



NALA

ENVIRONMENTAL

CONSULTING FIRM

**DEVIATION OF THE AUTHORISED 132KV POWERLINE AND
DEVELOPMENT OF AN ON-SITE SUBSTATION WITH
ASSOCIATED INFRASTRUCTURE FOR THE AUTHORISED
MSENGE EMOYENI WIND ENERGY FACILITY, EASTERN CAPE
PROVINCE**

JUNE 2022

BASIC ASSESSMENT REPORT

DOCUMENT DETAILS

Applicant	:	Msenge Emoyeni Wind Farm (Pty) Ltd
Title	:	Deviation of the authorised 132kV overhead powerline and development of an on-site substation with associated infrastructure associated with the Msenge Emoyeni Wind Energy Facility, Eastern Cape Province
Author/EAP	:	Nala Environmental (Pty) Ltd Arlene Singh Norman Chetsanga Justin Jacobs
Client	:	Msenge Emoyeni Wind Farm (Pty) Ltd
Purpose of Report	:	Public Review and comment
Date	:	June 2022

RESOLUTION OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

Nala Environmental (Pty) Ltd has been appointed by Msenge Emoyeni Wind Farm (Pty) Ltd as the independent environmental consultant to undertake the Basic Assessment (BA) for the deviation of the authorised 132kV overhead powerline and development of an on-site substation and associated infrastructure for the authorised Msenge Emoyeni Wind Energy Facility, located within the Blue Crane Route Local Municipality, Eastern Cape Province. The grid connection infrastructure is located within the Cookhouse Renewable Energy Development Zone and the Eastern corridor of the Strategic Transmission Corridors. A BA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998) and compiled in accordance with Appendix I of the EIA Regulations, 2014 (as amended).

This BA Report describes and assesses this proposed project and consists of the following sections:

- » **Section 1** - project background the BA process to be followed.
- » **Section 2** - details the project scope of the proposed project, project alternatives if applicable, and the need and desirability of the project
- » **Section 3** - outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed project
- » **Section 4** - approach to undertaking the BA process.
- » **Section 5** - description of the environment within and surrounding the broader study and development area.
- » **Section 6** - assessment of the potential impacts associated with the project and recommendations for the mitigation of significant impacts.
- » **Section 7** - assessment of the potential cumulative impacts.
- » **Section 8** - conclusions and recommendations based on the findings of the BA Report.
- » **Section 9** - applicable references

This BA report is available for review from the *22nd of June 2022 to the 21st of July 2022* at the <https://nalaenvironmental.co.za/projects/basic-assessment-process-for-the-deviation-of-the-authorised-132kv-power-line-and-development-of-an-on-site-substation-for-the-authorised-msenge-emoyeni-wind-energy-facility-eastern-cape-province/>. Comments received will be recorded during the 30-day review period will be included, addressed and responded to within the final Basic Assessment Report (refer to **Appendix C7 and Appendix C8**) for consideration of the National Department of Forestry, Fisheries and Environment, (DFFE).

SYNOPSIS OF THE PROJECT

The applicant, **Msenge Emoyeni Wind Farm (Pty) Ltd** is proposing the deviation of the authorised 132kV powerline with a 66kV overhead power line, development of an on-site substation associated access tracks and watercourse crossings for the authorised Msenge Emoyeni Wind Energy Facility (DFFE Ref: 12/12/20/1754/2), in the Eastern Cape Province. The Msenge Emoyeni Wind Energy Facility has been selected as a preferred bidder by a private offtaker. In order to comply with financial close activities, the Developer has liaised with Eskom regarding the authorised 132kV powerline routing (DFFE Ref: 12/12/20/1754/2) to the Poseidon Main Transmission Substation ("MTS"). It was determined that in order to provide suitable setbacks to the existing Amakhala and Nojoli turbines and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points, the authorised 132kV powerline routing would need to be deviated with a 66kV overhead power line. The proposed new routing falls outside of the previously assessed and authorised 20-30m wide servitude. It was also determined that due to the available capacity at the Poseidon MTS the applicant will construct a 66kV power line to take up the available capacity at point of connection. Msenge Emoyeni Wind Farm (Pty) Ltd, proposes the following:

- 66kV overhead single circuit powerline approximately 22.7 km long is to be deviated within a 300m wide corridor (150m on either side), from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon Main Transmission Substation.
- Access tracks of up to 7m in width along the powerline route from the proposed on-site substation located within the Msenge Emoyeni WEF to the Poseidon Main Transmission Substation.
- Water course crossings along the deviated powerline route from the proposed onsite substation to the Poseidon Main Transmission Substation.
- 33kV/132kV on-site substation with a footprint occupying an area of 250m x 200m, within a 300m radius to allow movement where possible.

The following properties have been identified for the deviation of the new 66kV powerline and associated infrastructure for the authorised Msenge Emoyeni WEF:

- Remainder of Farm Leeuw Fontein No. 221
- Portion 1 of Farm Normandale No. 206
- Portion 3 of Farm Plat House No. 203
- Remaining Extent of Farm Kop Leegte No. 205
- Remainder of Farm 260 No. 260
- Remainder of Farm 242 No. 242
- Remainder of Farm 148 No. 148
- Portion 3 of Farm 148 No. 148
- Portion 5 of the Farm Van Wyks Kraal No. 73

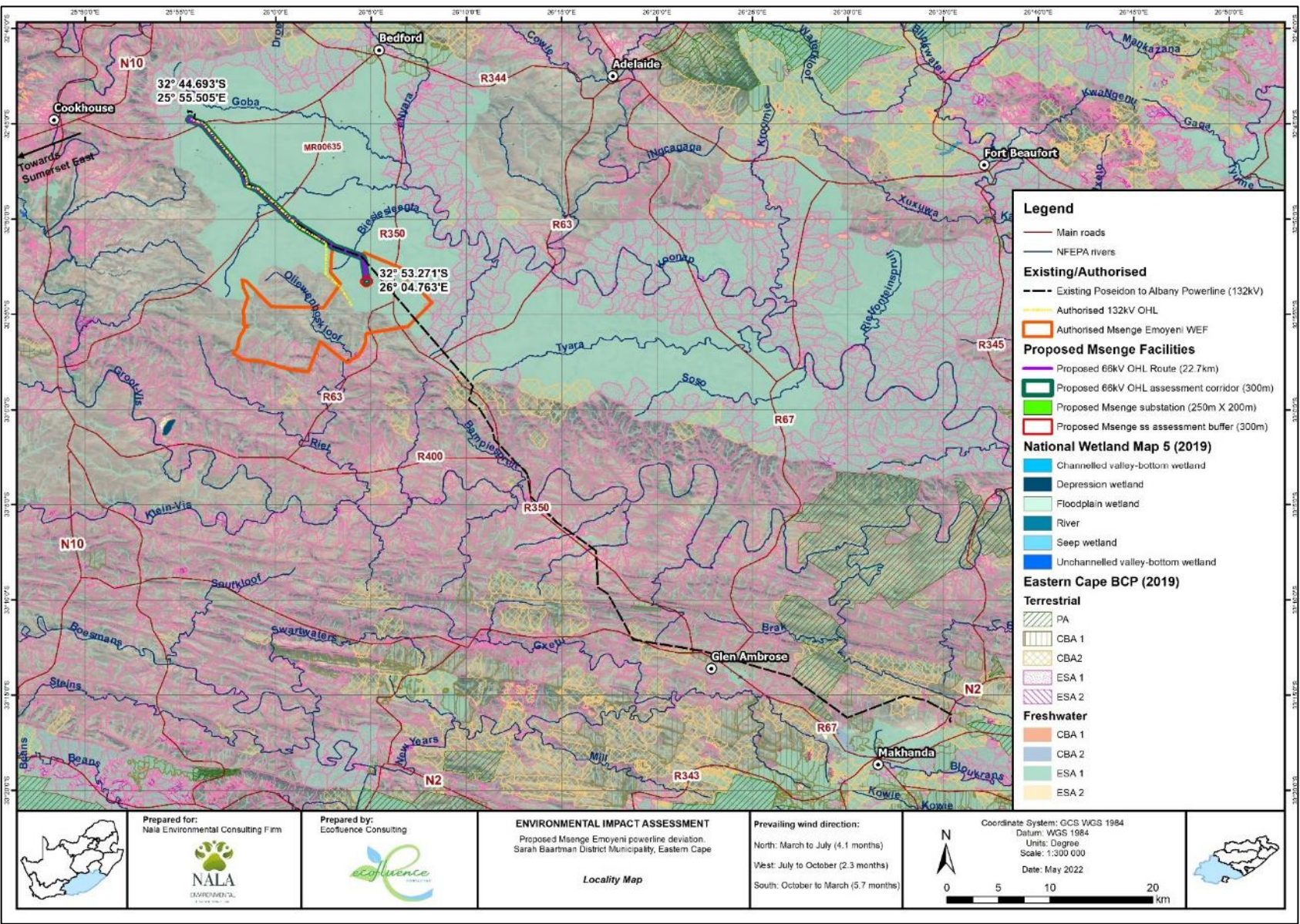


Figure 1: Locality map showing the new proposed grid connection infrastructure at the authorized Msenge Emoyeni WEF

The potential environmental impacts associated with the various infrastructure establishment identified and assessed through the BA process include:

Ecological Impacts – The impacts associated with terrestrial ecology (Appendix G) were determined to be destruction of natural vegetation from construction and associated activities, loss of rare or threatened plant species (SSC) from construction and associated activities, dust pollution deposition on vegetation, fragmentation of habitat, poaching of plants for the plant-collecting trade and Loss of plant populations to waterflow impediments at water crossings. At least one positive impact from the construction was determined to be the reduction of AIPs in the footprint of the developments. The bulk of the impact on the botanical species will have been felt in the construction phase, albeit highly localized. Impacts also include the continued fragmentation of habitats, the loss of SCC to the plant collecting trade and the loss of SCC plants due to poor livestock management (which includes game animals). Impacts were determined to be of Low-Medium significance with the implementation of mitigation measures. Based on the findings of the specialist surveys, previous reports, and all relevant literature, it is believed that the proposed 66kV overhead power line, access tracks and water course crossing infrastructure within the 300m development corridor and the on-site substation within the 300m development radius will not have an irreversible and substantial negative effect on the terrestrial fauna and flora in the area provided all the necessary mitigations are implemented and sensitive areas are avoided.

Avifauna Impacts – The main impact on avifaunal resources for the deviation of the powerline and addition of associated infrastructure were collisions and electrocution for the powerline and habitat, transformation, and displacement for the on-site substation. The expected impacts of the proposed Msenge Emoyeni 66kV OHL grid connection and on-site substation project range from Medium to High significance without any mitigation. However, with appropriate mitigation, the post-mitigation significance of the identified impacts should be reduced to Medium and Low significance e. No fatal flaws were discovered in the course of the investigation. It is therefore the opinion of the specialist and recommendation that the activity is authorised, on condition that the proposed mitigation measures are strictly implemented as laid out by the specialist. (Appendix E).

Aquatic Impacts – The impacts associated with aquatic resources for the proposed developed were identified as changes to the hydrological regimes of streams, loss of riparian vegetation along streams and drainage channels, sedimentation and increasing turbidity levels of instream habitats, loss of instream habitat and aquatic biota, dumping of rubble in riparian zones and dry river channels. chemical pollution of the streams, impacts on wetlands due to construction and maintenance activities. The significance of impacts was determined to be of Medium – Low significance prior to the implementation of mitigation measures and of Low significance following the implementation of mitigation measures. Based on the findings of the specialist surveys (Appendix F), previous reports, and all relevant literature, it is believed that the proposed 66kV overhead power line access tracks and water course crossing infrastructure within the 300m development corridor and on-site substation within the 300m development radius infrastructure will not have an irreversible and substantial negative effect on the terrestrial fauna and flora in the area provided all the necessary mitigations are implemented and sensitive areas are avoided.

Impacts on Heritage Resources (including archaeology and palaeontology) – The main impact on heritage resources for this project was identified to be the potential to intersect paleontological and archaeological resources during excavation of foundations during construction. No archaeological resources of significance were identified within the area proposed for development during the heritage field assessment although one site of heritage value was previously identified within the 300m corridor for which a 30m buffer is proposed. The impacts of archaeological resources was identified to be of Medium significance prior to the implementation of the proposed mitigation measures and of Low significance post mitigation. No impacts to significant archaeological heritage resources are anticipated from the proposed development on condition that the recommended mitigation measures are implemented Impacts related to palaeontological heritage resources were identified to be of High significance prior to the implementation of mitigation measures and of Low significance post mitigation. The Palaeontological Assessment indicated that it was extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary and therefore is a very small chance that fossils may occur below the ground surface in the mudstones of the Middleton Formation, however the Chance Find Procedure has been recommended. Based on the outcomes of the heritage and palaeontological impact assessments (Appendix I), it is not anticipated that the proposed development of the grid connection infrastructure facility and its associated grid connection infrastructure will negatively impact on significant heritage resources.

Visual Impacts - The visual assessment of the proposed Msenge Emoyeni 66 kV Overhead Powerline indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. Overall, the post mitigation significance of the visual impacts is predominately Medium to Low. A high significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/ density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced. As such these visual impacts are not considered to be fatal flaws for a development of this nature particularly due to the remote location of the study area and very low density of visual receptors. It is, therefore, suggested that the proposed Msenge Emoyeni 66kV Overhead Powerline corridor, on-site substation, associated access track and watercourse crossings, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in the report.

Cumulative Impacts - A portion of the 66kV grid corridor and the proposed 33kV/132kV on-site substation is located within the authorised Msenge Emoyeni Wind Energy Facility, whilst the remaining portion of the of the corridor, watercourse crossings and access tracks falls outside of the authorised Msenge Emoyeni Wind Energy Facility and along the existing 132kV Albany- Poseidon power line. The project site is also surrounded by several other operational and authorised wind energy facilities (Amakhala Emoyeni WEF, Cookhouse WEF, Najoli WEF, Golden Valley WEF, Nxuba WEF and the Iziduli Emoyeni WEF) and the following existing powerline infrastructure:

- 132kV Albany-Poseidon powerline;
- 400kV Neptune - Poseidon I powerline
- 66kV Poseidon- Glenden I powerline;
- 220kV Pembroke - Poseidon I powerline;
- 400kV Poseidon - Delphi I powerline
- 66kV Poseidon - Bosberg I powerline;
- 132kV Poseidon- Hangklip powerline
- 220kV Poseidon- Golden Valley I powerline
- 400kV Poseidon - Grassridge I powerline
- 220kV Poseidon - Grassridge 2 powerline
- 220kV Rippon- Doornkom I powerline

Based on the specialist cumulative assessments and findings for the development of the proposed grid connection infrastructure, it can be concluded that the project cumulative impacts will be of a medium-high significance. This cumulative impact rating is however largely attributable to the existing and proposed developments in the area. The contribution of the proposed grid infrastructure development to the cumulative impact is expected to be of medium significance as a result of the number powerlines and turbines in the area. However, due to impacts associated with sensitive ecological, visual, avifaunal and aquatic features all specialist mitigation and recommendations are essential and must be implemented.

Based on the specialist cumulative assessments and findings regarding the development of the grid connection infrastructure for the authorised Msenge Emoyeni WEF (refer to **Section 7** and specialist reports contained within **Appendix J - L**) and its contribution to the overall impact within the surrounding area, it can be concluded that there are no cumulative impacts or risks identified as unacceptable with the development of the grid connection infrastructure within the surrounding area. Considering all aspects, cumulative impacts associated with the infrastructure establishment have been assessed to be acceptable, with no unacceptable loss or risk expected.

No environmental fatal flaws were identified in the detailed specialist studies conducted for the infrastructure establishment. All impacts associated with the project establishment within the development footprint can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures.

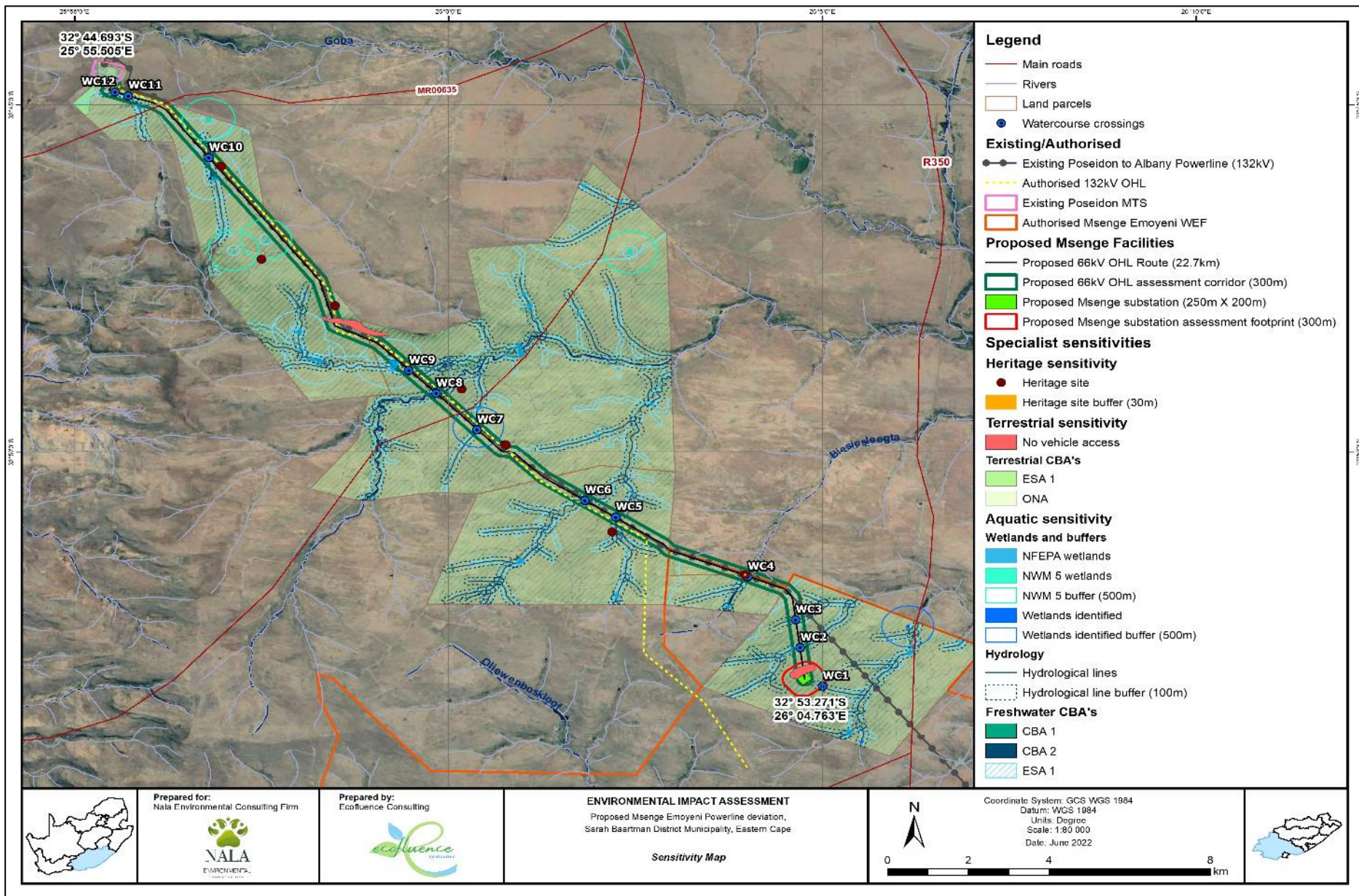


Figure 2: Environmental sensitivity map for the proposed project at the authorised Msenge Emoyeni WEF

DEFINITIONS

Activity (Development) – an action either planned or existing that may result in environmental impacts through pollution or resource use.

Alien vegetation - Alien vegetation is defined as undesirable plant growth (usually of foreign origin) which includes but is not limited to all declared category 1 and 2 listed invader species as set out in the 1983 Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien are those plant species that show the potential to occupy in number any area within the defined construction area and which are declared undesirable.

Alternatives: – a possible course of action, in place of another, of achieving the same desired goal of the proposed project. Alternatives can refer to any of the following but are not limited to: site alternatives, site layout alternatives, design or technology alternatives, process alternatives or a no-go alternative. All reasonable alternatives must be rigorously explored and objectively evaluated.

Applicant – the project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.

Biodiversity – the diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.

Commencement – The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Construction – means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

Cumulative impacts – impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities to produce a greater impact or different impacts.

Decommissioning – To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts – impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.

'Do nothing' alternative – The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species – Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Emergency – An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Emissions – The release or discharge of a substance into the environment which generally refers to the release of gases or particulates into the air.

Environment – In terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) (as amended), “Environment” means the surroundings within which humans exist and that are made up of:

- a) the land, water and atmosphere of the earth;
- b) micro-organisms, plants and animal life;
- c) any part or combination of (i) of (ii) and the interrelationships among and between them; and
- d) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Assessment – the generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.

Environmental Authorisation – an authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.

Environmental Assessment Practitioner (EAP) – the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.

Environmental impact – a change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation’s activities, products or services.

Environmental management - ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme – A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. The EMP focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

Fatal Flaw – issue or conflict (real or perceived) that could result in developments being rejected or stopped.

General Waste – household water, construction rubble, garden waste and certain dry industrial and commercial waste which does not pose an immediate threat to man or the environment.

Hazardous Waste – waste that may cause ill health or increase mortality in humans, flora and fauna.

Heritage – That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Incident - An undesired event which may result in a significant environmental Impact but can be managed through internal response.

Indigenous – All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts – indirect or induced changes that may occur as a result of the activity. These types of impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity.

Method statement – A written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

Mitigate – the implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.

No-Go Option – in this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.

Open Space – environmentally sensitive areas which are not suitable for development and consist of watercourses, buffers, floodplains, steep slopes, sensitive biodiversity and/or areas of cultural or heritage significance.

Pollution – A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances).

Pre-construction – The period prior to the commencement of construction, this may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Rare species: – Taxa with small world populations that are not at present Endangered or Vulnerable but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

Red data species – Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Registered Interested and Affected Party – an interested and affected party whose name is recorded in the register opened for that application

Rehabilitation – a measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.

Significance – significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).

Stakeholder engagement – the process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.

Watercourse – means:

- a) a river or spring;
- b) a natural channel or depression in which water flows regularly or intermittently;
- c) a wetland, lake or dam into which, or from which, water flows; and

d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

Wetland – means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

TABLE OF CONTENTS

	PAGE
DOCUMENT DETAILS	i
RESOLUTION OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT	ii
SYNOPSIS OF THE PROJECT	iii
DEFINITIONS	viii
TABLE OF CONTENTS.....	12
APPENDIX LIST	15
SECTION 1: INTRODUCTION.....	16
SECTION 2: PROJECT DESCRIPTION	22
2.1 Project Site Description.....	22
2.2 Extent of the new proposed grid deviation associated with the Msenge Emoyeni WEF	22
SECTION 3: ALTERNATIVES.....	26
3.1 Feasible and Reasonable Project Alternatives.....	26
3.2 Site Specific Alternatives.....	26
3.3 Grid Connection Alternatives.....	27
3.4 Technology Alternatives	27
3.5 The ‘Do-Nothing’ Alternative	27
3.6 Activities during the Project Development Stages	28
SECTION 4: NEED FOR AND APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS	31
4.1 Need & Desirability.....	31
4.2 Relevant legislative permitting requirements	32
4.3 Assessment of Issues Identified through the BA Process.....	43
4.4 Assumptions and Limitations of the BA Process.....	47
4.5 Details and Expertise of the Environmental Assessment Practitioner (EAP)	48
4.6 Planning context and Regulatory Context	49
4.6.1 Electricity Supply in South Africa.....	49
4.6.2 Eastern Cape Provincial Spatial Development Framework (PSDF) 2017.....	50
4.6.3 The Eastern Cape Climate Change Response Strategy, 2011/Draft Climate Change Adaptation Action Plan for the Eastern Cape 2017.....	51
4.6.4 Local Policy and Planning Context.....	51
4.7 Overview of the public participation	56
4.7.1 Overview of the Basic Assessment Process undertaken for establishment of grid connection infrastructure for the Msenge Emoyeni WEF.....	56
4.7.2 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended).....	56
4.7.3 Public Participation Process.....	57

SECTION 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT	61
5.1. Regional Setting	61
5.2. Climatic Conditions	64
5.3. Land use, Landcover and Landscape	64
5.4. Soil and Land Types	67
5.5. Hydrology and Surface Water	69
5.6. Ecological Profile of the Study Area and Development Area	72
5.7. Heritage Resources, including archaeology and palaeontology	88
5.7.1. Archaeology and the Built Environment	89
5.7.2. Palaeontology	91
SECTION 6: ASSESSMENT OF IMPACTS	95
6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report	96
6.2. Assessment of Impacts on Ecology (Fauna and Flora)	97
6.2.1. Results of the Ecological Impact Assessment	97
6.2.2. Description of Ecological Impacts	107
6.2.3. Assessment of Potential Impacts	107
6.2.4. Implications for Project Implementation	123
6.3. Assessment of Impacts on Avifauna	123
6.3.1. Results of the Avifauna Impact Assessment	123
6.3.2. Description of Avifaunal Impacts	124
6.3.3. Assessment of Potential Impacts	125
6.3.4. Implication of Project Implementation	130
6.4. Assessment of Impacts on Aquatic Resources	131
6.4.1. Results of the Aquatic Resources Impact Assessment	131
6.4.2. Description of Aquatic Impacts	133
6.4.3. Assessment of Aquatic Impacts	134
6.4.4. Recommended mitigation measures	141
6.4.5. Implications of Project Implementation	141
6.5. Assessment of Impacts on Agricultural Potential and Soils	141
6.5.1. Results of Agricultural and Soils Impact Assessment	141
6.5.2. Description of Agricultural Impacts	144
6.5.3. Assessment of potential Agricultural Impacts	144
6.5.4. Recommended mitigation measures	148
6.5.5. Implications of Project Implementation	149
6.6. Assessment of Impacts on Heritage (including archaeological and palaeontological resources)	149
6.6.1. Results of the Heritage and Palaeontological Impact Assessment	149

6.6.2.	<i>Description of Heritage Impacts (Including Archaeology and Palaeontology)</i>	151
6.6.3.	<i>Assessment of Potential Impacts</i>	151
6.6.4.	<i>Recommended mitigation measures</i>	153
6.6.5.	<i>Implications of Project Implementation</i>	153
6.7.	Assessment of Visual Impacts	153
6.7.1.	<i>Results of Visual Impact Assessment</i>	161
6.7.2.	<i>Description of Visual Impacts</i>	161
6.7.3.	<i>Assessment of Potential Impacts</i>	161
6.7.4.	<i>Implications of Project Implementation</i>	168
6.8.	Assessment of the ‘Do Nothing’ Alternative	169
SECTION 7: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS		170
7.1.	Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report	172
7.2.	Approach taken to Assess Cumulative Impacts	172
7.3.	Cumulative impacts on Ecology	174
7.4.	Cumulative Impacts on Avifauna	177
7.5.	Cumulative Impacts on Aquatic Resources	178
7.6.	Cumulative Impacts on Agricultural Potential and Soils	179
7.7.	Conclusion regarding Cumulative Impacts	181
SECTION 8: CONCLUSIONS AND RECOMMENDATIONS		183
8.1.	Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report	183
8.2.	Evaluation of the proposed grid connection infrastructure establishment	184
8.2.1.	<i>Impacts on Ecology</i>	185
8.2.2.	<i>Impacts on Avifauna</i>	185
8.2.3.	<i>Impacts on Aquatic Resources</i>	185
8.2.4.	<i>Assessment of Agricultural Potential and Soils Impacts</i>	185
8.2.5.	<i>Impacts on Heritage (including archaeology and palaeontology)</i>	186
8.2.5.	<i>Impacts on Visual Resources</i>	186
8.2.6.	<i>Assessment of Cumulative Impacts</i>	187
8.3.	Environmental Sensitivity Mapping	187
8.4.	Overall Conclusion (Impact Statement)	191
8.5.	Overall Recommendation	192
SECTION 9: REFERENCES		194

APPENDIX LIST

Appendix A:	EIA Project Consulting Team CVs
Appendix B:	Maps (A3)
Appendix C:	Public Participation Process
<i>Appendix C1:</i>	<i>IGAP Database</i>
<i>Appendix C2:</i>	<i>Background Information Document</i>
<i>Appendix C3:</i>	<i>Site Notices and Newspaper Advertisements</i>
<i>Appendix C4:</i>	<i>Organs of State Correspondence</i>
<i>Appendix C5:</i>	<i>Stakeholder Correspondence</i>
<i>Appendix C6:</i>	<i>Minutes of the Meeting</i>
<i>Appendix C7:</i>	<i>Comments Received</i>
<i>Appendix C8:</i>	<i>Comments and Responses Report</i>
<i>Appendix C9:</i>	<i>Public Participation Plan and Approval</i>
Appendix D:	Soil and Agricultural Impact Assessment
Appendix E	Avifaunal Impact Assessment
Appendix F:	Aquatic Impact Assessment
Appendix G:	Terrestrial Impact Assessment
Appendix H:	Visual Impact Assessment
Appendix I:	Heritage & Palaeontological Impact Assessment
Appendix J:	66kV Power Line Environmental Management Programme
Appendix K:	Generic Environmental Management Programme for the on-site substation
Appendix L:	Access Track and Watercourse Crossing Environmental Management Programme
<i>Appendix L(A):</i>	<i>Curricula Vitae</i>
<i>Appendix L(B):</i>	<i>Grievance Mechanism</i>
<i>Appendix L(C):</i>	<i>Alien Plant and Open Space Management Plan</i>
<i>Appendix L(D):</i>	<i>Plant Rescue and Protection Plan</i>
<i>Appendix L(E):</i>	<i>Re-vegetation and Rehabilitation Plan</i>
<i>Appendix L(F):</i>	<i>Bush Encroachment Management Plan</i>
<i>Appendix L(G):</i>	<i>Erosion Management Plan</i>
<i>Appendix L(H):</i>	<i>Stormwater Management Plan</i>
<i>Appendix L(I):</i>	<i>Waste Management Plan</i>
<i>Appendix L(J):</i>	<i>Emergency Preparedness, Response and Fire Management Plan</i>
<i>Appendix L(K):</i>	<i>Traffic Management Plan</i>
<i>Appendix L(L):</i>	<i>Key Legislation</i>
<i>Appendix L(M):</i>	<i>Chance Find Procedure</i>
Appendix M:	Specialist Declarations
Appendix N:	EAP Declaration of Independence and Affirmation
Appendix O:	Screening Tool Reports

SECTION 1: INTRODUCTION

Msenge Emoyeni Wind Farm (Pty) Ltd. proposes the deviation of the authorised 132kV powerline, development on an on-site substation and associated watercourse crossings and access track for the authorised Msenge Emoyeni Wind Energy (WEF) (DEA Ref.: 12/12/20/1754/2). The proposed 66kV powerline will evacuate electricity generated at the authorised Msenge Emoyeni WEF from the proposed 33kV/ 132kV on-site substation to the Poseidon Main Transmission Substation located approximately 20km south of the town of Bedford within the Blue Crane Route Local Municipality, Eastern Cape Province (refer to **Figure 1.1 & Table 1.1**). The authorised Msenge Emoyeni Wind Energy Facility site is located within the Cookhouse Renewable Energy Development Zone (REDZ) and the new proposed grid connection infrastructure falls within the Eastern Corridor of the Strategic Transmission Corridors.

Table 1.1: Location of proposed new grid infrastructure

Province	Eastern Cape Province
Local Municipality	Blue Crane Route Local Municipality
District Municipality	Sarah Baartman District Municipality
Nearest Town	Bedford, Cookhouse
Ward No.	Ward 1
Details of properties affected	<ul style="list-style-type: none"> » Remainder of Farm Leeuw Fontein No. 221 » Remaining Extent of Farm Kop Leegte No. 205 » Portion 1 of Farm Normandale No. 206 » Portion 3 of Farm Plat House No. 203 » Remainder of Farm 242 No. 242 » Remainder of Farm 148 No. 148 » Portion 3 of Farm 148 No. 148 » Remainder of Farm 260 No. 260 » Portion 5 of Farm Van Wyks Kraal No. 73
SG 21 Digit Codes	<ul style="list-style-type: none"> » C01000000000022100000 » C01000000000020500000 » C01000000000020600001 » C01000000000020300003 » C01000000000024200000 » C01000000000014800000 » C01000000000014800003 » C01000000000026000000 » C01000000000073000005

The Msenge Emoyeni Wind Energy Facility has been selected as a preferred bidder by a private offtaker. In order to comply with financial close activities, the Developer has liaised with Eskom regarding the authorised 132kV powerline routing (DFFE Ref.: 12/12/20/1754/2) to the Poseidon Main Transmission Substation (“MTS”). It was determined that in order to provide suitable setbacks to the existing Amakhala and Nojoli WEF’s turbines and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points, the authorised 132kV powerline routing would need to be deviated from the authorised routing which falls outside of the previously assessed and authorised 20-30m wide servitude. It was also determined that due to the available capacity at the Poseidon MTS, the applicant will construct a 66kV powerline to evacuate the generated power from the new proposed 33kV/132kV on-site substation.

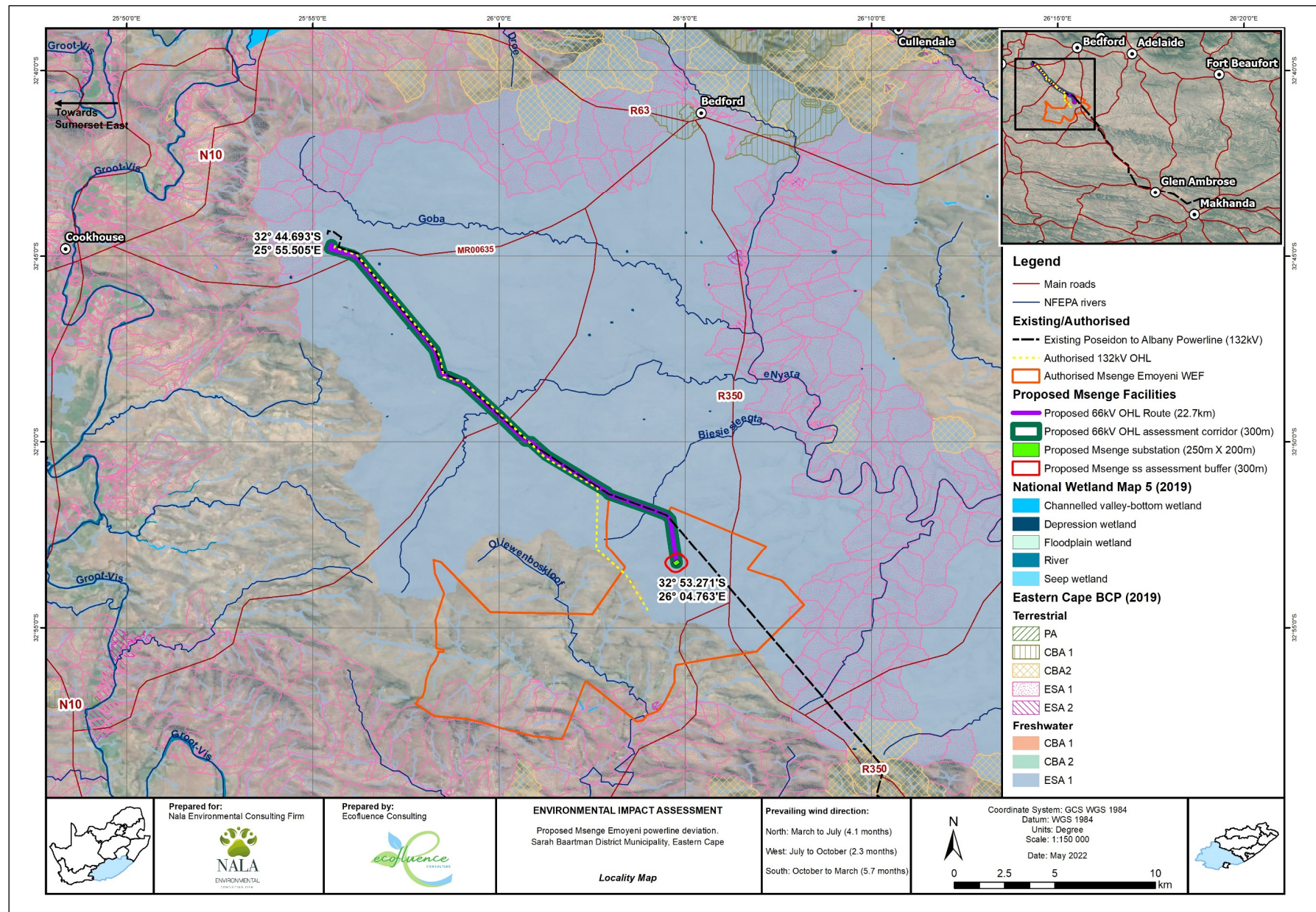


Figure 1.1: Locality map illustrating the authorised Msenge Emoyeni WEF and proposed 66kV grid deviation.

Table 1.2: Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report Summary of where requirements of Appendix I of the 2014 NEMA EIA Regulations (as amended, GN R326) are provided in this BA Report

Appendix I	YES/NO	Applicable Section in BA Report
<p>Objective of the basic assessment process</p> <p>2) The objective of the basic assessment process is to, through a consultative process</p> <p>a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;</p> <p>b) identify the alternatives considered, including the activity, location, and technology alternatives;</p> <p>c) describe the need and desirability of the proposed alternatives;</p> <p>d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine-</p> <p>(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and</p> <p>(ii) the degree to which these impacts-</p> <p>(aa) can be reversed;</p> <p>(bb) may cause irreplaceable loss of resources; and</p> <p>(cc) can be avoided, managed or mitigated; and</p> <p>e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to-</p> <p>(i) identify and motivate a preferred site, activity and technology alternative;</p> <p>(ii) identify suitable measures to avoid, manage or mitigate identified impacts; and</p> <p>(iii) identify residual risks that need to be managed and monitored.</p>	<p>YES</p>	<p>Legislation and Policy - Section 4 (4.2)</p> <p>Alternatives - Section 3</p> <p>Need and Desirability – Section 4.1</p> <p>Impacts – Sections 6, Section 7, Section 8</p>
<p>Scope of assessment and content of basic assessment reports</p> <p>3) (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include:</p> <p>(a) details of:</p>	<p>YES</p>	<p>Section 1, Section 4 (1.1) and Appendix A</p>

(i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;		
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	YES	Section 1, Section 4
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	YES	Section 1, Section 3 (3.6)
(d) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure;	YES	Section 2
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	YES	Section 1, Section 4 (4.2)
f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	YES	Section 3
(g) a motivation for the preferred site, activity and technology alternative;	YES	Section 3
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered;	YES	Section 3
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	YES	Section 4.3, Appendix C
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	YES	Section 4.3, Appendix C8
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	YES	Section 3
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	YES	Section 5 Section 6
vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	YES	Section 4
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	YES	Section 5 Section 6

(viii) the possible mitigation measures that could be applied and level of residual risk;	YES	Section 6
(ix) the outcome of the site selection matrix;	YES	Section 6 Section 8
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	YES	Section 3
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	YES	Section 6 Section 8
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	YES	Section 5 Section 6 Section 7
(i) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	YES	Section 7
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	YES	Section 5 Section 6 Section 7 Section 8
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	YES	Section 8
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	YES	Section 6 Section 7
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	YES	Section 8
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	YES	Section 4

(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	YES	Section 8
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A	
(r) an undertaking under oath or affirmation by the EAP in relation to - (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and IGAPs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties;	YES	Appendix N
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A	
(t) any specific information that may be required by the competent authority; and	N/A	
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A	
2) Where a government notice gazetted by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply	YES	Section 4

SECTION 2: PROJECT DESCRIPTION

This section provides a description of the proposed powerline deviation grid corridor and associated infrastructure associated with the authorised Msenge Emoyeni WEF. The project description may change to a minor extent based (i.e. within the corridors presented and site development areas proposed) based on the findings of the specialist studies i.e. site sensitivities, final engineering designs and legislative requirements.

2.1 Project Site Description

The authorised Msenge Emoyeni Wind Energy Facility (DFFE REF.:12/12/20/1754/2) project site, proposed new 66kV powerline within a 300m development corridor (150m on either side of the centre line), a 33kV/132kV on-site substation associated access tracks and watercourse crossings is located within Ward I of the Blue Crane Route Local Municipality within the Sarah Baartman District Municipality in the Eastern Cape Province. The proposed grid corridor will run in the same direction as the previously authorised 132kV powerline in a northerly direction from the proposed new 33kV/132kV on-site substation to the Poseidon Main Transmission Substation. The proposed 300m development corridor route was selected to evacuate power from the authorised Msenge Emoyeni WEF is informed by the most feasible grid connection point into the national grid by providing suitable setbacks to the operational Amakhala and Nojoli wind farms' turbines and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points. The placement of the 300m grid connection corridor also provides an opportunity for the consolidation of linear electrical infrastructure within the area, inclusive of the impacts that are bundled together at this location, this can be seen as an advantage to the development of the grid connection infrastructure from a social and environmental impact perspective. The proposed project site can be accessed via an existing main road running south from the R350 regional road located within the eastern section of the authorised Msenge Emoyeni WEF site.

The proposed new grid connection infrastructure will be located within the existing 132kV Albany-Poseidon power line servitude (refer to **Figure 2.1**), and partially within the authorised Msenge Emoyeni WEF, which is located within the Cookhouse REDZ and the Eastern Grid Corridor

2.2 Extent of the new proposed grid deviation associated with the Msenge Emoyeni WEF

The infrastructure and key components considered as part of this Basic Assessment process includes:

- 66kV overhead single circuit powerline approximately 22,7km long in a 300m wide assessment corridor (150m on either side), from the authorised Msenge Emoyeni WEF onsite substation to the Poseidon MTS.
- Access tracks of up to 7m in width following the powerline route from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon MTS within a 300m corridor (150m on either side) to enable construction and maintenance activities.
- Water course crossings along the powerline route from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon MTS.
- 33kV/132kV on-site substation with a footprint occupying an area of 250m x 200m, within a 300m radius.

