888 9890
-  jamiepote@live.co.za
-  Port Elizabeth, South Africa
-  [Linkedin.com](https://www.linkedin.com)
-  Jamiepote
-  [Bluesky-SA](https://bluesky.com)

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*

ABOUT ME

18 years broad professional experience in Biodiversity, Ecological and Vegetation Assessments on over 250 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 tools and Analysis.

EXPERIENCE AND CLIENTS

Key Sectors

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

Key Projects

- *Over 250 independent Biodiversity/Ecological Assessments throughout southern, western and central Africa.*
- *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.*
- *South-End Precinct Mixed Use Development for Mandela Bay Development Agency - Environmental application, Ecological assessments and Pre-Construction compliance.*
- *Coega Development Corporation IDZ projects – Ecological assessments, Flora search & rescue and Construction monitoring.*
- *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.*
- *Various Environmental Management and Rehabilitation Plans.*

24/03/2021



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 2022**



Handwritten signature of the Chairperson in black ink.

Chairperson

Handwritten signature of the Chief Executive Officer in black ink.

Chief Executive Officer



To verify this certificate scan this code

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

PROJECT EXPERIENCEPERFORMANCE 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 - Roggeveld Wind Energy Project 2020
- Biodiversity Assessment for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo 2008

TERRESTRIAL BIODIVERSITY ASSESSMENTS AND COMPLIANCE STATEMENTS

- Terrestrial Biodiversity Assessment (Addo BSD Offices) 2021
- Terrestrial Biodiversity Assessment (Blaauwater Farms) 2021
- Terrestrial Biodiversity Assessment (Buffelshoek Farm, Loerie) 2021
- Terrestrial Biodiversity & Aquatic Assessment & Review (Falcon Ridge Dam) 2021
- Terrestrial Biodiversity Assessment (Gubenxa Valley Deciduous Fruit) 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 (Burlington Farm Citrus Development, Cookhouse) 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 (Helpmekeer 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

ENERGY PROJECTS (WIND FARM AND PHOTOVOLTAIC INFRASTRUCTURE)

- Preliminary Biodiversity Screening for Chrisdelina Ranch Agricultural Project, Kizenga District 2020
- Preliminary Biodiversity Screening and GIS mapping for Balekani Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping for Sihhoye Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping Mpaka Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping for Chiwelwa Hydroelectric project 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 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
- Botanical Assessment and Open Space Management Plan for Mainstream WEF Phase 2, Eastern Cape 2010

SPECIALISED ECOLOGICAL REPORTS AND REVIEWS

- Rebels Vlei Riparian delineation 2021

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

• Buck Kraal Dam Rehabilitation Plan Review	2020
• Rehabilitation Plan for Hitgeheim Farm (Farm 960), Sunland, Eastern Cape	2017
• Green Star Rating Ecological Assessment for SANRAL office, Bay West City, NMBM	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

• 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

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

• 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

• 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	2015
• Rehabilitation Plan and Auditing for Grassridge-Poseidon Powerline Rehab, Eastern Cape	2013
• Ecological Assessment for Dieprivier Karreedouw 132kV Powerline, Eastern Cape	2012
• Flora and Fauna search and Rescue plan for Van Stadens Windfarm Powerline, NMB	2012
• Botanical Assessment for Dedisa-Grassridge Powerline, Eastern Cape	2010
• Ecological Assessment for Grahamstown-Kowie Powerline, Eastern Cape	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, Eastern Cape	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 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

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

- 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 Zachtvelei 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 Extension, 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, BCM 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 Craggs 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

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

• 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 Parsonsvei 3/4, Eastern Cape	2005
• Botanical Assessment for Bridgemead – Malabar PE, NMB	2004

AGRICULTURAL PROJECTS

• 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

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

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 Parsonsvei Erf 984 & 1134 Parsonsvei, 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 Zwartbosch 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

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

• 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 Mandela 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 (Jeffreys 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 (Jeffreys 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 Parsonsvei Erf 984 & 1134 Parsonsvei	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

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

- 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 Blue Crane Route & Camdeboo LM 12 Borrow Pits – (DoT) 2019
- Mining BAR/EMP's for Elundini LM 6 Borrow Pits (DoT)
- Mining BAR/EMP's for Bavians LM 6 Borrow Pits (DoT)
- Mining BAR/EMP's for Kouga & Koukamma LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for Sakhisizwe & Engcobo LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for Senqu LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for 24 Borrow Pits in 6 districts within the Eastern Cape– (SANRAL) 2018
- Mining BAR/EMP's for Ingquza Hill LM Borrow Pits – (SANRAL) 2017
- Mining BAR/EMP's for Bavians 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 Mqijima) 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 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/Bavians 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

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

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 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 Mqijima) 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

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

• ECO Audits for Koukamma Flood Damage Road Repairs – Hatch Goba	2014
• EMP and ECO for Utopia Estate, NMB	2013
• Final EMP submission for Seaview Garden Estate, NMB	2012
• ECO audits for NMB Road surfacing, NMB (multiple contacts)	2011
• EMP 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, Parsonsvej, NMB	2019
• Environmental Screening Report for proposed Khayaletu 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.

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

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).

12.7 Annexure G: 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 Regulation¹⁵.

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 Institute¹⁶.

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.

2.1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

2.2. 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.

2.3. 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.

¹⁵ The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act 107 of 1998).