Power Line and Tower Structures

The properties on which the grid line and associated infrastructure traverses (i.e. the proposed project) has third-party rights enshrined in the title deed. It is anticipated that the properties on which the proposed project will be constructed will be leased from the landowners. Msenge Emoyeni Wind Farm (Pty) Ltd has concluded majority of the required lease agreements and is underway with the remaining lease agreements for certain properties. The proposed single circuit powerline is expected to have concrete foundations and steel tower structures (i.e. pylons). Monopole pylon structures will be adopted for the proposed powerline. Lattice type structures will also be considered for the proposed power line; however, they will only be implemented where required due to the topography within the region or to comply with Eskom Standards. The line will consist of either self-supporting suspension structures or guyed monopoles (i.e. hybrid monopoles). The towers of the 66 kV powerline will all have a maximum height of 24m with

exceptional crossings structures higher than this possibly being required up to 36m in height. The span lengths are estimated to range between 150m and 280m. The powerline servitude will be approximately 31m (i.e. 15,5m on either side of the power line).

Access

Access is required during both the construction and operational phases of the proposed project. The site proposed for development has largely been transformed through agricultural practices and already has gravel roads in place for these purposes and for that of the existing 132kV Albany- Poseidon powerline. Where possible, existing access roads/tracks will be used to gain access to construction sites and the servitude. Where no access roads/tracks exist, the access points and roads will be negotiated with the relevant landowner and will be limited to single tracks as close to the servitude/within the servitude as possible. These will be established during the construction phase. Access tracks approximately 7m wide will enable the transportation of construction material as well as construction teams to the site and facilitate maintenance activities during the operational phase. Where possible access routes will be rehabilitated when no longer required.

Table 2.1: A summary of the details and dimensions of the proposed infrastructure associated with the project is provided below:

Infrastructure	Details
Single circuit powerline	The single-circuit powerline will be known as the Msenge Emoyeni 66 kV single-circuit powerline.
Powerline capacity	66 kV
Development Powerline corridor width	A 300m wide grid connection corridor (150m on either side of the centre line) is being assessed within which the grid connection infrastructure will be constructed and operated.
Powerline length	22.7km
Powerline servitude	31m (15.5 to each side)
Tower height	Maximum height is 24m for standard monopole structures. With exceptional crossings structures higher than this may be required up to 36m in height. Anticipated span lengths will be between 150m and 280m.
On-site Substation capacity	33/132kV
On-site Substation footprint	250m x 200m
Access Roads	Access for maintenance purposes will be limited to jeep tracks up to 7m wide.
Watercourse crossings	Approximately 12 watercourse crossings have been identified along the powerline route that will be constructed to accommodate for access tracks

Table 2.2: Centre line Co-ordinates of the proposed new grid connection infrastructure within the 300m development corridor

	Latitude	Longitude
Start (Proposed on-site substation)	32°53'16.10"S	26° 4'45.89"E
Point 2	32°52'5.23"S	26° 4'35.86"E
Point 3	32°51'58.38"S	26° 4'30.00"E
Point 4	32°51'24.96"S	26° 2'57.29"E
Point 5	32°51'19.82"S	26° 2'52.60"E
Point 6	32°50'22.15"S	26° 1'16.41"E
Point 7	32°49'59.89"S	26° 0'51.66"E
Point 8	32°49'58.71"S	26° 0'42.46"E

Point 9	32°48'25.43"S	25°59'2.79"E
Point 10	32°48'10.54"S	25°58'28.64"E
Point 11	32°47'31.39"S	25°58'16.22"E
Point 12	32°45'3.66"S	25°56'12.66"E
Point 13	32°44'57.93"S	25°56'2.68"E
Point 14	32°44'47.51"S	25°55'27.60"E
End (Poseidon Main Transmission Substation)	32°44'41.44"S	25°55'30.18"E

Table 2.3: Water Crossing Co-ordinates

	Latitude	Longitude
Water Crossing 1	32° 53.368"S	26° 5.004"E
Water Crossing 2	32°52'48.75"S	26° 4'42.37"E
Water Crossing 3	32°52'24.84"S	26° 4'38.64"E
Water Crossing 4	32°51'47.73"S	26° 4'0.27"E
Water Crossing 5	32°50'56.34"S	26° 2'14.18"E
Water Crossing 6	32°50'41.88"S	26° 1'49.39"E
Water Crossing 7	32°49'40.33"S	26° 0'22.86"E
Water Crossing 8	32°49'8.86"S	25°59'50.32"E
Water Crossing 9	32°48'49.13"S	25°59'28.26"E
Water Crossing 10	32°45'45.38"S	25°56'47.60"E
Water Crossing 11	32°44'52.00"S	25°55'42.98"E
Water Crossing 12	32°44'48.83"S	25°55'32.48"E

Table 2.4: 33kV/132kV on-site substation footprint (300m development radius)

	Latitude	Longitude
Corner 1	32°53'30.53"S	26° 4'43.54"E
Corner 2	32°53'13.32"S	26° 4'28.45"E
Corner 3	32°53'1.04"S	26° 4'48.27"E
Corner 4	32°53'16.52"S	26° 5'3.02"E

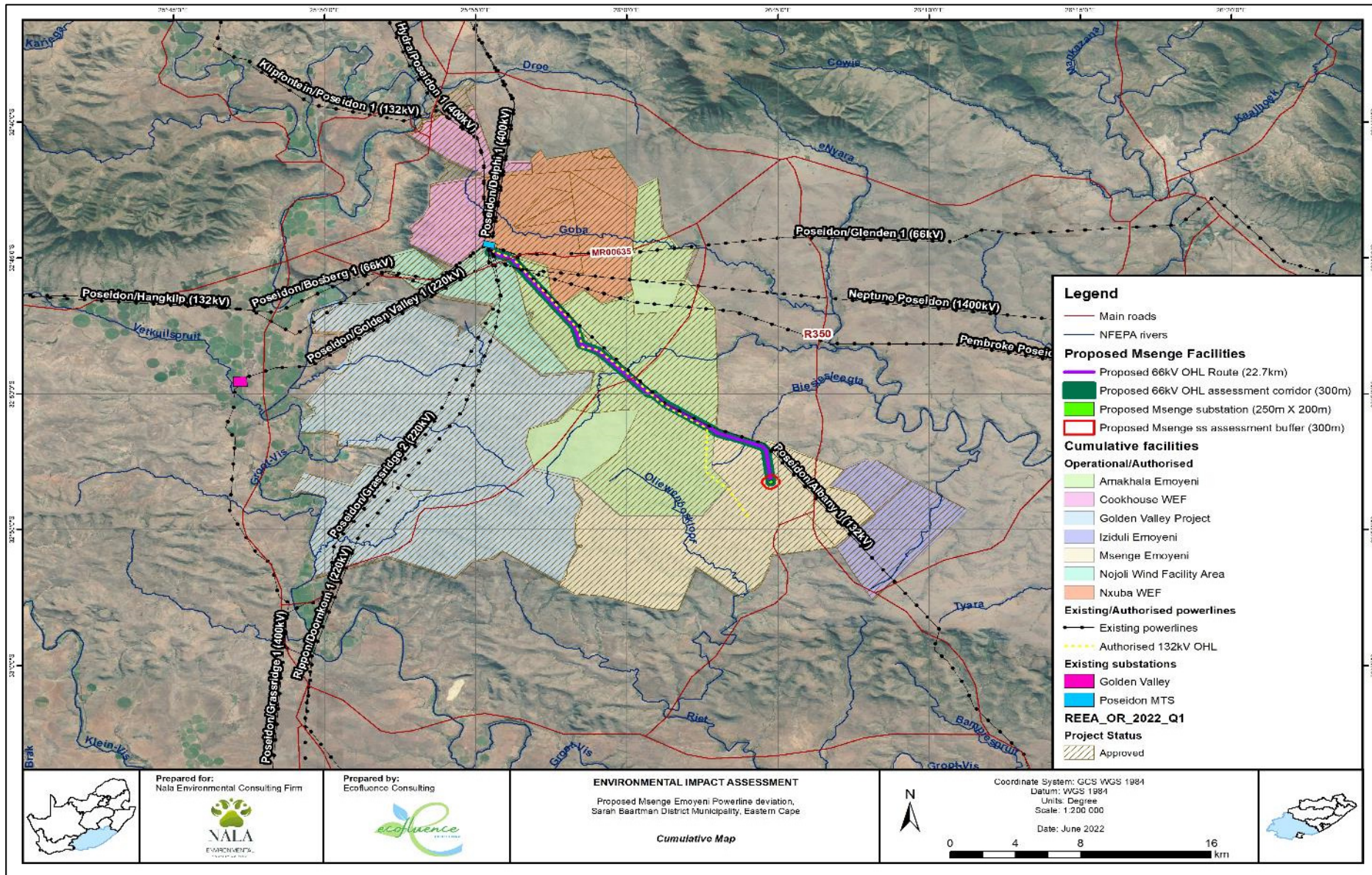


Figure 2.1: Location of the proposed 66kV powerline with a corridor of approximately 300m and on-site substation in relation to the existing operational/authorised facilities

SECTION 3: ALTERNATIVES

3.1. Feasible and Reasonable Project Alternatives

An EIA process must contain the consideration of alternatives, which can include site alternatives (i.e. development footprint), activity, technology and site access alternatives, as well as the “do-nothing” alternative as per the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326). Alternatives are to be assessed in terms of biophysical, economic, social and technical factors.

Applicable alternatives are discussed below and where no alternatives are found to be applicable, a motivation has been included.

3.2. Site Specific Alternatives

The proposed grid infrastructure is associated with the authorised Msenge Emoyeni WEF development site. As the grid infrastructure is required to evacuate electricity from this WEF to the National Grid, the 300m grid development corridor route is informed by the most feasible grid connection point into the national grid.

The preferred 300m grid connection corridor for the grid connection solution was identified through liaison with Eskom and takes into consideration existing facilities, their associated infrastructure and potential future grid infrastructure developments in the Bedford and Cookhouse area. The selection of the 300m grid corridor was based on the location of the grid connection point into the national grid in relation to the authorised Msenge Emoyeni Wind Energy Facility and the existing servitude of the 132kV Albany-Poseidon overhead powerline. The 300m grid corridor has been assessed within this basic assessment process to determine the specific areas within the corridor of high sensitivity, no-go areas and buffer zone to enable the powerline and associated infrastructure to be constructed within the 300m corridor and specifically avoid these areas. The preferred location of the substation and 300m radius was selected based on its optimized location within the authorised Msenge Emoyeni Wind Energy Facility and proximity to the existing 132kV Albany-Poseidon powerline.

The placement of the grid connection 300m corridor also provides an opportunity for the consolidation of linear electrical infrastructure within the area, inclusive of the impacts that are bundled together at this location, this can be seen as an advantage to the development of the grid connection infrastructure from a social and environmental impact perspective.

The specific characteristics considered, and the results thereof, are discussed in the sections below. The developer has considered several characteristics for the specific 300m development corridor that been selected, hence should the assessment outcome be that the following characteristics not be favourable for the development of the grid connection infrastructure, some limitations and challenges may then be expected.

- Availability of Land – In order to develop the grid connection infrastructure associated with the Msenge Emoyeni WEF, sufficient space and access to land outside of the wind farm project development site (and along the 300m wide grid connection corridor and 300m on-site substation development radius) is required. The land use along the grid corridor and substation radius mainly includes agricultural activities and existing Eskom servitude.
- Topographical considerations – The terrain traversed by the grid connection corridor and substation radius is fairly flat, providing good conditions for grid connection infrastructure.

- **Connection to the National Grid** – The project has been selected as a preferred bidder via private offtake. Following liaison with Eskom, it was determined that the authorised 132kV powerline routing would need to be deviated from the originally authorised powerline routing. The new proposed routing falls outside the originally assessed and authorised 20-30m wide servitude, hence the need for a new Basic Assessment process. The proposed new routing will provide suitable setbacks to the existing Amakhala and Najoli WEFs' turbines, and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points.
- **Consideration of environmental sensitivities** – Through the assessment of a larger corridor and the authorised Msenge Emoyeni Wind Energy Facility sites within which the grid connection infrastructure is located, an opportunity has been created by the applicant for the avoidance of sensitive environmental features and areas. The consideration of the grid connection corridor and substation radius which is approximately 5 times the width of the required power line servitude and substation footprint enables the avoidance of the environmental sensitivities, thereby ensuring that the grid connection infrastructure can be appropriately placed within the corridor and substation radius without resulting in unacceptable environmental impacts or fatal flaws. This application of the mitigation strategy which will allow for the avoidance, minimisation and mitigation of impacts will result in the identification of the most appropriate placement of the grid connection infrastructure within the grid connection corridor and substation radius.

Therefore, considering the above, no location/site alternatives for the placement of the grid connection infrastructure have been identified. Only the already indicated 300m wide grid connection corridor and 300m radius around the proposed on-site substation will be assessed as part of this BA Report.

3.3. Grid Connection Alternatives

Within the grid connection corridor, only one option is being considered for the connection of the authorised Msenge Wind Energy Facility from the proposed 33kV/132kV onsite substation to the Poseidon Main Transmission Substation (MTS), (OFFE Ref: 12/12/20/1754/2).

- The proposed 66kV powerline with a development corridor of approximately 300m (150m on either side of the centre line) is proposed to evacuate power from the authorised Msenge Emoyeni WEF; informed by the most feasible grid connection point into the national grid by providing suitable setbacks to the existing Amakhala and Najoli wind farms' turbines, and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points.
- The design of the powerline is required to conform to Eskom's technical standards as it will form part of the national electricity supply network and must therefore be in line with the existing network systems, technology and infrastructure. The 300m wide grid connection corridor and the 300m development radius so the proposed 33kV/132kV on-site substation assessed within this BA process represents a technically feasible area for construction of the power line and on-site substation within the authorised Msenge Emoyeni WEF site and allows for the avoidance of identified environmental sensitivities through the appropriate placement of the power line footprint and servitude within this corridor. No feasible alternative corridors or placement of the on-site substation along this corridor were identified for assessment.

3.4. Technology Alternatives

No feasible technology alternatives exist for the powerline or on-site substation.

3.5. The 'Do-Nothing' Alternative

The 'do-nothing' alternative is the option of Msenge Emoyeni Wind Farm (Pty) Ltd not constructing the grid connection infrastructure for the Msenge Emoyeni Wind Energy Facility. This would result in no environment or social impacts (positive or negative) as a result of the not developing the grid connection infrastructure.

The primary reasoning as to why the 'do-nothing' alternative is not considered as the preferred alternative in relation to the development of the grid infrastructure associated with the Msenge Wind Energy Facility is that the grid connection infrastructure is considered as key infrastructure in order to enable the evacuation of the generated power into the national grid. The activities associated with the development of the Msenge Wind Energy Facility have already received Environmental Authorisation from the Department of Forestry, Fisheries and Environment. The grid connection infrastructure previously authorised for the wind energy facility is no longer considered viable and is required to be optimized following liaison with Eskom. Should the 'do-nothing' alternative be implemented for the grid connection infrastructure, it will result in the inability of the authorised wind energy facility to connect to the national grid and therefore result in the wind energy facility not being feasible for operation.

This would result in the socio-economic benefits that would arise from the operation of the wind energy facility not being realised due to its inability operate and feed electricity into the national grid. The inability of the wind energy facility to operate would hinder socio-economic benefits at local, regional and national levels due to the additional electricity that would be fed into the country's national grid thereby limiting sales, production and losses within the GDP. The negative impacts of the 'do-nothing' alternative are considered to outweigh the positive impacts of this alternative.

The option of not developing the grid connection solution required for the operation of the Msenge Wind Energy Facility is not preferred and is considered to restrict the development of the authorised Msenge Wind Energy Facility.

3.6 Activities during the Project Development Stages

The table below provides the details regarding the requirements and the activities to be undertaken during the various infrastructure development phases (i.e. construction phase, operation phase and decommissioning phase).

Construction Phase:

The main activities associated with construction will be:

- Removal of vegetation for the proposed infrastructure;
- Excavations for infrastructure and associated infrastructure;
- Stockpiling of topsoil and cleared vegetation;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the 66 kV powerline, onsite substation, access tracks and watercourse crossings.

Duration	The construction phase will take place subsequent to the issuing of an EA from the DFFE and within the financial close period as per the requirements of the private offtaker. The construction phase for the proposed project is expected to extend between 12 to 18 months. Appropriate mitigation and management measures are included in the EMPs (Appendices J-L of the BA Report) with regard to traffic control.
----------	---

Transportation	The construction phase will involve the transportation of personnel, construction material and equipment to the site, and personnel away from the site. (for the delivery of concrete, other construction materials) will be required.
Site Establishment	In terms of site establishment, a laydown area will be required at the outset of the construction phase, as well as dedicated access routes from the laydown area to the working areas
Laydown area	It is expected that the laydown area will be temporary in nature (for the duration of the construction phase) and will include the establishment of the construction site camp (including site offices and other temporary facilities for the appointed contractors).
Dust generation	During the construction phase, dust will be generated from the earthworks and excavation required for the construction of the proposed infrastructure and building foundations, the removal of vegetation, the movement of vehicles and equipment accessing the site, and the infilling of excavations and levelling. Appropriate mitigation measures will be implemented during the construction phase to reduce the dust levels. Approved soil stabilizing agents may need to be used to minimise dust. Dust generation during the construction phase will be of a short-term duration and is predicted to be of low significance with the implementation of mitigation measures. Appropriate mitigation and management measures are included in the EMPs (Appendices J-L of the BA Report). The construction vehicles and equipment will also generate exhaust emissions. However, these emissions are also expected to be short-term in duration and of low significance with the implementation of mitigation measures.
Noise generation	In terms of noise generation, as part of the construction phase, noise will be generated by the construction activities, earthworks, personnel, equipment and vehicles on the site. The levels of noise are not expected to be excessive and will be in line with standard industry levels associated with the proposed activity. In addition, noise generation during the construction phase is considered to be localised and short-term, with a low to very low significance (with the implementation of mitigation measures). During the construction phase, the ambient noise is not expected to exceed 45 dB(A) during the day and 35 dB(A) at night for rural districts (as required by SANS 10103:2008). In addition, the proposed project will not generate any noise during the operational phase.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as the relevant EMPs, which are included in Appendix J-L of this BA Report. During the construction phase, it is estimated that approximately 200 employment opportunities will be created. The employment creation is also dependent on the final engineering design.

Operational Phase:

The following activities will occur during the operational phase:

- The transmission of electricity generated from the Msenge Emoyeni WEF to the Poseidon MTS;
- Maintenance of the powerline servitude including the gravel service roads and watercourse crossings.

- During the life span of the powerline (approximately 20 years), on-going maintenance will be required on a scheduled basis. This maintenance work will be undertaken by contractors employed by the project applicant or Eskom, and in compliance with the EMPr.

Once operational, the wind energy facility will be monitored remotely. It is estimated that the operational phase of the complete project will provide employment for approximately 10 full-time employees.

Decommissioning Phase:

The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the actual WEF becomes outdated or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMPr and the site will be rehabilitated and returned to its pre-construction state. It is expected that the areas affected by the various infrastructure will revert back to the original land-use (i.e. primarily agricultural use and existing Eskom servitude) once the Msenge Emoyeni WEF has reached the end of its economic life and all infrastructure has been decommissioned.

Decommissioning will result in job losses, which in turn can result in a number of social impacts, such as reduced quality of life, stress, depression etc. However, the number of people affected (~10) is relatively small. Decommissioning is also similar to the construction phase in that it will also create temporary employment opportunities.

SECTION 4: NEED FOR AND APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

The DFFE commissioned a Strategic Environmental Assessment (SEA) for Electrical Grid Infrastructure to assist Eskom with identifying priority corridors and to improve environmental regulatory processes inside the corridors in support of Strategic Infrastructure Project (SIP) 10. The final Power Corridors assessed as part of the 2016 Electricity Grid Infrastructure SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 113. The proposed Electrical Grid Infrastructure project falls within the Eastern Power Corridor included in the Electrical Grid Infrastructure SEA. As such, a BA is required. The decision-making timeframe has also been reduced from 107 days to 57 days.

The proposed project also falls within the Renewable Energy Zone (REDZ) 2 (i.e. Cookhouse REDZ). These eight REDZs that were assessed as part of the 2015 Wind and Solar Phase 1 SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 114 and Phase 2 Strategic Environmental Assessment for Wind and Solar Photovoltaic Energy in South Africa, 2019 identified 3 additional Renewable Energy Development Zones that are of strategic importance for large scale wind and solar photovoltaic energy development. These Renewable Energy Development Zones were published under Government Notice No. 786 Government Gazette No. 17 July of 2020.

In terms of the EIA Regulations of December 2014 (amended in April 2017) published in terms of the NEMA (Act No. 107 of 1998) as amended, the establishment of the grid corridor and associated infrastructure for the Msenge Emoyeni WEF triggers listed activities requiring environmental authorisation. As the project triggers activities listed in Listing Notice 1 (GNR 327) and Listing Notice 3 (GNR 324), the application for environmental authorisation is required to be supported by a BA process.

This project relates to the development of Electricity Grid Infrastructure to support the authorised Msenge Emoyeni WEF. Therefore, the development of Electricity Grid Infrastructure serves as the subject of this Application for Environmental Authorisation. The proposed project is in line with national planning initiatives to support and promote sustainable infrastructure development.

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the applicant has appointed Nala Environmental to undertake the BA Process in order to determine the biophysical, social and economic impacts associated with undertaking the proposed activity. The BA team also includes various specialists that have been appointed to undertake specialist studies to contribute to the BA Process. These specialist studies are included in Appendices D-I of this BA Report.

4.1. Need & Desirability

The requirements of Appendix I of the EIA Regulations, 2014, as amended, is to motivate for "*the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location*".

The need and desirability for the proposed grid infrastructure for the project is directly linked to the need for the Msenge Emoyeni WEF which was authorised in 2012 (DEFF ref.: 12/12/20/1754/2), as the main purpose of the proposed infrastructure is to support the development of the wind energy facility, specifically:

- » The grid infrastructure is required to connect this facility to the national grid at a feasible connection point into the Poseidon Main Transmission Substation. In South Africa there is currently a disconnect between electricity supply and demand i.e. electricity is not always produced at the exact

time that it is required resulting in periodic load shedding. There is a significant need for additional energy supply from renewable energy sources to supplement additional megawatts into the National Grid.

Considering the relationship, and the necessity of, the proposed grid infrastructure for the authorised Msenge Emoyeni WEF, the following need and desirability factors are applicable, and are aligned with national, regional, and local policies and plans (as detailed in Section 2):

The National Development Plan (National Planning Commission, 2011, p.10) proposes to create 11 million jobs by 2030 by:

- » “Realising an environment for sustainable employment and inclusive economic growth;
- » Promoting employment in labour-absorbing industries;
- » Raising exports and competitiveness;
- » Strengthening government’s capacity to give leadership to economic development; and
- » Mobilising all sectors of society around a national vision”.
- » The need for the country to respond to the international commitments regarding climate change and reduction in carbon emissions.
- » The need at a national level to diversify the power generation technology mix to include up to 14.4 GW of renewables by 2030, as defined in the Integrated Resource Plan (IRP), 2019.
- » The need for sustainable development at a Provincial level, including the need to utilise its extensive resources for the benefits of the local area.

From an overall environmental sensitivity and planning perspective, the proposed infrastructure supports the broader strategic context of the municipality as it will be an integral part of a wind energy facility which is considered an opportunity for economic development in the region as per the Sarah Baartman District Municipality’s Integrated Development Plan. It is also in line with broader societal needs and the public interest as it is linked to a renewable energy facility (Msenge Emoyeni WEF), for which there is national policy and support. No exceedance of freshwater, ecological, heritage or avifaunal limits will result from the construction of the proposed supporting infrastructure, as detailed in this Basic Assessment Report.

Approval of this BA project will enable and facilitate the construction of a larger suite of WEF projects, which will play a role in enhancing employment and economic growth objectives by creating employment opportunities and contributing to economic growth. The project will assist in reaching the objectives of the IDP of the municipality aims to ensure that the quality of life of the Sarah Baartman District communities through purposeful and quality service delivery and infrastructure development, is achieved. The project will assist in supporting the local and national electricity supply through its contribution to the National Eskom Grid as the infrastructure is directly linked to the Msenge Emoyeni WEF.

4.2. Relevant legislative permitting requirements

The National Environmental Management Act (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014, as amended

An application for environmental authorisation is submitted to the National Department of Forestry, Fisheries and Environment (DFFE). The DFFE requires a Basic Assessment for this project. The Basic Assessment will conform to the National Environmental Management Act 107 of 1998 (as amended). The Basic Assessment will provide information about the proposed 66kV powerline development corridor, proposed on-site substation, access track and watercourse crossings, and its scope is restricted to this component of the project. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant EA. As the proposed infrastructure is considered essential infrastructure for the Msenge Emoyeni WEF, which is a power generation activity, and therefore relates to the IRP 2010 – 2030, 2019, the National DFFE has been determined as the Competent Authority in terms of GNR 779 of 01

July 2016. The Provincial Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (EC DEDE&T) is a Commenting Authority on the project.

The BA process being conducted for the grid connection infrastructure proposed for the Msenge Emoyeni WEF is being undertaken in accordance with Section 24 (5) of the NEMA. Section 24 (5) of NEMA pertains to Environmental Authorisations (EAs), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

As the proposed development triggers listed activities in Listing Notice 1 (GNR327) and Listing 3 (GNR324), and falls within the REDZ (i.e. Cookhouse) and the Eastern Power Corridor thus it would need to follow a BA process in terms of the 2014 EIA Regulations, as amended.

Table 4.1: Listed activities as per the EIA regulations which are triggered by establishment of grid connection infrastructure associated with the authorised Msenge Emoyeni WEF

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	A 66kV overhead power line corridor approximately 22,7km long will be developed from the proposed onsite 33/132kV substation connection into the Poseidon MTS.
12(ii)(a)(c)	The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more; where such development occurs within (a) a watercourse and (c) within 32 meters of a watercourse, measured from the edge of a watercourse.	The powerline corridor, access tracks and watercourse crossings will need to cross the several drainage lines in order to connect the Poseidon MTS. This will result in infringement within the watercourse and/or within 32m of the watercourse with a physical footprint greater than 100 square metres.
19	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal, or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse	The development of grid connection infrastructure will require the infilling or depositing of material and the extraction, removal or moving of soils of more than 10 cubic meters from watercourses during construction
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	Clearance of vegetation will be required within the grid connection corridor during power line construction and access tracks.
28(ii)	Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	The proposed grid infrastructure that is intended to be developed will be greater than 1ha.
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.

4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres</p> <p>a. Eastern Cape</p> <p>i. Outside urban areas</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p>	<p>Access tracks along the powerline routing will be developed to a width of up to 7m wide to allow for construction and maintenance activities within CBA areas.</p>
12	<p>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.</p> <p>a. Eastern Cape</p> <p>ii. Within critical biodiversity areas identified in bioregional plans</p>	<p>Clearance of vegetation will occur within the grid connection corridor and proposed on-site substation footprint during power line, access track and water crossing construction which is greater than 300 square metres.</p>
14	<p>The development of – (xii) infrastructure or structures with a physical footprint of 10 square metres or more Where such development occurs (a) Within a watercourse (c) if no setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	<p>The development of the new powerline corridor including access tracks, watercourse crossings and on-site substation will encroach onto watercourses and will be located within 32m of watercourses.</p>
Activity No(s):	Provide the relevant Scoping and EIR Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.

National Water Act (Act No. 36 of 1998)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be licensed with the Competent Authority (i.e. the Regional DWS). Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

Table 4.2: Lists Water Uses associated with the proposed project and identified in terms of the NWA which require licensing either in the form of a GA, or in the form of a WUL. The table also includes a description of those project activities which relate to the applicable Water Uses.

Notice No.	Activity No.	Description of Water Use
NWA (No. 36 of 1998)	Section 21 (c)	Impeding or diverting the flow of water in a watercourse.
NWA (No. 36 of 1998)	Section 21 (i)	Altering the bed, banks, course or characteristics of a watercourse.

In the event that the flow of water in the ephemeral watercourses is affected and the bed, banks or course characteristics are altered, application would need to be made for a WUL in accordance with the requirements of the Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals (GNR 267), or a GA registered in accordance with the requirements of Revision of General Authorisation. The process of applying for a WUL or GA registration will only be completed once a positive EA has been received and the project selected as a Preferred Bidder. This is in line with the requirements of the Department of Water and Sanitation.

National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

Section 38: Heritage Resources Management	
I).	Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –
a.	the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
b.	the construction of a bridge or similar structure exceeding 50m in length;
c.	any development or other activity which will change the character of a site –
i).	exceeding 5 000m ² in extent; or
ii).	involving three or more existing erven or subdivisions thereof; or
iii).	involving three or more erven or divisions thereof which have been consolidated within the past five years; or
iv).	the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resource authority;
Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.	

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed grid connection infrastructure, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GNR 668).

A Heritage Impact Assessment has been undertaken as part of the BA Process (refer to Appendix I).

National Forests Act (Act No. 84 of 1998)

The project might involve the cutting, disturbing, damaging or destroying of protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998), as amended. A license in terms of section 15 of the NFA will not be required should the proposed 66kV powerline corridor and associated infrastructure be constructed as no protected trees were identified along the powerline corridor. Eight listed protected tree species (according to the National Forests Act, NFA) are likely to occur in the area, but the terrestrial specialist’s assessment only concurred with one potential species (*Sideroxylon inerme*) that is most likely to occur within the site, should this species be encountered on site a license in terms of section 15 of the NFA will be required.

National Veld and Forest Fire Act (Act No. 101 of 1998)

The applicant should provide fire breaks in accordance with Chapter 4 of the National Veld and Forest Fire Act (Act 101 of 1998) and should consider amongst other the following:

- » Fire rating
- » Consultation of adjoining owners and the fire protection association (if any)
- » be present at such burning or have an agent attend.

The fire break should be:

- » wide and long enough to prevent to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land;
- » it does not cause soil erosion; and is reasonably free of inflammable material capable of carrying a veldfire across it.

Table 4.3: Applicable Legislation, Policies and/or Guidelines associated with the development of the proposed grid connection infrastructure at Msenge Emoyeni WEF

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
Constitution of the Republic of South Africa (No. 108 of 1996)	<p>In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that:</p> <p><i>"Everyone has the right –</i></p> <ul style="list-style-type: none"> » <i>To an environment that is not harmful to their health or well-being, and</i> » <i>To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</i> <ul style="list-style-type: none"> * <i>Prevent pollution and ecological degradation,</i> * <i>Promote conservation, and</i> <p><i>Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."</i></p>	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the "right to an environment clause" includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
Civil Aviation Authority Act (No. 13 of 2009)	The proposed project will have a bearing on the safety and security of aircraft due to the tall heights of the powerline structures. Thus compliance to the Civil Aviation Act requirements on aircraft safety is essential	South African Civil Aviation Authority (SACAA)	2009

Conservation of Agricultural Resources Act, (No. 43 of 1983)	The proposed project may interfere with natural agricultural resources during its phases of development. The legislation would promote the conservation of the soil, the water sources and the vegetation.	Eastern Cape Department: Rural Development and Agrarian Reform	23 April 1983
NEMA (Act 107 of 1998, as amended)	The proposed project will require the implementation of appropriate environmental management practices.	National DFFE	19 November 1998
NEMA EIA Regulations published in GN R982, R983, R984 and R985, and as amended on 7 April 2017 in GN R326, R327, R325 and R324	These Regulations provide the procedures that need to be followed for the BA process.	National DFFE	8 December 2014
NEMA EIA Regulations published in Government Notice R983 and R985, and as amended on 7 April 2017 in GN R327 and R324	These Regulations contain the relevant listed activities that are triggered, thus requiring a BA. Please refer to Section A (7) of this BA Report for the complete list of listed activities.	National DFFE	8 December 2014 and amended on 7 April 2017
Electronic Communications Act (No. 36, 29 of 2005)	Interference with broadcasting signal distribution and telecommunication lines or facilities may be possible during development of this project. Compliance to the said Act will guard against such interference or disturbance.	Universal Service Agency and telecommunication companies	18 April 2006
National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)	General and hazardous waste will be generated during the construction phase, which will require proper management.	National DFFE	6 March 2009

National Environmental Management: Waste Amendment Act (Act 26 of 2014)	General and hazardous waste will be generated during the construction phase, which will require proper management.	National DFFE	2 June 2014
National Environmental Management: Air Quality Act (Act 39 of 2004)	The proposed stockpiling activities, including earthworks, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be applied.	National DFFE	19 February 2004
Water Services Act (Act 108 of 1997)	Water will be required during the construction and decommissioning phases of the proposed project, for consumption purposes, earthworks and grassing etc.	National Department of Water and Sanitation (DWS)	1997
Hazardous Substances Act (Act 15 of 1973)	During the proposed project, fuel and diesel will be utilised to power vehicles and equipment. In addition, potential spills of hazardous materials could occur during the construction and decommissioning phases.	Department of Health	1973
Environmental Conservation Act (ECA) (Act 73 of 1989 Amendment Notice No.1183 of 1997)	The ECA was promulgated prior to the NEMA, and was the main piece of legislation in dealing with environmental issues in South Africa. The ECA has largely been repealed and replaced with NEMA.	National DFFE	1997
National Forests Act (Act 84 of 1998)	The National Forest Act (Act 84 of 1998) governs the removal, disturbance, cutting or damage and destruction of identified "protected trees". If any protected species are found on site during the search and rescue or construction phase, the Provincial Department of Agriculture, Forestry and Fisheries (DAFF) will be contacted to discuss the permitting requirements. It is not unlikely that any listed trees will be encountered during the construction of the proposed infrastructure, nor would the clearing of "natural forest", as defined within the Act, be required on the site.	DAFF	1998
National Water Act (NWA) (Act 36 of 1998)	The need for a WUL will be confirmed with the DWS during the 30-day review of the BA Report. Consultation with the DWS will also ensure that the relevant legislative requirements are complied with.	Department of Water Affairs	1998

	<p>Should any infrastructure need to be placed directly within an active channel of any freshwater resource, a WUL will be required and must be applied for by the proponent. In terms of Section 21 l a-i) of the NWA the relevant authorisation must be obtained from the DWS for any and all any activities that take place within the watercourses. The General Authorisations (GAs) for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA have been revised (Government Notice R509 of 2016). The proposed works within or adjacent to the wetland areas and river channels are likely to change the characteristics of the associated freshwater ecosystems and may therefore require authorisation. Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of a GA.</p>		
<p>Integrated Environmental Management (IEM) guideline series published by the DEA (various documents dated from 2002 to present)</p>	<p>The IEM Guideline series provides guidance on conducting and managing all phases and components of the required BA and PPP, such that all associated tasks are performed in the most suitable manner.</p>	<p>National DFFE</p>	<p>2002 - present</p>
<p>National Heritage Resources Act (Act 25 of 1999)</p>	<p>The proposed project may require a permit in terms of the National Heritage Resources Act (Act 25 of 1999) prior to any fossils or artefacts being removed by professional palaeontologists and archaeologists. Additional information regarding this is provided in the Heritage Impact Assessment.</p>	<p>National Department of Arts and Culture</p>	<p>1999</p>
<p>Conservation of Agricultural Resources Act (Act 43 of 1983)</p>	<p>The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) has categorised a large number of invasive plants together with associated obligations of the landowner. Invasive plant species that should be removed or maintained only under certain commercial situations are identified in terms of the CARA. This Act will be</p>	<p>Department of Rural Development, Agriculture and Land Reform</p>	<p>1983</p>

	<p>applicable to the project if and where such plants arise within or adjacent to the project area. Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. The Terrestrial Ecology Impact Assessment of this BA Report indicated. The number of declared Alien Invader Plants is limited (<i>Opuntia ficus-indica</i>, <i>Opuntia aurantiaca</i>, <i>Opuntia megapotamica</i>), but their distributions are widespread and a significant threat to biodiversity and the rural economy. A large population of <i>Agave americana</i> is situated on the adjacent property (Farm 225) and poses a threat in the long-term.</p>		
<p>Ciskei Nature Conservation Act of 1987</p>	<p>This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations.</p> <p>The Act provides lists of protected species for the Province.</p> <p>A collection/destruction permit must be obtained from Eastern Cape DEDEAST for the removal of any protected plant or animal species found on site.</p> <p>Several individuals of protected plant species that are protected by the Eastern Cape Nature Conservation Ordinance No. 19 of 1974 were observed in various parts of the project area. Euphorbia metformis were also observed in the project area as per the Terrestrial Impact Assessment.</p>	<p>Eastern Cape DEDEAST</p>	<p>1987</p>
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004)</p>	<p>This Act serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. The proposed development, may not necessitate any particular application for a change in land use from an ecological perspective, however the effective disturbance and removal of species identified in the Terrestrial Ecology Impact Assessment as well as possible other species (i.e. TOPS species), will require specific permission from the applicable authorities. In addition, the planting and management of exotic plant species on route, if and where required, will be governed by the Alien and Invasive Species (AIS) regulations, which were gazetted in 2014. These regulations compel</p>	<p>National DFFE</p>	<p>September 2004</p>

	landowners to manage exotic weeds on land under their jurisdiction and control.		
National Forests Act (No. 84 of 1998) (NFA)	<p>According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notices of the List of Protected Tree Species under the National Forests Act (No.84 of 1998) was published in GNR 734.</p> <p>The prohibitions provide that “no person” may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under license granted by the Minister.</p> <p>The species that is likely to occur in the site is <i>Sideroxylon inerme</i> (Milkwood) and is always associated with thicket clumps.</p>	National Department of Environment, Forestry and Fisheries	1998
Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)	<p>In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit. Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA is not required to be obtained.</p> <p>Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.</p> <p>Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA is not required to be obtained.</p>	National Department of Mineral Resources	2022
National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)	Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it	National Department of Environment, Forestry and Fisheries	1998

	<p>does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.</p> <p>While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the proposed infrastructure establishment, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and personnel for firefighting purposes.</p>		
<p>National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)</p>	<p>The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. <p>The waste cannot be blown away.</p>	<p>National Department of Environment, Forestry and Fisheries</p>	<p>2008</p>

	No listed activities are triggered by the proposed infrastructure establishment for Msenge WEF and therefore no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard.		
National Road Traffic Act (No. 93 of 1996) (NRTA)	<p>The technical recommendations for highways (TRH II): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>	SANRAL – national roads Eastern Cape DoT	1996

This BA Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental Management Act (No. 107 of 1998). This Section of the BA Report includes the following information required in terms of Appendix I:

- » (a) the details of the EAP who prepared the report and (ii) the expertise of the EAPs, including a curriculum vitae.
- » (b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.

4.3. Assessment of Issues Identified through the BA Process

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). The table provides a summary of the specialist assessment requirements identified for the project site in terms of the screening tool and responses to each assessment requirement based on the nature and extent of the project.

Table 4.4: Sensitivity ratings from the DEFF’s web-based online Screening Tool associated with the establishment of a 66kV powerline corridor, and the onsite substation for the Msenge Emoyeni WEF.

Specialist Assessment as per DFFE Screening Tool	Sensitivity Rating as per the Screening Tool (relating to the need for the 66kV Powerline)	Sensitivity Rating as per the Screening Tool (relating to the need for the on-site substation station)	Response to findings
Agricultural Impact Assessment	High	Medium	A Soil and Agricultural Potential Assessment has been undertaken and included as Appendix D of the BA Report.
Landscape/Visual Impact Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	A Visual Impact Assessment has been undertaken for the proposed project and is included in this BA Report as Appendix H
Archaeological and Cultural Heritage Impact Assessment	High	Low	A Heritage Impact Assessment (which considers the impact on both archaeological and cultural aspects of the study area and the development area) has been undertaken for the study and development areas and is included in this BA Report as Appendix I.
Palaeontological Impact Assessment	Very High	Very High	The Palaeontological Impact Assessment (included as Appendix I of the BA Report) includes an assessment of the potential impact on palaeontological resources within the study and development areas
Terrestrial Biodiversity Impact Assessment	Very High	Low	A Terrestrial Impact Assessment (including consideration of flora and fauna) has been undertaken for the

			proposed infrastructure development and is included as Appendix G of the BA Report.
Aquatic Biodiversity Impact Assessment	Very High	Low	An Aquatic Impact Assessment has been undertaken for the infrastructure development at Msenge Emoyeni WEF and is included as Appendix F of the BA Report.
Avifauna Impact Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	Given the nature of the proposed infrastructure and that additional grid infrastructure is included an Avifauna Impact Assessment has been undertaken (Appendix E).
Civil Aviation Assessment	Low	Low	The proposed development is located 53km to the north-west of the Grahamstown/Makhanda Aerodrome. The CAA will be consulted during the BA process in order to determine any potential impacts and/or specific requirements.
Defence Assessment	Low	Low	The proposed study area and development area is not located within the vicinity of any military bases.
Geotechnical Assessment	Screening Report did not include a rating for this theme;	Screening Report did not include a rating for this theme;	A Geotechnical Assessment is being undertaken as part of the design phase of the project, separate to the BA
Socio-Economic Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	As the proposed infrastructure will replace the powerline infrastructure originally authorised, for which a Social Impact Assessment was undertaken, an SIA has not been undertaken as part of the BA process.
Hydrological Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	The specialist that undertook the aquatic assessment has covered the hydrological regimes and impacts to

			hydrological regimes within the aquatic assessment (Appendix E).
Plant Species Assessment	Low	Low	A Terrestrial Impact Assessment (including flora and fauna) has been undertaken for the proposed infrastructure establishment during periods as per GN 1150 of October 2020, and is included as Appendix G of the BA Report.
Animal Species Assessment	High	High	

Based on the results of the screening, and from experience on similar projects and in the study area, the EIA project team has identified the following issues as requiring investigation.

Table 4.5: Issues identified for investigation and specialist consultants appointed to evaluate the potential impacts associated with grid infrastructure for the Msenge Emoyeni WEF

Issue/Assessment	Specialist Name	Specialist Company	Appendices
Heritage and Palaeontological Impact Assessments	Jenna Lavin	CTS Heritage	Appendix I
Terrestrial Impact Assessment	Dr Patsy Scherman	Scherman Environmental cc	Appendix G
Aquatic Impact Assessment	Dr Patsy Scherman	Scherman Environmental cc	Appendix F
Soil and Agricultural Potential Assessment	Marine Pienaar	Terra Africa	Appendix D
Visual Impact Assessment	Peter Velcich Byrony van Niekerk	NuLeaf Planning and Environmental (Pty) Ltd	Appendix H
Avifauna Impact Assessment	Chris van Rooyen	Chris van Rooyen Consulting	Appendix E

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the grid infrastructure proposed at the Msenge Emoyeni WEF. Issues were assessed in terms of the following criteria:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0-1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5-15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4;
 - * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;

- * 8 is high (processes are altered to the extent that they temporarily cease);
- * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1-5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely);
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- » The **status**, which is described as either positive, negative or neutral;
- » The degree to which the impact can be reversed;
- » The degree to which the impact may cause irreplaceable loss of resources;
- » The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$$S = (E+D+M) P;$$

S = Significance weighting.

E = Extent.

D = Duration.

M = Magnitude.

P = Probability.

The **significance weightings** for each potential impact are indicated as follows:

- » **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
- » **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);
- » **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

As the Applicant has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations, 2014 (as amended)), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. The Environmental Management Programmes (EMPrs) are included as **Appendix J to L**.

4.4. Assumptions and Limitations of the BA Process

The following assumptions and limitations are applicable to the studies undertaken within this BA process:

- » All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- » It is assumed that the development footprint for grid connection infrastructure corridor and onsite substation 300m radius identified by the developer represents a technically suitable site for the establishment of the grid connection infrastructure proposed for the Msenge Emoyeni WEF which is based on the design undertaken by technical consultants for the project.
- » This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other power generation alternatives.

Refer to the specialist studies in **Appendices D – I** for specialist study specific limitations.

4.5. Details and Expertise of the Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326), the applicant, Msenge Emoyeni Wind Farm (Pty) Ltd has appointed Nala Environmental (Pty) Ltd as the independent environmental consultant to undertake the Basic Assessment and prepare a Basic Assessment Report for establishment of new grid connection infrastructure associated with the authorised the Msenge Emoyeni WEF. Nala Environmental nor any of its specialists are subsidiaries of/or are affiliated to Msenge Emoyeni Wind Farm (Pty) Ltd. Nala Environmental declares that there are no interests in secondary developments that may arise out of the authorisation of the proposed infrastructure.

Nala Environmental (Pty) Ltd was established in 2020 as an enterprise of environmental consultants that provide services to the renewable energy, construction and infrastructure sectors. Nala Environmental is involved in integrated environmental and social consulting services. Our intellectually gifted team boasts the capacity and technical expertise to also provide project management services at all stages of project development and implementation. We are wholly women owned with a 100% black women shareholding.

The Nala Environmental team comprises:

- » **Arlene Singh.** She holds a Bachelor degree in Environmental Science and an Honours degree in Environmental Management and has 10 years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, public participation, environmental management plans and programmes. She is registered as an Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2019/898) and registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).
- » **Norman Chetsanga.** He holds Bachelor of Environmental Science. (Hons.) Pollution Science (2008), Bindura University of Science Education. He has 10 years of experience in the environmental management field. Vast experience in environmental impact assessments review, approval and associated environmental compliance inspections. Well experienced in environmental legislation interpretation and compliance thereof. Has also attained auditing skills in Health and Safety matters during his career. He is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).
- » **Charleen Smuts.** Charleen Smuts is operating as sole-proprietor trading as Ecofluence Consulting, based in Cape Town. She is an Ecological and Wetland Scientist, registered as a Professional Natural Scientist (Pri. Sci. Nat) in the fields Ecological Science and Botanical Science. She has gained 9 years of professional experience in the environmental sector in which she has been actively involved with numerous legislated environmental processes in South Africa working with a range of clients. She is skilful in the field of Geographic Information Systems (GIS) leading to involvement in numerous large and small-scale mapping projects.

- » **Justin Jacobs.** He holds a Bachelor's degree in Zoology from the University of Pretoria, and an Honours degree in Biological Sciences from the University of Cape Town.

Curricula Vitae (CVs) detailing the Nala Environmental team's expertise and relevant experience are provided in Appendix A

4.6. Planning context and Regulatory Context

4.6.1. Electricity Supply in South Africa

The development of the Msenge Emoyeni Wind Energy Facility and its associated infrastructure development in the Blue Crane Route Local Municipal area is being initiated at a time when there is a considerable need and demand for additional electrical power supply into the national grid especially from renewable sources. This need stems from severe constraints that are placed on Eskom's power supply due to aging infrastructure, multiple malfunctions as a result and growing economy that requires stable electrical power supply to continue its growth. There have been more frequent interruptions to coal supply to coal fired power plants that are also in need of maintenance work. The current power supply interruptions in South Africa results in periodic load shedding more frequently and has resulted in stunted economic growth and development.

The current electricity supply constraints experienced in South Africa are not temporary and are expected to increase with population and projected economic growth over time due to growing demand and anticipated declines in power generation from the existing coal power plants. As indicated by the Integrated Energy Plan (IEP) existing electricity generation capacity will decline from 2025, with power plant retirement anticipated by 2031, 2041 and 2048. It is anticipated that in 2050 approximately 20% of the current electricity generation capacity will remain. Large capital investments are therefore required in the electricity sector to maintain an adequate supply of power to support economic growth. There are various import options that have become available since 2020 as per the IRP, i.e. when new coal capacity is added along with new wind, solar and gas. The plan envisages a more diverse, and hence more stable, electricity generation system by 2050.

The need for diversity of the energy generation mix from renewable sources stems from international and local pressure on South Africa to reduce its carbon emissions. South Africa has one of the most carbon intensive economies in the world and has higher CO₂ emissions per GDP purchasing power parity (2002 figures) from energy and cement production (Green Jobs Study, 2011) than China or the USA. This makes the greening of the electricity mix of national importance. The energy sector accounts for approximately 83% of the total GHG emissions (DEA, 2014) as coal is the primary fuel for combustion in the energy sector and accounts for at least 85% of the countries power generation.

Wind energy is associated with exceptionally low lifecycle emissions and does not emit carbon dioxide (CO₂) in generating electricity. The construction period for a wind energy facility and its associated infrastructure is considerably shorter than that of coal fired power stations, and an income stream is made available to local communities through employment, training, land rental and the provision of local equity. The greenhouse gases (GHG) associated with the construction phase of the projects are offset within a very short period of time compared with the project's lifespan. In a water scarce country like South Africa, it is wind energy is not dependent on water consumption as compared to coal fired power stations and poses limited health risks, and environmental pollution.

The national Integrated Resource Plan (IRP) 2010 developed the preferred energy mix to meet the electricity needs over a 20-year planning horizon to 2030. In line with the national commitment to transition to a low carbon economy, 17 800 MW of the 2030 IRP target are expected to be from renewable

energy sources, with 5 000 MW to be operational by 2019 and a further 2000 MW (i.e. combined 7000 MW) operational by 2020. In terms of the IRP 2019, South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources.

Table 5: IRP 2019

	Coal	Coal (Decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37 149		1 860	2 100	2 912	1 474	1 980	300	3 830	499
2019	2 155	-2373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1 433	-557				114	300			
2021	1 433	-1403					300	818		
2022	711	-844			513	400	1 000	1 600		
2023	750	-555				1 000	1 600		500	
2024			1860				1 600	1 000	500	
2025						1 000	1 600		500	
2026		-1219					1 600		500	
2027	750	-847					1 600	2 000	500	
2028		-475				1 000	1 600		500	
2029		-1 694			1 575	1 000	1 600		500	
2030		-1 050		2 500		1 000	1 600		500	
TOTAL INSTALLED CAPACITY by 2030 (MW)		33364	1860	4600	5000	8288	17742	600	6380	
% Total Installed Capacity (% of MW)		43	2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)		58.8	4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

- Installed Capacity
- Committed / Already Contracted Capacity
- Capacity Decommissioned
- New Additional Capacity
- Extension of Koeberg Plant Design Life
- Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030
- Koeberg power station rated / installed capacity will revert to 1926 MW (original design capacity) following design life extension work.
- Other / Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility
- Short term capacity gap is estimated at 2000 MW

Figure 4.1: IRP 2019 as promulgated in October 2019

This plan provides for the development of 17GW of electricity from wind energy and 2088MW of new storage capacity by 2030. The establishment of the proposed grid connection infrastructure at the Msenge Emoyeni WEF would support the development of the WEF, and ultimately contribute towards this goal.

4.6.2. Eastern Cape Provincial Spatial Development Framework (PSDF) 2017

The Eastern Cape Provincial Spatial Development Framework (PSDF) 2017 states that an overarching goal for the Province is to promote socio-economic development and promote infrastructure development to, achieve positive cost benefits and economic spin offs.

The PSDF 2017 takes into consideration the effects of climate change and greenhouse gas (GHG) emissions, have on the Eastern Cape Province with drought conditions prevailing in the west, water shortages along the coastal region and storms damaging crops and buildings. The effect would increasingly undermine human development gains.

The infrastructure action plan refers to opportunities for strategically positioned renewable energy development. The PSDF also identifies key sectoral development action plans which are the key components of the PSDF. The overall energy objective for the Province also includes promoting the development of renewable energy supply areas which are strategically important for increasing the diversity of energy supply and creating employment opportunities.

4.6.3. The Eastern Cape Climate Change Response Strategy, 2011/Draft Climate Change Adaptation Action Plan for the Eastern Cape 2017

The Eastern Cape Climate Change Response Strategy (ECCCRS) consists of climate change mitigation, adaptation, and resilience. The strategy includes the key climate change risks, response options and a list of Climate Change Adaptation Programmes. The strategy also highlights proposed budgets and responsibilities. The key aspects of the ECCCRS are summarised as follows:

- Green energy production.
- Adaption activities include food security and rainwater harvesting.
- Mitigation activities including the reduction of greenhouse gas emissions and
- Resilience considers increasing the capacity of people and ecosystems to reduce emissions and adapt to climate change.

In the Eastern Cape Province, the DEA (now DFFE) has collaborated with the mandated department, the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT), to support the updating and revision of 2011 Eastern Cape Climate Change Response Strategy (ECCCRS 2011).

Beyond the ECCCRS, the Eastern Cape's focus has mainly been on mitigation and sustainable energy production. This has resulted in the development of plans including the Provincial Bioenergy Implementation Support Plan (2015) and the Eastern Cape Sustainable Energy Strategy (2012).

The development the grid infrastructure will support the development of the Msenge Emoyeni WEF. This WEF will assist in achieving (although only to a limited extent) the promotion of the provincial green economy of the Eastern Cape through the storage and later release of generated power from the Msenge Emoyeni WEF.

4.6.4. Local Policy and Planning Context

The local level of government in which grid infrastructure for the Msenge Emoyeni WEF is located in the Blue Crane Route Local Municipality within the Sarah Baartman District Municipality. The policies at both the district and local level contain objectives which are in line with the proposed project. This includes, economic growth, poverty alleviation, job creation and community upliftment.

Sarah Baartman District Municipality Integrated Development Plan (IDP), 2017 -2022 (2020/21)

The vision of the Sarah Baartman DM is "An innovative and dynamic municipality striving to improve the quality of life for all communities in the District." The mission of the Sarah Baartman DM is "Coordinate, support and provide sustainable services and promote socio- economic development."

The following strategic and development objectives have been identified for the Sarah Baartman DM:

- Become big contributor to the country's energy mix strategy

- Create an enabling environment for investment and growth
- Unlock the growth and development of potential sectors through partnerships and networks
- Create a learning environment in the Cacadu Development Agency (CDA)
- Build economic intelligence gathering and management capability
- Facilitate technical, managerial, life and other forms of skills for the broader Cacadu community

The municipality realises that renewable energy sector positions it to be one of the major areas of investment both within the country and internationally in the years ahead. The renewable energy sector, specifically wind energy development is an area of great emerging opportunity for the Eastern Cape. The proposed grid connection infrastructure will support the Msenge Emoyeni WEF, which will contribute to the renewable energy investment in the District.

As per the current IDP (2022-2027) that is currently available for review and comment it is recognized that renewable energy is poised to be one of the major areas of investment both within the country and internationally in the years ahead. The renewable energy sector is an area of great emerging opportunity for the Eastern Cape. It is a very dynamic sector currently, as the implications of extensive government commitment to renewable energy become apparent. The anticipated massive growth in this sector provides major opportunities for growth in job creation in the province because of the potential of the area to host major renewable energy generation infrastructure as well as the potential to be a major manufacturer of such infrastructure leveraging off the automotive sector.

This announcement is significant for the Eastern Cape as five of the eight successful wind farm developments are to be developed in the Eastern Cape. This translates into 70% of the total power to be generated from successful wind farms announced as successful bidders in the first window (i.e. 443.46MW) will be generated within the Eastern Cape. In addition to the significance for the Eastern Cape, the announcement of successful wind farm developments is particularly significant for Sarah Baartman District Municipality, as three of the eight approved wind farm developments are to be developed in the district, with an additional wind farm to be developed in Nelson Mandela Bay Municipality. The two largest energy generating wind farms, i.e. Cookhouse Wind Farm (135MW) and Jeffreys Bay (133.86MW) have been built and are operational.

The development of the Msenge Emoyeni Wind Energy Facility will help realise the 2050 vision of the Sarah Baartman District Municipality as leaders in alternative and renewable energy creation.

Blue Crane Route Local Municipality Draft Integrated Development Plan for 2021/2022

The Eastern Cape Province has lower levels of solar radiation in comparison with other provinces in South Africa. Wind generation initiatives in the Sarah Baartman District are fast growing with a large number of generation facilities under investigation. Opportunities in terms of energy generation from biomass and the manufacture of biofuel remained to be explored. However, it should be noted that large scale biomass production is dependent on agricultural infrastructure, sustainability and possible environmental impact. The Sarah Baartman District in comparison to the eastern side of the Eastern Cape has very low hydro power generation capacity / potential, however, distinct potential exists in the Blue Crane Route region along the Fish River.

The importance of wind energy generation in the district was confirmed by the announcement by the Department of Energy, three of the eight approved wind farm developments were developed in the district, with an additional wind farm in Nelson Mandela Bay Metro Municipality. The Bedford and Cookhouse region currently has 5 operational wind energy facilities.

The municipality realises the importance of renewable energy opportunities, specifically the importance of wind energy generation in the district and its contribution of electricity supply to the national grid. The proposed project is therefore in line with the municipalities vision in this regard as it will support the development of the Msenge Emoyeni WEF and its grid connection infrastructure.

Supporting Policy Documents:

Table 4.6: The main drivers for renewable energy projects are supported by the following International, National and Provincial (Eastern Cape) policy and planning documents.

Policy Document	Relevance to the proposed project
The Kyoto Protocol (2002)	The Kyoto Protocol is relevant as the proposed project will contribute to a reduction in the production of greenhouse gases by aiding in the provision of a renewable source of electricity and will assist South Africa in proving its continued commitment to meeting its international obligations in terms of reducing its emissions.
The United Nations Framework Convention on Climate Change (UNFCCC)	The UNFCCC is relevant as the proposed project will contribute to the reduction in the production of greenhouse gases by providing a renewable source of electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.
National Development Plan (2012)	The proposed project will contribute towards additional energy capacity in South Africa.
National Climate Change Response White Paper (2012)	The proposed project will provide an alternative to fossil fuel-derived energy generation i.e. the renewable source from the Msenge Emoyeni WEF and will contribute to climate change mitigation.
White Paper on Renewable Energy Policy (2003)	The proposed project is in line with the White Paper and the objectives therein to develop an economy in which renewable energy has a significant market share and provides access to electricity throughout South Africa, therefore contributing to sustainable development and environmental conservation.
Integrated Energy Plan for the Republic of South Africa (2003)	The proposed project is in line with the plan with regards to diversification of energy generation and the promotion of universal access to clean energy
Integrated Resource Plan 2019	The proposed project is in line with the IRP 2019 with respect to the energy mix and movement to a low carbon targets up to 2030.
Long Term Mitigation Scenarios (2007)	The proposed project will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.
Strategic Infrastructure Projects (2020)	The proposed project will contribute to SIP project role out.

When considering the overall need for the development of the Msenge Emoyeni Wind Energy Facility and consequently the proposed transmission infrastructure, it is clear from the above that renewable energy is strongly supported from a planning and policy perspective on the national, provincial, district, and local level.

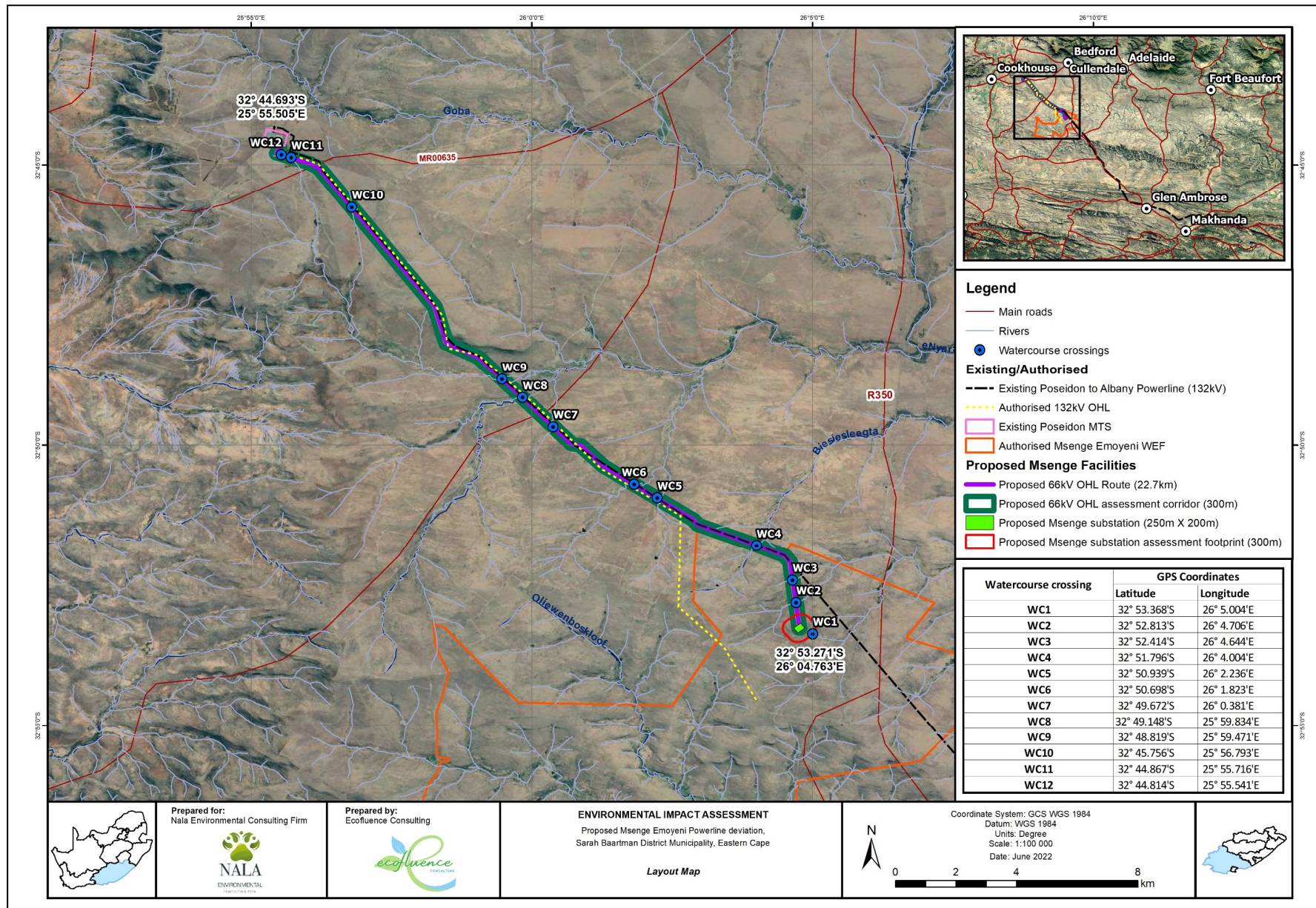


Figure 4.1: Map illustrating the 300m powerline corridor and the proposed onsite substation associated with the authorised Msenge Emoyeni WEF

4.7. Overview of the public participation

4.7.1. Overview of the Basic Assessment Process undertaken for establishment of grid connection infrastructure for the Msenge Emoyeni WEF

Key tasks undertaken for the BA included:

- Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- Pre-Application Meeting with the DFFE to determine the requirements of the Basic Assessment process and present the public participation plan.
- Submission of the completed Application for Environmental Authorisation to the competent authority (i.e. DFFE) in terms of Regulations 5 and 6 of the EIA Regulations, 2014 (GNR 326), as amended.
- Undertaking a public participation process in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project
- Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended and the relevant Specialist Protocols defined in Government Notice 320 of 20 March 2020, as per the DFFE Screening Tool report and as relevant.
- Preparation of a BA report and EMPr's in accordance with the requirements of Appendix 1 and Appendix 4 of GNR326.
- 30-day public and authority review period of the BA report.
- Compilation of a Comments and Responses (C&R) report detailing the comments raised by IGAPs, addressing these comments in detail and finalisation of the BA report.
- Submission of a final BA report to the DFFE for review and decision-making

4.7.2. Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

In terms of Government Notice 779 of 01 July 2016, the National Department of, Forestry, Fisheries and Environment (DFFE) is the competent authority for all projects related to the IRP. As the project is located within the Eastern Cape Province, the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEA&T) is the commenting authority. Consultation with the regulating authorities (i.e. DFFE and ECDEDEAT) as well as with all other relevant Organs of State has been undertaken and will continue throughout the BA process. To date, this consultation has included the following:

- » Undertaking of a pre-application consultation meeting with the DFFE.
- » Submission of a Public Participation Plan for approval prior to the commencement of the process.
- » Submission of the application for Environmental Authorisation to the DFFE.
- » Submission of the BA Report for review and comment by:
 - * The competent and commenting authorities.
 - * State departments that administer laws relating to a matter affecting the environment relevant to an application for Environmental Authorisation.
 - * Organs of State which have jurisdiction in respect of the activity to which the application relates.

As per the approved Public Participation Plan, all correspondence with authorities has been via electronic communication/electronic formats. A record of all authority correspondence undertaken during the BA process is included in **Appendix C**.

4.7.3 Public Participation Process

Public participation is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended) is an essential and regulatory requirement for an environmental authorisation process. The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this proposed project.

The sharing and availability of information forms the basis of the public participation process and offers the opportunity to I&APs to become actively involved in the BA process from the commencement of the public participation process. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process the Nala Environmental website will allow for the following:

- Enables a wider reach, allowing more widespread consultation for projects, not just in the immediate project area but also within the surrounding towns/cities.
- Allows stakeholders and I&APs the opportunity to engage on a project from anywhere in South Africa and at any time.
- Enables stakeholders and I&APs to express their interest in a project and register on the project (for inclusion on the project database).
- Enabling the EAP and stakeholders/I&APs to meet virtually, therefore avoiding any risk associated with COVID-19.
- Allows for instant messaging via the whatsapp to chat function

The public participation process therefore aims to ensure that:

- » Public participation is facilitated in such a manner that all I&APs are provided with an opportunity to comment on the project and ensure that I&AP's are made aware of the proposed project in their community, municipality and town.
- » Adequate review period is provided for I&APs to comment on the findings of the BA Report.
- » Different ways are made available to I&APs to correspond and submit their comments i.e. the Nala Environmental website via WhatsApp to chat function, fax, post, email, WhatsApp, SMS and Telegram.
- » Different platforms are made available to I&AP's to undertake meetings to discuss aspects related to the project or to present the findings of the project when taking the current COVID-19 restrictions i.e. telephonic, MS Teams, Zoom or WhatsApp video calls.
- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review, this can be provided via hard copy documentation, and available via download from the Nala Environmental website, WeTransfer or DropBox.
- » The information presented during the public participation process is presented in such a manner that it avoids the possible isolation of the public and prevents them from participating.

A Public Participation Plan was prepared and submitted to the DFFE on **31 March 2022**. Approval of the Plan was provided by the DFFE Case Officer via email on **31 March 2022 (Appendix C9)**.

Tasks undertaken as part of the public participation process are described in the section which follow.

i. Stakeholder identification and Register of Interested and Affected Parties

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—

- (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
- (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and

(c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

IGAPs have been identified through a process of networking and referral and obtaining information from liaison with potentially affected parties in the greater surrounding area, through databases previously used for the Msenge Emoyeni Wind Energy facility and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project through either directly contacting the Nala Environmental via email or fax or use of the WhatsApp to chat function on the Nala Environmental website. An initial list of key stakeholders identified and registered is listed in **Table 4.7**.

Table 4.7: List of Stakeholders identified for the inclusion in the project database during the public participation process for establishment of 66kV powerline, 33kV/132kV on-site substation associated access tracks and watercourse crossings for the Msenge Emoyeni WEF

National Government Department	<ul style="list-style-type: none"> ➤ Department of Mineral Resources and Energy (DMRE) ➤ Department of Forestry, Fisheries and the Environment (DFFE) ➤ Department of Agriculture, Rural Development and Land Reform (DARDLR) ➤ Department of Water and Sanitation (DWS)
Government Bodies and State-Owned Companies	<ul style="list-style-type: none"> ➤ Eskom Holdings SOC Limited ➤ National Energy Regulator of South Africa (NERSA) ➤ South African Civil Aviation Authority (CAA) ➤ South African Heritage Resources Agency (SAHRA) ➤ South African National Roads Agency Limited (SANRAL)
Provincial Government Departments	<ul style="list-style-type: none"> ➤ Eastern Cape Department: Rural Development and Agrarian Reform ➤ Eastern Cape Department of Economic Development, Environmental Affairs and Tourism ➤ Eastern Cape Department of Roads and Public Works ➤ Eastern Cape Provincial Heritage Resources Authority
Local Government Departments	<ul style="list-style-type: none"> ➤ Sarah Baartman District Municipality ➤ Blue Crane Route Local Municipality
Key Stakeholders	<ul style="list-style-type: none"> ➤ BirdLife South Africa ➤ Endangered Wildlife Trust (EWT)
Landowners	<ul style="list-style-type: none"> ➤ Neighbouring landowners, tenants and occupiers

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and IGAP information has been recorded within a register of IGAPs (refer to Appendix C1 for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, 4.1 of the Public Participation Guidelines has been followed. The register of IGAPs contains the names of:

- all Organs of State that hold jurisdiction in respect of the activity to which the application relates; and all persons who submitted written comments or.
- everyone who requested to be registered on the database through via writing in, emailing and sending their feedback through the whatsapp to chat function and disclosed their interest in the project; attended virtual meetings during the public participation period.
- IGAPs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of IGAPs will be an on-going process for the life-cycle of the Basic Assessment process.

ii. Interested and Affected Parties & Stakeholder Notifications

- (b) Giving written notice, in any of the manners provided for in section 47 D of the Act, to—
- (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, and to any alternative site where the activity is to be undertaken;
 - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) The municipality which has jurisdiction in the area;
 - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) Any other party as required by the competent authority;

An inception notice, which included a Background Information Document (attached as Appendix C2), was circulated on the **17th of June 2022** to all I&APs via email, registered mail and telephonically. All notification proofs are provided in **Appendix C3**. All I&APs were notified on the **21st of June 2022** of the availability of the BAR for public review by means of email, registered mail and telephonically (all notifications and proofs are attached in Appendix C3).

iii. Newspaper Advertisements

- Placing an advertisement in—
- (i) One local newspaper; or
 - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
 - (d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);

A newspaper advertisement was placed in the (Eastern Cape) Herald on the **17th of June 2022** in order to notify the general public of the proposed development. The advert invited I&AP's and stakeholders to register as an interested or affected party on the project so that all project information and information regarding the availability of the documentation can be made available to them and where project information could be obtained. Proof of placement is provided in Appendix C3.

iv. Review of Basic Assessment report

The BA has been made available for the 30 -day review period from **22 June 2022– 21 July 2022**. Notifications regarding the availability of the draft BAR for review and comment were circulated to I&APs at the commencement of the review period. I&APs were encouraged to view the reports and submit written comments. Electronic copies of the BA were circulated to Organs of State, at the onset of the review period. Hard copies of the report were couriered to Organs of State that have requested it. A copy of the report and related appendices were made available in tablet format at the JG Farr Memorial Library in Bedford. Electronic copies of the BA report and appendices has been made available at the on the Nala Environmental website for download and review in the reader's own time.

v. Issues raised by Interested & Affected Parties

The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and recordings of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these regulations.

Formal comments and issues that have been raised by IGAPs regarding the proposed grid infrastructure will be included and responded to in the Comments and Responses report (Appendix C8). Proof of all comments received will be presented in the Final Basic Assessment Report once the review period is completed and presented in Appendix C8. The minutes of the virtual meetings hosted by Nala Environmental where IGAP's raised queries and addressed during the 30-day comment period will also be made available in an added Appendix C6.

vi. Advertisements and Notifications

According to Regulation 4(2) of the NEMA EIA Regulations 2014 (and subsequent 2017 amendments) "The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by:

- (a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—
 - (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - (ii) Any alternative site.

During the initial site visit, five site notices in English were placed on site at various strategic public points along the route of the proposed powerline properties and public locations (see Appendix C3 for proof of placement). The site notices were placed at each of the following locations:

Site Notice No.	Co-ordinates
Blue Crane Route Local Municipality Offices (Somerset East)	32°43'09.35"S 25°35'04.85"E
Site notice 1 (Remainder of Farm Leeuw Fontein No. 221)	32°5'11.1"S 26°0'55.1"E
Site notice 2 (fencing of Remainder of Farm 260 No. 260)	32°45'57.26"S 26°01'52.15"E
Site notice 3 (fencing of Remainder of Farm 242 No. 242)	32°44'57.92"S 25°56'12.39"E
JG Farr Memorial Library, Bedford	32°40'41.61"S 26°05'18.32"E

SECTION 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section provides a description of the environment that may be affected by the deviation of the authorised overhead powerline and development of an on-site substation and associated infrastructure associated with the authorised Msenge Emoyeni Wind Energy Facility. The information is provided in order to assist the reader in understanding the pre-development environment and the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical and social environments that could be directly or indirectly affected by the development or could affect proposed infrastructure have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this BA process is being conducted.

5.1. Regional Setting

The Eastern Cape Province is in the south-eastern extent of South Africa and constitutes South Africa's second largest province, occupying an area of 168 966km² representing 13.9% of South Africa's land mass. The dry western interior is one of the country's premier sheep-rearing destinations. Currently, the population of the province is estimated at 6 734 001, and a population density of 39/km². The capital city is Bhisho, and other important towns include Gqeberha (formerly known as Port Elizabeth), East London, Makhanda (previously Grahamstown), Mthatha (previously Umtata), Graaff Reinet and Cradock. It is bordered by the Western Cape, and Northern Cape provinces to the west and north-west, Free State and Lesotho, and KwaZulu-Natal provinces to the north and east, and the Indian Ocean to the south. The Great Fish River is a significant feature running 644km through the province.

The Eastern Cape is considered to be one of South Africa's poorest provinces. Widespread poverty is evident in the province as subsistence agriculture dominates in the former homelands. The province has excellent agricultural and forestry potential. The fertile Langkloof Valley in the south-west has enormous deciduous fruit orchards, while the Karoo interior is an important sheep-farming area. The Alexandria-Makhanda area produces pineapples, chicory and dairy products, while coffee and tea are cultivated at Magwa. People in the former Transkei region are dependent on the farming of cattle, maize and sorghum.

The metropolitan economies of Port Elizabeth and East London are based primarily on manufacturing, the most important industry being motor manufacturing. The province is the hub of South Africa's automotive industry.

The Eastern Cape is made up of six (6) district municipalities, namely Alfred Nzo, Amathole, Chris Hani, Joe Gqabi, OR Tambo, and Sarah Baartman (refer to **Figure 5.1**).

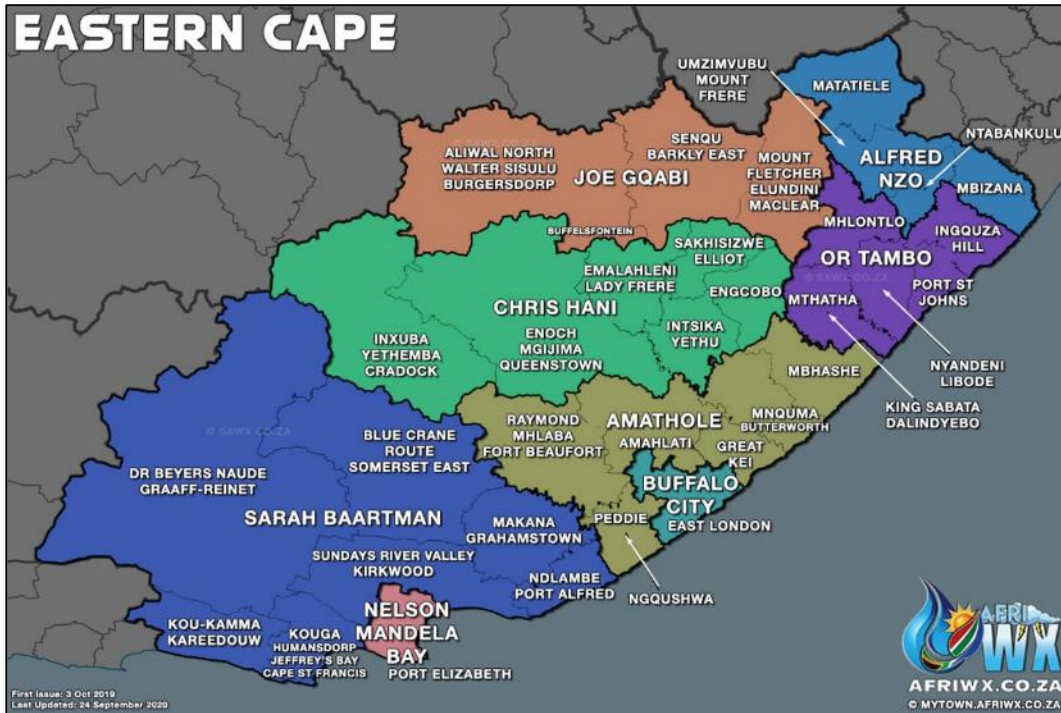


Figure 5.1: District municipalities of the Eastern Cape Province (Source: AfriWX South Africa)

The Sarah Baartman District Municipality (DM), within which the project site located, is situated in the south-western extent of the province and is a Category C municipality. The Sarah Baartman DM biggest municipality in the province covering an area of 58 245km² and is also one of the largest contributors to provincial GDP. Large commercial farms in the Karoo produce high-quality meat, wool and mohair, while the coastal belt has dairy farming and some forestry. The Kouga Valley is a big deciduous fruit producer, while the Kirkwood/Addo area is known for its citrus. Sarah Baartman DM has three of the region’s national parks and several private game farms. Makana hosts the National Arts Festival, Rhodes University and several fine schools.

The seat of the Sarah Baartman DM is the city of Gqeberha (formerly known as Port Elizabeth), although Gqeberha is not itself in the district. Other prominent cities and towns located within the DM include, Cookhouse, Graaff- Reinet, Makhanda, Somerset East. The main economic activities within the DM include agriculture (mohair), and tourism.

The Sarah Baartman DM comprises seven (7) local municipalities (LMs), namely Blue Crane Route, Dr Beyers Naude, Kouga, Koukamma, Makana, Ndlambe, and Sundays River Valley (refer to **Figure**).

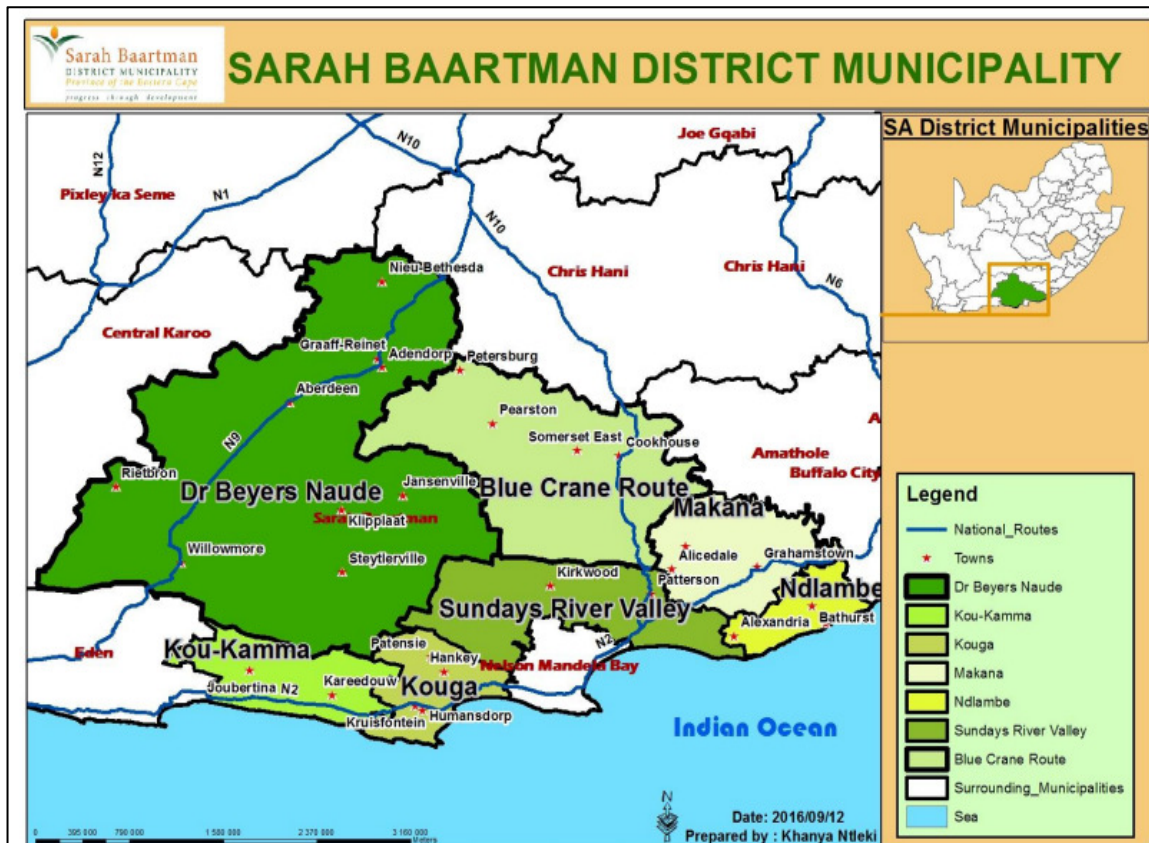


Figure 5.2: Local Municipalities of the Sarah Baartman DM (Source: IDP SBDMP; 2017-2022)

The project site for the establishment of 66kV powerline, 33kV/132KV on-site substation, associated access tracks and watercourse crossings for the authorised Emoyeni WEF is located in the Blue Crane Route Local Municipality (LM). The LM is a Category B municipality and is the second largest in the Sarah Baartman DM covering an extent of 11 068km². The key towns in the LM include Cookhouse, Somerset East, and Petersburg.

Transport and communication is the biggest contributor of the LM's GDP at 22.8%, followed by the government (18.8%), finance and business services (12.2%), manufacturing (12%), agriculture (11.3%), wholesale and retail trade (10.2%), community services (9%), and construction (2%) sectors.

In 2016 the estimated population of the Blue Crane Route LM was approximately 36 063 which accounts for 8% of the population of the Sarah Baartman District Municipality. The Blue Crane Route makes up 19% of the District Municipality's landmass with a population density of 3.25/km². The poverty levels are high with 46.1% of the population not receiving any income as per the StatsSA 2011 survey.

The closest towns to the authorised Msenge Emoyeni WEF are Cookhouse and Bedford, located approximately 28km to the north-west and 20km to the north respectively.

5.2. Climatic Conditions

The climate of the project area is defined in Figure 5.3. below. The climate is warm and temperate in Bedford. There is significant rainfall throughout the year in Bedford. Even the driest month still has a lot of rainfall. The climate here is classified as Cfb by the Köppen-Geiger system. The average annual temperature is 16.3 °C in Bedford. About 644 mm/25.4 inch of precipitation falls annually. The driest month is June, with 23 mm/0.9 inch of rainfall. Most precipitation falls in January, with an average of 82 mm | 3.2 inch. The warmest month of the year is January, with an average temperature of 20.9 °C. In July, the average temperature is 11.4 °C. It is the lowest average temperature of the whole year

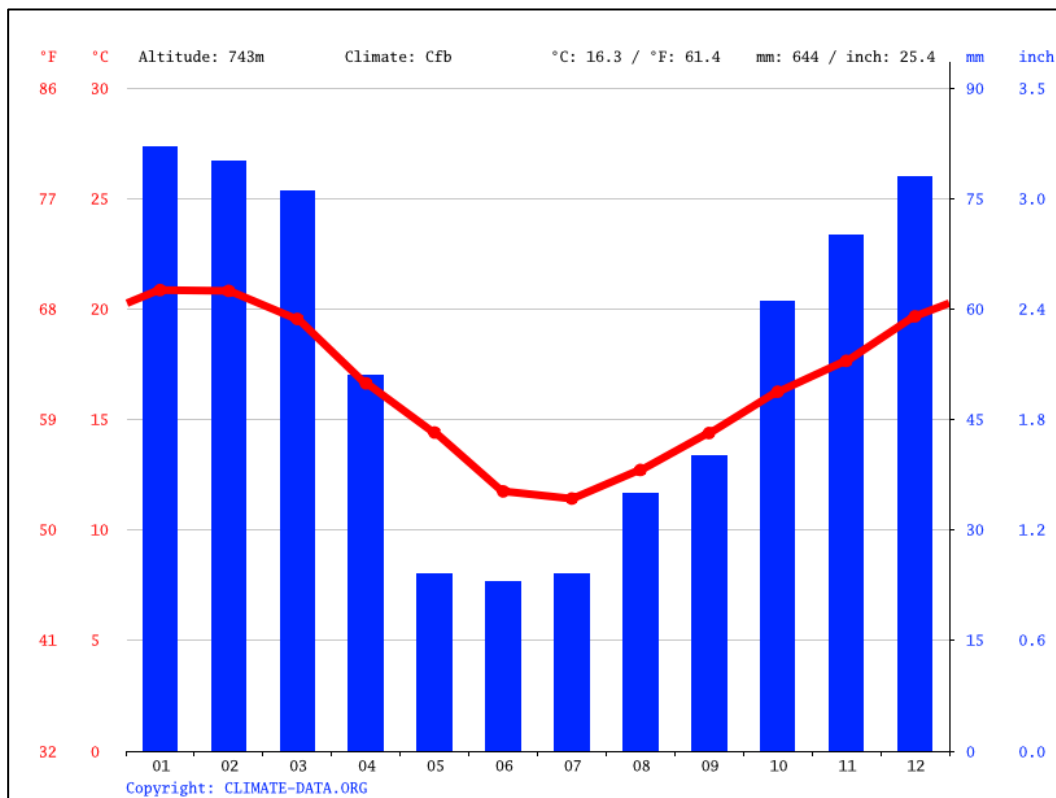


Figure 5.3: Climate for the project area (Climate data.org)

5.3. Land use, Landcover and Landscape

The land use for these soils is livestock and game farming. No irrigation infrastructure, such as centre pivots, are present within the project. The Msenge grid deviation area is currently used for livestock and game farming and can support approximately 91 head of cattle at the long-term grazing capacity of 8ha/LSU (DALRRD, 2018). However, it is not anticipated that livestock and game farming will be excluded from the area and livestock that animals will be allowed to graze in the areas around the power line pylons. The dominant land capability class within the grid deviation, is Low-Moderate (Class 07). The highest land capability class within this area is Moderate-High (Class 09) which is in the middle of the study area and only occurs in very small areas. Land adjacent and further away from the Msenge grid deviation consists of a similar mixture of land capability class than that within the grid deviation corridor.