¹⁶ 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 the 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 <u>Terrestrial Biodiversity Specialist Assessment</u> .	✓
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 <u>Terrestrial Biodiversity Compliance Statement</u> .	✗
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 <u>Terrestrial Biodiversity Compliance Statement</u> 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 <u>Terrestrial Biodiversity Specialist Assessment</u> 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 <u>construction phase</u> , in which case a <u>compliance statement applies</u> . 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 <u>specialist registered with the South African Council for Natural Scientific Professionals (SACNASP)</u> 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 <u>description of the ecological drivers or processes</u> of the system and how the proposed development will impact these;	✓
2.3.2	<u>ecological functioning and ecological processes</u> (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	✓
2.3.3	the <u>ecological corridors</u> that the proposed development would impede including migration and movement of flora and fauna;	✓
2.3.4	the description of any <u>significant terrestrial landscape features</u> (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)	<u>main vegetation types</u> ;	✓
(b)	<u>threatened ecosystems</u> , including listed ecosystems as well as locally important habitat types identified;	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
(c)	<u>ecological connectivity, habitat fragmentation, ecological processes and fine-scale habitats; and</u>	✓
(d)	<u>species, distribution, important habitats (e.g., feeding grounds, nesting sites, etc.) and movement patterns identified;</u>	✓
2.3.6	the assessment <u>must identify any alternative development footprints within the preferred site which would be of 'low' sensitivity</u> 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 <u>reasons why an area has been identified as a CBA;</u>	✓
(b)	an indication of <u>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;</u>	✓
(c)	the <u>impact on species composition and structure of vegetation</u> with an indication of the extent of clearing activities in proportion to remaining extent of the ecosystem type(s);	✓
(d)	the <u>impact on ecosystem threat status;</u>	✓
(e)	the <u>impact on explicit subtypes in the vegetation;</u>	✓
(f)	the <u>impact on overall species and ecosystem diversity of the site; and</u>	✓
(g)	the <u>impact on any changes to threat status of populations of species of conservation concern in the CBA;</u>	✓
2.3.7.2	terrestrial ecological support areas (ESAs) , including:	✓
(a)	the <u>impact on the ecological processes</u> that operate within or across the site;	✓
(b)	the <u>extent the proposed development will impact on the functionality of the ESA;</u> and	✓
(c)	<u>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;</u>	✓
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-	✓
(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 <u>impact(s) on the terrestrial habitat of SWSA;</u> and	✓
(b)	the impacts of the proposed development <u>on the SWSA water quality and quantity (e.g., describing potential increased runoff leading to increased sediment load in water courses),</u>	✓
2.3.7.6	FEPA sub catchments , including-	✓
(a)	the <u>impacts of the proposed development on habitat condition and species in the FEPA sub catchment;</u>	✓
2.3.7.7	indigenous forests , including:	✓
(a)	impact on the <u>ecological integrity of the forest and</u>	✓
(b)	<u>percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.</u>	✓
2.4	The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report	✓
3	Terrestrial Biodiversity Specialist Assessment Report	

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:	✓
3.1.1	<u>contact details of the specialist</u> , their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
3.1.2	a <u>signed statement of independence</u> by the specialist;	✓
3.1.3	a <u>statement on the duration, date and season of the site inspection</u> and the relevance of the season to the outcome of the assessment,	✓
3.1.4	<u>description of the methodology used</u> to undertake the site verification and impact assessment and site inspection, including equipment and modeling used, where relevant;	✓
3.1.5	a <u>description of the assumptions made</u> and any uncertainties or gaps in knowledge or data as well as a statement of the <u>timing and intensity of site inspection</u> observations;	✓
3.1.6	a <u>location of the areas not suitable for development</u> , which are to be avoided during construction and operation (where relevant);	✓
3.1.7	<u>additional environmental impacts</u> expected from the proposed development;	✓
3.1.8	any <u>direct, indirect and cumulative impacts</u> of the proposed development;	✓
3.1.9	the <u>degree to which impacts, and risks can be mitigated</u> ;	✓
3.1.10	the degree to which the <u>impacts and risks can be reversed</u> ;	✓
3.1.11	the degree to which the <u>impacts and risks can cause loss of irreplaceable resources</u> ;	✓
3.1.12	proposed <u>impact management actions</u> and <u>impact management outcomes</u> proposed by the specialist <u>for inclusion in the Environmental Management Programme (EMPr)</u> ,	✓
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,	✓
3.1.14	a substantiated statement based on the findings of the specialist assessment, <u>regarding the acceptability, or not, of the proposed development</u> if it should receive approval a not; and	✓
3.1.15	<u>any conditions to which this statement is subjected</u> .	✓
3.2	The <u>findings of the Terrestrial Biodiversity Specialist Assessment</u> must be <u>incorporated into the Basic Assessment Report</u> or the <u>Environmental Impact Assessment Report</u> , including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	✓
3.3	A <u>signed copy of the assessment</u> 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 <u>must be prepared by a specialist registered with the SACNASP</u> and <u>having expertise in the field of ecological sciences</u> .	✗
4.2	The compliance statement must:	✗
4.2.1	<u>be applicable to the preferred site and proposed development footprint</u> ;	✗
4.2.2	<u>confirm that the site is of 'low' sensitivity for terrestrial biodiversity</u> ; and	✗
4.2.3	indicate <u>whether or not the proposed development will have any impact on the biodiversity feature</u> .	✗
4.3	The <u>compliance statement must contain, as a minimum</u> , 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 <u>signed statement of independence</u> by the specialist;	✗

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
4.3.3	a <u>statement on the duration, date and season</u> of the site inspection and the relevance of the season to the outcome of the assessment;	✗
4.3.4	a <u>baseline profile description</u> of biodiversity and ecosystems of the site;	✗
4.3.5	the <u>methodology used to verify the sensitivities</u> 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, <u>confirmation from the terrestrial biodiversity specialist</u> that, in their opinion, based on the mitigation and remedial measures propped, <u>the land can be returned to the current state within two years of completion of the construction phase</u> ;	✗
4.3.7	where required, <u>proposed impact management outcomes or any monitoring requirements</u> for inclusion in the EMP;;	✗
4.3.8	a <u>description of the assumptions made and any uncertainties or gaps in knowledge or data</u> ; and	✗
4.3.9	any <u>conditions to which this statement is subjected</u> .	✗
4.4	A <u>signed copy of the compliance statement must be appended to the Basic Assessment Report</u> 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 “ <i>very high</i> ” or “ <i>high</i> ” sensitivity for <u>terrestrial animal species</u> 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 “ <i>medium sensitivity</i> ” for <u>terrestrial animal species</u> 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 “ <i>low</i> ” sensitivity for <u>terrestrial animal species</u> 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 “ <i>very high</i> ” or “ <i>high</i> ”, for terrestrial animal species sensitivity and it is found to be of a “ <i>low</i> ” 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 “ <i>low</i> ” terrestrial animal species sensitivity and it is found to be of a “ <i>very high</i> ” or “ <i>high</i> ” 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 “ <i>very high</i> ” or “ <i>high</i> ” sensitivity, the assessment and reporting requirements prescribed for the “ <i>very high</i> ” or “ <i>high</i> ” 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 <i>study area</i> .	✓
1.8	Where the nature of the activity is not expected to have an impact on species of	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	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 <i>project areas of influence</i> (PAOI) must be determined by the specialist in accordance with <i>Species Environmental Assessment Guideline</i> ¹⁷ , and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial animal species	
2	Terrestrial Animal Species Specialist Assessment	✗
	<u>VERY HIGH SENSITIVITY RATING</u>	✗
	<ol style="list-style-type: none"> Critical habitat for range-restricted species¹⁸ of conservation concern, that have a global range of less than 10 km². SCC listed on the IUCN Red List of Threatened Species¹⁹ or on South Africa's National Red List website²⁰ 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. <p>These areas are irreplaceable for SCC.</p> <p><u>HIGH SENSITIVITY RATING</u></p> <ol style="list-style-type: none"> 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. <p>These areas are unsuitable for development due to a very likely impact on SCC.</p>	
2.1	The assessment must be undertaken by a <u>specialist registered with the South African Council for Natural Scientific Professionals (SACNASP)</u> 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 <i>Species Environmental Assessment Guideline</i> ²¹ ; and must:	✗
2.2.1	<u>identify the SCC which were found, observed or are likely to occur</u> within the study area;	✗
2.2.2	<u>provide evidence</u> (photographs or sound recordings) of <u>each SCC found</u> or observed within the study area, which must be disseminated by the specialist to a recognized online database facility ²² , immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	✗
2.2.3	<u>identify the distribution, location, viability</u> ²³ and provide a detailed description of population size of the SCC, identified within the study area;	✗
2.2.4	<u>identify the nature and the extent of the potential impact of the proposed development on the population</u> of the SCC located within the study area;	✗