Visual Landscape

The study area occurs on land that ranges in elevation from about 620m above sea level (a.s.l.) to 960m a.s.l. The topography consists of flats and gently undulating plains interspersed with hills and rocky outcrops. The vegetation in the study area is relatively homogeneous. The broader study area is situated predominately within the Bedford Dry Grassland vegetation type. Therefore, land cover consists primarily of open, dry grassland interspersed with Acacia karroo woodland vegetation (especially along the drainage lines). Visually, the plants comprise low growing, small arid shrubs and tufted grasses, with scattered slightly taller shrubs and trees. Given the predominately dry grassland vegetation, the vegetation cover is sparse. The natural vegetation occurring, therefore, provides little to no visual cover for any built structures but the clusters or rows of trees (usually close to farm houses and roads) may provide height and effective visual screening for sensitive receptors at these sites. This region receives approximately 310 – 550 mm of precipitation per annum and is devoid of any rain fed agriculture or cultivation. The predominant land uses occurring throughout the region are livestock (sheep, goats and cattle) farming.

It is uncertain whether all of the potentially affected homesteads / farmsteads are inhabited or not. It stands to reason that the farmsteads that are not currently inhabited will not be visually impacted upon at present. These farmsteads do, however retain the potential to be affected visually should they ever become inhabited again in the future. Several secondary and internal farm roads cross the study area. It must be noted that all secondary roads and internal farm roads are gravel roads unlikely to carry much traffic. There are no formally protected or conservation areas present within the study area, but the greater environment has a vast, undeveloped and rugged character. Settlements, where these occur, are very limited in extent and domestic in scale. The greater environment with its wide open, undeveloped landscapes is considered to have a high visual quality and this study area is not known as tourist destination.

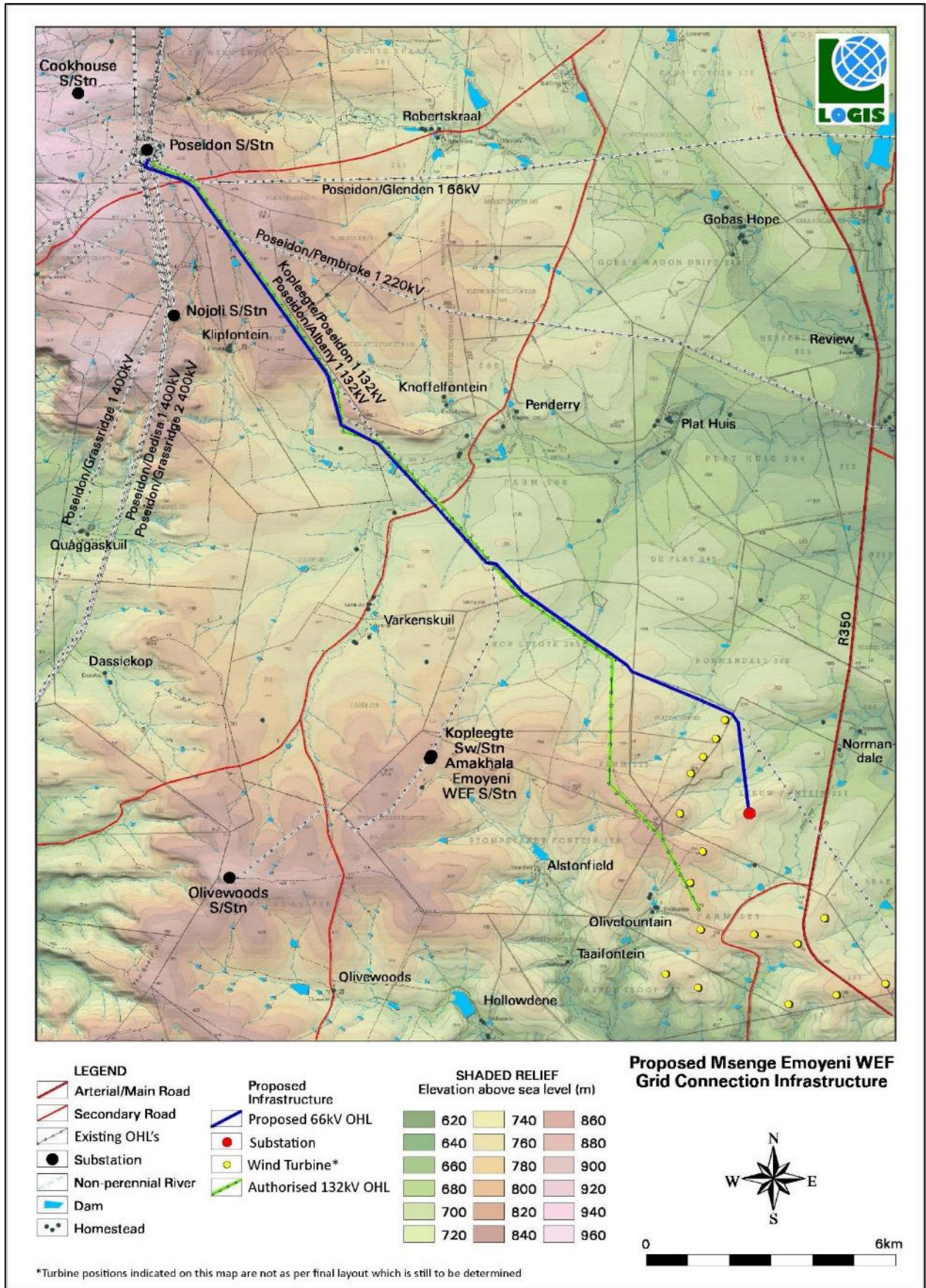


Figure 5.4: Shaded relief map of the study area

5.4. Soil and Land Types

The soil profiles classified within the Msenge grid deviation consists of natural soil profiles (undisturbed by human activities). Four different natural soil forms have been identified within the grid corridor and the collector substation study area.

- The Mispah soils have shallow soil depths (100-300 mm) The effective soil depth of the Mispah soils is restricted by solid and fractured rock. In some areas, the solid rock is visible on the surface as rock outcrops (as shown in Figure 6 of the Soils and Agricultural potential specialist report **Appendix D**). The Mispah soil form was found throughout the study area and covered most of the site (386.6 ha). The entire study area for the collector substation also consists of soils of the Mispah form.
- The Coega soil form covers the second largest area within the grid deviation corridor. The total area of Coega soils is 131.8 ha. These soils are found in three separate areas in the southern half of the powerline corridor. The Coega soil form consists of an orthic horizon on hard carbonate. The effective soil depth of these soils is restricted by solid and fractured hard carbonate.
- The Swartland soil covered 85.2 ha of the grid deviation corridor and was found only in the northern end of the corridor. The Swartland soil form consists of orthic topsoil overlying a pedocutanic subsoil horizon. The pedocutanic horizon of these soils reaches a soil depth of 500 mm from where it is underlain by a lithic C horizon that is 300 mm thick.
- The Spioenberg soils are present in four different areas, covering a total area of 127.1 ha within the grid deviation corridor and collector substation study area. The Spioenberg soil form also consists of orthic topsoil overlying a pedocutanic subsoil horizon. However, the pedocutanic horizon of the Spioenberg soils reaches only a soil depth of 400 mm from where it is underlain by hard rock.

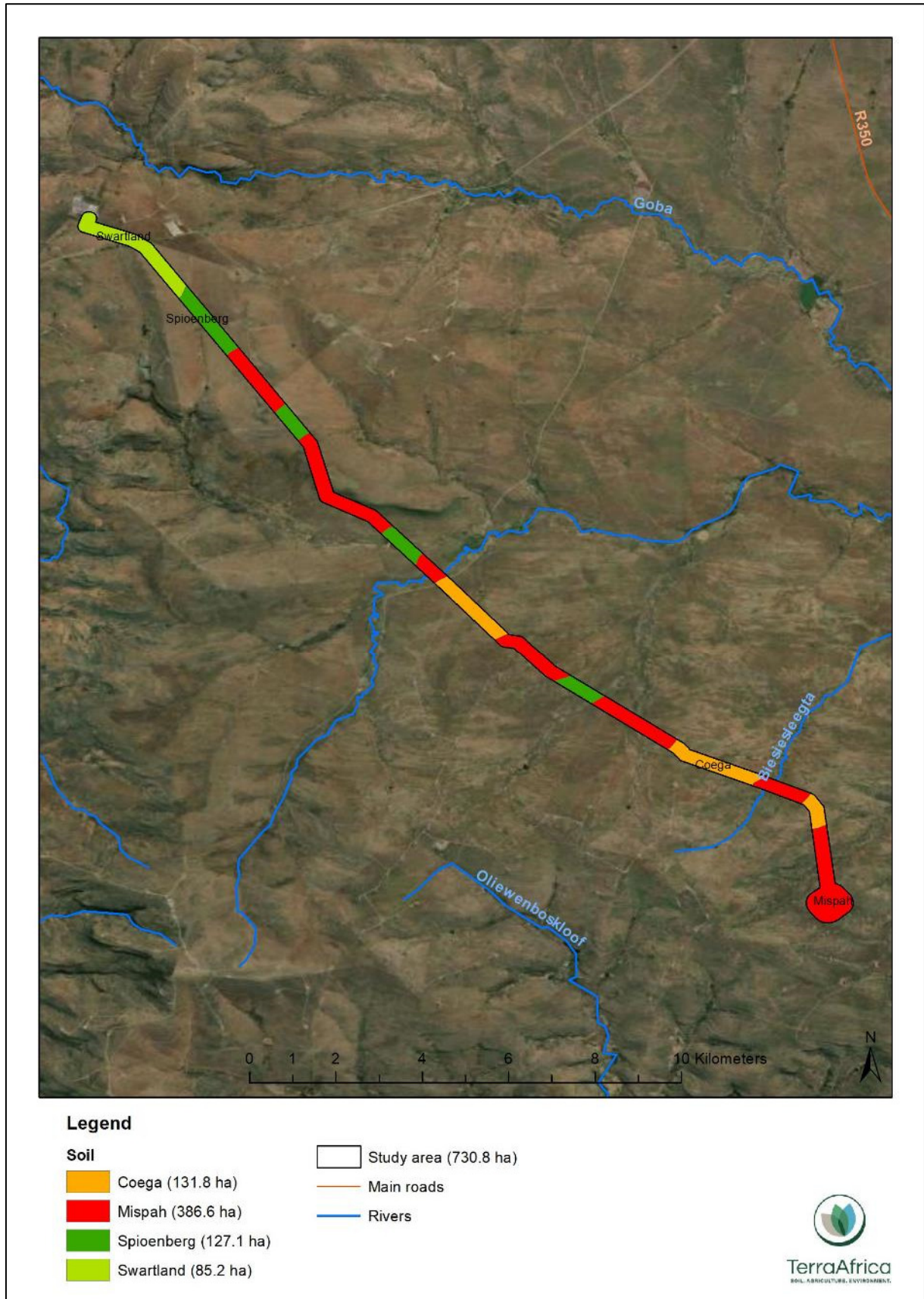


Figure 5.5: Soil classification map of the Msenge Emoyeni Grid Deviation

5.5. Hydrology and Surface Water

The Msenge Emoyeni WEF is located in the Great Fish River catchment of Water Management Area (WMA) 7, i.e. the Mzimvubu to Tsitsikamma WMA. The study area straddles quaternary catchment Q91A draining south into the Oliewenboskloof and Riet rivers; and Q92F, draining north into the Biesiesleepte and eNyara rivers.

The freshwater (aquatic) landscape in the footprint of the proposed infrastructure predominantly falls within ESA I. Two of the water course crossings are classified as CBA 1 areas and several CBA 2 areas occur within close proximity to the buffer zone of the DHL.

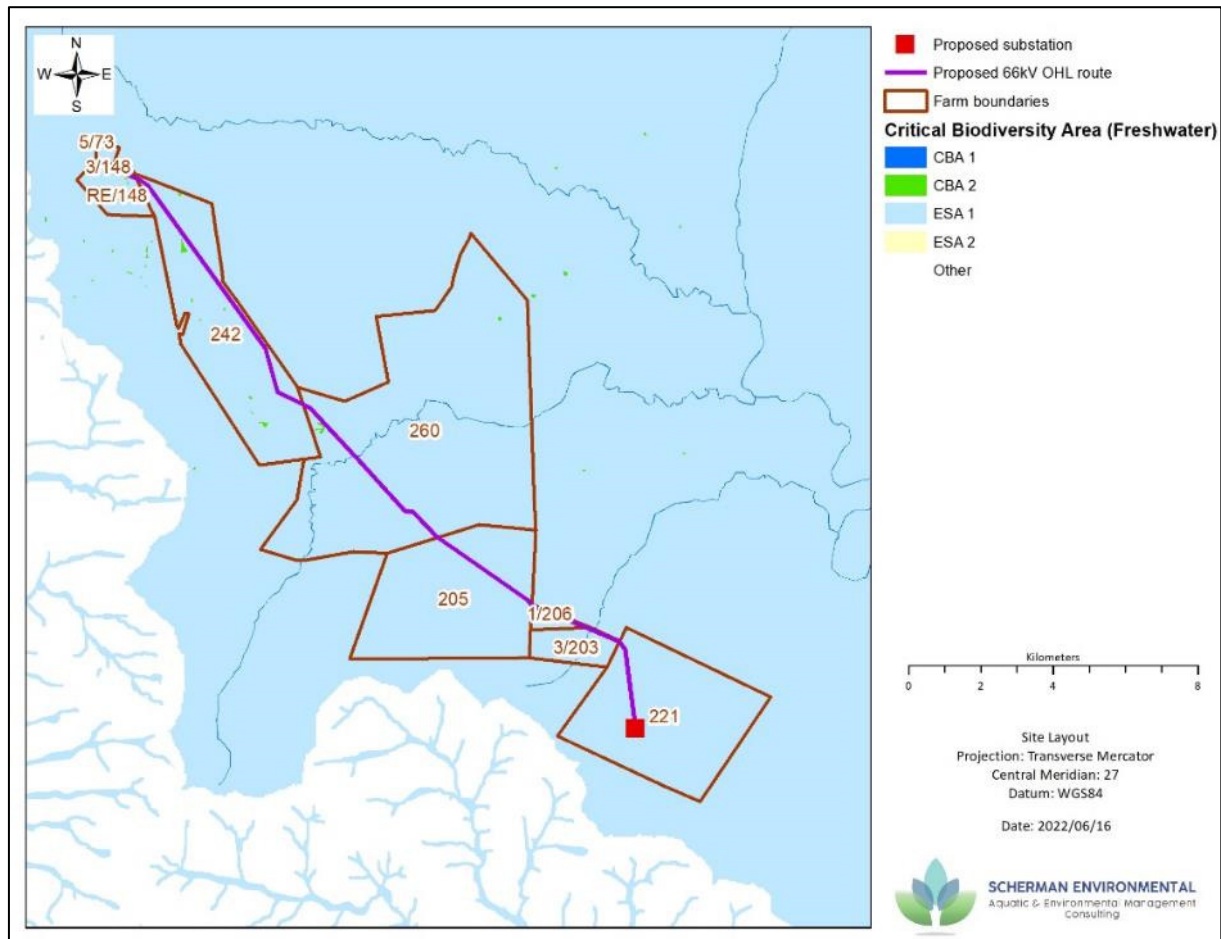


Figure 5.6: Map of aquatic CBAs and ESAs identified for the study area

The present state categorisation for the main river systems across the site – Biesiesleepte (SQR Q92F-07942) and eNyara (SQR Q92F-07889) was a C category, i.e. Moderately Modified according to DWS (2014). This assessment was confirmed by Colloty (2013) and TBC (2020). No change is apparent on the site, confirming the C categorization for drainage features across the site.

The National Protected Area Expansion Strategy (NPAES), updated in 2017, presents a 20-year strategy for the expansion of protected areas in South Africa for improved ecosystem representation, ecological sustainability and resilience to climate change (DEA, 2016). The proposed powerline corridor and associated infrastructure does not fall within the 2017 NPAES.

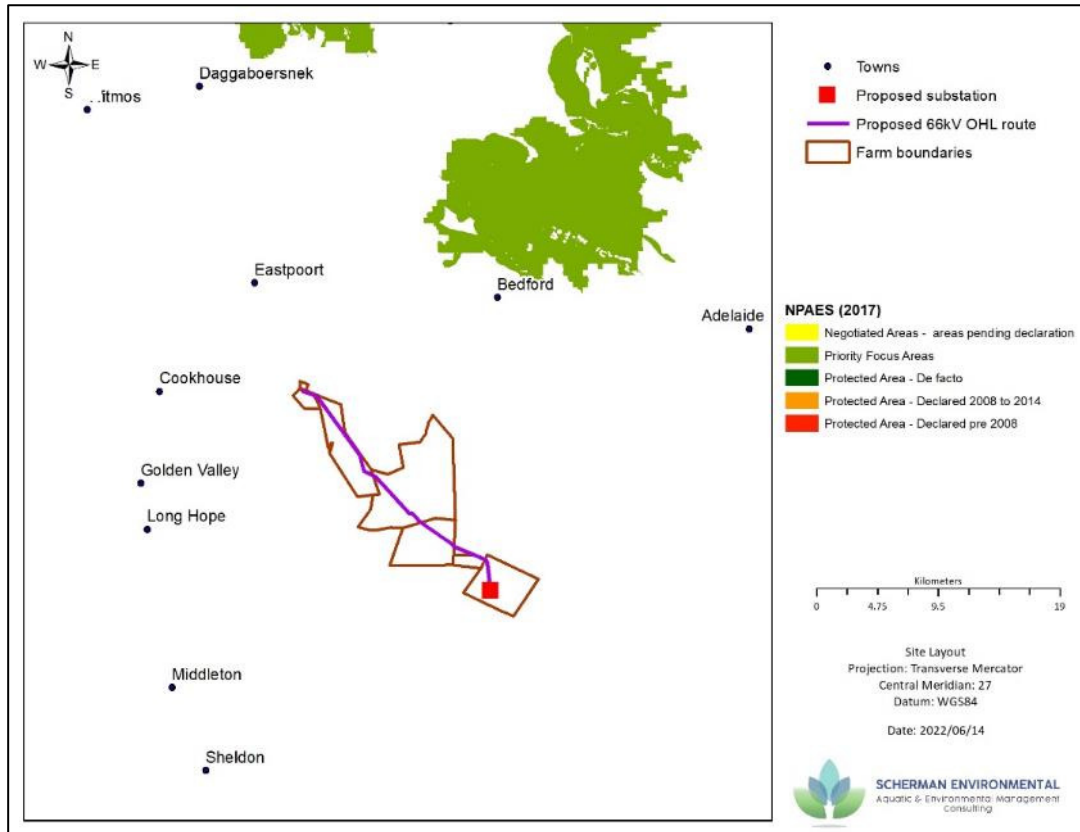


Figure 5.7: Protected areas in the Bedford district (according to NPAES, 2017)

In terms of the NBA 2018 IUCN Red listing of Ecosystems, the Msenge site falls within the classification Least Concern. An ecosystem type has to have > 60% of its total extent in a good OR moderately modified (A, B or C ecological category) to be classified as Least Concern.

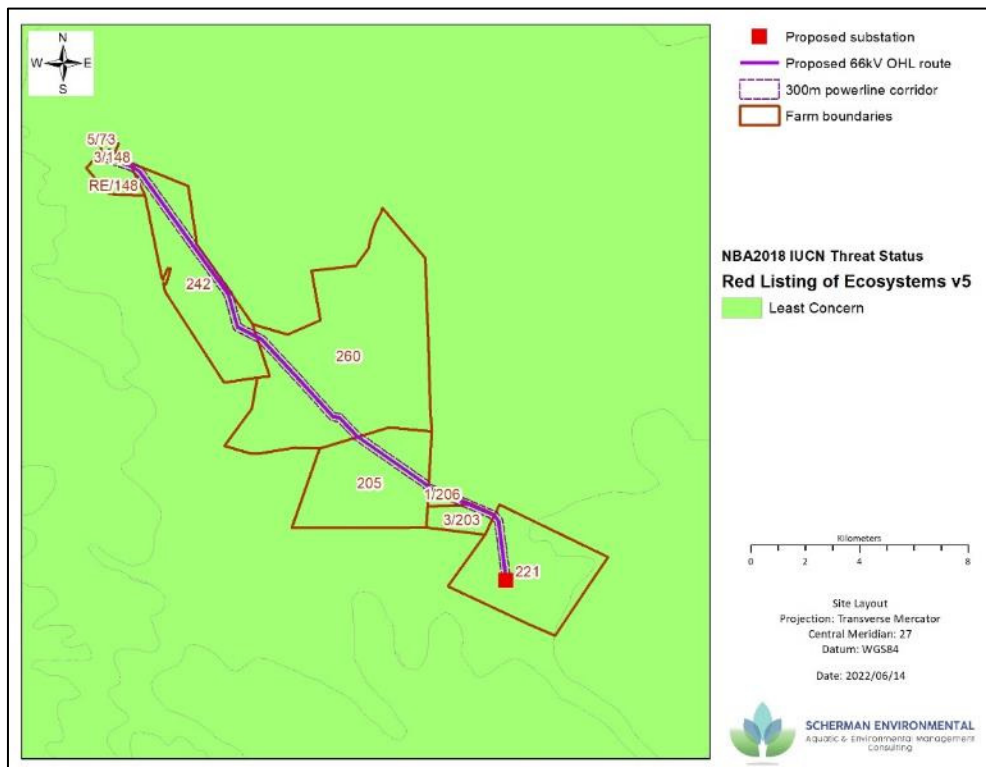


Figure 5.8: Ecosystem threat status classification for the Msenge site (NBA, 2018)

The Strategic Water Source Areas (SWSA) map for South Africa shows that no SWSAs are found in the Bedford/Cookhouse area.

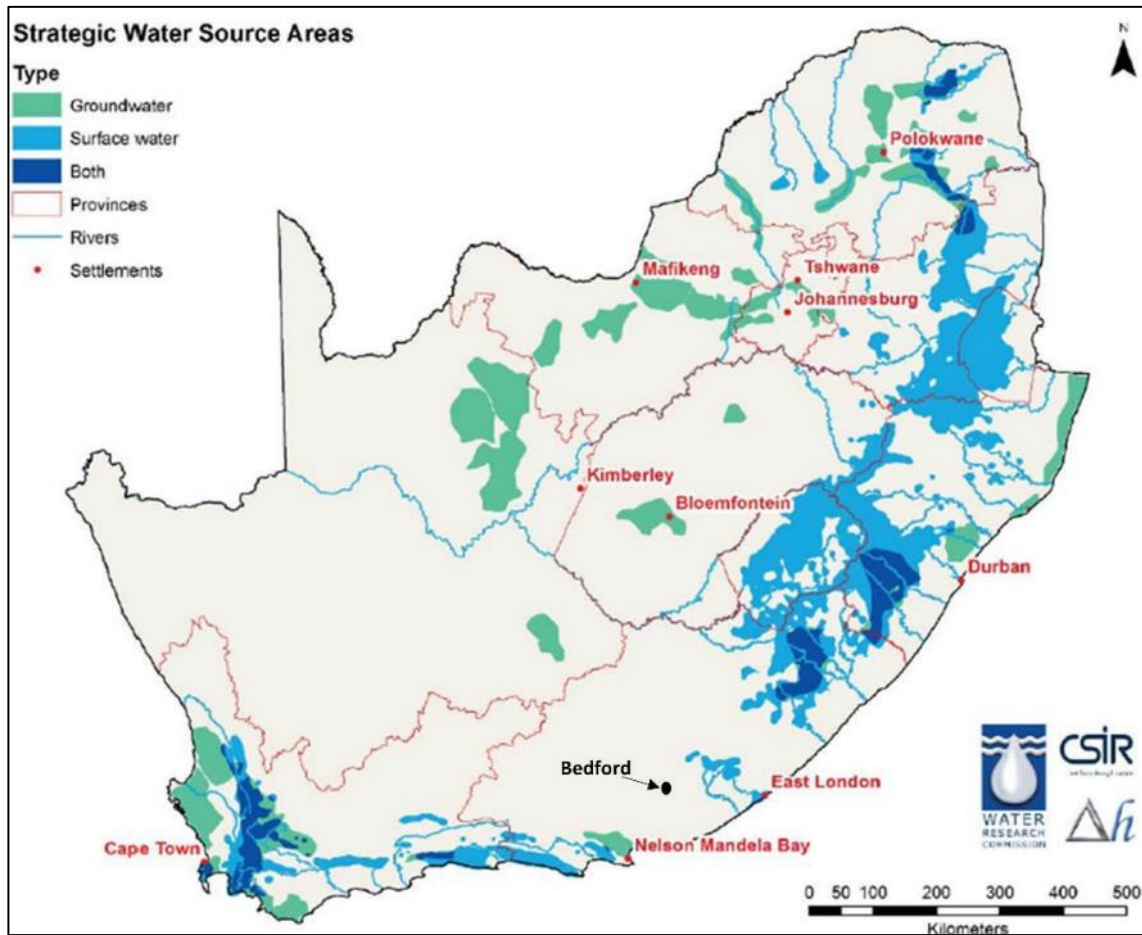


Figure 5.9: Strategic Water Sources Areas identified in South Africa (Le Maitre, 2018a)

As per the findings of the specialist assessment, the following hydrological features were seen along the powerline corridor (Refer to Appendix I of the Aquatic Impact Assessment report Appendix F):

- Extensive farm dams, mostly in-channel;
- Off-channel dams and livestock watering points;
- Other artificial features such as quarries;
- Few natural wetlands, with most being outside the powerline deviation route and location of the proposed substation;
- A network of highly fragmented and mostly dry drainage lines across the study area, mostly with narrow riparian zones and little protective intact vegetation buffer

5.6. Ecological Profile of the Study Area and Development Area

Ecosystem Threat Status

The Ecosystem Threat Status, defined in the National Biodiversity Assessment (NBA) of 2018, gives an indication of the degree to which ecosystems are still intact or losing vital aspects of their structure, function and composition (Skowno et al. 2019a). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds. For the NBA 2018 the IUCN Red List of Ecosystems was used as the risk assessment framework for terrestrial ecosystems (Skowno et al. 2019a).

The Ecosystem Threat Status of the project area is Least Concern (LC). This is an ecosystem type that has experienced little or no loss of natural habitat or deterioration in condition (Skowno et al. 2019a). Widespread and abundant species are typically classified in this category.

Ecosystem Protection Level

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected (Skowno et al. 2019a). Ecosystem types are categorised as Not Protected, Poorly Protected, Moderately Protected or Well Protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003).

Figure 5. shows the Ecosystem Protection Status of the project area is Not Protected (NP). This is an ecosystem type that has less than 5% of its biodiversity target included in one or more protected areas (Skowno et al. 2019a). A small section of Farm 221 is Poorly Protected (PP) but falls out of the footprint of the proposed infrastructure. PP is an ecosystem type which has between 5% and 50% of its biodiversity target included in one or more protected areas.

The National Protected Area Expansion Strategy (NPAES 2017)

The National Protected Area Expansion Strategy (NPAES), updated in 2017, presents a 20-year strategy for the expansion of protected areas in South Africa for improved ecosystem representation, ecological sustainability and resilience to climate change (DEA, 2016). The proposed 300m grid corridor within which the 66kV powerline, access tracks and water course crossings will be located and on-site substation does not fall within the 2017 NPAES.

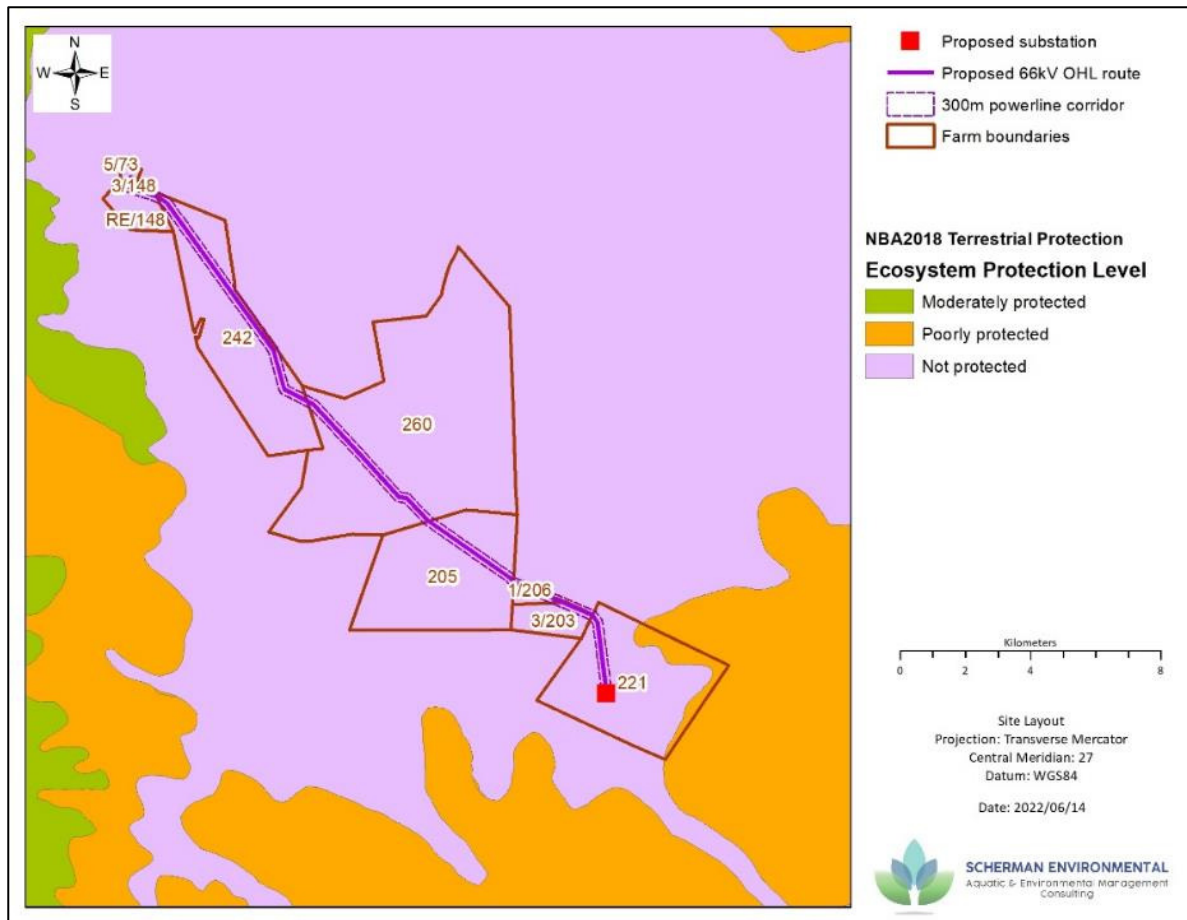


Figure 5.10: The Ecosystem Protection Status of the project area as defined in the NBA of 2018

Critical Biodiversity Areas (CBA)

A Biodiversity Conservation Plan (BCP) is a provincial dataset that guides and informs land use and resource-use planning and decision making in order to preserve long-term functioning and health of priority areas outside of the protected areas network (ECBCP, 2019). These are known as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). The proposed grid infrastructure does not fall within a CBA or ESA area (Figure 5.11). The project area falls within "Other Natural Areas" which are in a natural or near natural state but have not been identified as priority areas in the current BCP (ECBCP, 2019). These areas still support biodiversity and deliver ecosystem services. Therefore, specialist's recommendations on biodiversity rich habitats based on observations taken in the field should be taken note of.

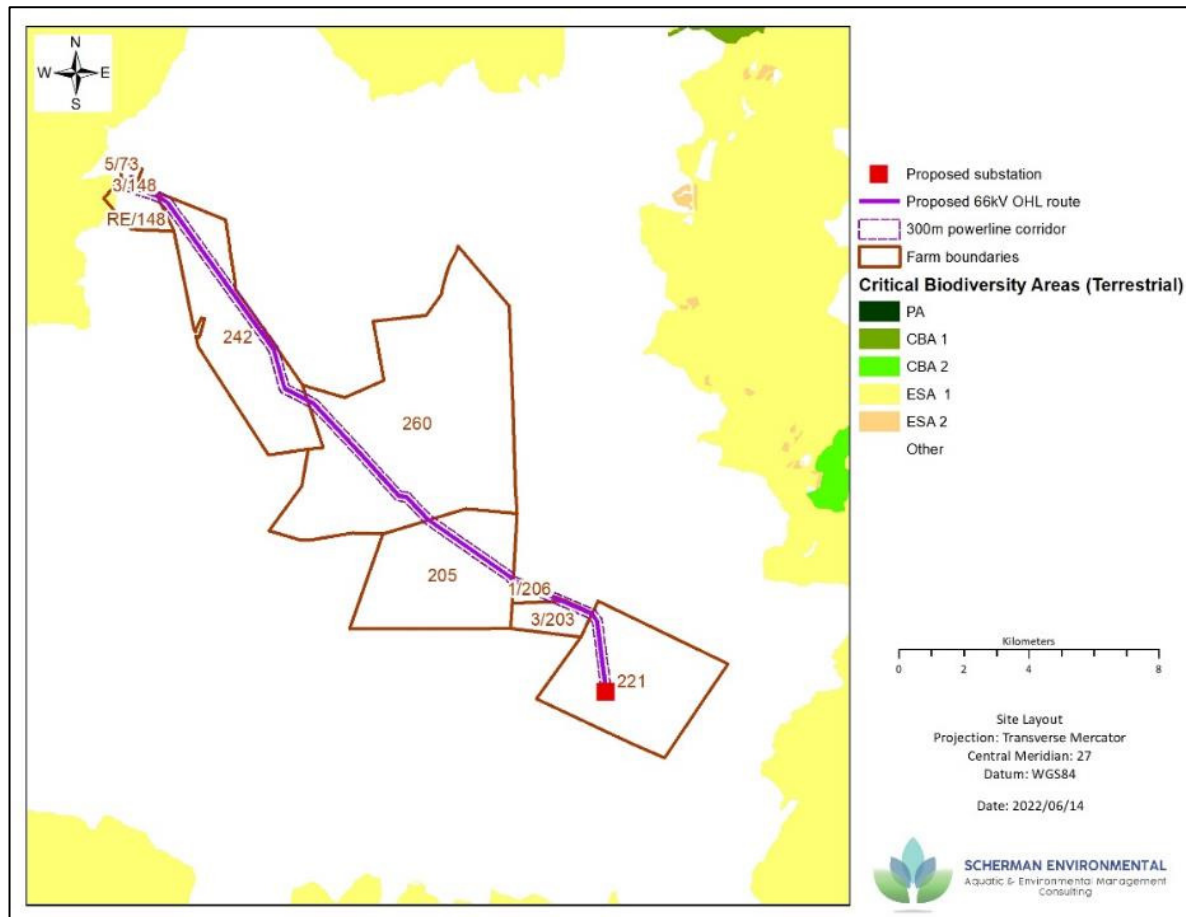


Figure 5.11: Critical Biodiversity Areas (Terrestrial) in relation to the project area

VegMap 2006 (Mucina & Rutherford 2006)

The seminal work of Mucina & Rutherford (2006) significantly improved the national vegetation mapping efforts. Unfortunately, the fine resolution of the STEP mapping for Thicket (122 distinct Thicket types) was lost and spatially distilled into 14 Thicket types. The biome was also renamed the Albany Thicket Biome (Hoare et al. 2006). Figure 5.12 below indicates that the entire development footprint for this report is restricted to Bedford Dry Grasslands and Great Fish Thicket (Mucina et al. 2006). Bedford Dry Grasslands have, no formal conservation areas and only 1% of the vegetation conserved in private nature reserves. The typical species listed are very similar to those of Acocks (1988)

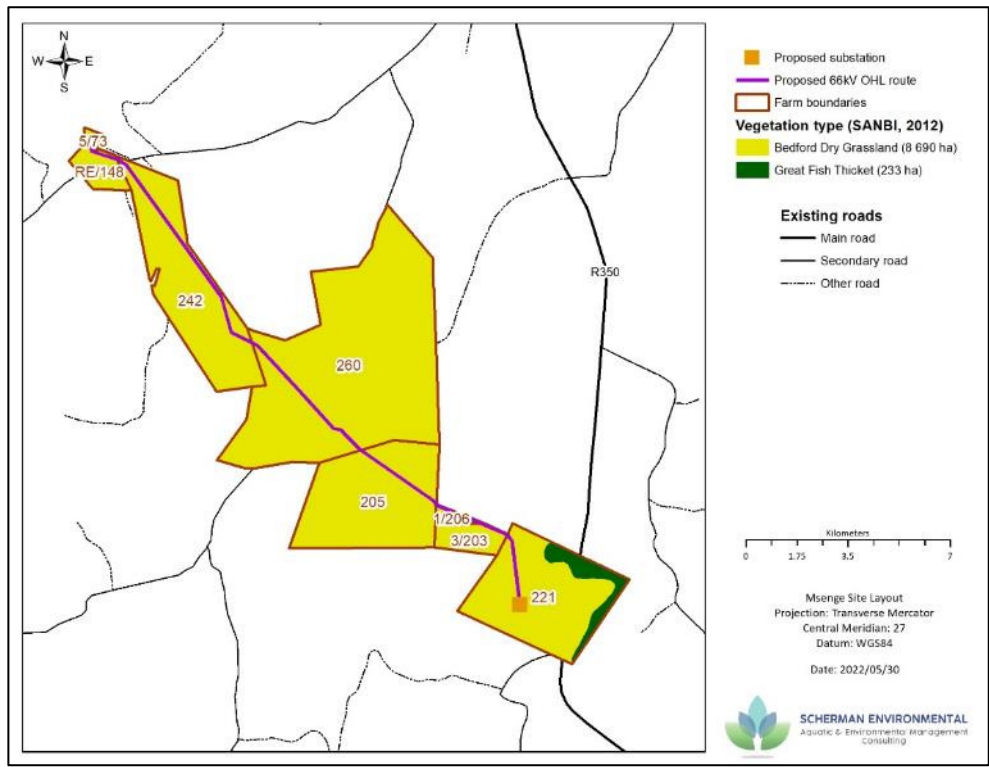


Figure 5.12: The distribution of vegetation types from the 2012 stage of the SANBI VegMap Project (Mucina & Rutherford 2006), in relation to the planned infrastructure

VegMap 2018 (SANBI 2018)

The recent changes to the national vegetation mapping for the Eastern Cape (Error! Reference source not found.5.12) have largely been concentrated in the Albany Thicket Biome. The 14 thicket types listed by Hoare *et al.* (2006), have been expanded to 44 to reincorporate some of the thicket classes defined by Vlok¹ *et al.* (2003). The study area does not reflect any solid thicket types in the development footprint (Error! Reference source not found. below), but lists the mosaic thicket type: Double Drift Karroid Thicket. This was previously absorbed into Great Fish Thicket (Hoare *et al.* 2006), but the boundaries for this vegetation type would be the same as in Mucina *et al.* (2006).

¹ Largely restricted the “mosaic” thicket types.

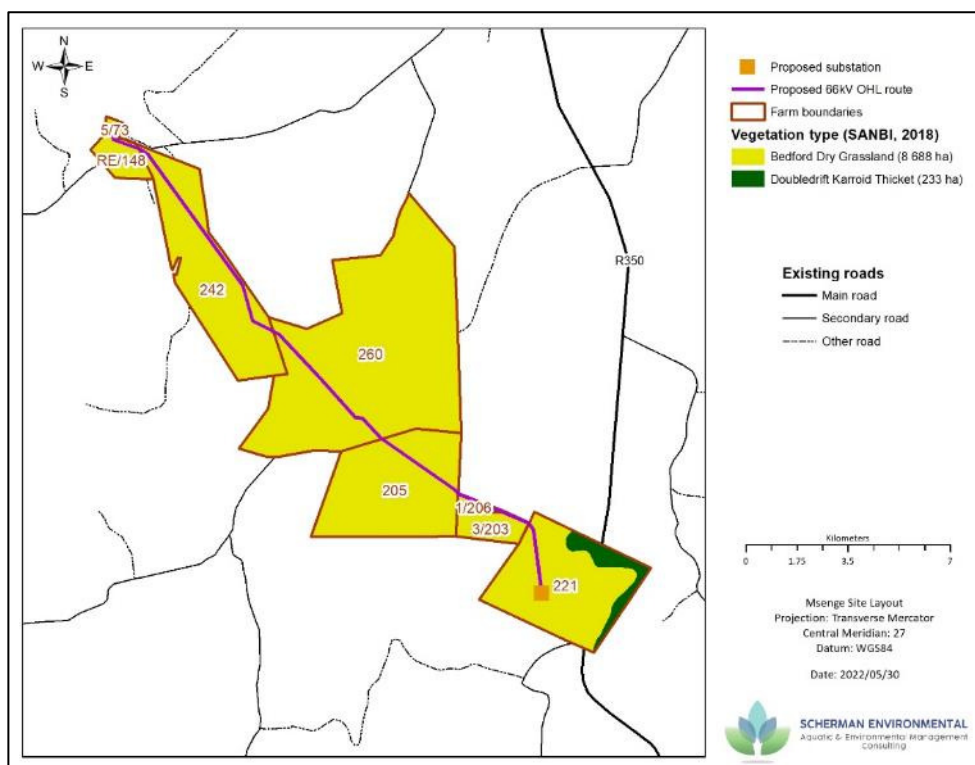


Figure 5.13: The distribution of vegetation types from the 2018 stage of the SANBI VegMap Project (SANBI 2018), in relation to the planned infrastructure

Species of Conservation Concern (SCC)

The SCC can be divided into three classes, with some degree of overlap. Those plants protected under the National Forest Act (Act 84 no of 1988) are presented in Appendix 3 of the Terrestrial Report (Appendix G), with an estimation of their LOD in the study site as well as the most recent national conservation status. The only species that is likely to occur in the site is *Sideroxylon inerme* (Milkwood) and is always associated with thicket clumps. The second tier is national list for SCC is the NEMBA Threatened or Protected Species (ToPs) list – see Appendix 4 of the Terrestrial Report (Appendix G). The lowest tier is the provincially species listed as Endangered or Protected according to the Provincial Ordinance of 1974, which is sadly outdated and leads to confusion with the listing of SSS due to taxonomic advancements. The full list is attached as Appendix 5 of the Terrestrial Report (Appendix G), but without expansion on the families listed as a group (e.g. Apocynaceae or Aizoaceae).