¹⁷ Available at <https://bgis.sanbi.org/>

¹⁸ Species with a geographically restricted area of distribution.

¹⁹ <https://www.iucnredlist.org/>

²⁰ This category includes the categories Extremely Rare, Critically Rare and Rare

²¹ Available at <https://bgis.sanbi.org/>

²² The preferred platform is iNaturalist.org but any other national or international virtual museum.

²³ the ability to survive and reproduce in the long term.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
2.2.5	determine the <u>importance of the conservation of the population of the SCC</u> 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;	✗
2.2.6	determine the <u>potential impact of the proposed development on the habitat</u> of the SCC located within the study area;	✗
2.2.7	include a <u>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</u> . This review must provide information on the need to conserve the SCC and <u>indicate whether the development is compliant with the applicable species management plans</u> and if not, include a motivation for the deviation;	✗
2.2.8	identify <u>any dynamic ecological processes occurring within the broader landscape</u> 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 <u>potential impact of ecological connectivity in relation to the broader landscape</u> , resulting in impacts on the identified SCC and its long-term viability;	✗
2.2.10	determine <u>buffer distances</u> as per the <i>Species Environmental Assessment Guidelines</i> used for the population of each SCC;	✗
2.2.11	discuss the <u>presence or likelihood of additional SCC</u> including threatened species not identified by the screening tool, <i>Data Deficient</i> or <i>Near Threatened Species</i> , as well as any undescribed species ²⁴ ; 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 <u>alternative development footprints</u> 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	<u>contact details and relevant experience</u> as well as the <u>SACNASP registration number</u> of the specialist preparing the assessment including a curriculum vitae;	✗
3.1.2	a signed <u>statement of independence</u> by the specialist;	✗
3.1.3	a statement on the <u>duration, date and season of the site inspection</u> and the relevance of the season to the outcome of the assessment;	✗
3.1.4	a description of the <u>methodology used to undertake the site sensitivity verification, impact assessment and site inspection</u> , including equipment and modelling used where relevant;	✗
3.1.5	a description of the <u>mean density of observations/number of sample sites per unit area</u> ²⁵ and the site inspection observations;	✗
3.1.6	a description of the <u>assumptions made and any uncertainties or gaps in knowledge or data</u> ;	✗
3.1.7	<u>details of all SCC found or suspected to occur on site</u> , ensuring sensitive species are appropriately reported ²⁶ ;	✗
3.1.8	the <u>online database name, hyperlink and record accession numbers</u> for disseminated evidence of SCC found within the study area;	✗
3.1.9	the <u>location of areas not suitable for development</u> and to be avoided during construction where relevant;	✗

²⁴ Undescribed species are to be assessed as “High Sensitivity”.

²⁵ Species Environmental Assessment Guideline

²⁶ 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.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.10	a discussion on the <u>cumulative impacts</u> ;	✗
3.1.11	<u>impact management actions and impact management outcomes</u> proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✗
3.1.12	a <u>reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development</u> 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 <u>motivation must be provided</u> 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 <u>signed copy of the assessment</u> 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:	✓
	1. <u>Suspected habitat for SCC</u> based either on historical records (prior to 2002) or <u>being a natural area included in a habitat suitability model</u> for this species ²⁷ .	
	2. <u>SCC listed on the IUCN Red List of Threatened Species or South Africa’s National Red List website</u> 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 <u>suspected habitat for SCC</u> 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 <u>investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups (“taxa”)</u> for which the assessment is being undertaken.	✓
4.3	The assessment must be <u>undertaken within the study area</u> .	✓
4.4	The <u>site inspection</u> to determine the presence or likely presence of SCC must be undertaken in accordance with the <i>Species Environmental Assessment Guidelines</i> .	✓
4.5	The <u>site inspection is to confirm the presence, likely presence or confirmed absence of a SCC</u> identified within the site identified as “medium” sensitivity by the screening tool.	✓
4.6	Where <u>SCC are found on site or have been confirmed</u> 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 <u>no SCC are found on site during the site inspection</u> 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	✗
	1. Areas where no natural habitat remains.	
	2. Natural areas where there is no suspected occurrence of SCC.	
5.1	The compliance statement <u>must be prepared by a SACNASP registered specialist</u> under one of the two fields of practice (Zoological Science or Ecological Science).	✗
5.2	The compliance statement must:	✗
5.2.1	<u>be applicable to the study area</u> ;	✗

²⁷ 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
5.2.2	<u>confirm that the study area, is of “low” sensitivity</u> for terrestrial animal species; and	✗
5.2.3	indicate <u>whether or not the proposed development will have any impact</u> on SCC.	✗
5.3	The compliance statement ²⁸ must contain, as a minimum, the following information:	✗
5.3.1	<u>contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;</u>	✗
5.3.2	a signed <u>statement of independence</u> by the specialist;	✗
5.3.3	a statement on the <u>duration, date and season</u> of the site inspection and the relevance of the season to the outcome of the assessment;	✗
5.3.4	a description of the <u>methodology</u> used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✗
5.3.5	the mean <u>density of observations/ number of samples sites per unit area</u> ¹⁵ .	✗
5.3.6	where required, <u>proposed impact management actions and outcomes</u> or any monitoring requirements for inclusion in the EMPr;	✗
5.3.7	a <u>description of the assumptions made and any uncertainties or gaps</u> in knowledge or data; and	✗
5.3.8	any <u>conditions</u> to which the compliance statement is subjected.	✗
6	A <u>signed copy of the Terrestrial Animal Species Compliance Statement</u> 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 “ <i>very high</i> ” or “ <i>high</i> ” sensitivity for <u>terrestrial plant species</u> 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 “ <i>medium sensitivity</i> ” for <u>terrestrial plant species</u> 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 “ <i>low</i> ” sensitivity for <u>terrestrial plant species</u> 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 “ <i>very high</i> ” or “ <i>high</i> ”, for terrestrial plant species sensitivity and it is found to be of a “ <i>low</i> ” 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 “ <i>low</i> ” terrestrial plant species sensitivity and it is found to be of a “ <i>very high</i> ” or “ <i>high</i> ” 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 “ <i>very high</i> ” or “ <i>high</i> ” sensitivity, the assessment and reporting requirements prescribed for the	✓

²⁸ 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
	“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 <i>study area</i> .	✓
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 <i>project areas of influence</i> (PAOI) must be determined by the specialist in accordance with <i>Species Environmental Assessment Guideline</i> ²⁹ , 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	✗
	<u>VERY HIGH SENSITIVITY RATING</u> <ol style="list-style-type: none"> Critical habitat for range-restricted species³⁰ of conservation concern, that have a global range of less than 10 km². SCC listed on the IUCN Red List of Threatened Species³¹ or on South Africa’s National Red List website³² 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. <p>These areas are irreplaceable for SCC.</p> <p><u>HIGH SENSITIVITY RATING</u></p> <ol style="list-style-type: none"> 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. <p>These areas are unsuitable for development due to a very likely impact on SCC.</p>	✗
2.1	The assessment must be undertaken by a <u>specialist registered with the South African Council for Natural Scientific Professionals (SACNASP)</u> 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 <i>Species Environmental Assessment Guideline</i> ³³ ; and must:	✗
2.3.1	<u>Identify the SCC which were found, observed or are likely to occur</u> within the study area;	✗
2.3.2	<u>provide evidence</u> (photographs) of <u>each SCC found</u> or observed within the study area, which must be disseminated by the specialist to a recognized online	✗

²⁹ Available at <https://bgis.sanbi.org/>

³⁰ Species with a geographically restricted area of distribution.

³¹ <https://www.iucnredlist.org/>

³² This category includes the categories Extremely Rare, Critically Rare and Rare

³³ Available at <https://bgis.sanbi.org/>

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	database facility ³⁴ , immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	
2.3.3	identify the <u>distribution, location, viability</u> ³⁵ and provide a detailed description of population size of the SCC, identified within the study area;	✗
2.3.4	identify the <u>nature and the extent of the potential impact of the proposed development on the population of the SCC</u> located within the study area;	✗
2.3.5	determine the <u>importance of the conservation of the population of the SCC</u> 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 <u>potential impact of the proposed development on the habitat</u> of the SCC located within the study area;	✗
2.3.7	include a <u>review of relevant literature on the population size of the SCC, the conservation interventions</u> as well as any <u>national or provincial species management plans for the SCC</u> . This review must provide information on the need to conserve the SCC and <u>indicate whether the development is compliant with the applicable species management plans</u> and if not, include a motivation for the deviation;	✗
2.3.8	identify <u>any dynamic ecological processes occurring within the broader landscape</u> 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 <u>potential impact of ecological connectivity in relation to the broader landscape</u> , resulting in impacts on the identified SCC and its long-term viability;	✗
2.3.10	determine <u>buffer distances</u> as per the <i>Species Environmental Assessment Guidelines</i> used for the population of each SCC;	✗
2.3.11	discuss the <u>presence or likelihood of additional SCC</u> including threatened species not identified by the screening tool, <i>Data Deficient</i> or <i>Near Threatened Species</i> , as well as any undescribed species ³⁶ ;	✗
2.3.12	identify any <u>alternative development footprints</u> 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	<u>contact details and relevant experience</u> as well as the <u>SACNASP registration number</u> of the specialist preparing the assessment including a curriculum vitae;	✗
3.1.2	a signed <u>statement of independence</u> by the specialist;	✗
3.1.3	a statement on the <u>duration, date and season of the site inspection</u> and the relevance of the season to the outcome of the assessment;	✗
3.1.4	a description of the <u>methodology used to undertake the site sensitivity verification, impact assessment and site inspection</u> , including equipment and modelling used where relevant;	✗
3.1.5	a description of the <u>assumptions made and any uncertainties or gaps</u> in knowledge or data;	✗
3.1.6	a description of the <u>mean density of observations/number of sample sites per unit area</u> ³⁷ and the site inspection observations;	✗

³⁴ The preferred platform is iNaturalist.org but any other national or international virtual museum.

³⁵ the ability to survive and reproduce in the long term.

³⁶ Undescribed species are to be assessed as “High Sensitivity”.