Faunal Communities

i. Mammals

The mammal list was compiled using the Mammal Map (MammalMap, 2022), the IUCN Red List spatial data (IUCN, 2017) and all previous reports (TBC, 2020; SE, 2017; Nkurenkuru, 2018; Hoare, 2010). It must be noted that TBC (2020) was incredibly comprehensive and thus formed a strong base upon which we built our mammal list of the area. Altogether 83 species of mammal could occur in the area, ten of which are conservation concern according to the most recent global assessment (IUCN, 2017).

Specifically, one mammal is endangered, three are vulnerable and six are near threatened (IUCN, 2017). The likelihood of occurrence (LOO) for the globally threatened taxa are as follows: *Aonyx capensis* (high LOO), *Eidolon helvum* (medium LOO), *Felis nigripes* (high LOO), *Hydrictis maculicollis* (high LOO), *Mystromys albicaudatus* (low LOO), *Panthera pardus* (high LOO), *Parahyaena brunnea* (high LOO), *Pelea capreolus* (high LOO), *Redunca fulvorufula*

(high LOD) and *Syncerus caffer* (low LOD). Our predicted LODs are largely in agreement with those of TBC (2020), apart from the assessment of *Eidolon helvum*, which was assessed as having a low LOD according to TBC (2020).

Table 5.1: List of mammals expected to occur in the area

Species	Common name	Global conservation status (IUCN)
<i>Amblysomus hottentotus</i>	Hottentot's Golden Mole	LC
<i>Antidorcas marsupialis</i>	Springbok	LC
<i>Aonyx capensis</i>	Cape/African Clawless Otter	NT
<i>Atilax paludinosus</i>	Marsh/Water Mongoose	LC
<i>Canis mesomelas</i>	Black-backed Jackal	LC
<i>Caracal caracal</i>	Caracal	LC
<i>Chlorocebus pygerythrus</i>	Vervet monkey	LC
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	LC
<i>Cryptomys hottentotus</i>	African Mole-rat	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC
<i>Dendrohyrax arboreus</i>	Southern Tree Hyrax	LC
<i>Dendromus melanotis</i>	Grey Climbing Mouse	LC
<i>Dendromus mesomelas</i>	Brants' Climbing Mouse	LC
<i>Desmodillus auricularis</i>	Cape Short-eared Gerbil	LC
<i>Eidolon helvum</i>	African Straw-coloured Fruit-bat	NT
<i>Elephantulus rupestris</i>	Western Rock Sengi	LC
<i>Felis nigripes</i>	Black-footed Cat	VU
<i>Felis silvestris</i>	African Wildcat	LC
<i>Galerella pulverulenta</i>	Cape Grey Mongoose	LC
<i>Genetta genetta</i>	Common/Small-spotted Genet	LC
<i>Genetta tigrina</i>	Cape Genet	LC
<i>Georychus capensis</i>	Cape Mole rat	LC
<i>Grammomys cometes</i>	Mozambique Woodland Mouse/ Mozambique Thicket Rat	LC
<i>Graphiurus murinus</i>	Woodland Dormouse	LC
<i>Graphiurus ocellaris</i>	Spectacled Dormouse	LC

<i>Herpestes ichneumon</i>	Egyptian/Large Grey Mongoose	LC
<i>Herpestes pulverulentus</i>	Cape Grey Mongoose	LC
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	NT
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC
<i>Ichneumia albicauda</i>	White-tailed Mongoose	LC
<i>Ictonyx striatus</i>	Striped Polecat/Zorilla	LC
<i>Kerivoula lanosa</i>	Lesser Woolly Bat	LC
<i>Leptailurus serval</i>	Serval	LC
<i>Lepus saxatilis</i>	Cape Scrub Hare	LC
<i>Macroselides proboscideus</i>	Karoo Round-eared Sengi	LC
<i>Mastomys natalensis</i>	Natal Multimammate Mouse	LC
<i>Mellivora capensis</i>	Honey Badger	LC
<i>Micaelamys (Aethomys) namaquensis</i>	Namaqua rock rat	LC
<i>Mus minutoides</i>	African Pygmy Mouse	LC
<i>Mus musculus</i>	House Mouse	LC
<i>Myosorex varius</i>	Forest Shrew	LC
<i>Myotis tricolor</i>	Cape Hairy Bat	LC
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU
<i>Neoromicia capensis</i>	Cape Bat	LC
<i>Neoromicia zuluensis</i>	Aloe/Zulu Pipistrelle Bat	LC
<i>Nycteris thebaica</i>	Egyptian Slit-faced/Cape Long-eared Bat	LC
<i>Oreotragus oreotragus</i>	Klipspringer	LC
<i>Drycteropus afer</i>	Aardvark	LC
<i>Otocyon megalotis</i>	Bat-eared Fox	LC
<i>Otomys irroratus</i>	Southern African Vlei Rat	LC
<i>Otomys karoensis (saundersiae)</i>	Roberts' Vlei Rat	LC
<i>Otomys unisulcatus</i>	Karoo Vlei Rat	LC
<i>Panthera pardus</i>	Leopard	VU
<i>Papio ursinus</i>	Chacma Baboon	LC
<i>Parahyaena brunnea</i>	Brown Hyena	NT
<i>Pedetes capensis</i>	Springhare	LC

<i>Pelea capreolus</i>	Grey Rhebok	NT
<i>Phacochoerus africanus</i>	Common Warthog	LC
<i>Philantomba monticola</i>	Blue Duiker	LC
<i>Poecilogale albinucha</i>	African Striped Weasel	LC
<i>Potamochoerus larvatus</i>	Bushpig	LC
<i>Procavia capensis</i>	Rock Hyrax	LC
<i>Pronolagus saundersiae</i>	Hewitt's Red Rock Hare	LC
<i>Proteles cristata</i>	Aardwolf	LC
<i>Raphicerus campestris</i>	Steenbok	LC
<i>Raphicerus melanotis</i>	Cape Grysbok	LC
<i>Rattus rattus</i>	House Rat	LC
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN
<i>Rhabdomys pumilio</i>	Four-striped Grass Mouse	LC
<i>Rhinolophus capensis</i>	Cape Horseshoe Bat	LC
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC
<i>Rousettus aegyptiacus</i>	Egyptian Fruit Bat	LC
<i>Saccostomus campestris</i>	South African Pouched Mouse	LC
<i>Scotophilus dinganii</i>	African Yellow Bat	LC
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC
<i>Suricata suricatta</i>	Meerkat	LC
<i>Sylvicapra grimmia</i>	Common Duiker	LC
<i>Syncerus caffer</i>	African Buffalo	NT
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	LC
<i>Thryonomys swinderianus</i>	Greater Cane Rat	LC
<i>Tragelaphus oryx</i>	Common Eland	LC
<i>Tragelaphus strepsiceros</i>	Greater Kudu	LC
<i>Vulpes chama</i>	Cape Fox	LC

ii. Reptiles

The reptile list (Table 5.2) was compiled using the application HerpDistributionSA (Rebello, 2021), which is an amalgamation of all the records from online repositories (ReptileMap, 2021 and iNaturalist, 2021) and physical specimen collections (Port Elizabeth Museum and McGregor Museum) collected

before December 2021. All species recorded within QDS 3226CC and 3225DD on HerpDistributionSA were listed as potentially occurring within the study area. The list was also supplemented with species that may occur in the area based on their known distribution (Branch 1998, Marais 2004, Bates et al. 2014). Eighty-four species were listed for the area using the methodology listed above. Whilst comprehensive, the data used by Rebelo (2021) was gleaned from citizen science platforms and thus there may be misidentifications within the quarter degree cells. Whilst every effort has been made to check the distributions of all species of conservation concern, it must be noted that some least concern species may not be found in the area. Sixteen species of reptile were recorded in the project area during the survey; When combined with the results of previous studies, this amounts to total of 20 direct/indirect reptile sightings on the property. None of these animals were of conservation concern.

Table 5.2: List of reptiles encountered in the project area. Assessment Encounter denotes whether a species was encountered during this survey or on surveys undertaken by previous consultants. Blank sections indicate that the species were not included in the reports.

Species	Common Name	Conservation Status IUCN (2017)	Assessment Encounter			
			TBC (2020)	Scherman Environmental (2022)	SE (2017)	Nkurenkuru (2018)
<i>Agama atra</i>	Southern Rock Agama	LC	Yes	Yes	Yes	Yes
<i>Bitis arietans</i>	Puff Adder	LC			Yes	
<i>Boaedon capensis</i>	Brown House Snake	LC	Yes			
<i>Chersina angulata</i>	Angulate tortoise	LC		Yes	Yes	
<i>Cordylus cordylus</i>	Cape Girdles Lizard	LC	Yes	Yes		
<i>Stigmachelys pardalis</i>	Leopard Tortoise	LC	Yes	Yes		Yes
<i>Homopus areolatus</i>	Parrot-beaked padloper	LC		Yes		
<i>Karusasaurus polyzonus</i>	Karoo Girded Lizard	LC		Yes		
<i>Leptotyphlops nigricans</i>	Black Thread Snake	LC		Yes		
<i>Naja nivea</i>	Naja nivea	LC			Yes	
<i>Nucras lalandii</i>	Delalandes' Sandveld Lizard	LC		Yes		Yes
<i>Pachydactylus maculatus</i>	Spotted Gecko	LC	Yes	Yes		
<i>Psammophis notostictus</i>	Karoo Whip Snake	LC		Yes		
<i>Psammophylax rhombeatus</i>	Spotted Skaapsteker	LC		Yes	Yes	
<i>Pedioplanis lineocellata pulchella</i>	Common sand lizard	LC	Yes	Yes		
<i>Pedioplanis burchelli</i>	Burchell's Sand Lizard	LC		Yes		
<i>Pseudocordylus microlepidotus fasciatus*</i>	Karoo Crag Lizard	LC	Yes			
<i>Trachylepis varia</i>	Variable skink	LC		Yes	Yes	
<i>Trachylepis capensis</i>	Cape skink	LC		Yes	Yes	
<i>Varanus albigularis</i>	Rock Monitor	LC			Yes	Yes
		Species Count	7	16	8	4

» **Avifauna**

The SABAP2 data indicates that a total of 213 bird species could potentially occur within the PAOI and immediate surroundings – Appendix 4 of the Avifauna Impact Assessment report provides a comprehensive list of all the species. Of these, 51 species are classified as priority species and 14 are South African Red List species. Of the priority species, 41 are likely to occur regularly at the Project Area of Impact (PAOI) and immediate surrounding area, with the remaining ten occurring sporadically. Table 5.3 below lists all the priority species and the possible impact on the respective species by the proposed Msenge Emoyeni WEF 66kV OHL grid connection and on-site substation project. The following abbreviations and acronyms are used:

- EN = Endangered
- VU = Vulnerable
- NT = Near Threatened
- LC = Least Concern
- H = High
- M = Medium
- L = Low

Table 5.3: Priority powerline species potentially occurring within the primary and broader area.

Name		SABAP Reporting Rates		Status			Powerline priority	Likelihood of regular occurrence in the PADI	Recorded during surveys	Habitat							Impacts				
Species name	Scientific name	Full protocol	Ad hoc protocol	Red List Global	Red List Regional	Endemic (SA)				Grassland	Shrubland/Thicket	Rivers/Drainage Lines	Surface Waterbodies (Dams & Wetlands)	Mountains, Ridges, Rocky Outcrops	Alien Trees	HV Powerlines	On-site Substation - Electrocutation	Powerline - Electrocutation HV	Powerline - Collision	Displacement: Disturbance	Displacement: Habitat Transformation
African Fish Eagle	<i>Haliaeetus vocifer</i>	0.8	0.0	-	-		x	L			x	x		x			x		x		
African Harrier-Hawk	<i>Polyboroides typus</i>	9.3	2.5	-	-		x	M		x	x		x	x			x	x			
African Marsh Harrier	<i>Circus ranivorus</i>	0.0	1.3	-	EN		x	L					x				x		x		
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	5.9	1.3	-	-		x	M		x	x		x				x	x	x		
African Spoonbill	<i>Platalea alba</i>	4.2	1.3	-	-		x	H	x				x	x				x			
Amur Falcon	<i>Falco amurensis</i>	5.1	0.0	-	-		x	M		x							x				
Black Stork	<i>Ciconia nigra</i>	0.0	1.3	-	VU		x	L					x	x	x			x	x		
Black-headed Heron	<i>Ardea melanocephala</i>	28.8	13.9	-	-		x	H	x								x	x	x		
Black-winged Kite	<i>Elanus caeruleus</i>	26.3	11.4	-	-		x	H		x							x				
Blue Crane	<i>Grus paradisea</i>	62.7	15.2	VU	NT		x	H	x	x			x					x	x		
Booted Eagle	<i>Hieraaetus pennatus</i>	0.8	0.0	-	-		x	L					x	x	x	x		x	x		
Cape Crow	<i>Corvus capensis</i>	58.5	25.3	-	-		x	H		x	x						x	x	x		
Cape Vulture	<i>Gyps coprotheres</i>	9.3	1.3	EN	EN		x	H	x	x	x		x	x			x	x			
Common Buzzard	<i>Buteo buteo</i>	17.8	5.1	-	-		x	H	x	x	x		x				x	x			
Common Moorhen	<i>Gallinula chloropus</i>	0.8	0.0	-	-		x	L					x	x							
Denham's Bustard	<i>Neotis denhami</i>	16.9	2.5	NT	VU		x	H	x	x								x	x		
Egyptian Goose	<i>Alopochen aegyptiaca</i>	47.5	12.7	-	-		x	H	x				x	x				x			
Gabar Goshawk	<i>Micronisus gabar</i>	1.7	0.0	-	-		x	L					x	x				x			
Greater Kestrel	<i>Falco rupicoloides</i>	2.5	0.0	-	-		x	M		x	x						x		x		
Grey Crowned Crane	<i>Balearica regulorum</i>	0.8	0.0	EN	EN		x	L		x			x					x	x		
Grey Heron	<i>Ardea cinerea</i>	13.6	5.1	-	-		x	H	x									x	x		
Hadada Ibis	<i>Bostrychia hagedash</i>	55.1	20.3	-	-		x	H	x	x			x	x				x	x		
Hamerkop	<i>Scopus umbretta</i>	1.7	1.3	-	-		x	L					x	x					x		

Name		SABAP Reporting Rates		Status			Powerline priority	Likelihood of regular occurrence in the PADI	Recorded during surveys	Habitat							Impacts				
Species name	Scientific name	Full protocol	Ad hoc protocol	Red List Global	Red List Regional	Endemic (SA)				Grassland	Shrubland/Thicket	Rivers/Drainage Lines	Surface Waterbodies (Dams & Wetlands)	Mountains, Ridges, Rocky Outcrops	Alien Trees	HV Powerlines	On-site Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision	Displacement: Disturbance	Displacement: Habitat Transformation
Helmeted Guineafowl	<i>Numida meleagris</i>	37.3	8.9	-	-		x	H		x	x		x		x	x		x	x	x	x
Jackal Buzzard	<i>Buteo rufufuscus</i>	32.2	6.3	-	-	x	x	H	x	x	x		x	x	x	x		x	x		x
Kori Bustard	<i>Ardeotis kori</i>	0.8	0.0	NT	NT		x	M		x	x								x	x	
Lanner Falcon	<i>Falco biarmicus</i>	2.5	2.5	-	VU		x	M		x			x	x	x			x			x
Lesser Kestrel	<i>Falco naumanni</i>	1.7	0.0	-	-		x	M		x	x			x	x			x			
Little Grebe	<i>Tachybaptus ruficollis</i>	6.8	3.8	-	-		x	H	x			x	x							x	
Little Sparrowhawk	<i>Accipiter minullus</i>	0.8	0.0	-	-		x	L			x				x			x			x
Ludwig's Bustard	<i>Neotis ludwigii</i>	11.0	2.5	EN	EN		x	H		x									x	x	
Martial Eagle	<i>Polemaetus bellicosus</i>	5.1	1.3	EN	EN		x	H	x		x	x	x		x	x		x	x		x
Pale Chanting Goshawk	<i>Melierax canorus</i>	31.4	7.6	-	-		x	H	x	x	x	x	x					x	x		x
Pied Crow	<i>Corvus albus</i>	78.0	39.2	-	-		x	H	x	x	x			x	x			x	x		x
Red-billed Teal	<i>Anas erythrorhyncha</i>	6.8	8.9	-	-		x	M			x	x								x	
Red-knobbed Coot	<i>Fulica cristata</i>	3.4	1.3	-	-		x	M			x	x								x	
Reed Cormorant	<i>Microcarbo africanus</i>	7.6	0.0	-	-		x	M			x	x								x	
Rock Kestrel	<i>Falco rupicolus</i>	50.0	15.2	-	-		x	H	x	x	x			x	x	x		x			x
Secretarybird	<i>Sagittarius serpentarius</i>	16.9	2.5	EN	VU		x	H	x	x	x		x							x	x
South African Shelduck	<i>Tadorna cana</i>	19.5	3.8	-	-		x	H	x		x	x								x	
Southern Black Korhaan	<i>Afrotis afra</i>	13.6	6.3	VU	VU	x	x	H	x	x										x	x
Spotted Eagle-Owl	<i>Bubo africanus</i>	4.2	1.3	-	-		x	H			x			x	x	x		x	x	x	
Spur-winged Goose	<i>Plectropterus gambensis</i>	6.8	1.3	-	-		x	M					x							x	
Verreaux's Eagle	<i>Aquila verreauxii</i>	2.5	0.0	-	VU		x	H	x				x	x	x	x			x	x	x
Western Cattle Egret	<i>Bubulcus ibis</i>	9.3	0.0	-	-		x	H	x	x			x		x					x	x
White-bellied Bustard	<i>Eupodotis senegalensis</i>	16.1	1.3	-	VU		x	H		x	x									x	x
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	3.4	0.0	-	-		x	H	x			x	x							x	
White-faced Whistling Duck	<i>Dendrocygna viduata</i>	0.0	0.0	-	-		x	H	x			x	x							x	

Name		SABAP Reporting Rates		Status			Powerline priority	Likelihood of regular occurrence in the PAOI	Recorded during surveys	Habitat							Impacts				
Species name	Scientific name	Full protocol	Ad hoc protocol	Red List Global	Red List Regional	Endemic (SA)				Grassland	Shrubland/Thicket	Rivers/Drainage Lines	Surface Waterbodies (Dams & Wetlands)	Mountains, Ridges, Rocky Outcrops	Alien Trees	HV Powerlines	On-site Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision	Displacement: Disturbance	Displacement: Habitat Transformation
White-necked Raven	<i>Corvus albicollis</i>	20.3	1.3	-	-		x	H		x	x			x				x	x		x
Yellow-billed Duck	<i>Anas undulata</i>	24.6	7.6	-	-		x	H				x	x							x	
Yellow-billed Kite	<i>Milvus aegyptius</i>	1.7	0.0	-	-		x	L		x	x			x	x			x	x		

The site visit produced a combined list of 58 species (Appendix 4 of the avifauna report Appendix E) covering both the PAOI and to a limited extent, the surrounding area. Twenty-two priority species were observed along the proposed powerline alignment. Species of conservation concern (SCC) recorded during the field survey are Cape Vulture *G. coprotheres*, Verreaux's Eagle *A. verreauxii*, Martial Eagle *P. bellicosus*, Blue Crane *G. paradisea*, Denham's Bustard *N. denhami* and Secretarybird *S. serpentarius*. All other observations were of small passerine and game bird species that are common to this area.

Each of the aforementioned species has the potential to be displaced by the proposed Msenge Emoyeni WEF 66kV grid connection and on-site substation as a result of habitat transformation and disturbance. A single crow's nest was observed within the primary PAOI. An additional eight nests were observed to the south of the broader area, most notably a Secretarybird *S. serpentarius* nest approximately 11km south-west from the proposed on-site substation site (Figure 5.14). Given the distance, it is unlikely that these birds will be vulnerable to the disturbance impact associated with the construction of the 66kV DHL grid connection and on-site substation.

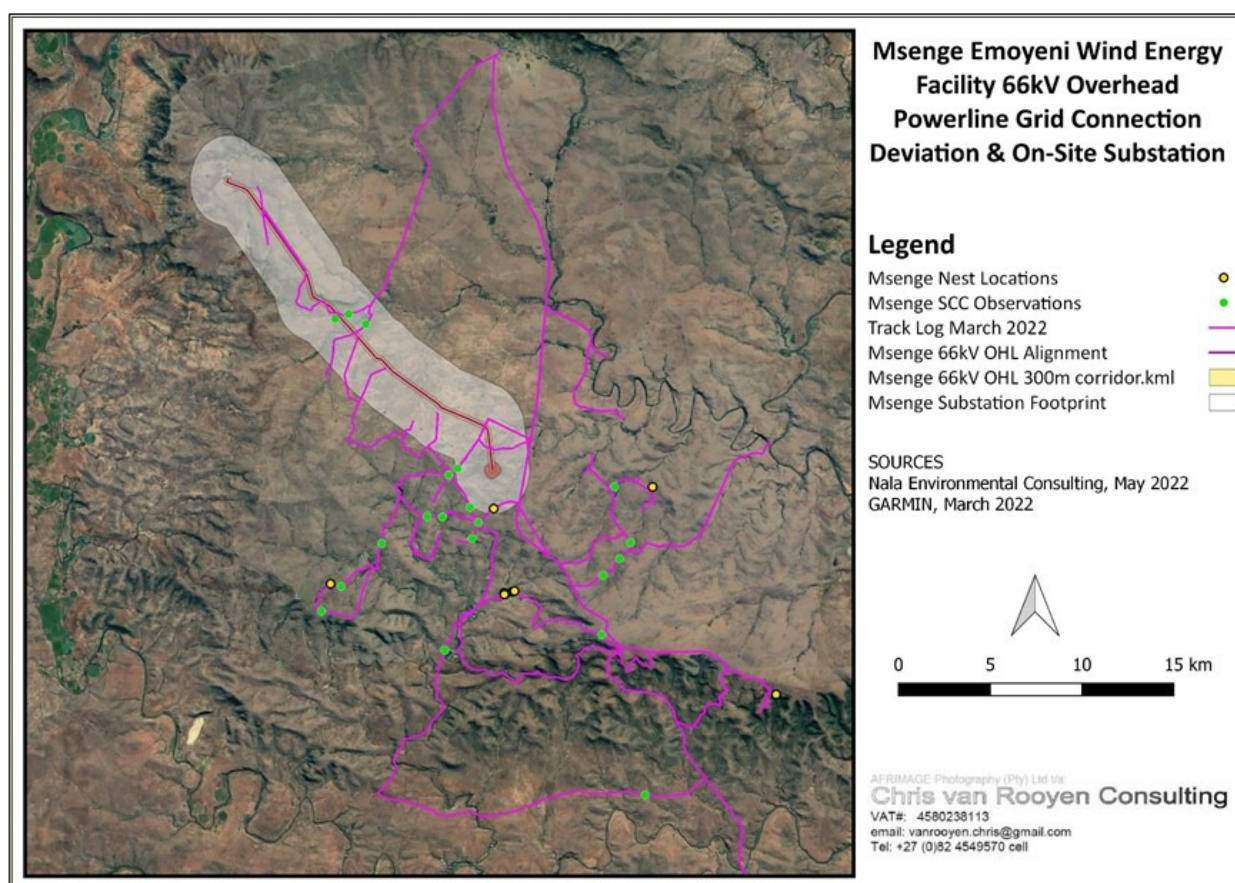


Figure 5.14: Regional map detailing the incidental count observations, nest locations and tracks surveyed during the field survey to the PAOI conducted on 26-30 March 2022.

Fourteen existing high voltage powerlines are operational within primary PAOI, one of which runs parallel to the proposed Msenge Emoyeni 66kV DHL grid connection deviation alignment, within the 300m grid connection corridor (Figure 5.15). Transmission lines are an important breeding and roosting substrate for raptors and will typically attract Marital Eagle *P. bellicosus*, Verreaux's Eagle *A. verreauxii*, Booted Eagle *H. pennatus*, Great Kestrel *F. rupicoloides*, Lesser Kestrel *F. naumanni* and Cape Vulture *G. coprotheres*, the latter being observed perching on the high voltage lines during the field survey in March 2022 (Jenkins et al. 2013).

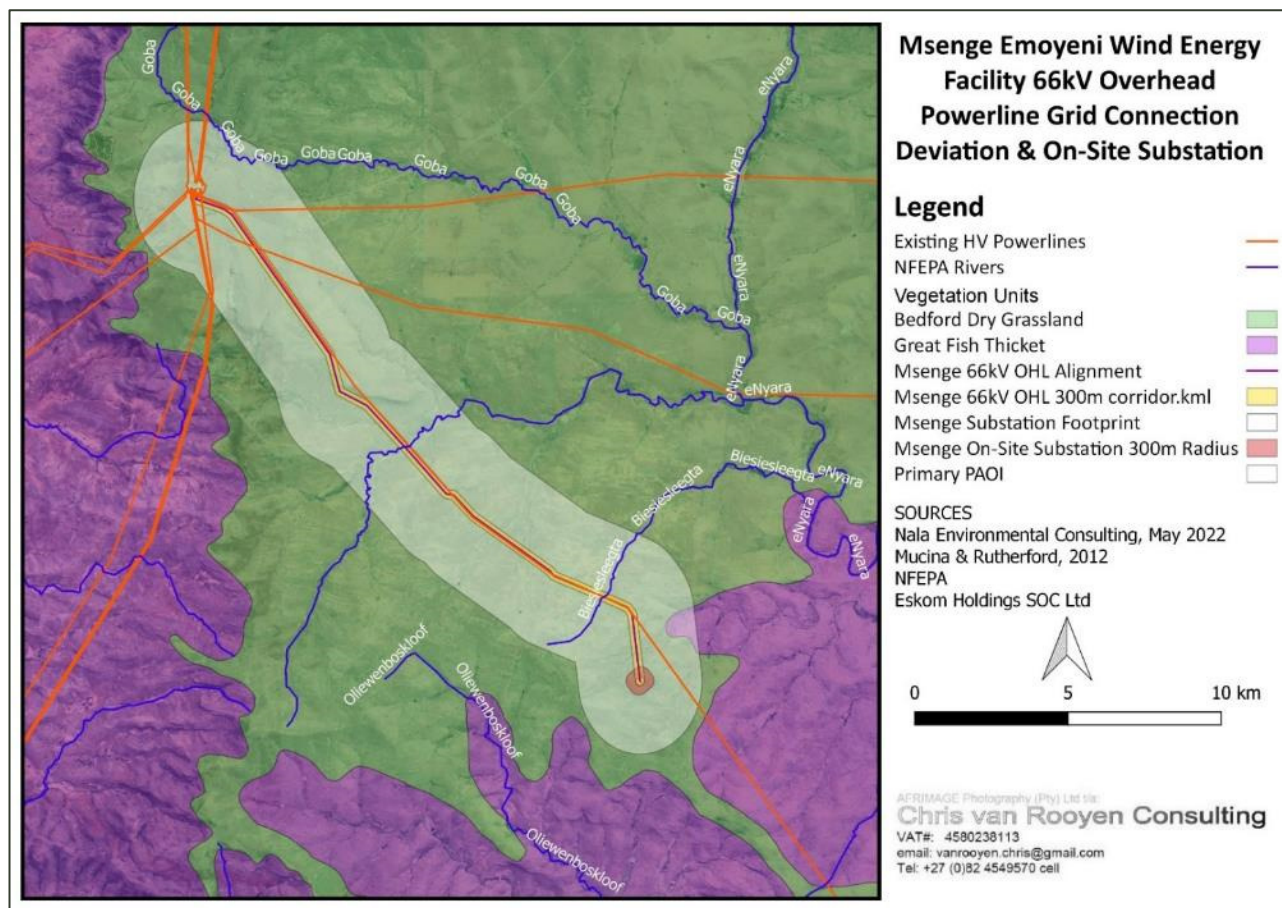


Figure 5.15: Regional map delineating the vegetation units, river systems and existing high voltage powerlines within the Msenge Emoyeni 66kV OHL grid connection deviation and on-site substation project PAOI

» **Conservation Areas, Protected Areas and Important Bird Areas (IBA)**

Two protected areas occur within a 30km radius of the primary PAOI. The Somerset East Bosberg Nature Reserve and Molweni Protected Environment (**Figure 5.16**). The Somerset East Bosberg Nature Reserve is characterised by, tall forest, grassy plains as well as Karoo succulents and mountain fynbos that support at least 83 species of birds. No information could be obtained for the Molweni Protected Environment, but it is assumed that the diversity and abundance of avifauna in the reserve will be similar to the surrounding area. It is not expected that the proposed project will impact on avifauna in these reserves due to the distance from the project.

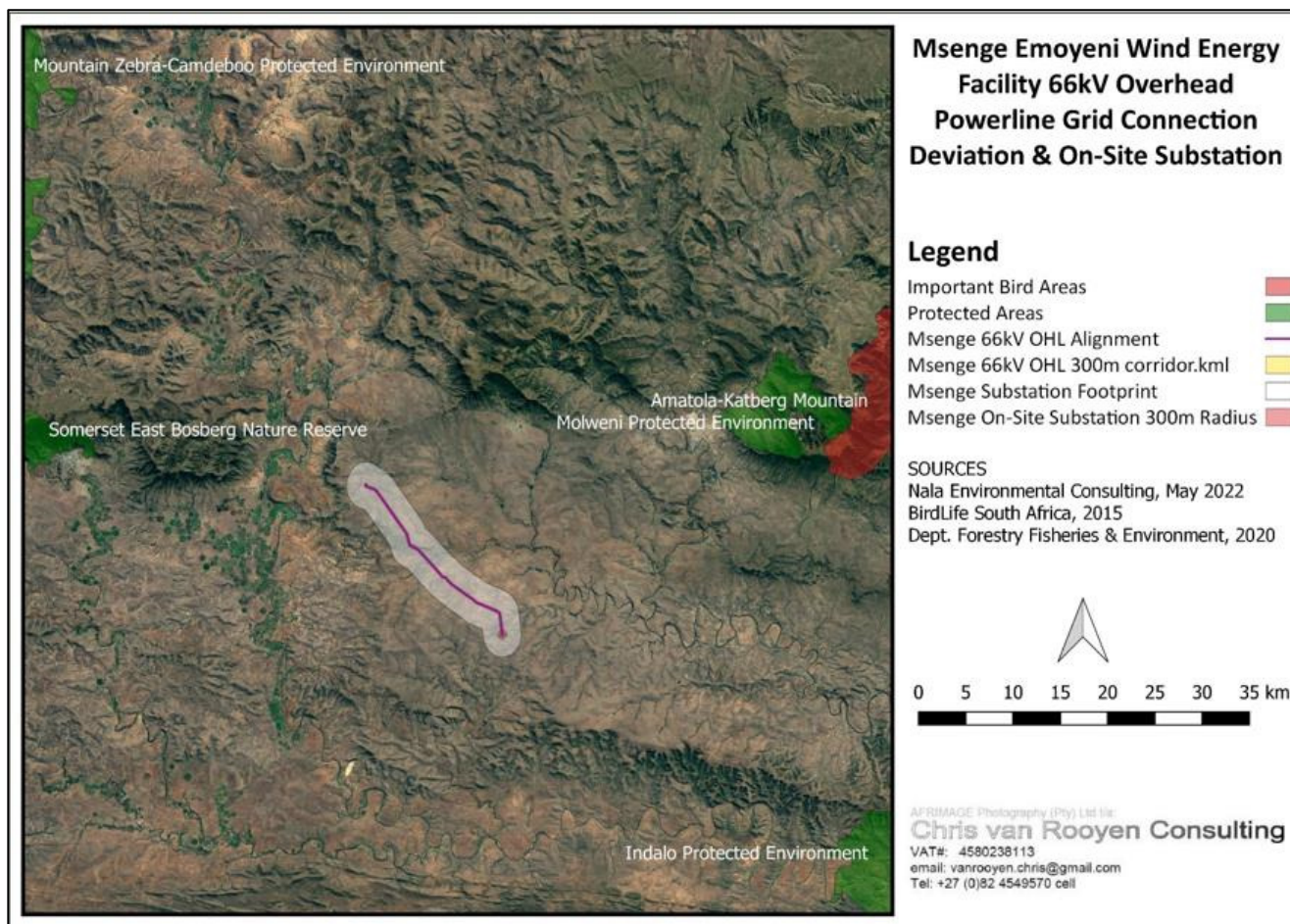


Figure 5.16: The project area in relation to Important Bird Areas (IBAs) and Protected Areas.

The Primary Project Area of Impact does not overlap with any Important Bird Areas (IBAs). The closest IBA is the Amatola-Katberg Mountain IBA (SA092) which is located approximately 35km to the north-east of the proposed Msenge Emoyeni WEF 66kV grid connection and on-site substation (BLSA, 2015). This IBA is centred on the rugged Amatola Mountain range with its steep slopes, thickly forested gorges and high-altitude grasslands. These habitats support globally threatened species such as

- Blue Crane *B. paradiseus*,
- Denham's Bustard *N. denhami*,
- Grey Crowned Crane *Balearica regularum* (flocks of up to 200 individuals have been recorded),
- Secretarybird *S. serpentarius*,
- Crowned Eagle *Stephanoaetus coronatus*,
- Kynsna Woodpecker *Campethera notata* and Bush Blackcap *Campethera notata*.

Regionally threatened species that feature prominently include

- Cape Parrot *Poicephalus Robustus robustus* (300–500 individuals),
- African Marsh Harrier *Circus ranivorus*,
- Lanner Falcon *Falco biarmicus*
- Orange Ground Thrush *Zoothera gurneyi*.

In addition, range and biome-restricted species that are fairly common include

- Forest Buzzard *Buteo trizonatus*,
- Knysna Turaco *Turaco corythaix*,
- Grey Cuckooshrike *Coracina caesia*,
- Buff-streaked Chat *Campicoloides bifasciata*,
- Chorister Robin-Chat *Cossypha dichroa*,
- White-starred Robin *Pogonocichla stellata*,
- Barratt's Warbler *Bradypterus barratti*,
- Yellow-throated Woodland Warbler *Phylloscopus ruficapilla*,
- Olive Bush-Shrike *Chlorophoneus olivaceus*,
- Grey Sunbird *Cyanomitra veraxii*,
- Sweet Waxbill *Coccyzygia melanotis*
- and Forest Canary *Crithagra scotops* (BLSA, 2015).

This IBA is a considerable distance from the proposed development area and will therefore not be directly affected by the construction and operation of the proposed Msenge Emoyeni WEF 66kV grid connection and on-site substation. It must however be noted that similar vegetation types i.e. grassland and thicket do occur within the development area and species that are supported by these vegetation units within the IBA, are also likely to occur in the proposed Project Area of Impact and may be impacted on by the construction and operation of the 66kV OHL and on-site substation. These impacts will negatively affect these species if the necessary avoidance and mitigation measures are not implemented.

5.7. Heritage Resources, including archaeology and palaeontology

As per Binneman (2014) "The proposed Msenge Emoyeni WEF and associated infrastructure are located within the 1:50 000 topographic reference maps 3225DD Golden Valley and 3226CC Herbert's Hope (refer to Map I in Heritage Impact Assessment G). The developments fall within the Blue Crane Route Local Municipality in the Eastern Cape Province. It is situated approximately 20 kilometres south of Bedford (nearest point) and west of the R350 main road connecting Grahamstown with Bedford. The Poseidon Substation is situated approximately 18 kilometres north-west of the development."

Binneman (2014) goes on to note that "The general landscape comprises a gentle undulating hill landscape, lowlands and non-perennial open valley drainage systems/lines (Figure I of the HIA **Appendix I**). No perennial rivers traverse the study area. The major rivers occur many kilometres to the north, east (Great Fish River) and west (Sunday's River). The dominant natural vegetation is grassland, small, low shrubs in places and patches of Acacia karroo in the drainage valleys. The main activity in the study area is commercial stock farming and the land is used for grazing of livestock. Apart from the usual small scale disturbances due to farming activities such as fences, tracks, dams, soil erosion and power lines which crosses through the area, the hill tops show little disturbances. Most development and disturbance, such as homesteads, and associated infrastructure occur mainly along and adjacent to the network of gravel roads which traverse the study area, or in valleys areas close to drainage lines."

In 2022, the ground survey found the area much in the same state as described by Binneman in 2014 with the notable exception that the Amakhala Emoyeni wind farm has been built with 56 2.4MW turbines. There is also an existing 132kV overhead powerline connecting this completed WEF to the Poseidon substation which runs along the route vast majority of the proposed route studied for this project. Around 7-9km of the north west end and the south east section run over ground which has been transformed by ploughing and levelling of ground for grazing sheep and cattle while the middle segment of approximately 5km is less transformed over a hilly section which gently slopes down into one of the non-perennial floodplains noted by Binneman. Most of the archaeological observations were made in this area.

5.7.1. Archaeology and the Built Environment

The area under assessment in this application has been previously assessed by the ACO (Halkett et al.) as part of an extensive heritage assessment for a larger area proposed for the Amkhala Emoyeni WEF (2010, SAHRIS NID 8376). In addition, the area under assessment has also been surveyed by Binneman for the first phase of the Amkhala Emoyeni WEF (2012) and for the Msenge Emoyeni WEF (2014, SAHRIS NID 271038). These reports are used to provide insight into the heritage sensitivities of the area. In general, it is known that the area was likely occupied by Early, Middle and Later Stone Age people. According to Halkett et al. (2010), "Before colonisation of the Eastern Cape by the British in the early 19th century, Khoer herders formed powerful transhumant communities herding cattle and sheep throughout the coastal plain... They enjoyed dominance as far as the Great Fish River, where they shared a loose border with Xhosa farming communities to the east." Halkett et al. (2010) go on to note that "The arrival of the "Trekboer" farmers in the mid-18th century started what has become known as the "Bushman War" which continued for almost 60 years. Eventually, the kommandos that were dispatched from regional centres prevailed and the "wild bushmen" of the Karoo were subjugated by the early 19th century."

In their field survey, Halkett et al. (2010) identified diffuse and isolated scatters of Early and Middle Stone Age artefacts. They note that these artefacts are often located along the margins of small depressions in the bedrock where rain water has collected. Some were also located along rocky ridges and in areas where the ground has been scarred by erosion. They further note that while these findings have limited heritage significance, they do seem to have some level of spatial integrity. Halkett et al. also identified a number of Later Stone Age sites, some with pottery. These sites tend to be located closer to "rivers", particularly in sandy areas. Additional heritage resources identified in the broader area include various historic farmhouses dated to the early and mid-19th century as well as a number of abandoned/ruinous structures and colonial period artefacts. The field survey also identified a number of "stone features consisting of loose aggregations of boulders which could represent the remains of early settlements or possibly graves", as well as formal cemeteries and informal groupings of graves. The findings of the survey conducted by Binneman (2014) corroborate the results of the assessment by Halkett et al (2010).

None of the archaeological observations noted in the field assessment were determined to have sufficient scientific significance to be conservation-worthy and their recording in this report is considered sufficient. One of the archaeological findings from a previous assessment completed here, SAHRIS ID 87039, a stone kraal graded IIIB (of moderate local significance, is located within the 300m grid corridor. The location of this stone kraal is described as "next to the service track under the power line. The age of the stone kraal is not known, but it is not as high and well constructed as the other stone walls in the area and may not be of similar age." It is recommended that no-go 30m buffer must be implemented around this kraal to ensure that no impact takes place. The DHL can pass over the kraal if necessary.

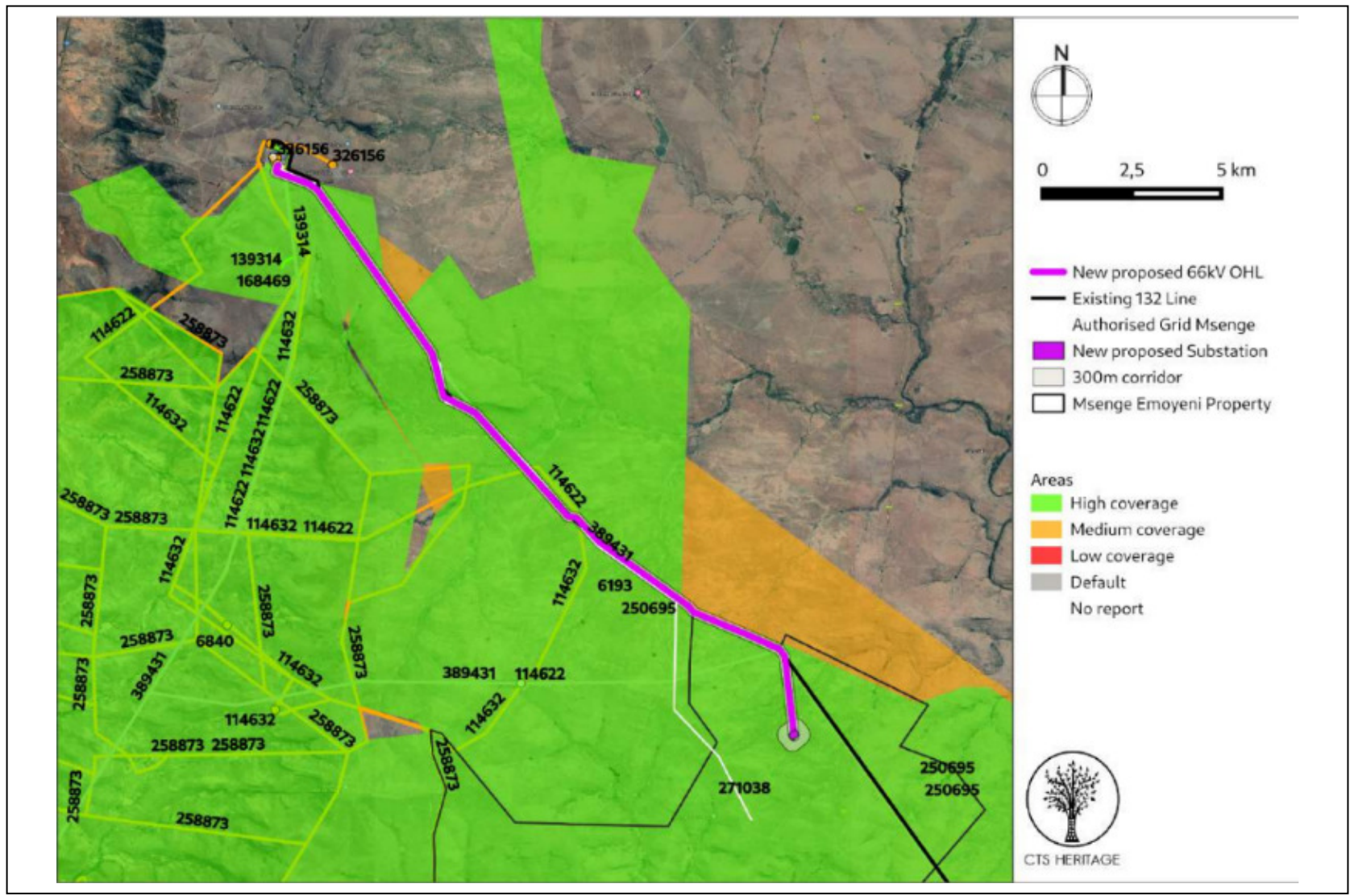


Figure 5.17: Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated. Please see Appendix 2 of the HIA (Appendix I of this BAR) for a full reference list.