³⁷ Species Environmental Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.7	<u>details of all SCC found or suspected to occur on site</u> , ensuring sensitive species ³⁸ are appropriately reported;	✗
3.1.8	the <u>online database name, hyperlink and record accession numbers</u> for disseminated evidence of SCC found within the study area;	✗
3.1.9	the <u>location of areas not suitable for development</u> and to be avoided during construction where relevant;	✗
3.1.10	a discussion on the <u>cumulative impacts</u> ;	✗
3.1.11	<u>impact management actions and impact management outcomes</u> proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✗
3.1.12	a <u>reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development</u> 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 <u>motivation must be provided</u> 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 <u>signed copy of the assessment</u> 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:	✓
	1. <u>Suspected habitat for SCC</u> based either on there being records for this species collected in the past, prior to 2002, or <u>being a natural area included in a habitat suitability model</u> ³⁹ .	
	2. <u>SCC listed on the IUCN Red List of Threatened Species or South Africa’s National Red List</u> 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 <u>suspected habitat for SCC</u> 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 <u>investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups (“taxa”)</u> for which the assessment is being undertaken.	✓
4.3	The assessment must be <u>undertaken within the study area</u> .	✓
4.4	The <u>site inspection</u> to determine the presence or likely presence of SCC must be undertaken in accordance with the <i>Species Environmental Assessment Guidelines</i> .	✓
4.5	The <u>site inspection is to confirm the presence, likely presence or confirmed absence of a SCC</u> identified within the site identified as “medium” sensitivity by the screening tool.	✓
4.6	Where SCC are found on site or <u>have been confirmed</u> 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 <u>no SCC are found on site during the site inspection</u> or the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted.	✓

³⁸ 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.

³⁹ 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
5	LOW SENSITIVITY RATING – for terrestrial plant species	
	<u>Terrestrial Plant Species Compliance Statement</u>	
	1. Areas where no natural habitat remains. 2. Natural areas where there is no suspected occurrence of SCC.	✗
5.1	The compliance statement <u>must be prepared by a SACNASP registered specialist</u> under one of the two fields of practice (Botanical Science or Ecological Science).	✗
5.2	The compliance statement must:	✗
5.2.1	be <u>applicable to the study area</u> ;	✗
5.2.2	<u>confirm that the study area, is of “low” sensitivity</u> for terrestrial plant species; and	✗
5.2.3	<u>indicate whether or not the proposed development will have any impact</u> on SCC.	✗
5.3	The compliance statement ⁴⁰ must contain, as a minimum, the following information:	✗
5.3.1	<u>contact details and relevant experience as well as the SACNASP registration</u> number of the specialist preparing the compliance statement including a curriculum vitae;	✗
5.3.2	a <u>signed statement of independence</u> by the specialist;	✗
5.3.3	a statement on the <u>duration, date and season</u> of the site inspection and the relevance of the season to the outcome of the assessment;	✗
5.3.4	a description of the <u>methodology</u> used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✗
5.3.5	where required, <u>proposed impact management actions</u> and outcomes or any monitoring requirements for inclusion in the EMPr;	✗
5.3.6	a <u>description of the assumptions made and any uncertainties or gaps</u> in knowledge or data;	✗
5.3.7	the mean <u>density of observations/ number of samples</u> sites per unit area ⁴¹ ; and	✗
5.3.8	any <u>conditions</u> to which the compliance statement is subjected.	✗
6	A <u>signed copy</u> of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✗

⁴⁰ 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

⁴¹ Refer to the Species Environmental Assessment Guideline

PAGE INTENTIONALLY LEFT BLANK

END



Site Verification Report

Proposed Paulputs South Grid Connection

Date: 29/06/2021
Version: Draft
Author: J. Pote

Site Verification Report

Proposed Paulputs South Grid Connection

Compiled by: Jamie Pote (Pr. Sci. Nat.)

Postnet Suite 57, Private Bag X13130, Humewood, Port Elizabeth, 6013, South Africa
jamiepote@live.co.za +27 (0)76 888 9890

Compiled for: Arcus Consulting

Date of report: 29/06/2021

Draft Report

This Report has been prepared with all reasonable skill, care, and diligence within the scope of appointment by Mr Jamie Pote, with consideration to the resources devoted to it by agreement with the client, incorporating our Standard Terms and Conditions of Business. This Report is prepared exclusively for use by the client, and the author disclaims any liability in respect of its use by any party other than the client and for the purpose for which it was written. The Report is subject to all the copyright and intellectual property laws and practices of South Africa and contains intellectual property and proprietary information that is protected by such copyright in favour of the author. No person, other than the client, may reproduce, distribute to any third party, or rely on the content of any portion of this report, without the prior written consent of the author. The author accepts no responsibility of whatsoever nature to third parties to whom this Report, or any part thereof, is made known. Any such persons or parties rely on the report at their own risk.

Revisions

Report/Revision Version	Date:	Approved by:
First Draft	29/06/2021	Jamie Pote
Revisions/Comments		
Final Draft		
IAP comments		
Final Version		

Table of Contents

Revisions	ii
Table of Contents	i
List of Figures	i
List of Tables.....	i
1 Introduction & Background	1
1.1 Background and Project Description	1
1.2 Purpose of Report	1
1.3 Data sources and references	2
1.4 Site visit.....	3
1.5 Assumptions, Uncertainties and Gaps in Knowledge.....	3
2 National Environmental Screening Tool.....	3
3 Findings, Outcomes and Recommendations	5
3.1 Terrestrial Biodiversity	5
3.2 Plant Species (Flora).....	5
3.3 Animal Species (Fauna).....	6
3.4 Aquatic.....	6
4 Conclusions.....	6
5 Annexures.....	7
5.1 Annexure A: Declaration, Specialist Profile and Registration.....	7

List of Figures

Figure 1:Terrestrial Biodiversity Sensitivity.	3
Figure 2:Plant Species Sensitivity	3
Figure 3: Animal Species Sensitivity.....	4
Figure 4: Aquatic Sensitivity.....	4
Figure 5: Map indicating Northern Cape CBA areas and Rivers and Wetlands.	5

List of Tables

Table 1: Terrestrial Biodiversity Features.	5
Table 2: Flora Species of Conservation Concern.....	6

1 Introduction & Background

1.1 Background and Project Description

Paulputs Wind Energy Facility (RF) (Pty) Ltd ('PWEF'), a wholly owned subsidiary of WKN-WindCurrent (Pty) Ltd, was granted environmental authorisation for the 300 MW (75 Turbine) Paulputs Wind Energy Facility (WEF) and its associated 132 kV grid connection on 11 December 2019 by the Department of Environment, Forestry and Fisheries (DEFF) (DEFF Reference No. 14/12/16/3/3/2/1120).

As part of the original Environmental Impact Assessment (EIA), three alternative Grid Connection options (A, B and C) and three alternative on-site substation options (A, B and C) were assessed. The Competent Authority (CA), DEFF, chose to only issue a favourable authorisation for the preferred Grid Connection option 'C' and on-site substation option 'A'. (Figure 1.1).

In effect of the above, Paulputs South (the Applicant) intend to apply for Environmental Authorisation for the construction and operation of the proposed development, which includes:

- A 132 kV, double circuit, loop-in/loop-out Grid Connection; and a
- A 4.4 ha substation yard comprising: 1.2 ha on-site substation, 1 ha for offices, 1.2 ha battery energy storage systems (BESS), and 1 ha permanent laydown area.

Both the Grid Connection and substation above were assessed as part of the approved Paulputs WEF (Reference No. 14/12/16/3/3/2/1160), and as such, this BAR assessment will serve to validate the information contained within the approved EIA report (Arcus, 2019) for the Paulputs WEF:

- The proposed Grid Connection route was originally referred to as the Grid Connection Option A; and
- The Proposed On-site Substation area was originally referred to as the Substation Option C.

In terms of Regulation 11 of the NEMA EIA Regulations, 2014 (as amended), the Applicant ('Paulputs South') requested that the Department consider issuing two separate Environmental Authorisations as the Grid Connection will eventually be taken over by Eskom. This approach has been approved by the DEFF on 08 September 2020 and one combined Basic Assessment Report and Application will be submitted for consideration.

The site is situated approximately 35 km east of Pofadder, situated in the Northern Cape. The site straddles the N14 national road, with the Paulputs South site to the south-east of the N14. The Paulputs South Grid Connection connects the Paulputs South site to a proposed substation approximately 20 km to the north-west of the Paulputs South site.

This site verification report addresses the Paulputs South Grid Connection application.

1.2 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).

1.3 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.
- Critical Biodiversity Areas of the Northern Cape (2016) – Bioregional Plan.
- Namakwa District Biodiversity Sector Plan (2008) – Bioregional Plan.

- Succulent Karoo Ecosystem Planning (SKEP, 2002).
- 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.

1.4 Site visit

A site visit was conducted on 01 & 02 June 2021, during early winter months. The site falls within a summer rainfall area, which was evident during the site visit being in the dry season. However, for the purposes of this assessment it was deemed to be adequate since previous assessments and site visits had been undertaken by 3Foxes Biodiversity Solutions for the EIA. During the summer season

1.5 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.
- Aspects relating to birds have also been undertaken in a separate Avifaunal Assessment and will thus not be addressed in the terrestrial Biodiversity Assessment.
- Any flora and 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.

2 National Environmental Screening Tool

The DFFE Screening Tool indicates the following:

- Terrestrial Biodiversity is Low & Very High (Figure 1).
- Plant species sensitivity is Medium (Figure 2).
- Animal Species sensitivity is Medium & High (Figure 3).
- Aquatic Sensitivity is Low & Very High (Figure 4).

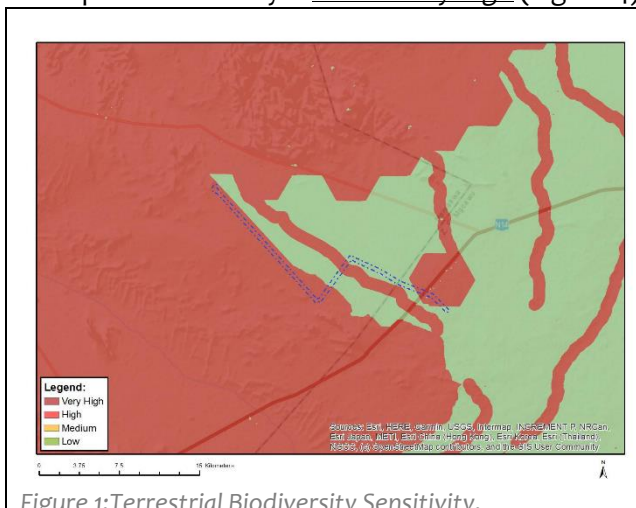


Figure 1: Terrestrial Biodiversity Sensitivity.