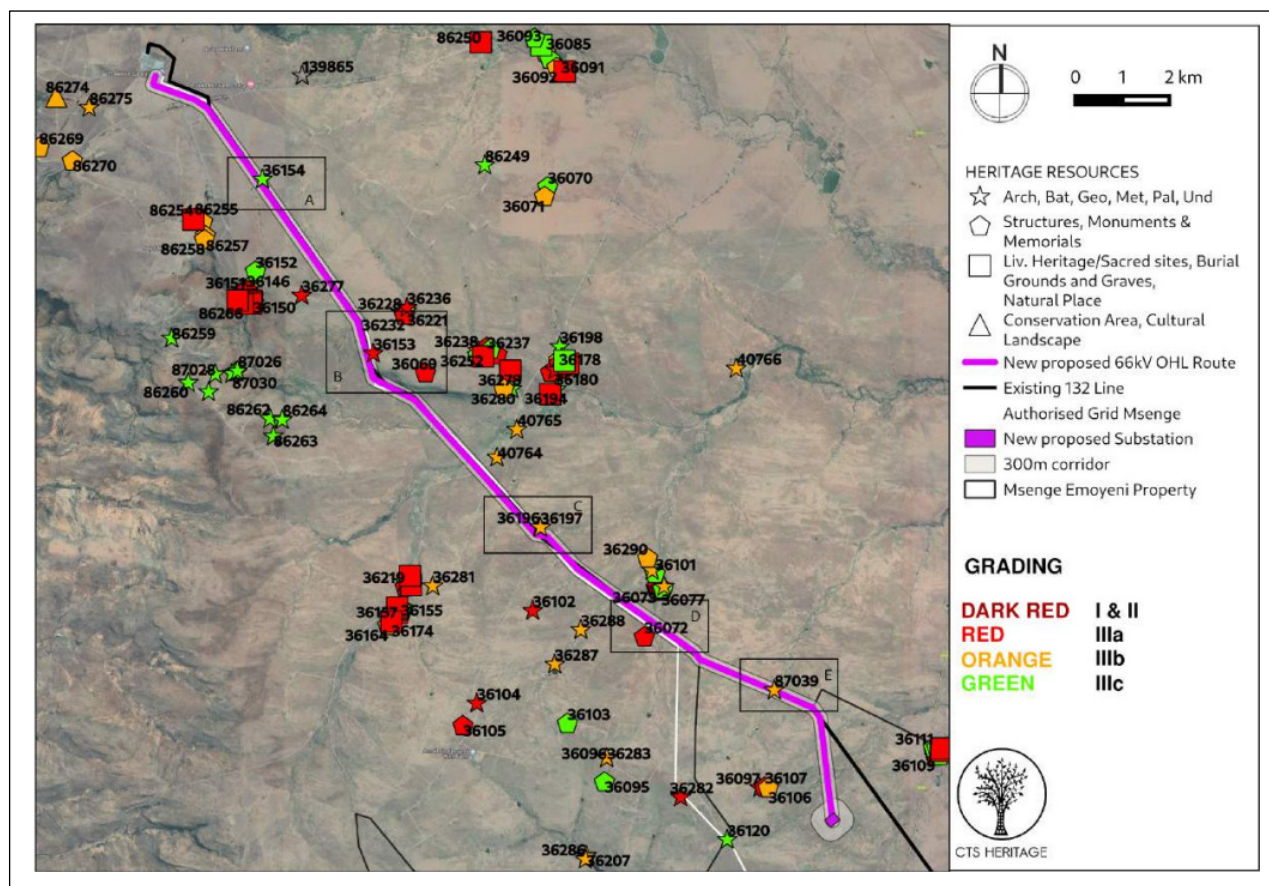


Figure 5.18: Heritage Resources previously identified within the study area, with SAHRIS Site IDs highlighted in the boxes. Please See Appendix 4 of the HIA (Appendix I of this BAR) for full description of heritage resource types.

5.7.2 Palaeontology

According to the SAHRIS Fossil Sensitivity Map the area proposed for development is underlain by sediments that have very high palaeontological sensitivity (**Figure 5.19**). The geology map of the area (Council of GeoScience Map 3226, King Williams Town, **Figure 5.20 and Figure 5.21**) indicates that the area is underlain by sediments of the Karoo Supergroup assigned to the Beaufort group, within the Middleton Formation of the Adelaide Subgroup. According to the SAHRIS Fossil Heritage Browser which is based on Palaeotechnical Assessments completed for SAHRA, the Beaufort Group is known for “Diverse terrestrial and freshwater tetrapods of Tapinocephalus to Lystrosaurus Biozones (amphibians, true reptiles, synapsids – especially therapsids), palaeoniscoid fish, freshwater bivalves, trace fossils (including tetrapod trackways) and sparse vascular plants (Glossopteris Flora, including petrified wood).

De Klerk (2010) conducted a detailed palaeontological assessment for the proposed development and concluded that “Because fossils are rare in this part of the Lower Beaufort Group sediments, it is difficult to find them, even in ideal outcrop conditions. Because of the low relief topography in a great part of the footprint area, and the consequent deeper soil profile reducing the availability of bedrock outcrop, there is a very low likelihood of finding well-preserved fossils. There is, however, a reasonably good chance that fossils may be exposed in areas that are excavated for foundations, roads or trenches.” As such, the proposed OHL development and substation are unlikely to negatively impact significant palaeontological heritage resources, however it is recommended that a Chance Fossil Finds procedure be implemented (Appendix L(M))

Based on the fossil record but confirmed by the site visit and walk through there are no visible rocky outcrops and NO FOSSILS on the land surface of the Cistecephalus Assemblage Zone (upper Middleton Formation, Adelaide Subgroup, Karoo Supergroup) even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the mudstones of the Middleton Formation so a Fossil

Chance Find Protocol should be added to the EMPr. If fossils are found by the contractor, environmental officer, or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample. There is no preferred route or no-go area for the OHL.

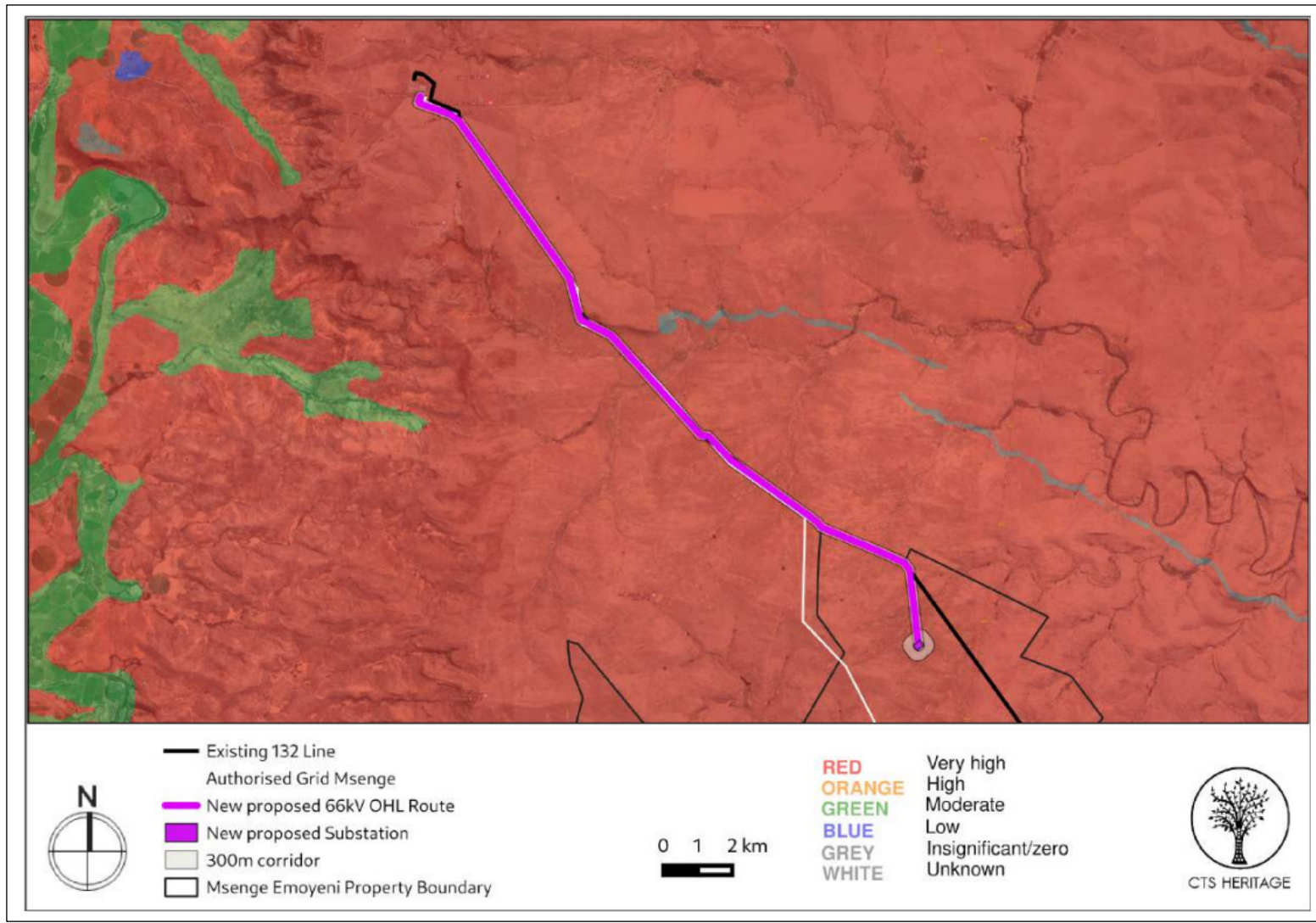


Figure 5.19: A Palaeosensitivity map illustrating and indicating the fossil sensitivity underlying the study area the location of the entire development area.

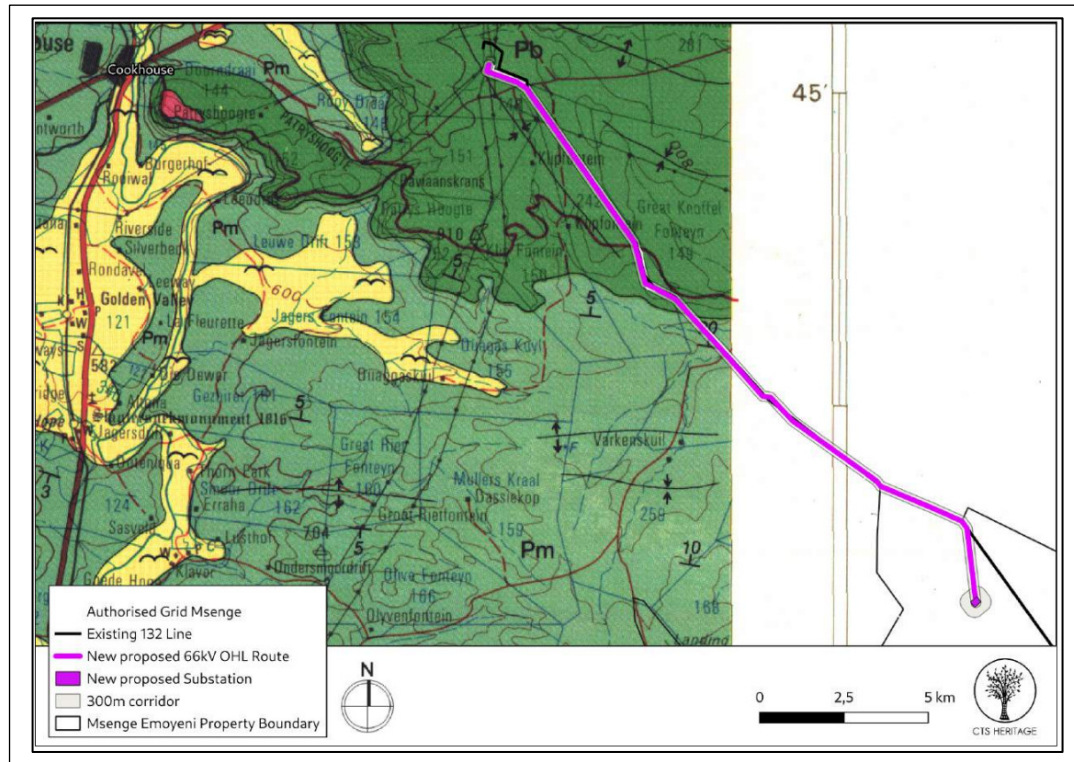


Figure 5.20: Extract from the CGS 3224 Graaf Reniet Map indicating that the development area is underlain by sediments of the Beaufort group, within the Middleton Formation of the Adelaide Subgroup (Pum) and Jurassic Dolerite (Jd)

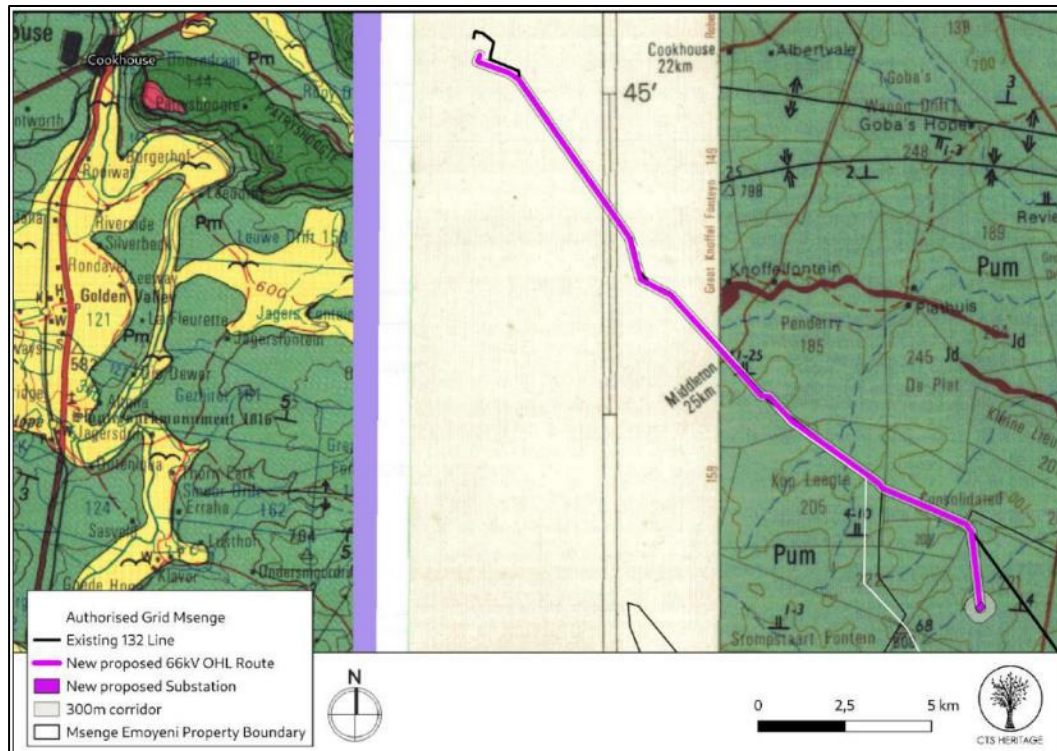


Figure 5.21: Extract from the CGS 3226 King Williams Town Map indicating that the development area is underlain by sediments of the Beaufort group, within the Middleton Formation of the Adelaide Subgroup (Pum).

SECTION 6: ASSESSMENT OF IMPACTS

This Section serves to assess the significance of the positive and negative environmental impacts (direct and indirect expected to be associated with the proposed deviation of the authorised 132kV overhead powerline and development of an on-site substation and associated infrastructure for associated with the authorised Msenge Emoyeni Wind Energy Facility. The proposed project will comprise the following key infrastructure and components:

- 66kV overhead single circuit powerline approximately 22,7 km long is to be deviated within a 300m wide assessment corridor (150m on either side), from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon Main Transmission Substation.
- Access tracks of up to 7m in width along the powerline route from the proposed on-site substation located within the Msenge Emoyeni WEF to the Poseidon Main Transmission Substation.
- Water course crossings along the deviated powerline route from the proposed onsite substation to the Poseidon Main Transmission Substation.
- 33kV/132kV on-site substation with a footprint occupying an area of 250m x 200m, within a 300m radius to allow movement where possible.

The full extent of the identified development areas was considered through the BA process by the independent specialists and the EAP through the review of existing information, desktop evaluations and field surveys.

The proposed infrastructure will comprise the following phases:

- » ***Pre-Construction and Construction*** – will include pre-construction surveys; site preparation; establishment of access roads, laydown areas; construction of foundations involving excavations; the transportation of components/construction equipment to site, manoeuvring and operating vehicles for unloading and installation of equipment; and commissioning of new equipment and site rehabilitation. The construction phase for the various infrastructure is estimated to be up to 12 -18 months.
- » ***Operation*** – will include the operation of the grid connection infrastructure. The operation phase is expected to be at least 20 years (with maintenance) which is aligned with the anticipated lifespan of the WEF. Depending on the economic viability of the Msenge Emoyeni WEF, the length of the operation phase may be extended beyond a 20-year period.
- » ***Decommissioning*** –At the end of the project's life, decommissioning will include site preparation, disassembling of the components, clearance of the grid connection infrastructure corridor, and rehabilitation.

Environmental issues associated with pre-construction, construction and decommissioning activities may include, among others, threats to biodiversity and ecological processes, including habitat alteration and impacts to fauna and flora, impacts to sites of heritage value, soil erosion and contamination of water and soils associated with spillages of hazardous materials and inappropriate storage, handling and disposal of waste. Impacts associated with decommissioning are expected to be similar to those associated with construction activities. However, in some instances some specialists have identified and assessed specific decommissioning impacts associated with the project, these impacts are assessed as separate impact tables where relevant below.

6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This section of the BA Report includes the following information required in terms of Appendix I: Content of the BA Report:

Table 6.1: Content of the BA Report.

Requirement	Relevant Section
3(h)(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed, (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated.	The impacts and risks associated with the development of various infrastructure including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impact can be reversed and cause an irreplaceable loss of resources are included in sections 6.2, 6.3., 6.4., 6.5., 6.6, 6.7.
3(h)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The positive and negative impacts associated with the development of the 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings are included in sections 6.2., 6.3., 6.4., 6.5., 6.6., 6.7.
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The mitigation measures that can be applied to the impacts associated with the 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings are included in sections 6.2., 6.3., 6.4., 6.5., 6.6., 6.7.
3(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	A description of all environmental impacts identified for various infrastructure during the BA process, and the extent to which the impact significance can be reduced through the implementation of the recommended mitigation measures provided by the specialists are included in sections 6.2., 6.3., 6.4., 6.5., 6.6., 6.7.
3(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts, (ii) the nature, significance and consequences of the impact and risk, (iii) the extent and duration of the impact and risk, (iv) the probability of the impact and risk occurring, (v) the degree to which the impact and risk can be reversed, (vi) the degree to which the impact and risk may cause irreplaceable loss of resources and, (vii) the degree to which the impact and risk can be avoided, managed or mitigated.	An assessment of each impact associated with the development of the 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings, including the nature and significance, the extent and duration, the probability, the reversibility, and the potential loss of irreplaceable resources, as well as the degree to which the significance of the impacts can be mitigated are included in sections 6.2., 6.3., 6.4., 6.5., 6.6., 6.7.
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMP.	Mitigation measures recommended by the various specialists for the reduction of the impact significance are included in sections 6.2., 6.3., 6.4., 6.5., 6.6., 6.7.

6.2. Assessment of Impacts on Ecology (Fauna and Flora)

The development and operation of the 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings for the authorised Msenge Emoyeni WEF will have an impact on the ecological resources identified within the development area. These resources include vegetation, protected and listed plant species; fauna; habitat; conservation and broad-scale ecological processes.

A summary of the ecological impacts identified and the significance thereof for the proposed development are included below. Refer to **Appendix G** for more detail.

6.2.1. Results of the Ecological Impact Assessment

Vegetation Types

None of the properties investigated showed grasslands, thicket or savanna in good ecological condition (see **Figure 6.1** below), which indicates a steady regime of overgrazing and insufficient resting to allow palatable species to persist in the landscape. At most of the sites visited, the ecological conditions indicated towards rangelands that require significant periods of rest. The bush clumps exhibited the most degree of vegetation structure changes.



Figure 6.1: The remnants of a large bush clump which would have exhibited a closed canopy, complex architecture and a canopy height of 2-3m

SCC located during field RRRG visits (2022)

The Table 6.2 below gives a composite summary of the plant species technically listed as SCC, that were positively identified during the 2022 field visits (includes species from the Msenge WEF footprint).

Table 6.2: SCC identified by RRRG during the fieldwork.

No	Genus	Species	Sub-species	Variation	Conservation Status
1	<i>Aloe</i>	<i>maculata</i>			Protected (EC Prov Ordinance 1974) ²
2	<i>Aloe</i>	<i>striata</i>			Protected (EC Prov Ordinance 1974)
3	<i>Aloiampelas</i>	<i>tenuior</i>			Least Concern (Mtshali 2018) but Protected (EC Prov Ordinance 1974)
4	<i>Ammacharis</i>	<i>coranica</i>			Protected (EC Prov Ordinance 1974)
5	<i>Anacampseros</i>	<i>arachnoides</i>			Protected (EC Prov Ordinance 1974)
6	<i>Boophane</i>	<i>distichia</i>			Listed as Protected in NEMBA 2007.
7	<i>Chasmatophyllum</i>	<i>musculinum</i>			Protected (EC Prov Ordinance 1974)
8	<i>Delosperma</i>	<i>adelaidensis</i>			Listed as Protected in NEMBA 2007.
9	<i>Diascua</i>	<i>cuneata</i>			Protected (EC Prov Ordinance 1974)
10	<i>Duvalia</i>	<i>casespitosa</i>			Protected (EC Prov Ordinance 1974)
11	<i>Duvalia</i>	<i>Modesta</i>			Protected (EC Prov Ordinance 1974)
12	<i>Euphorbia</i>	<i>gorgonis</i>			Not Determined (Möller & Becker 2019)
13	<i>Euphorbia</i>	<i>meliformis</i>			Near Threatened Protected (EC Prov Ordinance 1974). Listed as Protected in NEMBA 2007. ³
14	<i>Euphorbia</i>	<i>micracantha</i>			Least concern (Möller & Becker 2019), but not listed on SANBI Red Data list
15	<i>Euphorbia</i>	<i>stellata</i>			Least Concern ⁴
16	<i>Faucaria</i>	<i>tuberculosa</i>			Protected (EC Prov Ordinance 1974)
17	<i>Glotiphyllum</i>	<i>longum</i>			Protected (EC Prov Ordinance 1974)
18	<i>Haemanthus</i>	<i>albibus</i>			Protected (EC Prov Ordinance 1974)
19	<i>Hereroa</i>	<i>granulata</i>			Protected (EC Prov Ordinance 1974)
20	<i>Huernia</i>	<i>theretii</i>			Protected (EC Prov Ordinance 1974)
21	<i>Mestaklema</i>	<i>albanucum</i>			Protected (EC Prov Ordinance 1974), Listed as Protected in NEMBA 2007.
22	<i>Mestaklema</i>	<i>tuberosum</i>			Protected (EC Prov Ordinance 1974)

² Government Gazette 1974.

³ Government Gazette 2007.

⁴ Included in this list due to the combination of the date of last assessment (2005) and the danger from plant collectors and overgrazing.

23	<i>Pachypodium</i>	<i>succulentum</i>			Protected (EC Prov Ordinance 1974)
24	<i>Radamanthus</i>	<i>sp/</i>			New species to science (Data Deficient)
25	<i>Ruschia</i>	<i>brittinae</i>			Protected (EC Prov Ordinance 1974)
26	<i>Ruschia</i>	<i>cradockensis</i>			Protected (EC Prov Ordinance 1974)
27	<i>Stapelia</i>	<i>grandiflora</i>			Protected (EC Prov Ordinance 1974)

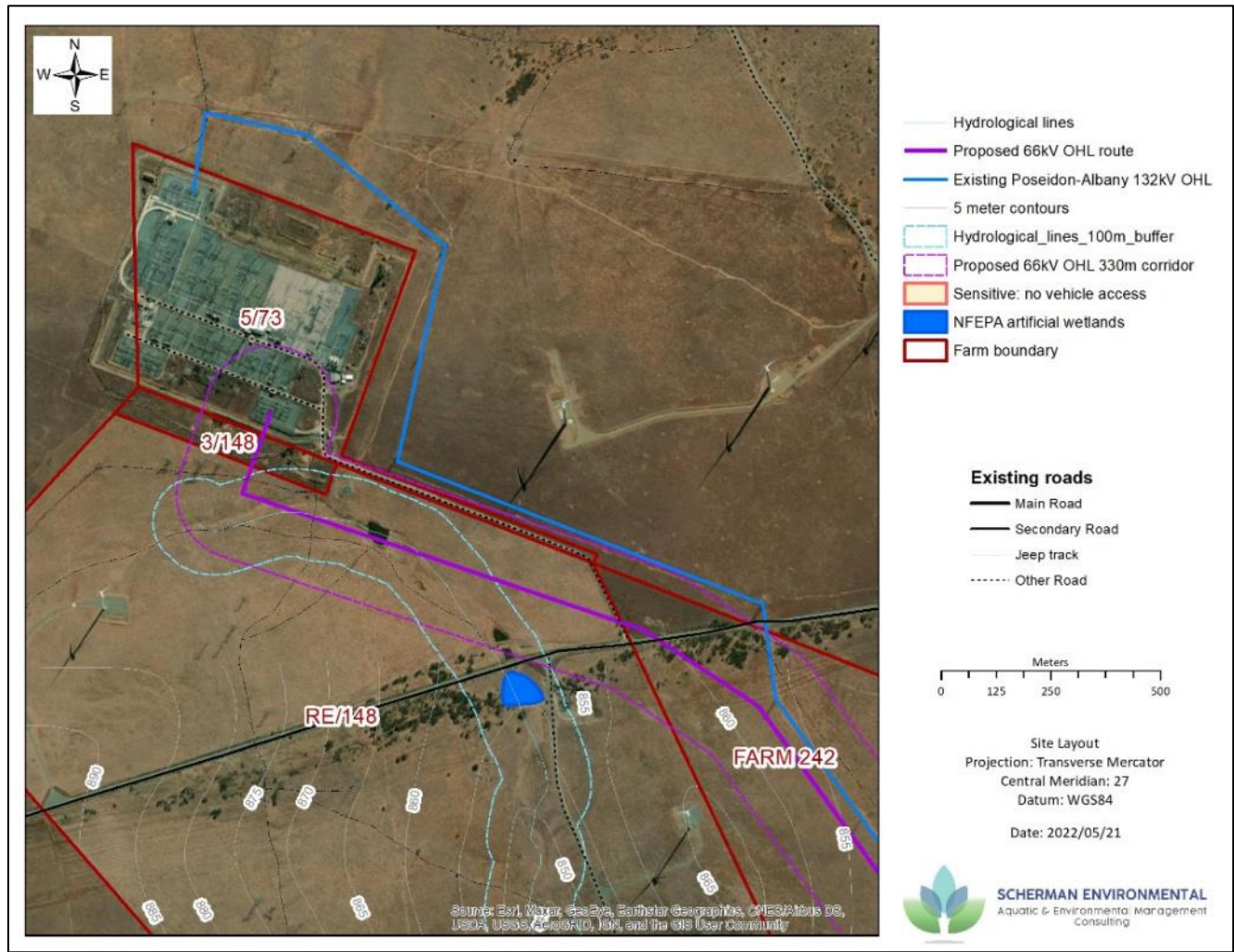


Figure 6.2: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. Farm 5/73, 3/148, RE/148 and 242

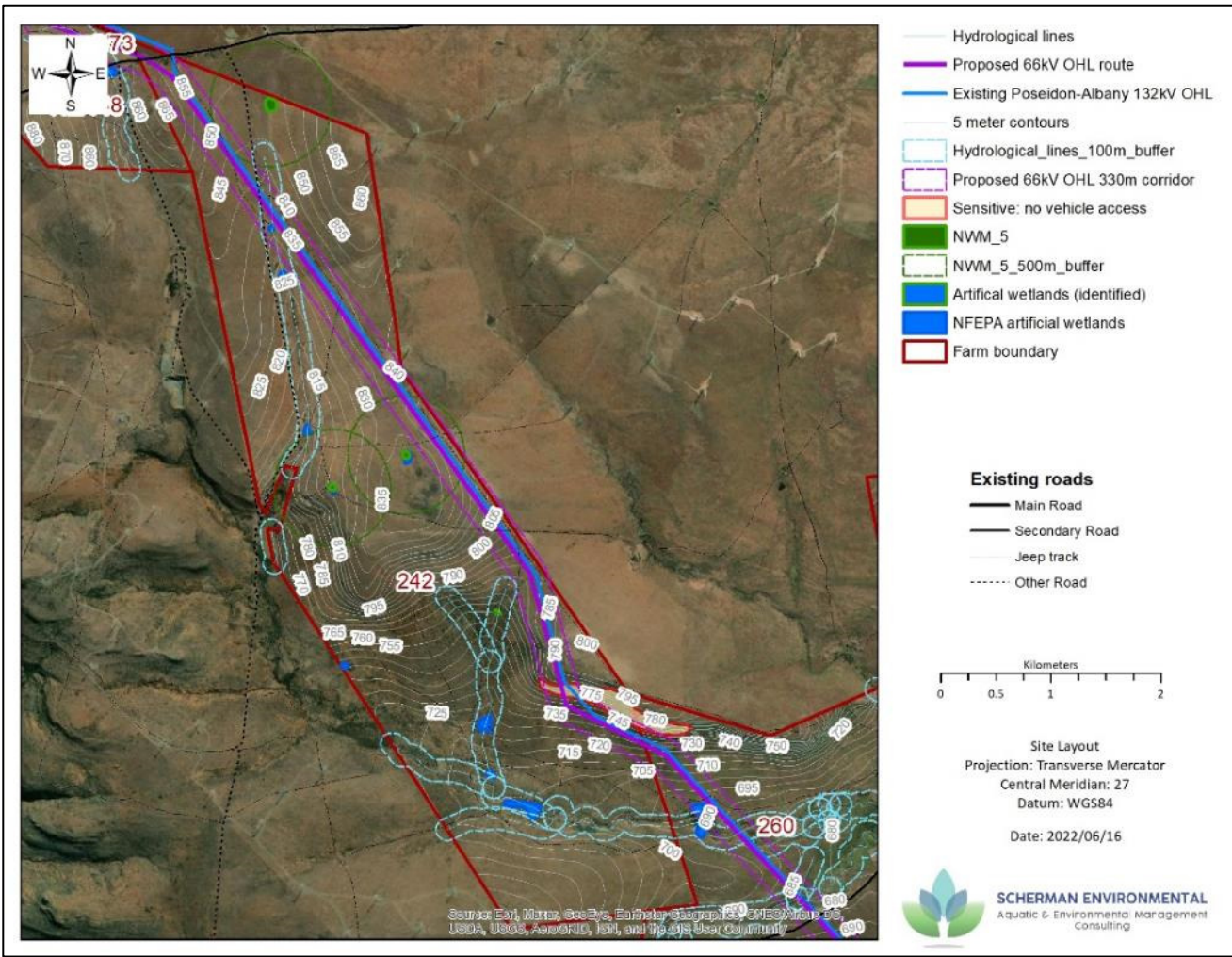


Figure 6.3: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. Farm 242

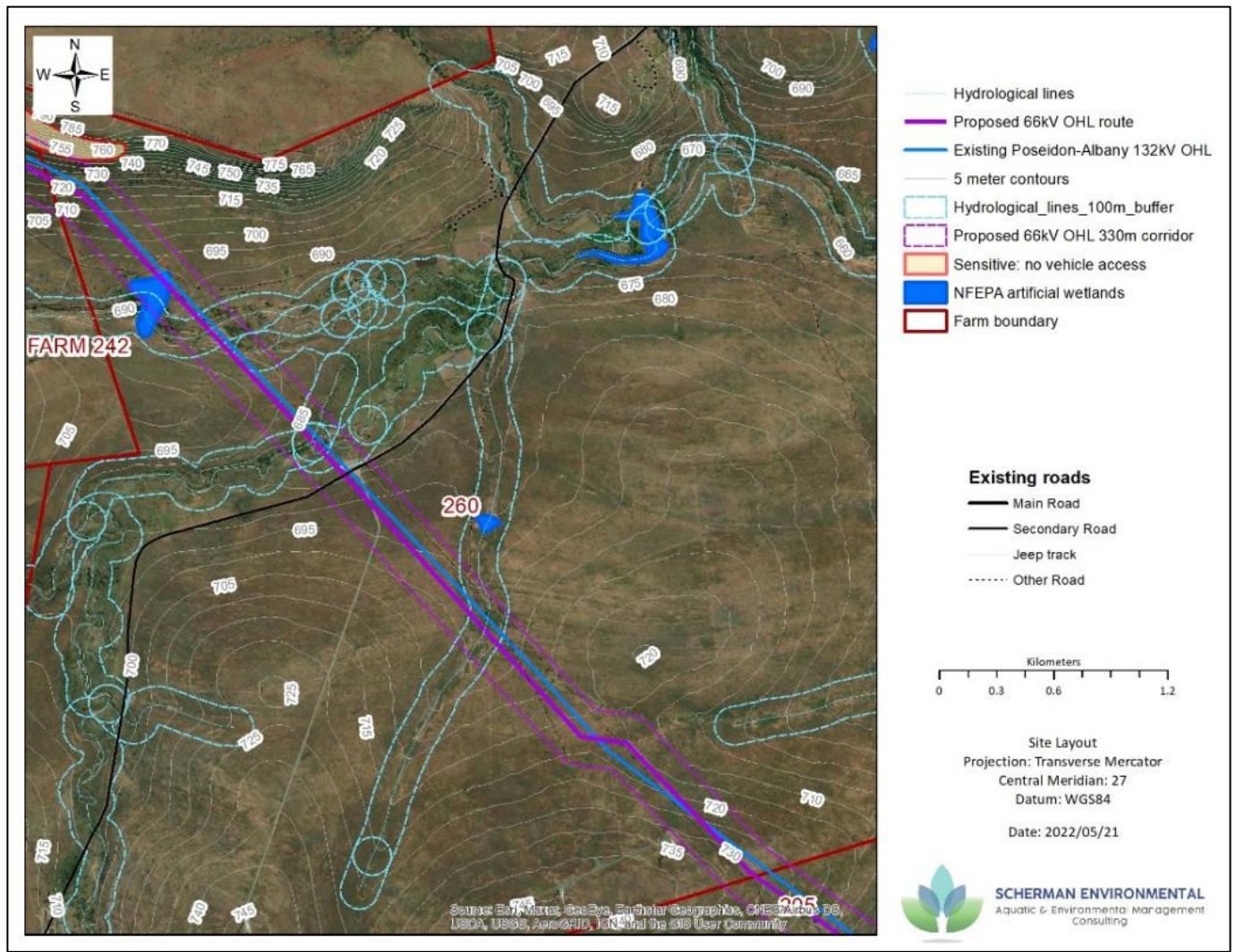


Figure 6.4: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. **Farm 260**

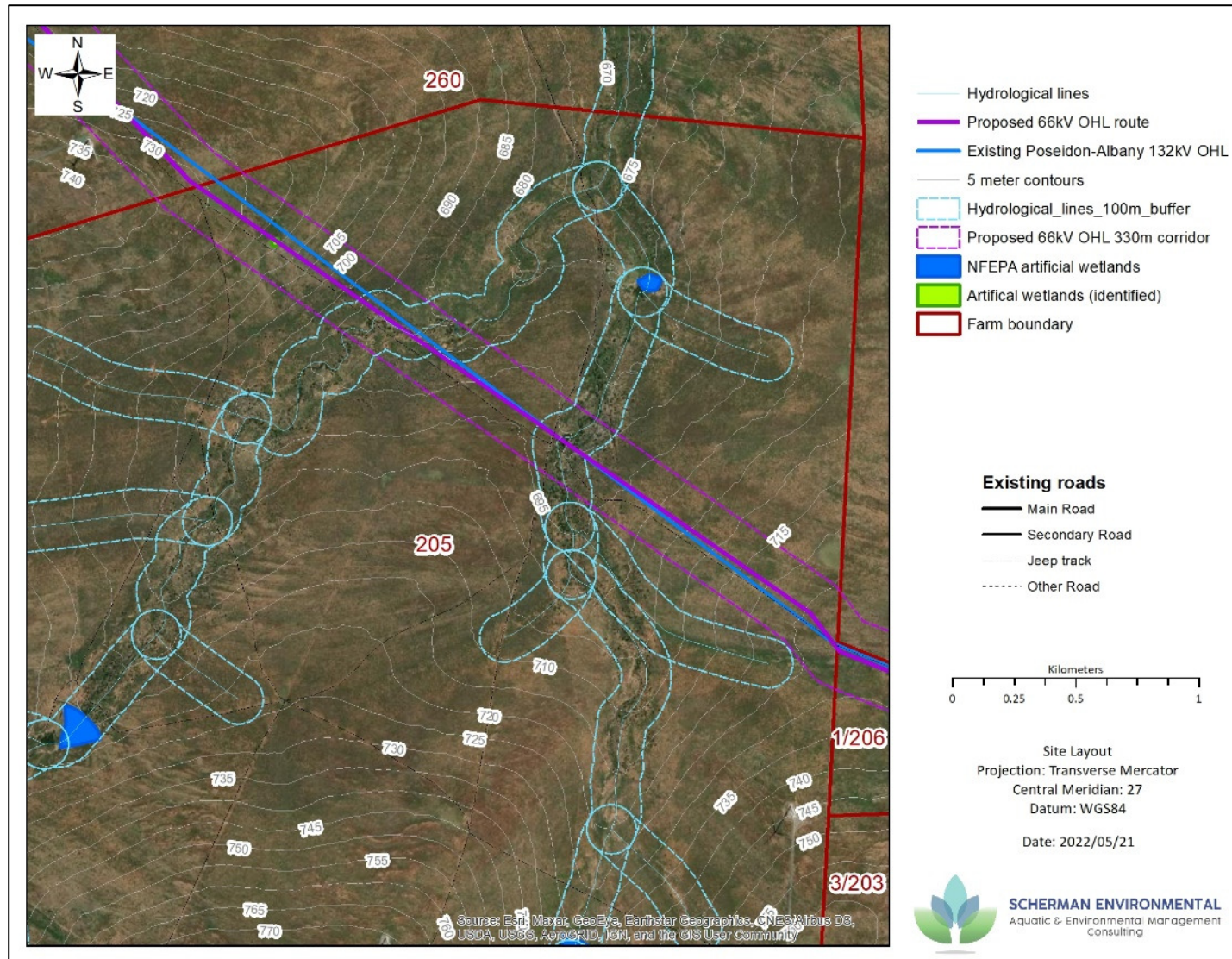


Figure 6.5: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. **Farm 205**

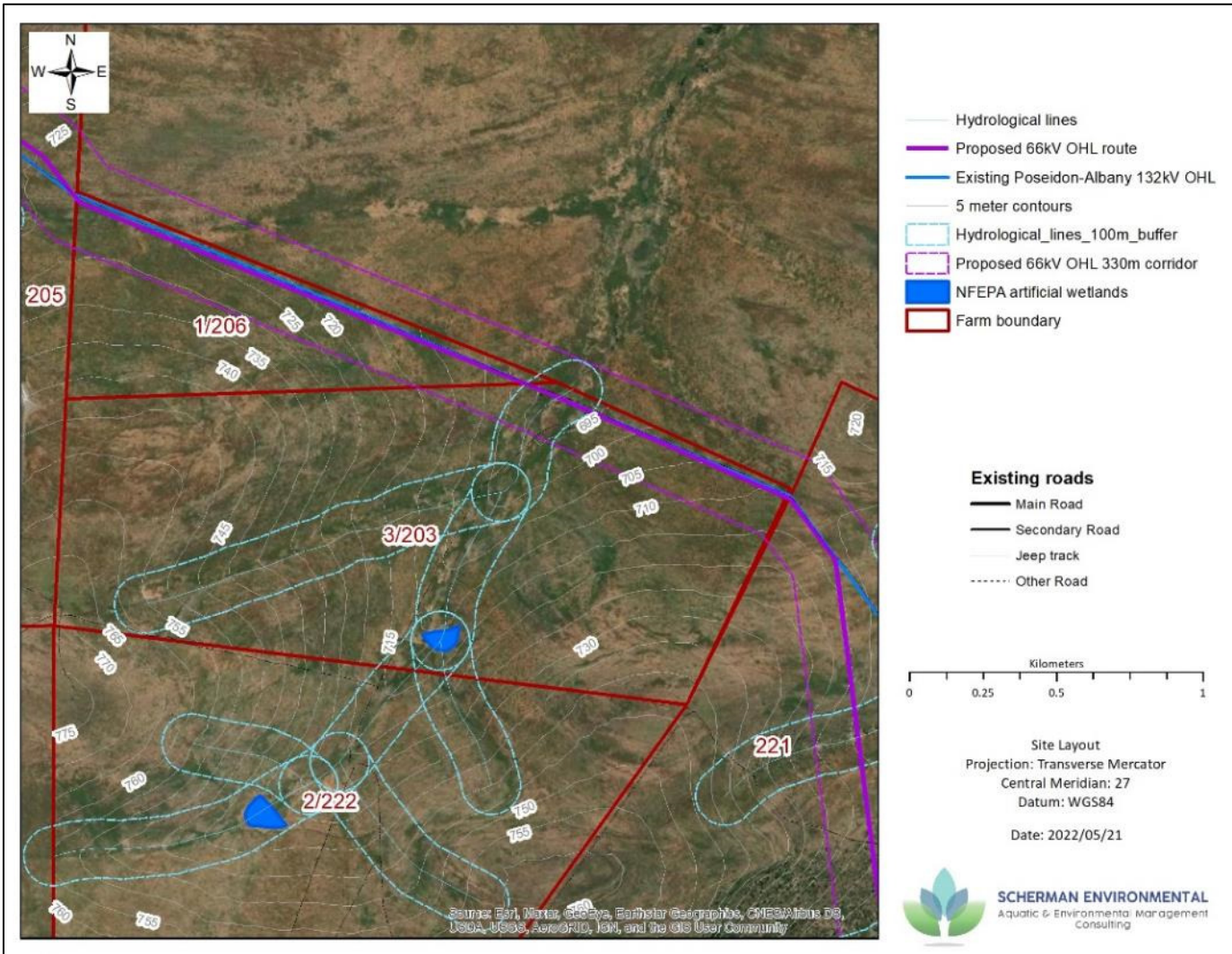


Figure 6.6: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. **Farm 1/206 and 3/203**