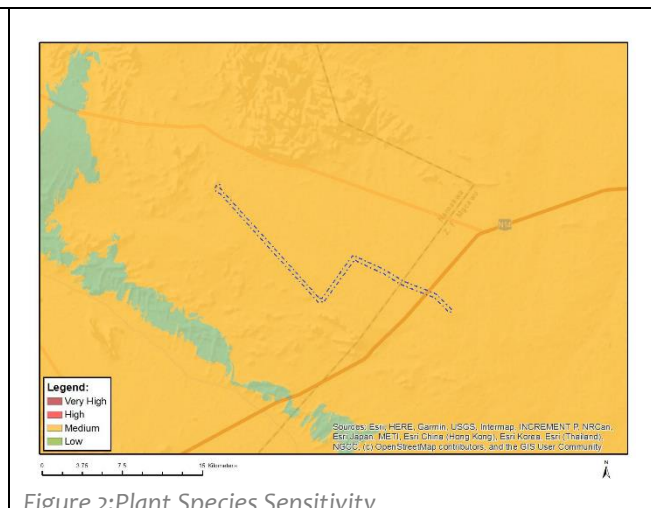


Figure 2: Plant Species Sensitivity

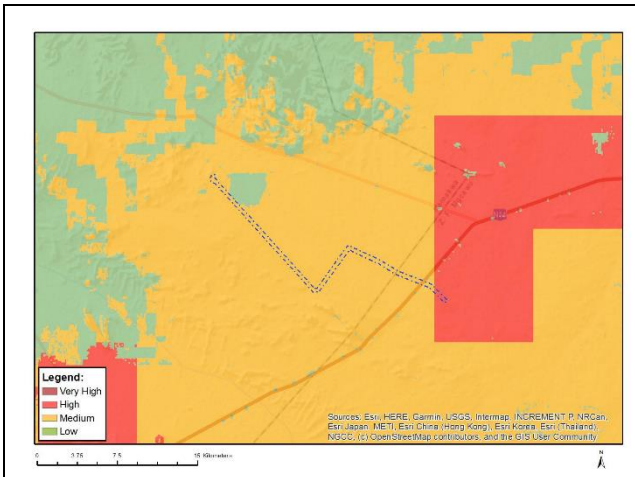


Figure 3: Animal Species Sensitivity

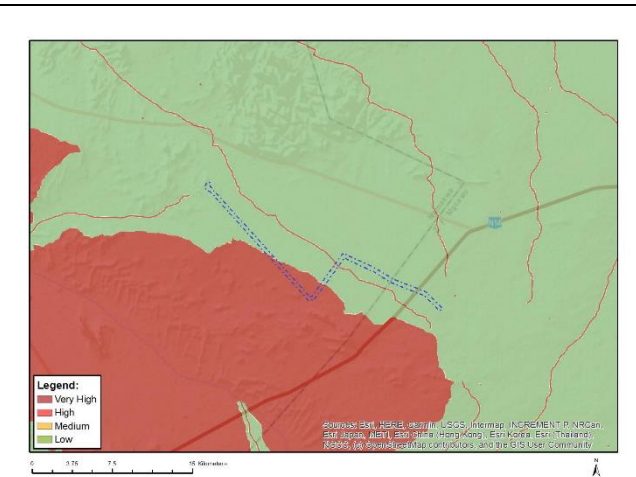


Figure 4: Aquatic Sensitivity

Sensitivity	Feature(s) in proximity
Terrestrial Biodiversity Sensitivity	
Very High	Critical Biodiversity Area 1 & 2, Ecological Support Area, FEPA quinary catchments.
High	None
Medium	None
Low	None
Plant (Flora) Sensitivity	
Very High	None
High	None
Medium	<i>Crotalaria pearsonii</i> , Sensitive species 144
Low	None
Animal (Fauna) Sensitivity	
Very High	None
High	<i>Neotis ludwigii</i>
Medium	<i>Neotis ludwigii</i>
Low	None
Aquatic Sensitivity	
Very High	Rivers, Wetlands, FEPA quinary catchments.
High	None
Medium	None
Low	None

The following is deduced from the DFFE National Environmental Screening Tool:

1. Terrestrial Biodiversity Theme is Very High, with Critical Biodiversity Area 1 & 2, Ecological Support Area and FEPA quinary catchments indicated as being present.
2. Plant Species Theme is Medium with two flora species conservation concern (*Crotalaria pearsonii* & sensitive species 144) indicated as possibly occurring in the vicinity of the site.
3. Animal Species Theme is Medium/High with possibly species including a single bird, *Neotis ludwigii*.
4. The Aquatic Theme indicates the possible presence of Rivers, Wetlands, FEPA quinary catchments (Very High).

This site verification report will address the Terrestrial Biodiversity and Plant species aspects. The bird species *Neotis ludwigii* is not included in the terrestrial biodiversity assessment, as it is assessed independently in the Avifaunal assessment undertaken by Dr Owen Davies. No other faunal sensitivities are indicated. The aquatic sensitivities (Rivers, Wetlands and Estuaries, FEPA quinary catchments) are also

assessed as a part of the Aquatic Assessment component undertaken by Dr Brian Colloty. These two aspects will thus not be considered further in this site verification report.

3 Findings, Outcomes and Recommendations

3.1 Terrestrial Biodiversity

Site verification of the Terrestrial Biodiversity sensitivities is summarised in Table 1 and depicted in Figure 5, where CBA 1 is dark green, CBA 2 is light green and ESA is light blue.

Project : Paulputs South WEF Grid Connection
Layout - Northern Cape Critical Biodiversity Areas

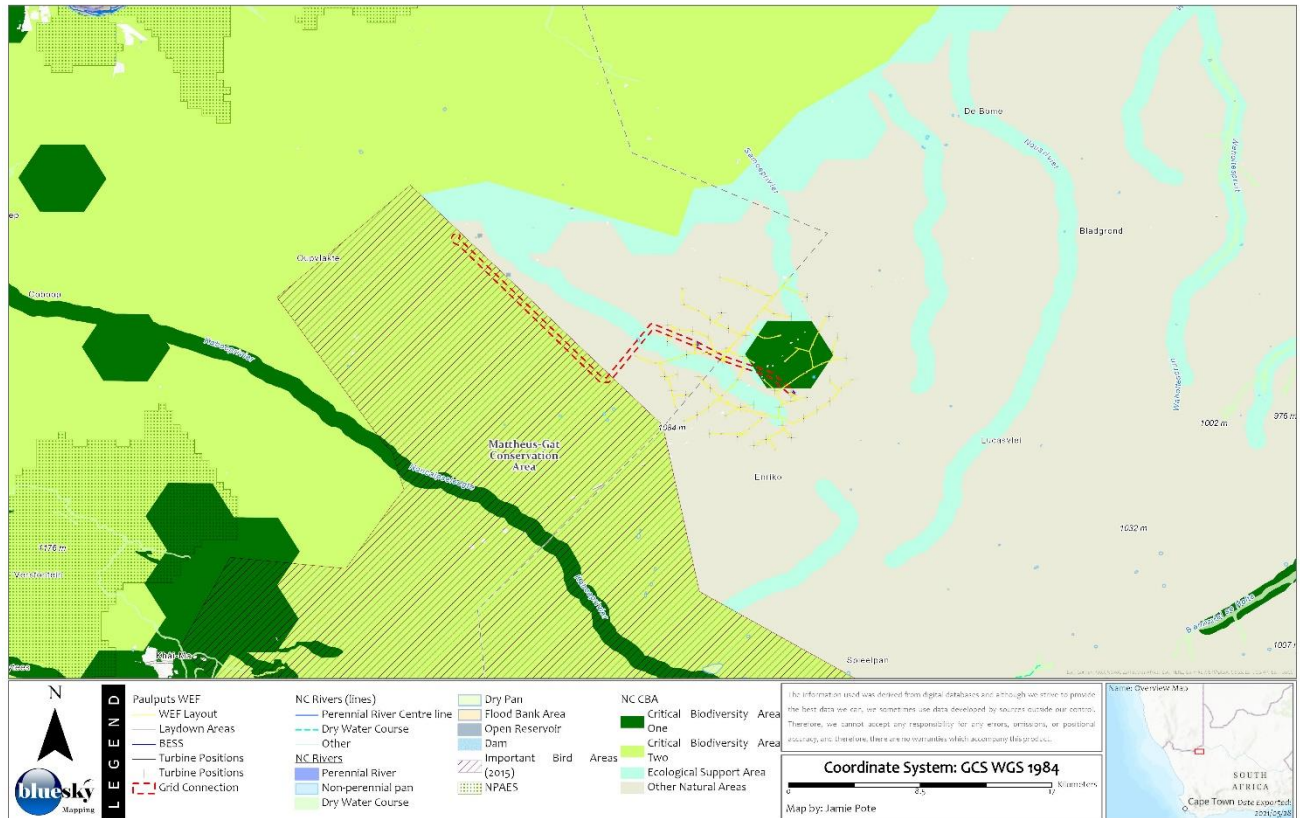


Figure 5: Map indicating Northern Cape CBA areas and Rivers and Wetlands.