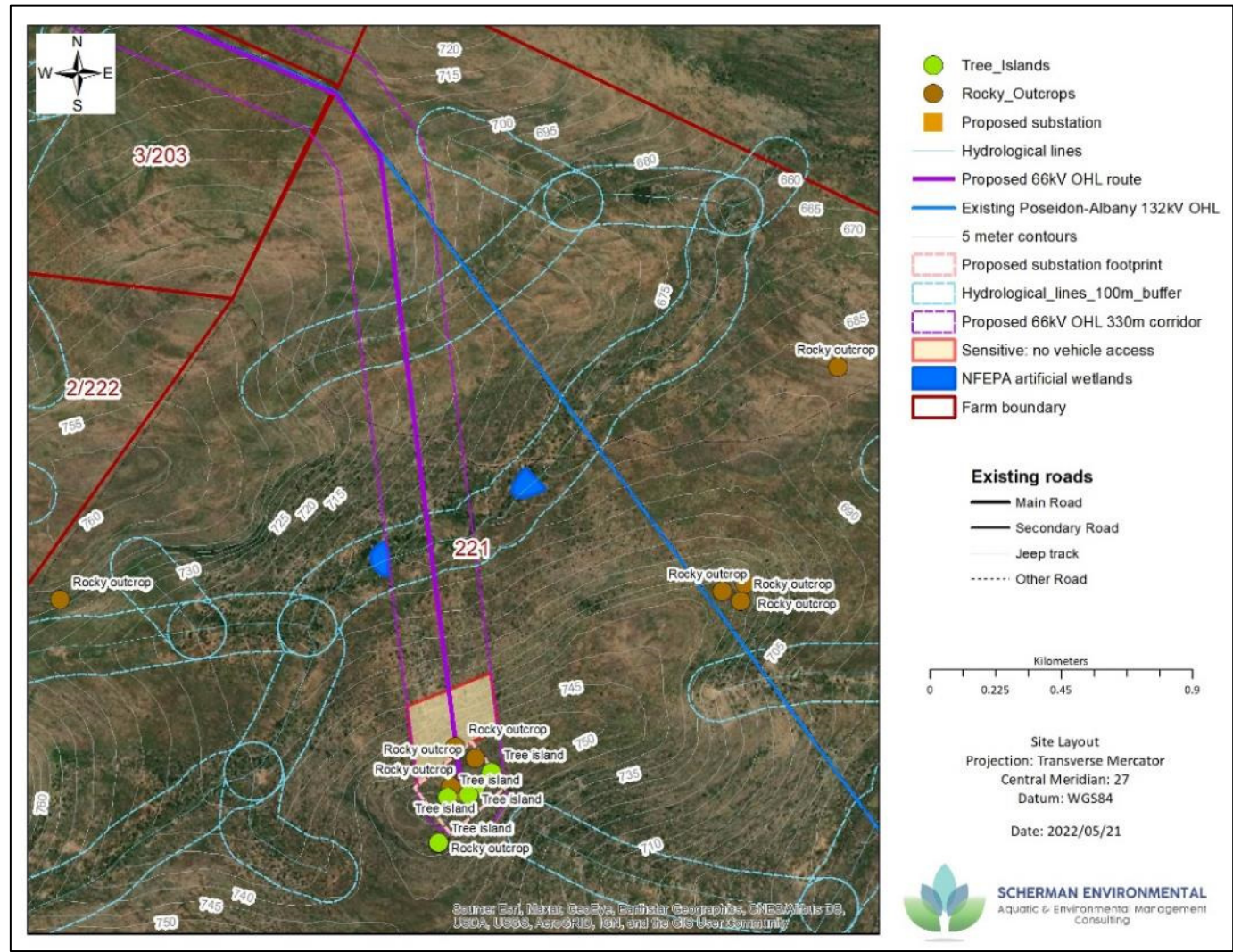


Figure 6.7: Ecological sensitivity of development footprint of the grid connection infrastructure establishment associated with the Msenge Emoyeni WEF. Farm 221

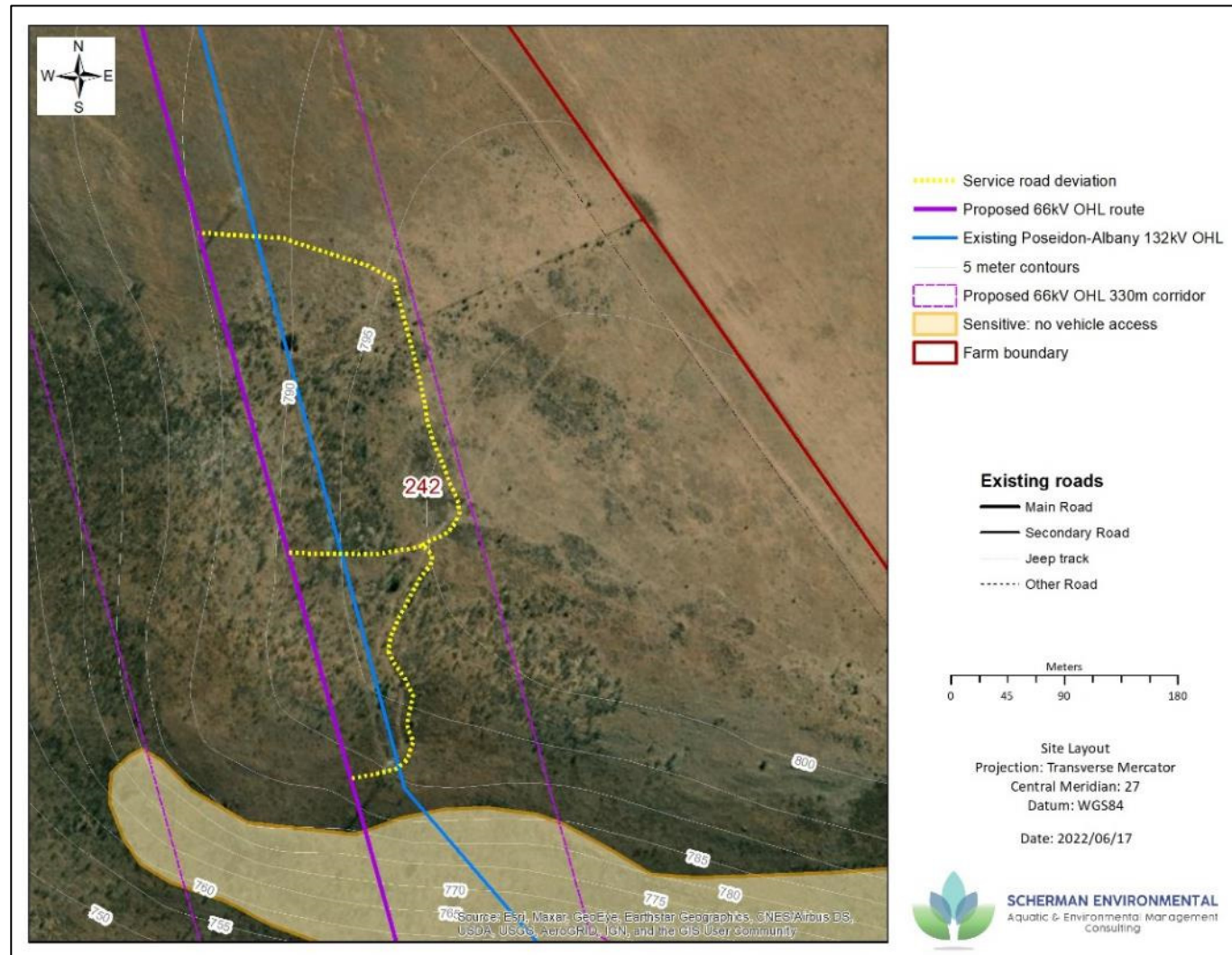


Figure 6.8: Sensitive areas in which vehicular access should be limited in the project area

6.2.2. Description of Ecological Impacts

Flora

Table 6.1 provides a summary of all impacts that will potentially affect the terrestrial flora over the course of the project.

Table 6.1: Summary of impacts (impact statement) affecting the terrestrial flora over the course of the project.

Phase	Impact type	Expected Impacts
Construction Phase	Direct	Destruction of natural vegetation from construction and associated activities,
		Loss of rare or threatened plant species (SCC) from construction and associated activities
		Dust pollution deposition on vegetation
		Habitat fragmentation
		Positive: reduction of AIPs in the footprint of the developments
	Indirect	Poaching of plants for the plant-collecting trade
Loss of plant populations to waterflow impediments at water crossings		
Operational Phase	Direct	Habitat fragmentation
	Indirect	The loss of SCC to the plant collecting trade
		The loss of SCC plants due to poor livestock management (which includes game animals).
		Increase in the diversity and density of AIPs
		The spread of bush encroacher species will negatively impact the highly localized SCC and reduce grazing capacity
Loss of plant populations to waterflow impediments at water crossings		

6.2.3. Assessment of Potential Impacts

Construction Phase Impacts (Flora)

During the construction phase the bulk of the direct impacts will be observed. These negative impacts are 1) Destruction of natural vegetation from construction and associated activities, 2) Loss of rare or threatened plant species (SSC) from construction and associated activities 3) Dust pollution deposition on vegetation, 4) Fragmentation of habitat. At least one positive impact from the construction will be 5) the reduction of AIPs in the footprint of the developments. Indirect impacts include 1) Poaching of plants for the plant-collecting trade and 2) Loss of plant populations to waterflow impediments at water crossings.

Nature: Destruction of natural vegetation (excluding the SCC) from construction and related activities		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	Short (1)	Short (1)
Magnitude	Minor (2)	Minor (2)
Probability	Definite (5)	Definite (5)
Significance	Medium (20)	Low (20)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<p>The minor detouring of service roads to use existing farm tracks, the existing service track for the existing Poseidon-Albany OHL, wise use of contours and avoiding species rich rocky outcrops. Road width and construction material storage needs to be monitored by the ECO. All species that are not listed as SCC but are transplantable (e.g. <i>Aloe ferox</i>, <i>Gasteria bicolor</i>, <i>Crassula</i> spp. and <i>Cotyledon</i> spp.) could be effectively used in the Revegetation and Rehabilitation Plans. Wherever possible OHL service roads should avoid the direct route when rocky outcrops or bush clumps occur.</p>		
Residual Impacts:		
<ul style="list-style-type: none"> • Translocated species could succumb to drought or infection during the transplanting stage. • Translocated species efforts could be nullified by overstocking and poor rangeland management. 		

Nature: Loss of rare or threatened plant species (SCC) from construction and associated activities		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	Short (1)	Short (1)
Magnitude	Low (4)	Minor (2)
Probability	Definite (5)	Definite (5)
Significance	Medium (30)	Low (20)
Status (positive or negative)	Negative	Positive
Reversibility	Low	Medium
Irreplaceable loss of resources?	Yes	Limited

Can impacts be mitigated?	Yes
Mitigation:	
<p>The minor detouring of service roads to use existing farm tracks, wise use of contours and avoiding species rich rocky outcrops. Carefully selected SCC (transplanting success) should be located well in advance of the construction phase and relocated to suitable habitats in close proximity. Rare (R), Critically Endangered (CR), Near Threatened (NT) and Vulnerable (VU)⁵ species should be successfully translocated to fenced off areas that are zoned as “Set Asides” and protected from livestock and small game. These areas should be far from public roads and not advertised. The location of road construction materials requires careful and systematic assessment, as per the Plant Rescue and Protection Plan. The service roads beneath the OHLs are a potential risk for SCC and will also require a systematic search for SCC, and included in the implementation of the Plant Rescue and Protection Plan. The service roads should also be planned and laid out with a botanical ecologist. Error! Reference source not found. of the Terrestrial specialist report- Appendix G shows a section of the OHL which traverses a species-rich rocky slope and a service road through this zone should be avoided at all costs. Similarly, the base for the OHL pylons should not be located close to the boundary of this rocky slope. The Eskom service roads from the north should be used to access the last structure on the upslope, and the Eskom service roads from the south east (gate opposite the Amakhala WEF main entrance) should be used to access the structure on the down-slope⁶.</p>	
Residual Impacts:	
<ul style="list-style-type: none"> • Translocated species could succumb to drought or infection during the transplanting stage. • Search and Rescue efforts could be nullified by overstocking and poor rangeland management. • The location of Set Aside areas for rare and endemic plants could become hotspots for plant poaching 	

Nature: Dust pollution from road and infrastructure construction		
	Without mitigation	With mitigation
Extent	Low (I)	Low (I)
Duration	Short (I)	Short (I)
Magnitude	Small (I)	Small (I)
Probability	Definite (5)	Definite (5)
Significance	Medium (15)	Low (15)
Status (positive or negative)	Negative	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes – but not necessary.	
Mitigation:		

⁵ This needs to include species that have “Not Evaluated” or NE status (e.g. *Euphorbia gorgonis* and *E. micrantha*) as well as species whose threat status is seriously outdated or incorrect (e.g. *Faucaria tuberculosa*).

⁶ It is highly likely that the regular access from Eskom vehicles has led to the large infestation of *Opuntia megapotamica* on the lower slopes

If dust pollution is a significant concern and spraying road surfaces is required, then to spray the roadside vegetation will mitigate the effect on the plants. Given that the Eastern Cape is a drought stressed area, this is probably not a viable mitigation activity and the first post-construction rainfall event will reverse the impact.

Residual Impacts:

- None
- Excessive and sustained dust pollution could negatively impact *Euphorbia tridentata* populations and the ECO would need to monitor these populations until the dust risk has abated. If there were another five year drought that coincided with the construction phase, this risk may need reassessment.

Nature: Fragmentation of Habitats		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (28)	Medium (28)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To a limited extent – except at the decommissioning stages	
Mitigation:		
<p>If the monitoring during the lifespan of the WEF indicates significant but unintended or un-anticipated impacts on the plant ecology of SCC – then the entire road network needs to be decommissioned (after the Decommissioning Phase) and the roads need to be rehabilitated back to the original vegetation. The width of the road networks needs to be kept to a minimum. The mass rearing and propagation of key SCC species could include the rewilding into areas that may have become fragmented or where seed dispersal is restricted (e.g. across the R350).</p>		
Residual Impacts:		
None		

Nature: Destruction of declared Alien Invader Plants		
	Without mitigation	With mitigation
<i>Extent</i>	Low (1)	Low (1)
<i>Duration</i>	Short (1)	Short (1)
<i>Magnitude</i>	Small (1)	Small (1)
<i>Probability</i>	Definite (5)	Definite (5)
<i>Significance</i>	Medium (15)	Low (15)
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Not needed	
Mitigation:		
None needed except for the enforcement of an Alien Management Plan as per NEMBA requirements for all properties >5 hectares.		
Residual Impacts:		
Construction and maintenance vehicles could transport propagules to new areas.		

Nature: Poaching of plants for the plant-collecting trade		
	Without mitigation	With mitigation
<i>Extent</i>	Low (1)	Low (1)
<i>Duration</i>	Short (1)	Short (1)
<i>Magnitude</i>	Low (4)	Small (1)
<i>Probability</i>	Probably (3)	Probable (3)
<i>Significance</i>	Medium (18)	Low (9)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	High	High
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
Mitigation:		
The security of the WEF needs to restrict access with a controlled access point and locked gates along the R350 and other district roads. The location of key SCC needs to be carefully guarded and documents not freely available to the public. For selected key species such as		

E. meloformis, *Faucaria tuberculosa*, and *Huernia* spp., permits are needed from DEDEAT to collect specimens (in the construction footprint and possibly outside the buffers), for mass propagation and rewilding back to the site to prevent numbers of plants falling below a threshold for a Minimum Viable Population (MVP).

Residual Impacts:

None

Nature: Loss of plant populations to waterflow impediments at water crossings

	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (27)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	No (unless SCC)	No
Can impacts be mitigated?	Yes	

Mitigation:

Bedford has Mean Annual Precipitation (MAP) ~500mm pa. It also serves as a catchment area for more xeric areas in the lower catchments (<300mm pa). The compound effect of slight impediments to natural water flow could have significant impacts for the ecology downstream. The region is already stressed with the unregulated harvesting of water runoff for small dams. The best designs for water crossings should be flat, ground-level water crossings and not culverts with pipes that cause restricted flow and water to backup.

Residual Impacts:

Road maintenance at road crossings (including blockages to water flow) could retard baseflows and impact downstream micro-hydrology.

Flora-Operation Phase Impacts (Flora)

The bulk of the impact on the botanical species will have been felt in the construction phase, albeit highly localized. A direct impact would be the continued fragmentation of habitats. Two key and possibly serious indirect impacts for this long-term form of land-use are: 1) the loss of SCC to the plant collecting trade and 2) the loss of SCC plants due to poor livestock management (which includes game animals). Other indirect impacts would be 3) the rampant increase in the diversity and density of AIPs if the mitigation measures listed above for the construction phase are not implemented and sustained, 4) the spread of bush encroacher species which will negatively impact the highly localized SCC and reduce grazing capacity and 5) loss of plant populations to waterflow impediments at water crossings.

Nature: Fragmentation of Habitats		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (28)	Medium (28)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To a limited extent – except at the decommissioning stages	
Mitigation:		
<p>If the monitoring during the lifespan of the WEF indicates significant but unintended or un-anticipated impacts on the plant ecology of SCC – then the entire road network needs to be decommissioned (after the Decommissioning Phase) and the roads need to be rehabilitated back to the original vegetation. The width of the road networks need to be kept to a minimum. The mass rearing and propagation of key SCC species could include the rewilding into areas that may have become fragmented or where seed dispersal is restricted (e.g. across the R350).</p>		
Residual Impacts:		
None		

Nature: Poaching of plants for the plant-collecting trade		
	Without mitigation	With mitigation
Extent	Low ⁷ (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Low (3)	Minor (2)
Probability	Probable (5)	Improbably (5)
Significance	Medium (40)	Improbable (20)
Status (positive or negative)	Negative	Positive
Reversibility	Low	Medium

⁷ The challenge with EIA reports is to make a composite assessment for an impact when the impact may not be uniformly distributed across SCC. *Faucaria tuberculosa* for example may have a exceptionally high vulnerability and irreplaceability, whereas *Euphorbia tridentata* is super-abundant and unlikely to become locally extinct.

<i>Irreplaceable loss of resources?</i>	Yes	Limited
<i>Can impacts be mitigated?</i>	Yes	
<i>Mitigation:</i>		
<p>The security of the WEF and access to the powerline corridor needs to restrict access with a controlled access point and locked gates along the R350 and other district roads. The location of key SCC needs to be carefully guarded and documents not freely available to the public. For selected key species such as <i>E. meloformis</i>, <i>F. tuberculosa</i>, and <i>Huernia</i> spp., permits are needed from DEDEAT to collect specimens (in the construction footprint and possibly outside the buffers), for mass propagation and rewilding back to the site to prevent numbers of plants falling below a threshold for a Minimum Viable Population (MVP). The recommendations of the Plant Rescue and Protection Plan need to be implemented. It is also strongly recommended that the developer considers the drafting of a Co-management Agreement for Sustainable Landuse Management. This document should be drafted by a rangeland ecologist with experience in these vegetation types.</p>		
<i>Residual Impacts:</i>		
<ul style="list-style-type: none"> • Uncoordinated mass propagation and rewilding could lead to serious genetic pollution or hybridization, which is akin to a species extinction. 		

<i>Nature: Loss of SCC populations from the lack of an integrated WEF and Livestock Management Plan</i>		
	Without mitigation	With mitigation
<i>Extent</i>	Low (1)	Low (1)
<i>Duration</i>	>15 years (4)	>15 years (4)
<i>Magnitude</i>	Low (4)	Minor (2)
<i>Probability</i>	Probable (4)	Probable (4)
<i>Significance</i>	Medium (36)	Low (28)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low ⁸	High
<i>Irreplaceable loss of resources?</i>	No (unless SCC)	No
<i>Can impacts be mitigated?</i>	Yes	
<i>Mitigation:</i>		
<p>The implementation of Sustainable Livestock Management is important. This involves revisiting of carrying capacities – based on regular veld condition assessments and not outdated lookout tables from Dohne Research Station. The veld needs to rest and the income from the WTGs to the farmer needs to be used as leverage to destock and wait for the productivity of the land to increase. High resolution</p>		

⁸ Reversibility can be applied to SCC up to a point where a threshold is crossed for a Minimum Viable Population, after which the probability % drops off rapidly to zero (the point of local species extinction).

mapping of all SCC should be undertaken and some areas need to be fenced off – based on the recommendations of an expert in SCC. The Set Asides could provide much needed refugia for key species like *Euphorbia meloformis*, *Faucaria tuberculosa* and others.

Residual Impacts:

Game management is extremely challenging in the realm of sustainable livestock management due to the inability to rotate the animals in a camp system. Unregulated high densities of wild animals (especially extra-limital species) could have significant and adverse impacts on SCC populations.

Nature: The spread of AIPs will negatively impact the highly localized SCC and reduce grazing capacity

	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Low and expensive	Low but less expensive
Irreplaceable loss of resources?	Yes	Limited
Can impacts be mitigated?	Yes	

Mitigation:

The need for fine-scale AIP baseline mapping will be instrumental in the successful implementation of the AIP Management Plan, it is recommended that monitoring and implementation of the AIP Management Plan must be undertaken monthly for the first two years of the operational phase.

Residual Impacts:

Climate change is likely to exacerbate the growth rate of succulent AIPs due to elevated carbon dioxide levels and elevated temperatures, which in tandem elevated evapotranspiration rates, will give them an unfair advantage over the indigenous spp.

Nature: The spread of bush encroacher species will negatively impact the highly localized SCC and reduce grazing capacity

	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)

Significance	Medium (33)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Low and expensive	Low but less expensive
Irreplaceable loss of resources?	Yes	Limited
Can impacts be mitigated?	Yes	
Mitigation:		
<p>In the same vein as the AIPs, the bush encroacher species like <i>V. karoo</i> are likely to out compete the indigenous species, especially forbs, shrubs and succulent species. This is due to the impacts of climate change. The SCC are almost exclusively succulent species which require high levels of solar radiation and are typically shade-intolerant.</p> <p>The Bush Encroachment Management Plan needs to be implemented. The Bush Encroachment Management Plan needs to be implemented in conjunction with the Revegetation and Rehabilitation Plan to make sensible use of the spinescent brush material.</p>		
Residual Impacts:		
<p>The seed banks for <i>V. karoo</i> are likely to last for many decades and the Bush Encroachment Management Plan timeframe is likely to outlast the WEF development.</p>		

Nature: Loss of plant populations to waterflow impediments at water crossings		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	>15 years (4)	>15 years (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (27)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	No (unless SCC)	No
Can impacts be mitigated?	Yes	
Mitigation:		
<p>The road crossings will require maintenance in the beginning to remove topsoil and silt that collects and retards the rate of flow during rainfall events. With the implementation of the various management plans, there will be an increase in vegetation cover and less topsoil movement.</p>		
Residual Impacts:		

None

Decommissioning Phase Impacts (Flora)

The impact of the decommissioning phase is extremely difficult to anticipate due to the uncertainty of the project lifetime. The associated wind energy facility for which the new proposed grid infrastructure is associated may be financially viable, or upgraded by the end of the first project period and this would reduce the probability of the access tracks being decommissioned and the subsequent rehabilitation.

Construction Phase Impacts (Fauna)

The anticipated impacts to fauna are related to the following:

- **Livestock:** the introduced livestock have modified the habitat through the homogenization of previously heterogeneous habitat resulting in the loss of food, shelter, and habitat for indigenous fauna.
- **Fences:** fences impede the movement of medium and large-bodied fauna and can cause mortality in meso-ungulates (i.e., springboks) and large leopard tortoises (*Stigmochelys pardalis*) when they get stuck in the barbed wire or between low-hanging wire strands.

Nature: The planned infrastructure will require the clearing of large tracts of pristine habitat for the roads, the road buffers and the substation. This will include physical removal of vegetation and rocky outcrops to create corridors for infrastructure. This fragments the environment and affects the movement of fauna. This also indirectly alters species compositions and provides suitable habitat for alien invasions. The fragmentation, destruction and degradation of habitat will cause indirect mortality to terrestrial fauna through the loss of habitat (i.e., food, shelter, water, predator avoidance).

	Without mitigation	With mitigation
<i>Extent</i>	Low (2)	Very Low (1)
<i>Duration</i>	Long-term (4)	Medium-term (3)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Highly Probable (4)	Probable (3)
<i>Significance</i>	Medium (48)	Low (24)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	

Mitigation:

- Construction needs to be limited to the designated footprint.
- Where rocky outcrops are unavoidable, a suitable specialist must be tasked with checking the area for fauna and removing any animals. The rocks should thereafter be relocated to a suitable habitat away from infrastructure so that they can be

recolonized again by wildlife. Rocks should not be placed directly adjacent to the road as this creates ideal habitats which fauna will inhabit, subjecting them to increase mortality from roadkill.

- Areas that have been cleared during the construction phase need to re-vegetated with a similar species composition to ensure the areas are not colonised by opportunistic and alien species, which indirectly alters the biotic and abiotic landscape for terrestrial fauna.
- The affected area must be monitored for invasive vegetation and cleared and controlled when necessary. Alien vegetation homogenizes the ecosystem and causes additional indirect losses of habitat and fragmentation.

Residual Impacts:

The loss of habitat is unavoidable irrespective of whether mitigation is employed. Habitat clearing and infrastructure development will cause the loss and fragmentation of habitat, which will affect the distributions and densities of fauna within the infrastructure footprint. Habitat degradation can be limited, and broad sweeping habitat loss can be avoided provided the above mitigations are adhered to.

Nature: The planned construction process will result in the pollution of the immediate construction area its buffers. Whilst suspended dust has a nominal effect on the terrestrial fauna, the vibration and noise pollution will affect the behaviors of terrestrial and fossorial animals, which could lead to actions that cause harm or death (i.e., ungulates run into fences, reptiles flee shelter and get predated on). Additionally, the construction process will require the use of water, chemicals, and raw materials that, if poorly managed, could pollute the immediate surroundings. The most sensitive areas are the various waterbodies scattered across the site that support a plethora of organisms. Drainage lines are particularly vulnerable as mismanaged runoff from the construction process could filter into ephemeral ponds and negatively affect both the organisms that live in the water, and the organisms that rely on the water for hydration.

	Without mitigation	With mitigation
<i>Extent</i>	Low (2)	Very Low (1)
<i>Duration</i>	Medium-term (3)	Very Short Duration (1)
<i>Magnitude</i>	High (6)	Very Low (2)
<i>Probability</i>	Highly Probable (4)	Improbable (2)
<i>Significance</i>	Medium (44)	Low (8)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Medium	High
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	

Mitigation:

- Minimize the noise pollution by abbreviating construction time. Refrain from working at night to minimize effect on nocturnal predators and prey that rely on audible cues.
- Minimize light pollution by ceasing construction at night. Lights along the route and to the substation need to keep to a minimum. Red lights should be used where possible to reduce impact on nocturnal species.

- Develop and adhere to a waste management protocol to ensure the waste products produced during the construction process are not exported into the system. Water and chemicals used during the construction process must be adequately managed to ensure that there is no interference with natural aquatic systems, especially near wetlands and drainage lines.

Residual Impacts:

There will be unavoidable impacts on terrestrial fauna despite mitigations. These will likely come in the form of behavioral shifts with animals moving away from excessive sources of noise and vibration (potentially putting them at risk). This is however nominal and will only be a factor during the construction process. Pollution and more especially aquatic pollution is completely avoidable provided the mitigations mentioned above are adhered to.

Nature: This applies to the direct unintentional mortality of terrestrial fauna. Unintentional mortality relates to animals dying during the construction process through the use of construction tools and/or machinery (i.e. animals crushed or lacerated).

	Without mitigation	With mitigation
Extent	Low (2)	Very Low (1)
Duration	Medium-term (3)	Short Duration (2)
Magnitude	Low (4)	Very Low (2)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (36)	Low (15)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Medium
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- All workers need to undergo an induction prior to entering the site that informs them about the animals in the area and the best practices for avoiding animal mortality and displacement.
- Construction needs to be limited to the designated footprint.
- Construction needs to cease at night to ensure that cryptic nocturnal fauna are not harmed.
- All construction routes need to receive a walkthrough to flush any animals out in the immediate vicinity. A suitable specialist must be consulted to remove animals that do not move of their own accord.
- Responsibilities of the specialist will include checking burrows, dismantling termite mounds, and flipping rocks and logs. All encountered animals during this process need to be moved clear of the construction site to suitable site in accordance with national and provincial legislation. We must stress the importance of the controlled dismantling of termite mounds as they harbour high diversities of a wide range of small and meso-vertebrates and invertebrates. Animal densities will be higher in termite mounds in the colder months so encounter rates will definitely shift depending on the season of construction.

Residual Impacts:

Whilst unintentional human-mediated faunal mortality is unavoidable due to the secretive nature of most wildlife, adherence to the above mitigations would render the residual impacts negligible.

Nature: Intentional mortality relates to people killing or harming animals during the construction process either out of fear or apathy for the wildlife. Intentional displacement refers to the harvesting of fauna either dead or alive for medicinal or commercial purposes (i.e., poaching for pet trade).		
	Without mitigation	With mitigation
Extent	Low (2)	Very Low (1)
Duration	Medium-term (3)	Very Short Duration (1)
Magnitude	Low (4)	Very Low (1)
Probability	Definite (5)	Probable (3)
Significance	Medium (45)	Low (9)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> All workers need to undergo an induction prior to entering the site that educates them on wildlife that they may encounter in the field with the goal of mitigating fear associated with these animals. Specific attention should be brought to animals that have a substantial amount of stigma associated with them (i.e., snakes, toads, owls). Faunal experts should be approached to produce educational material about the animals associated with the area and where necessary, awareness talks should be given to workers to minimize human-animal conflict (i.e., snake awareness and snakebite talks). Signs need to be erected around the property that stipulate that faunal harvesting is illegal and that legal action will be sought if workers are caught harvesting or poaching wildlife. A select cohort of workers should be given specialized snake handling courses to ensure all on-site interactions with potentially dangerous wildlife are appropriately and safely handled. 		
Residual Impacts:		
Complete adherence to the proposed mitigations will result in the complete resolution of the above impact. However, given the fear, stigma, and superstition associated with certain animals, there will always be some degree of impact. Adherence to the mitigations, even partially, will substantially mitigate this impact.		

Operational phase Impacts (Fauna)

Nature: The planned infrastructure will require maintenance and upkeep to ensure that negative effects are not exported into the adjacent environment following the construction process. Whilst the degree of habitat loss, degradation and fragmentation is lower than in the construction phase, the continued use of the infrastructure poses a threat to the immediate environment in the form of excess water run-off, soil, habitat destruction, and invasive species colonization.

	Without mitigation	With mitigation
<i>Extent</i>	Low (2)	Very Low (1)
<i>Duration</i>	Long Term (4)	Short Duration (2)
<i>Magnitude</i>	Low (4)	Very Low (2)
<i>Probability</i>	Highly Probable (4)	Improbable (2)
<i>Significance</i>	Medium (40)	Low (10)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	High
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> Operational activities to be limited to the designated footprint (i.e., no driving off road). The areas adjacent to infrastructure need to be avoided to ensure the mitigations undertaken during the construction phase are not undone. The rocky outcrops that have been re-introduced into the buffer zones and adjacent habitat need to be avoided completely to ensure that wildlife colonisation is not hindered. Rocky outcrops that have been translocated through the redistribution of rocks often harbour higher densities and diversities of rupicolous fauna as they present a more complex and heterogenous habitat. The increased availability of microsites and microhabitats (in and amongst the rock cracks) compared to the pristine adjacent environment means these areas are more sensitive. They should thus be avoided. If this not possible, a suitable and qualified specialist needs to clear these areas of fauna prior to operational activities. Re-vegetated areas, created during the construction phase, need to be continually monitored to ensure that invasive species do not congregate the buffers and adjacent habitat causing habitat homogenization, soil erosion (topsoil loss) and fragmentation. Water run-off from the road networks needs to be monitored and mitigated to ensure it doesn't affect neighbouring habitats through for example, the siltation of temporary pools within drainage lines. 		
<p>Residual Impacts:</p> <p>The continued loss, degradation and fragmentation is drastically reduced, compared to the construction process but if the mitigations are not adhered to the degradation of habitat will be inevitable.</p>		

Nature: Roadkill is one of the greatest causes of mortality in reptiles, amphibians, mammals, and birds. Given the intricate road networks that connect turbines and infrastructure across the study site, roadkill is one of the largest threats to terrestrial fauna on the property. Roadkill happens when vehicles hit animals while crossing the road.

	Without mitigation	With mitigation
<i>Extent</i>	Low (2)	Very Low (1)
<i>Duration</i>	Long Term (4)	Long Term (4)

Magnitude	Medium (5)	Very Low (2)
Probability	Definite (5)	Improbable (2)
Significance	Medium (55)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> All motorists using the road infrastructure need to receive an induction to educate them about the negative impacts of roadkill and the driving techniques that can be employed to avoid roadkill. Speed signs and 'animal crossing' warning signs need to be erected along the road throughout the study site. Mobile speed cameras need to be erected at pre-determine sensitive areas to ensure drivers reduce their speed. All motorists caught speeding need to be fined to discourage further speeding. Road use should be limited to specific personal at night to ensure a reduction of motorists on the road as roadkill is a more prevalent threat to nocturnal fauna because of the animals' cryptic habits and the motorist's inability to see wildlife as effectively at night. 		
Residual Impacts:		
<p>The loss of wildlife as roadkill is unavoidable given the sporadic nature of animal movements. Whilst roadkill is always expected, the frequency of incidents can be dramatically reduced with the implementation of mitigations. The negative impacts of roadkill are negligible provided the above mitigations are adhered to.</p>		

Nature: Intentional mortality relates to people killing or harming animals during the operational process either out of fear or apathy for the wildlife. Intentional displacement refers to the harvesting of fauna either dead or alive for medicinal or commercial purposes (i.e., pet trade). Whilst the risk of this impact is drastically reduced during the operational process, because of a reduction of personnel and temporary workers, the potential impact persists.

	Without mitigation	With mitigation
Extent	Low (2)	Very Low (1)
Duration	Medium-term (3)	Very Short Duration (1)
Magnitude	Low (3)	Very Low (1)
Probability	Definite (5)	Probable (3)
Significance	Medium (40)	Low (9)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No

Can impacts be mitigated?	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> • All workers need to undergo an induction prior to entering the site that educates them on wildlife that they may encounter in the field with the goal of mitigating fear associated with these animals. Specific attention should be brought to animals that have a substantial amount of stigma associated with them (i.e., snakes, toads, owls). • Faunal experts should be approached to produce educational material about the animals associated with the area and where necessary awareness talks should be given to workers to minimize human-animal conflict (i.e., snake awareness and snakebite talks). • Signs need to be erected around the property that stipulate that animal faunal harvesting is illegal and that legal action will be sought if workers are caught harvesting or poaching wildlife. • Lastly a select cohort of workers should be given specialized snake handling courses to ensure all on-site interactions with potential wildlife are appropriately and safely handled. 	
<p>Residual Impacts:</p> <p>Complete adherence to the proposed mitigations will result in the complete resolution of the above impact. However, given the fear, stigma, and superstition associated with certain animals, there will always be some degree of impact. Adherence to the mitigations, even partially, will substantially mitigate this impact.</p>	

Roads and traffic: roadkill is one of the greatest causes of mortality in reptiles, amphibians, mammals, and birds. Given the intricate road networks that connect turbines and infrastructure across the study site, roadkill is likely one of the largest existing causes of direct mortality for terrestrial fauna, on the property.

6.2.4. Implications for Project Implementation

Based on the outcomes of the assessment of impacts associated with the establishment of the various infrastructure on the ecological features, the specialist indicated that the proposed infrastructure will not have an irreversible and substantial negative effect on the terrestrial flora in the area provided all the necessary mitigations are implemented and provided all the necessary mitigations are implemented and sensitive areas are avoided

6.3. Assessment of Impacts on Avifauna

6.3.1. Results of the Avifauna Impact Assessment

The site visit produced a combined list of fifty-eight (58) species, covering both the Project Area of Interest and to a limited extent, the surrounding area. Twenty-two (22) priority species were observed along the proposed powerline alignment. Species of conservation concern recorded during the field survey are:

- Cape Vulture *G. caprotheres*,
- Verreaux's Eagle *A. verreauxii*,
- Martial Eagle *P. bellicosus*,
- Blue Crane *G. paradisea*,
- Denham's Bustard *N. denhami* and
- Secretarybird *S. serpentarius*.

All other observations were of small passerine and game bird species that are common to this area. Each of the aforementioned species has the potential to be displaced by the proposed Msenge Emoyeni WEF 66kV grid connection and on-site substation as a result of habitat transformation and disturbance. A single crow's nest was observed within the primary PAOI. An additional eight nests were observed to the south of the broader area, most notably a Secretarybird *S. serpentarius* nest approximately 11km south-west from the proposed on-site substation site given the distance, it is unlikely that these birds will be vulnerable to the disturbance impact associated with the construction of the 66kV OHL grid connection and on-site substation.

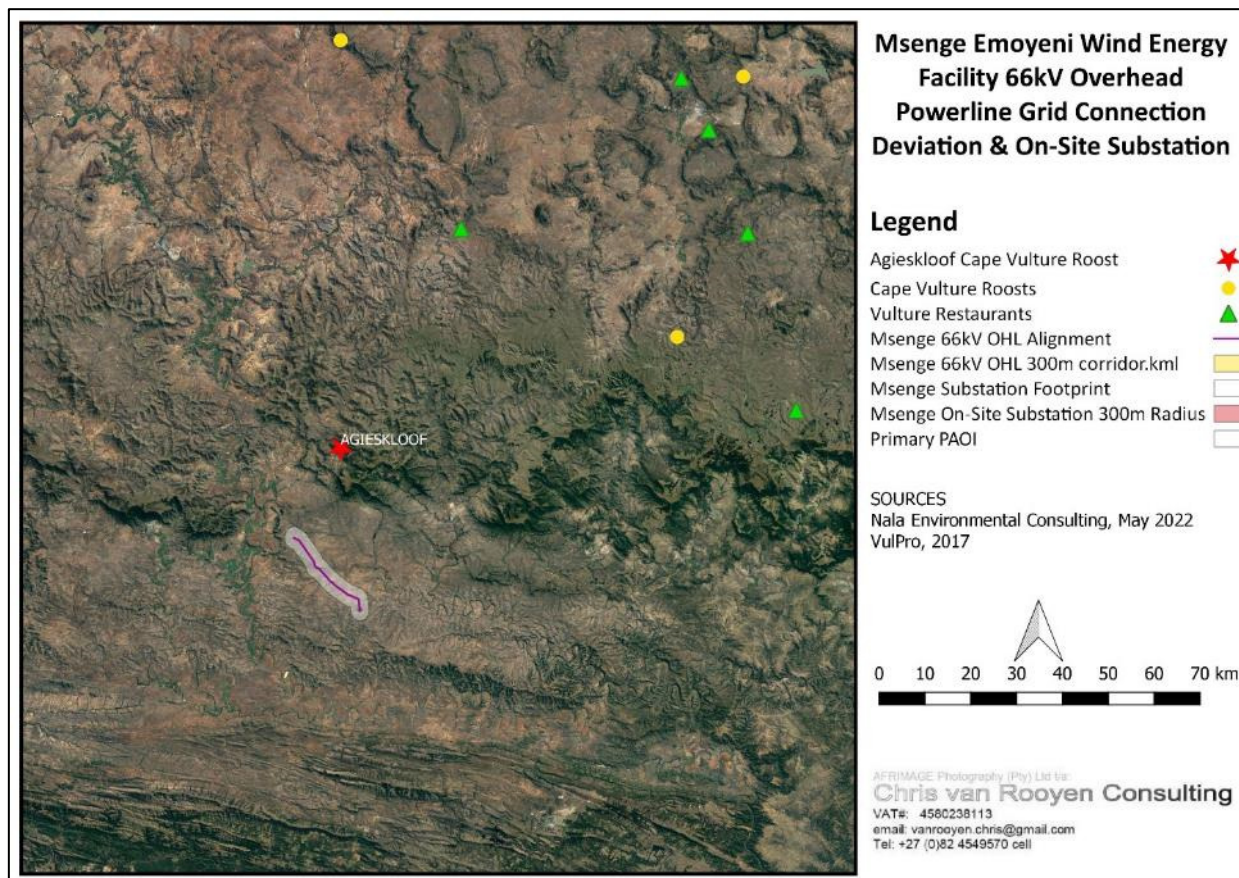


Figure 6.9: Regional map detailing the location of the proposed Msenge Emoyeni 66kV OHL grid connection deviation and on-site substation project in relation to the Agieskloof Vulture Colony, other Cape Vulture roosts and colonies and Vulture Restaurants

The primary Project Area of Interest is located within the Grassland biome and comprises of a single vegetation unit i.e. Bedford Dry Grassland, a sub-escarpment grassland type. This vegetation unit is found east of Fort Beaufort and is located on gently undulating plains that supports open, dry grassland interspersed with Acacia karroo woodland vegetation, especially along drainage lines. The grassland is relatively short (10-100cm in height) and is dominated by *Digitaria argyrograpta*, *Tragus koelerioides*, *Eragrostis curvula* and *Cymbopogon caesius*. It may also contain a dwarf shrubby component of karroid origin.

6.3.2. Description of Avifaunal Impacts

Negative impacts on avifauna by electricity infrastructure generally take two (2) main forms, namely:

- Electrocution and collisions (Ledger & Annegarn, 1981; Ledger 1983; Ledger, 1984; Hobbs and Ledger, 1986a; Hobbs & Ledger, 1986b; Ledger, Hobbs & Smith, 1992; Verdoorn, 1996; Kruger & Van Rooyen, 1998; Van Rooyen, 1998; Kruger, 1999; Van Rooyen, 1999; Van Rooyen, 2000; Van Rooyen, 2004; Jenkins et al., 2010).