Table 1: Terrestrial Biodiversity Features.

Feature		COMMENT
Critical Biodiversity Area 1	Present	Paulputs South Grid Connection overlaps with CBA 1 area
Critical Biodiversity Area 2	Present	Paulputs South Grid Connection overlaps with CBA 2 area
Ecological Support Area	Present	Several ESA designated areas are present, associated with buffers around watercourses and drainage lines.
FEPA quinary catchments	Present	Refer to Aquatic Specialist Assessment. The site is drained by several non-perennial watercourses.

3.2 Plant Species (Flora)

Site verification of the two species is summarised in Table 2.

Table 2: Flora Species of Conservation Concern.

SCIENTIFIC NAME	FAMILY	STATUS ¹	COMMENT/PRESENCE
<i>Crotalaria pearsonii</i>	Fabaceae	NEST (M), VU [B1ab (iii,v)], NCA	Outside of range (Southern Richtersveld to Aggeneys and Kenhardt). Unlikely to occur, was not recorded in original Ecological Assessment, nor during site verification. Records suggest it occurs in rocky hill areas, which are generally absent on site or will be avoided.
Sensitive species 144	-	NEST (M), VU [A3ce], NCA	Widespread species, Nieuwoudtville eastwards to Olifantsfontein and northwards to the Brandberg in Namibia. Not present in abundance in the immediate site area, some individuals may be present along the Paulputs North Grid Connection. However, risk to this species is negligible, as it can be easily avoided during powerline micro-siting and construction.

The screening tool correctly identifies a single species (Sensitive species 144) as possibly being present, as it is in the general area. The likelihood of *Crotalaria pearsonii* being present is low, however, it will be investigated further in the plant species assessment.

3.3 Animal Species (Fauna)

No mammals, reptiles, amphibians, or invertebrate species are listed. Refer to separate Avifaunal Specialist Assessment Report for birds regarding *Neotis ludwigii*.

3.4 Aquatic

Wetland and River features are confirmed to be present. In general aquatic features are avoided as far as possible and are limited to road crossings where necessary. Specific aquatic sensitivities are assessed in a separate aquatic assessment.

4 Conclusions

The site verification thus confirms that the terrestrial biodiversity screening tool correctly identifies Critical Biodiversity Area 1 & 2 as well as Ecological Support Area as being within the project footprint. The site is also drained by several non-perennial watercourses, hence would be considered to be within FEPA quinary catchments. It further confirms that Sensitive Species 144 does occur in the vicinity of the site and should be addressed in the plant species assessment. It also concludes that the likelihood of *Crotalaria pearsonii* being present is low but should none the less be confirmed during the site visit.

The terrestrial biodiversity, plant and animal species sensitivities will be further investigated in the assessment report.

¹ NEST – National Environmental Screening Tool; NCA - Northern Cape Nature Conservation Act (Act no. 9 of 2009), Schedule 1 or 2; ToPS – Threatened or Protected Species [NEM:BA]; IUCN: Least Concern (LC), Near Threatened (NT), Critically Endangered (CR), Endangered (EN), Vulnerable (VU); CITIES - Conservation for International trade in Endangered Species.

5 Annexures

5.1 Annexure A: Declaration, Specialist Profile and Registration



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

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)

PROJECT TITLE

Paulputs Wind Energy Facility: Terrestrial Biodiversity

Kindly note the following:

1. This form must always be used for 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 01 September 2018. 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.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	None		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition
			100 %
Specialist name:	Jamie Pote		
Specialist Qualifications:	BSc (Hons)		
Professional affiliation/registration:	SACNASP (115233)		
Physical address:			
Postal address:	Postnet Suite 13130, P.Bag X13130		
Postal code:	6013	Cell:	076 888 9890
Telephone:		Fax:	
E-mail:			

2. DECLARATION BY THE SPECIALIST

I, Mr Jamie Pote _____, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

N/A

Name of Company:

15 June 2021

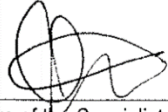
Date

Details of Specialist, Declaration and Undertaking Under Oath

Page 2 of 3

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.



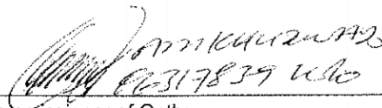
Signature of the Specialist

N/A

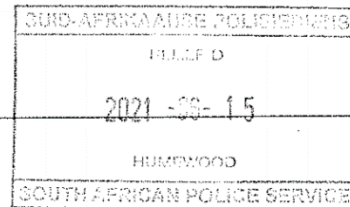
Name of Company

15 June 2021

Date



Signature of the Commissioner of Oaths



2021-06-15







Date



Jamie Pote

BIODIVERSITY ADVISOR, ECOLOGIST AND ENVIRONMENTAL SCIENTIST

CONTACT

-  (+27) 76 888 9890
-  jamiepote@live.co.za
-  Port Elizabeth, South Africa
-  [Linkedin.com](https://www.linkedin.com)
-  Jamiepote
-  [Bluesky-SA](https://bluesky.com)

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*

ABOUT ME

18 years broad professional experience in Biodiversity, Ecological and Vegetation Assessments on over 250 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 tools and Analysis.

EXPERIENCE AND CLIENTS

Key Sectors

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

Key Projects

- *Over 250 independent Biodiversity/Ecological Assessments throughout southern, western and central Africa.*
- *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.*
- *South-End Precinct Mixed Use Development for Mandela Bay Development Agency - Environmental application, Ecological assessments and Pre-Construction compliance.*
- *Coega Development Corporation IDZ projects – Ecological assessments, Flora search & rescue and Construction monitoring.*
- *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.*
- *Various Environmental Management and Rehabilitation Plans.*

24/03/2021



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 2022**



Handwritten signature of the Chairperson in black ink.

Chairperson

Handwritten signature of the Chief Executive Officer in black ink.

Chief Executive Officer



To verify this certificate scan this code

PAGE INTENTIONALLY LEFT BLANK

END