- Displacement due to habitat transformation and/or loss and disturbance associated with the construction of the electricity infrastructure and other associated infrastructure is another impact that could potentially impact on avifauna.

As a result of the construction activities for the 66kV grid connection and on-site substation infrastructure it is expected that destruction, fragmentation and degradation of avifauna habitats, displacement of avifaunal communities including several SCC, and related impacts will occur.

The following potential impacts have been identified:

Construction phase

- Displacement due to disturbance associated with the construction of the proposed Msenge Emoyeni WEF 66kV OHL and on-site substation; and
- Displacement due to habitat transformation associated with the construction of the proposed Msenge Emoyeni WEF 66kV OHL and on-site substation.

During construction moving vehicles will also cause sensory disturbances to avifauna, affecting their life cycles and movement, and will also lead to direct mortalities due to collisions. During the construction phase risk of poaching and roadkill has the potential to occur.

Operational phase

- Collisions with the proposed Msenge Emoyeni WEF 66kV OHL;
- Electrocutation on the proposed 66kV OHL infrastructure; and
- Electrocutation of priority species on the electrical infrastructure within the proposed on-site substation.

During the operational phase the impacts are expected to be associated mostly with power line collisions and electrocutations. Moving vehicles will cause sensory disturbances to avifauna, affecting their life cycles and movement, and will also lead to direct mortalities due to collisions. The corridor of the power line will be maintained to prevent uncontrolled events such as fire. This practice will however result in the disturbance and displacement of breeding and non-breeding species.

Decommissioning phase

During the decommissioning phase the impacts will be displacement due to disturbance associated with the decommissioning of the OHL and on-site substation.

6.3.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: Displacement of priority species due to habitat transformation/loss associated with construction of the on-site substation		
	Without mitigation	With mitigation
Extent	2 local	2 local
Duration	4 long term	4 long term
Magnitude	6 medium	4 low

<i>Probability</i>	3 probable	improbable
<i>Significance</i>	Medium (36)	Low (24)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	low	medium
<i>Irreplaceable loss of resources?</i>	yes	no
<i>Can impacts be mitigated?</i>	to a limited extent	
<p>Mitigation:</p> <ul style="list-style-type: none"> Vegetation clearance should be limited to what is absolutely necessary. The mitigation measures proposed by the vegetation specialist must be strictly enforced. 		
<p>Residual Risks:</p> <p>The residual risk of displacement will be reduced after mitigation, but the habitat transformation, and therefore displacement, in the footprint will be permanent.</p>		

Nature: Displacement of priority species due to habitat transformation/loss associated with construction of the 66kV single circuit DHL		
	Without mitigation	With mitigation
<i>Extent</i>	1 site	1 site
<i>Duration</i>	2 short term	2 short term
<i>Magnitude</i>	6 moderate	4 low
<i>Probability</i>	3 distinct possibility	2 improbable
<i>Significance</i>	Low (27)	Low (14)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	medium	medium
<i>Irreplaceable loss of resources?</i>	no	no
<i>Can impacts be mitigated?</i>	to a limited extent	
<p>Mitigation:</p> <ul style="list-style-type: none"> Vegetation clearance should be limited to what is absolutely necessary. The mitigation measures proposed by the vegetation specialist must be strictly enforced. 		
<p>Residual Risks:</p> <p>The residual risk of displacement is low and is also limited by the temporary nature of the impact as the vegetation in the servitude will regrow after the construction phase, except in the case of trees that will be permanently removed or trimmed regularly.</p>		

Nature: Displacement of priority species due to disturbance associated with construction of the 66kV single-circuit OHL and on-site substation		
	Without mitigation	With mitigation
<i>Extent</i>	2 regional	2 local
<i>Duration</i>	2 short	2 short
<i>Magnitude</i>	8 high	6 moderate
<i>Probability</i>	4 highly probable	3 probable
<i>Significance</i>	Medium (48)	Medium (30)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	low	medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> Conduct a pre-construction inspection (avifaunal walk-through) of the final on-site substation and 66kV single circuit OHL alignment and access road to identify Red List species that may be breeding within the project footprint to ensure that the impacts to breeding species (if any) are adequately managed. If a SSC nest is occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding birds during the construction period. This could include measures such as delaying some of the activities until after the breeding season. Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. Measures to control noise and dust should be applied according to current best practice in the industry. Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. 		
<p>Residual Risks:</p> <p>The residual risk of displacement will be reduced to a low level after mitigation, if the proposed mitigation is implemented. The residual risks are also limited by the temporary nature of the impact.</p>		

Operational Phase Impacts

Nature: Mortality of priority species due to collisions with the 66kV single circuit OHL		
	Without mitigation	With mitigation

<i>Extent</i>	3 regional	3 regional
<i>Duration</i>	4 long term	4 long term
<i>Magnitude</i>	8 high	6 moderate
<i>Probability</i>	4 highly probable	3 probable
<i>Significance</i>	High (60)	Medium (39)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	low	medium
<i>Irreplaceable loss of resources?</i>	yes	yes
<i>Can impacts be mitigated?</i>	to a limited extent	to a limited extent
Mitigation:		
Bird Flight Diverters must be fitted to the entire OHL according to the applicable Eskom Engineering Instruction (Eskom Unique Identifier 240 – 93563150: The utilisation of Bird Flight Diverters on Eskom Overhead Lines). These devices must be installed as soon as the conductors and earthwires are strung.		
Residual Risks:		
There will be an ongoing residual risk of collisions with the 66kV single circuit OHL, but mitigation should make a significant difference, except for bustards.		

Nature: Electrocution of priority species within the on-site substation		
	Without mitigation	With mitigation
<i>Extent</i>	3 regional	3 regional
<i>Duration</i>	4 long term	4 long term
<i>Magnitude</i>	6 moderate	4 low
<i>Probability</i>	3 probable	2 improbable
<i>Significance</i>	Medium (39)	Low (22)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	low	high
<i>Irreplaceable loss of resources?</i>	yes	no
<i>Can impacts be mitigated?</i>	yes	
Mitigation:		

The hardware within the proposed substation yard is too complex and the risk too low to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded by the maintenance staff once operational, site specific mitigation (insulation) be applied reactively if need be. This is an acceptable approach because Red List priority species are unlikely to frequent the substation, although some more common priority species might well be present more often and exposed to the electrocution risk.

Residual Risks:

The residual risk of electrocution will be low once mitigation is implemented.

Nature: Electrocution of priority species on the Msenge Emoyeni WEF 66kV single circuit OHL infrastructure

	Without mitigation	With mitigation
Extent	3 regional	3 regional
Duration	4 long term	4 long term
Magnitude	8 high	6 moderate
Probability	4 highly probable	2 improbable
Significance	High (80)	Low (26)
Status (positive or negative)	negative	negative
Reversibility	low	high
Irreplaceable loss of resources?	yes	yes
Can impacts be mitigated?	yes	

Mitigation:

It is imperative that there is a minimum clearance of 1.8m between the jumpers and/or insulators and the horizontal earthed component on the lattice structure. Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also recommended (if suitable insulation material is readily available), alternatively all jumpers must be suspended below the crossarms.

Residual Risks:

The residual risk of electrocution will be low once mitigation is implemented.

Decommissioning Phase

Nature: Displacement of priority species due to disturbance associated with decommissioning of the onsite substation and 66kV overhead power line		
	Without mitigation	With mitigation
<i>Extent</i>	2 local	2 local
<i>Duration</i>	1 very short	1 very short
<i>Magnitude</i>	8 high	6 moderate
<i>Probability</i>	4 highly probable	3 probable
<i>Significance</i>	Medium (44)	Low (27)
<i>Status (positive or negative)</i>	negative	negative
<i>Reversibility</i>	low	medium
<i>Irreplaceable loss of resources?</i>	yes	No
<i>Can impacts be mitigated?</i>	yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> • Conduct an avifaunal inspection of the OHL prior to the commencement of the decommissioning activities. Should any active nests be present, decommissioning activities during the breeding season should be avoided if possible. • Decommissioning activity should be restricted to the immediate footprint of the infrastructure as far as possible. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. 		
<p>Residual Risks:</p> <p>The residual risk of displacement will be reduced to a low level after mitigation, if the proposed mitigation is implemented. The residual risks are also limited by the temporary nature of the impact.</p>		

6.3.4. Implication of Project Implementation

The expected impacts of the proposed Msenge Emoyeni 66kV OHL grid connection deviation within the 300m corridor and on-site substation project range from MEDIUM to HIGH significance and negative status pre-mitigation. However, with appropriate mitigation, the post-mitigation significance of the identified impacts should be reduced to MEDIUM and LOW negative. No fatal flaws were discovered in the course of the investigation. It is therefore recommended by the specialist that the activity is authorised, on condition that the proposed mitigation measures are strictly implemented as detailed in the EMPR. (Appendix G of the Avifauna Impact Assessment (Appendix E of this BAR).

6.4 Assessment of Impacts on Aquatic Resources

6.4.1 Results of the Aquatic Resources Impact Assessment

The desktop assessment included the identification of **CBAs and ESAs**, as shown in **Figure 6.9**. The freshwater (aquatic) landscape in the footprint of the proposed infrastructure predominantly falls within ESA 1. Two of the water course crossings are classified as CBA 1 areas and several CBA 2 areas occur within close proximity to the buffer zone of the OHL.

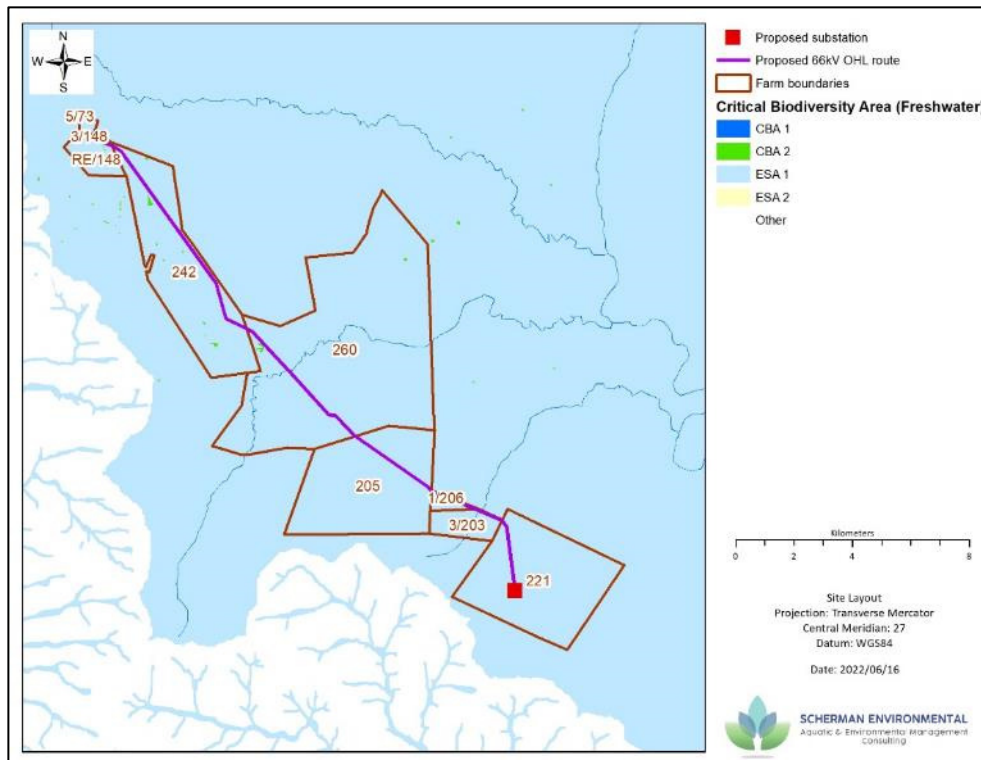


Figure 6.10: Map of aquatic CBAs and ESAs identified for the study area

The National Protected Area Expansion Strategy (NPAES), updated in 2017, presents a 20-year strategy for the expansion of protected areas in South Africa for improved ecosystem representation, ecological sustainability and resilience to climate change (DEA, 2016). The Msenge WEF does not fall within the 2017 NPAES

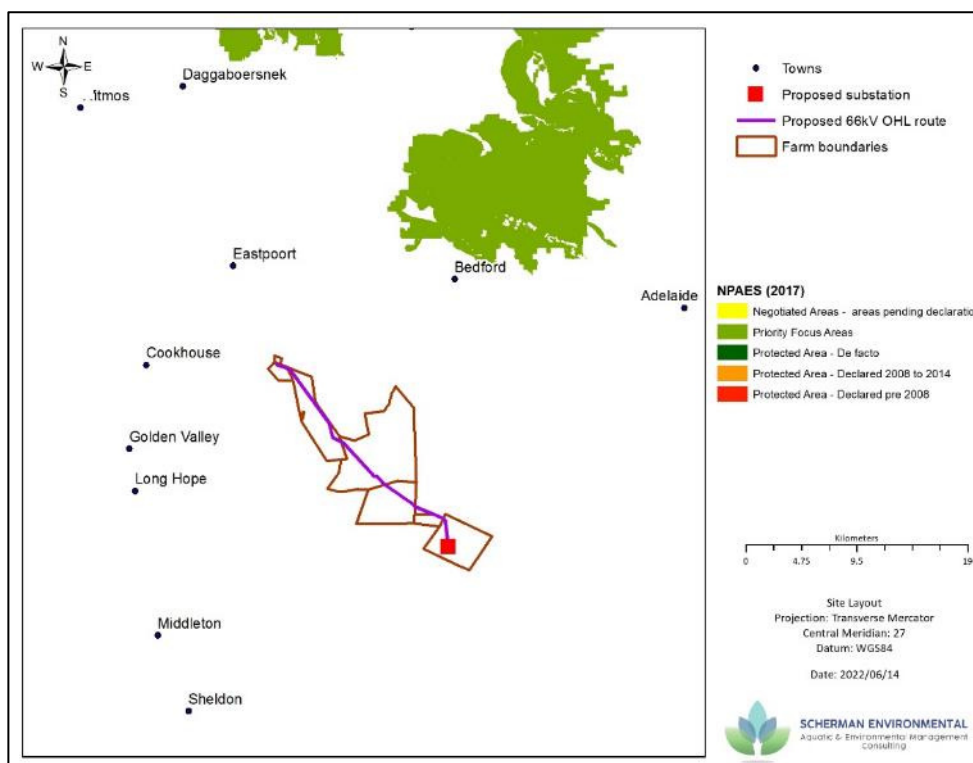


Figure 6.11. Protected areas in the Bedford district (according to NPAES, 2017)

The following hydrological features were seen along the powerline route:

- Extensive farm dams, mostly in-channel
- Off-channel dams and livestock watering points.
- Other artificial features such as quarries.
- Few natural wetlands, with most being outside the powerline deviation route and location of the proposed substation.
- A network of highly fragmented and mostly dry drainage lines across the study area, mostly with narrow riparian zones and little protective intact vegetation buffer

Present state

The present state categorisation for the main river systems across the site – Biesiesleepte (SQR Q92F-07942) and eNyara (SQR Q92F-07889) was a C category, i.e. Moderately Modified according to DWS (2014). This assessment was confirmed by Colloty (2013) and TBC (2020). No change is apparent on the site, confirming the C categorization for drainage features across the site.

Buffers

An important aspect of sensitivity mapping is to delineate appropriate buffer zones around streams, drainage lines and wetlands or pans. Buffer zones are used in land-use planning to protect natural resources and limit the impact of one land use on another. Different types of buffers can be evaluated, e.g. aquatic impact buffer zones, or buffers for the conservation of biodiversity. Various provincial guidelines on buffers have been issued within the Eastern Cape Province, with the regulatory buffers along drainage lines and streams set at 32m (guidelines set out in the gazetted Eastern Cape Biodiversity Conservation Plan (ECBCP) –These regulatory guidelines are set throughout the country, with a 500m regulatory zone around wetlands and pans.

Table 6.4. Recommended buffers for rivers (the predominant buffer for the study region is highlighted in blue) (ECBCP; Berliner & Desmet 2007).

River criterion used	Buffer width (m)	Rationale
Mountain streams and upper foothills of all 1:500 000 rivers	50	These longitudinal zones generally have more confined riparian zones than lower foothills and lowland rivers and are generally less threatened by agricultural practices.
Lower foothills and lowland rivers of all 1:500 000 rivers	100	These longitudinal zones generally have less confined riparian zones than mountain streams and upper foothills and are generally more threatened by development practices.
All remaining 1:500 000 streams	32	Generally smaller upland streams corresponding to mountain streams and upper foothills, smaller than those designated in the 1:500 000 rivers layer. They are assigned the riparian buffer required under South African legislation.

The 32m buffer generally used for planning along rivers, streams and drainage lines, and recommended in ECBCP (2019) for the Msenge site, was applied in the mapping delivered before ground-truthing was undertaken. It should however be noted that the 32m buffer width is a regulatory and planning guideline, with a wider buffer required for protection of aquatic drainage features. Due to the extensive number of instream farm dams across all the properties assessed during the site survey of March and April 2022, resulting in highly fragmented drainage systems, it is recommended that 100m buffers be applied across the area. Although there may be instances where a requirement for a 32m buffer may be argued, it was not possible to evaluate every drainage line and a general buffer width had to be assigned.

Implementation of a 100m buffer along drainage lines, many often include large instream artificial dams, may provide some protection for severely impacted drainage systems in the study area. Should infrastructure be required within this buffer, a site-specific assessment should be conducted to consider whether the 100m “protection” buffer can be downgraded to a 32m regulatory/planning buffer. Note that water use licensing will be triggered in this instance.

Protection and regulatory buffers around wetlands and pans are set at 500m. NFEPA wetland mapping delineated this 500m buffer around all wetlands and pans, including artificial features such as dams, quarries and oxidation ponds. The preparation of NWM5 was an attempt to delineate natural wetlands across the country. Few NWM5 wetlands are mapped in the study area, with a few more identified during the site survey. The output regarding natural wetlands is not of high confidence, as it was not possible to check every delineated “wetland” in the study area. Note that 500m regulatory buffers around NFEPA wetlands were removed for an artificial structure, e.g. quarries or farm dam (Roets, DWS, pers. comm., 31 March 2022). These protective/regulatory buffers are only indicated around identified natural wetlands in the sensitivity mapping provided, although all dams and artificial features are indicated. Mapping shows the extensive spread of farm dams across the study area, severely impacting the status of drainage features, and creating highly modified drainage features across the study site. Note that reservoirs were not included in mapping; only the position of instream and off-channel dams.

Note that any activities within 500m buffers around wetlands or pans will trigger water use licensing

6.4.2. Description of Aquatic Impacts

The following impacts are anticipated during the

Construction Phase.

- Changes to the hydrological regimes of streams.
- Loss of riparian vegetation along streams and drainage channels.
- Sedimentation and increasing turbidity levels of instream habitats, loss of instream habitat and aquatic biota.

- Dumping of rubble in riparian zones and dry river channels.
- Chemical pollution of the streams.
- Impacts on wetlands

Operational Phase

Impacts expected are minimal due to the stable nature of the operation. As hydrological disturbances occur primarily during construction, impacts during operations are minimal, assuming appropriate mitigation measures have been instituted.

- Pollution of the streams and wetlands due to maintenance activities, including sedimentation from roads.

Decommissioning Phase.

Hydrological disturbances are not expected during decommissioning, as it is assumed that flow mitigation structures, e.g. culverts, stay in place. Decommissioning is assumed to rather relate to

- Sedimentation and increasing turbidity levels of instream habitats, loss of instream habitat and aquatic biota, due to activities on site.
- Dumping of rubble in riparian zones and dry river channels.
- Chemical pollution of the streams.
- Impacts on wetlands due to site-based activities.

6.4.3. Assessment of Aquatic Impacts

Construction phase Aquatic Impacts

Nature: Changes to the hydrological regimes of streams. The scores are impacted by the ephemeral nature of the streams, fragmentation and modified current state.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Probable (3)
Significance	Medium (45)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- Reduce the number of crossings as far as practically possible by utilizing existing tracks.
- Conduct as much of the construction as possible during the dry season, and outside the 100m buffer.
- Use crossing designs which will allow minimal change in streamflow.
- No unnecessary construction-related activities, e.g. stockpiles, within the drainage lines or minimum of 100m buffer on either side of the active channel.
- Crossings should cater for 1:100 year floods.
- Silt traps must be in place to prevent sedimentation.
- Appropriate stormwater management structures should be in place, according to the Stormwater Management Plan.

Residual Impacts:

None anticipated.

Nature: Loss of riparian vegetation along streams and drainage channels.

	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (36)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- Reduce the number of crossings as far as practically possible by utilizing existing farm tracks.
- Conduct as much of the construction outside the 100m buffer.
- No unnecessary construction-related activities, e.g. stockpiles, within the 100m buffer on either side of the active channel.
- Translocate any species as identified, and according to the methods in the relevant Management Plans, e.g. Revegetation and Rehabilitation Plan.

Residual Impacts (taken from the Terrestrial Flora Report):

- Translocated species could succumb to drought or infection during the transplanting stage.
- Translocated species efforts could be nullified by overstocking and poor rangeland management.

Nature: Sedimentation and increasing turbidity levels of instream habitats, loss of instream habitat and aquatic biota. The scores are impacted by the ephemeral nature of the streams, fragmentation and modified current state.

	Without mitigation	With mitigation
<i>Extent</i>	Site (1)	Site (1)
<i>Duration</i>	Short (2)	Short (2)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Highly probable (4)	Probable (3)
<i>Significance</i>	Medium (36)	Low (27)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Moderate	High
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<ul style="list-style-type: none"> • Reduce the number of crossings as far as practically possible by utilizing existing tracks. • Avoid any traffic along drainage lines or in buffer zones which may cause sediment movement. • Conduct as much of the construction as possible outside the 100m buffer. • Silt traps must be in place to prevent sedimentation. • Appropriate stormwater management structures should be in place, according to the Stormwater Management Plan. 		
Residual Impacts:		
None anticipated.		

Nature: Dumping of rubble in riparian zones and dry river channels.

	Without mitigation	With mitigation
<i>Extent</i>	Site (1)	Site (1)
<i>Duration</i>	Short (2)	Short (2)
<i>Magnitude</i>	Low (4)	Minor (2)
<i>Probability</i>	Highly probable (4)	Improbable (2)
<i>Significance</i>	Low (28)	Low (10)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	Yes

Can impacts be mitigated?	Yes
Mitigation:	
<ul style="list-style-type: none"> • Conduct as much of the construction outside the channel and 100m buffer. • Conduct construction according to the Environmental Management Programme and Management Plans set up for construction. 	
Residual Impacts:	
None anticipated.	

Nature: Chemical pollution of the streams.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Probable (3)
Significance	Medium (45)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Reduce the number of crossings as far as practically possible by utilizing existing tracks. • Conduct as much of the construction as possible during the dry season, and outside the 100m buffer. • No unnecessary construction-related activities, e.g. stockpiles or concrete mixing, within the drainage lines or minimum of 100m buffer on either side of the active channel. • Silt traps must be in place to prevent sedimentation. • Emergency protocols must be in place in case of spills. • All construction materials must be stored and used so that there is no leaking into the streams. • Laydown yards, camps and storage areas must be beyond the watercourse areas. • Proper mitigations and management, especially in terms of materials used and management of domestic waste from construction workers on site. 		
Residual Impacts:		
None anticipated.		

Nature: Impacts on wetlands. Due to the limited number of natural wetlands, the extent of the impact will be wider than the site.

	Without mitigation	With mitigation
<i>Extent</i>	Regional (3)	Site (2)
<i>Duration</i>	Long -term (4)	Short-term (2)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Improbable (2), as few natural wetlands in the area or along the route	Improbable (2)
<i>Significance</i>	Low (26)	Low (16)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	To a limited degree, and there will be an impact on wetland function.	
Mitigation:		
<ul style="list-style-type: none"> • Reduce the number of crossings as far as practically possible by utilizing existing farm tracks. • Conduct construction outside the 500m buffer around the wetland. • No unnecessary construction-related activities, e.g. stockpiles, within the 500m buffer around the wetland. • Any bypasses for the development of crossings of streams and drainage lines should not be on the side of the wetland, to minimize disturbance of the wetland systems. 		
Residual Impacts:		
Residual impacts will be on wetland function and a reduction in PES and EIS scores.		

Operation phase Aquatic Impacts

Nature: Pollution of the streams and wetlands.		
	Without mitigation	With mitigation
<i>Extent</i>	Site (1)	Site (1)
<i>Duration</i>	Long (4)	Long (4)
<i>Magnitude</i>	Low (4)	Minor (2)
<i>Probability</i>	Improbable (2)	Improbable (2)
<i>Significance</i>	Low (18)	Low (14)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Moderate	High
<i>Irreplaceable loss of resources?</i>	No	No

Can impacts be mitigated?	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> No unnecessary activities, e.g. stockpiles or concrete mixing, within the drainage lines or minimum of 100m buffer on either side of the active channel, or within the 500m regulatory buffer around wetlands. Silt traps must be in place to prevent sedimentation. Emergency protocols must be in place in case of spills. All materials must be stored and used so that there is no leaking into the streams. Laydown yards, camps and storage areas must be beyond the watercourse areas. Proper mitigations and management, especially in terms of materials used and management of domestic waste from workers on site. 	
<p>Residual Impacts:</p> <p>None anticipated.</p>	

Decommissioning phase Aquatic Impacts

<p>Nature: Sedimentation and increasing turbidity levels of instream habitats, loss of instream habitat and aquatic biota. The scores are impacted by the ephemeral nature of the streams, fragmentation and modified current state.</p>		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Very short (1)	Very short (1)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (32)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <p>Avoid any traffic along drainage lines or in buffer zones which may cause sediment movement.</p>		
<p>Residual Impacts:</p> <p>None anticipated.</p>		

<p>Nature: Dumping of rubble in riparian zones and dry river channels.</p>		
	Without mitigation	With mitigation

<i>Extent</i>	Site (1)	Site (1)
<i>Duration</i>	Very short (1)	Very short (1)
<i>Magnitude</i>	Low (4)	Minor (2)
<i>Probability</i>	Highly probable (4)	Probable (3)
<i>Significance</i>	Low (24)	Low (12)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	
Mitigation:		
Conduct decommissioning according to the Environmental Management Programme and Management Plans set up for the activity.		
Residual Impacts:		
None anticipated.		

Nature: Pollution of the streams and wetlands.		
	Without mitigation	With mitigation
<i>Extent</i>	Site (1)	Site (1)
<i>Duration</i>	Short (2)	Short (2)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Definite (5)	Probable (3)
<i>Significance</i>	Medium (45)	Low (21)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Moderate	High
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Conduct as much decommissioning as possible during the dry season, and outside the 100m buffer. • No unnecessary activities, e.g. stockpiles, within the drainage lines or minimum of 100m buffer on either side of the active channel, or within the 500m regulatory buffer around wetlands. • Silt traps must be in place to prevent sedimentation. • Emergency protocols must be in place in case of spills. 		

<ul style="list-style-type: none"> • Laydown yards, camps and storage areas must be beyond the watercourse areas. • Proper mitigations and management, especially in terms of materials used and management of domestic waste from workers on site.
<p>Residual Impacts:</p> <p>None anticipated.</p>

6.4.4. Recommended mitigation measures

- All construction activities must take place outside delineated buffer zones.
- Institute 100m buffers around drainage lines and 500m buffers around natural wetlands.
- Construction must take place during the dry season.
- Install silt traps to reduce sediment loss.
- Laydown areas must be created for stockpiling of equipment and chemicals, and for storage of materials during project-related activities.
- Emergency protocols must be in place in case of spills.
- Prepare appropriate environmental management plans, e.g. stormwater and waste management plans, and monitor compliance.
- Conduct training of on-site staff so as to ensure good environmental practice.
- Reduce the number of crossings so as to reduce the impacts on connectivity of drainage lines.

6.4.5. Implications of Project Implementation

Several impacts can be expected to local watercourses during the construction and operation of the proposed Msenge Emoyeni grid and associated infrastructure. Due to the extensive number of instream farm dams across all the properties assessed during the site survey of March and April 2022, resulting in highly fragmented drainage systems, it is recommended that 100m buffers be applied across the area. Implementation of a 100m buffer along drainage lines, many often include large instream artificial dams, may provide some protection for severely impacted drainage systems in the study area. Should infrastructure be required within this buffer, a site-specific assessment should be conducted to consider whether the 100m "protection" buffer can be downgraded to a 32m regulatory/planning buffer.

The impact assessment showed that most impacts were Medium and can be mitigated to Low. Note that water use licensing will be required for the development.

6.5. Assessment of Impacts on Agricultural Potential and Soils

6.5.1 Results of Agricultural and Soils Impact Assessment

The results provided by the screening tool indicate that the largest part of the Msenge Emoyeni Grid Deviation has Medium sensitivity. Only small areas are of Low sensitivity which are found in the centre of the proposed 66kV powerline (refer to Figure 6.12). The northern half of the substation area consists of land with Medium agricultural sensitivity while the southern half have Low agricultural sensitivity. There are only a few very isolated small areas of High sensitivity in the middle section of the powerline deviation corridor. The area adjacent to the grid deviation, consists mostly of land with Medium agricultural sensitivity. The proposed on-site substation area is surrounded by land of Low and Medium agricultural sensitivity.

The proposed development area was also superimposed on five different raster data sets obtained from the National Department of Agriculture, Land Reform and Rural Development (DALRRD). The long-term grazing capacity for South Africa 2018 that present the long term grazing capacity of an area with the understanding that the veld is in a relatively good condition (South Africa, 2018). The Eastern Cape Field Crop Boundaries show crop production

areas may be present within the development area. The field crop boundaries include rainfed annual crops, non-pivot and pivot irrigated annual crops, horticulture, viticulture, old fields, small holdings and subsistence farming (DALRRD, 2019).

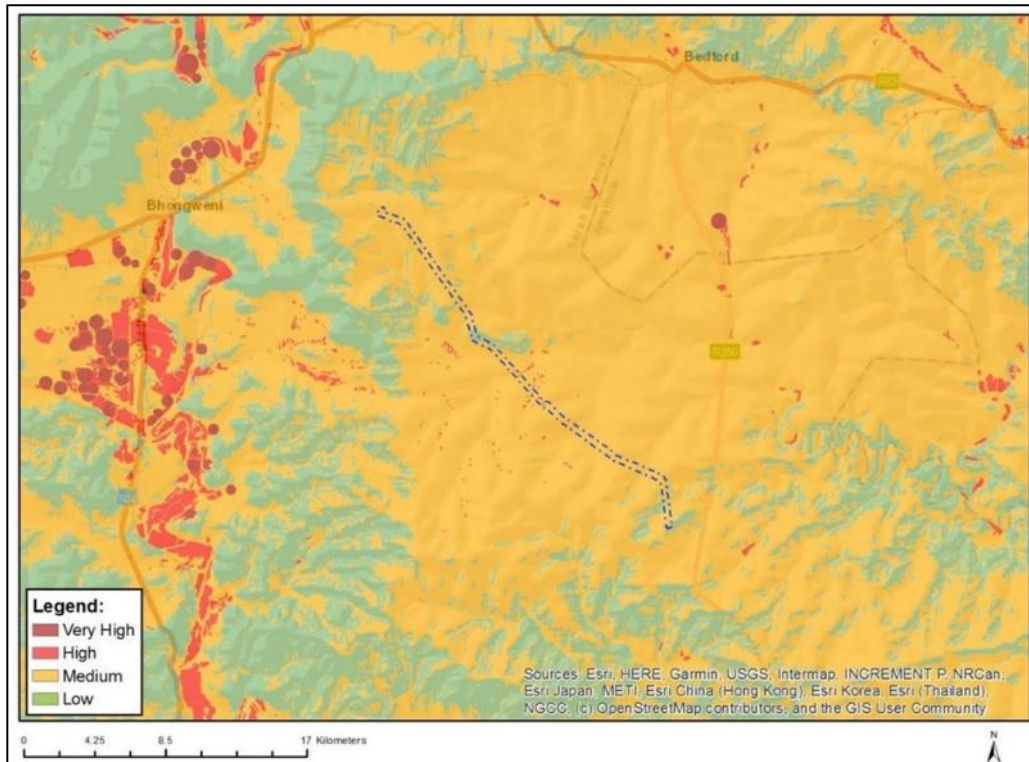


Figure 6.12. Agricultural Theme Sensitivity

The soil profiles classified within the Msenge grid deviation consists of natural soil profiles (undisturbed by human activities). Four different natural soil forms have been identified within the grid corridor and the collector substation study area.

- The Mispah soils have shallow soil depths (100-300 mm) The effective soil depth of the Mispah soils is restricted by solid and fractured rock. In some areas, the solid rock is visible on the surface as rock outcrops (as shown in **Figure 6.13**). The Mispah soil form was found throughout the study area and covered most of the site (386.6 ha). The entire study area for the collector substation also consists of soils of the Mispah form.
- The Coega soil form covers the second largest area within the grid deviation corridor. The total area of Coega soils is 131.8 ha. These soils are found in three separate areas in the southern half of the powerline corridor. The Coega soil form consists of an orthic horizon on hard carbonate. The effective soil depth of these soils is restricted by solid and fractured hard carbonate.
- The Swartland soil covered 85.2 ha of the grid deviation corridor and was found only in the northern end of the corridor. The Swartland soil form consists of orthic topsoil overlying a pedocutanic subsoil horizon. The pedocutanic horizon of these soils reaches a soil depth of 500 mm from where it is underlain by a lithic C horizon that is 300 mm thick.
- The Spioenberg soils are present in four different areas, covering a total area of 127.1 ha within the grid deviation corridor and collector substation study area. The Spioenberg soil form also consists of orthic topsoil overlying a pedocutanic subsoil horizon. However, the pedocutanic horizon of the Spioenberg soils reaches only a soil depth of 400 mm from where it is underlain by hard rock.

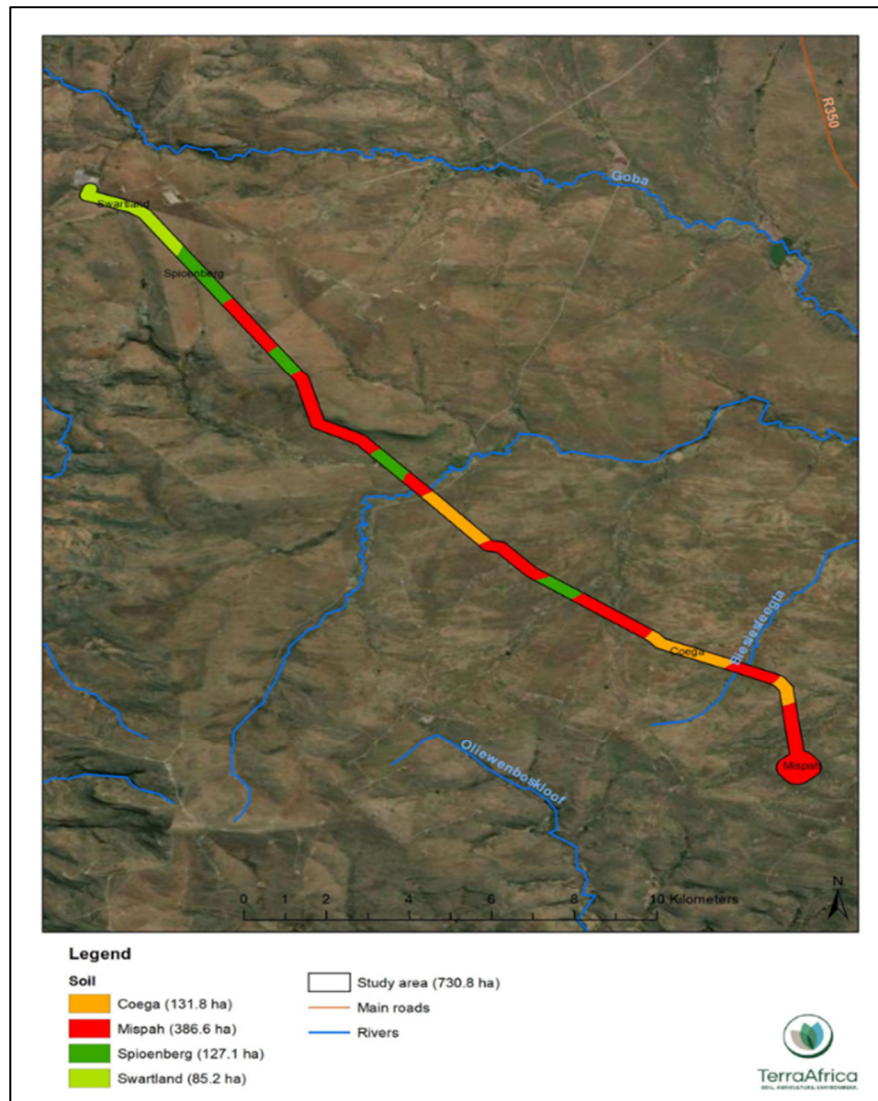


Figure 6.13: Soil classification map of the Msenge Emoyeni Grid Deviation

The dominant land capability class within the grid deviation, is Low-Moderate (Class D7). The highest land capability class within this area is Moderate-High (Class D9) which is in the middle of the study area and only occurs in very small areas. Land adjacent and further away from the Msenge grid deviation consists of a similar mixture of land capability class than that within the grid deviation.

The largest part of the Msenge grid deviation, has low agricultural potential (645.6 ha) and included all the soil forms except the Swartland soil. Low-Moderate classes were assigned to the Swartland soil form which occurred in the northwestern parts. This is mainly due to the depths of the Swartland soil which reached 800 mm. The low agricultural potential of the soils within the development area confirmed by the absence of crop field boundaries within the Msenge grid deviation. No pivot irrigation areas, rainfed annual crops or planted pastures as well as old fields occurred in the study area or close to it. The grid assessment corridor and collector substation area properties is currently used either for livestock farming or game farming and cattle water troughs and handling facilities were observed within the area assessed. This is the only agricultural land use within the grid corridor. The average grazing capacity of the area is considered to be moderate-high.

The verified site sensitivity of the Msenge grid deviation, differs from the results of the Environmental Screening Tool. Following on-site verification, it was found that the largest part of the Msenge grid deviation as well as the entire area of the collector substation, has Low agricultural sensitivity. The total area with Low sensitivity is 645.6 ha. The soil forms present within the grid deviation, are mainly shallow soils that range in depth between 300

to 400 mm. These shallow soils are unsuitable for rainfed crop production and is best left under natural vegetation that can be used for livestock and game grazing.

The only exception to this, was the area in the northern part of the grid deviation where Swartland soils with effective soil depth of 800 mm, are present. This area of 85.2 ha has been classified as having Medium agricultural sensitivity. Although the area with the Swartland soils may be more suitable for rainfed crop production, the entire Msenge grid deviation area is used for livestock and game farming. No irrigation infrastructure, such as centre pivots, are present within the project. The area can support approximately 91 head of cattle at the average long-term grazing capacity of the area. However, it is not anticipated that livestock and game farming will be excluded from the area and livestock will be allowed to graze in the areas around the power line pylons. Soil in the grid deviation will have low sensitivity, depending on the successful implementation of mitigation measures to prevent soil erosion, compaction and pollution.

6.5.2. Description of Agricultural Impacts

The most significant impacts of the proposed project on soil and agricultural productivity will occur during the construction phase of the power line pylons and collector substation. During the construction phase, the vegetation will be removed and the soil surface prepared for the delivery of materials and erection of the infrastructure. During the operational phase, the risk remains that soil will be polluted by the waste generated or in the case of a spill incident when maintenance workers visit the area to do any maintenance work or repairs. During the decommissioning phase, soil will be prone to erosion when the infrastructure is removed from the soil surface.

Impact: Reduction of land with natural vegetation for livestock and game grazing

Earth-moving equipment will be used to clear the vegetation all along the proposed power line alignment. In areas where obstacles such as rock outcrops are present, earth-moving equipment will be used to prepare the surface for the delivery of the construction materials.

Impact: Soil erosion

All areas where vegetation is removed from the soil surface in preparation for the powerline construction, will result in exposed soil surfaces that will be prone to erosion. Both wind and water erosion are a risk. Once the soil particles are removed, vegetation will have difficulty establishing itself on the rock, lithic and hard carbonate material in the area.

Impact: Soil pollution

During the construction phase, construction workers will access the different farm portions for the preparation of the terrain and the installation of the pylons. Both potential spills and leaks from construction vehicles and equipment as well as waste generation on site, can result in soil pollution.

6.5.3. Assessment of potential Agricultural Impacts

Construction phase

Nature: The availability of grazing land for livestock and game farming will be reduced during the construction phase. It is anticipated that the significance of the impact will gradually reduce as vegetation re-establishes during the operational phase and animals can graze again around the pylons.

	Without mitigation	With mitigation

<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Short duration - 2-5 years (2)	Very short duration - 0-1 years (1)
<i>Magnitude</i>	Low (4)	Minor (2)
<i>Probability</i>	Definite (4)	Probable (3)
<i>Significance</i>	Low (28)	Low (12)
<i>Status (positive or negative)</i>	Negative	Positive
<i>Reversibility</i>	High	High
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	N/A
Mitigation:		
<ul style="list-style-type: none"> • Vegetation clearance must be restricted to areas within the servitude where the power line will be constructed. • Removal of obstacles to allow for access of construction vehicles must be kept to only where essential. • Prior arrangements must be made with the landowners to ensure that livestock and game are moved to areas where they cannot be injured by vehicles traversing the area. • No boundary fence must be opened without the landowners' permission. • All left-over construction material must be removed from site once construction on a land portion is completed. • No open fires made by the construction teams are allowable during the construction phase. 		
Residual Impacts:		
The residual impact from the construction and operation of the Msenge grid infrastructure is considered low.		
Cumulative Impacts:		
Any additional power lines and other grid infrastructure that are built in the area to strengthen the electricity grid, will result in additional areas where grazing veld will be disturbed.		

Nature: The clearing and levelling of a limited area of land within the proposed power line servitude will increase the risk of soil erosion in the area. It is anticipated that the risk will naturally reduce as grass and lower shrubs re-establishes in the area once the construction has wrapped up and the operational phase continues.

	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Medium-term (3)	Medium-term (3)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Probable (3)	Improbable (2)

<i>Significance</i>	Medium (30)	Low (16)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	N/A
<p>Mitigation:</p> <ul style="list-style-type: none"> Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude; Unnecessary land clearance must be avoided; Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface. Where possible, conduct the construction activities outside of the rainy season. 		
<p>Residual Impacts:</p> <p>The residual impact from the construction and operation of the Msenge grid infrastructure on the susceptibility to erosion is considered low.</p>		
<p>Cumulative Impacts:</p> <p>Any additional power lines and substations that are built in the area to strengthen the electricity grid, will result in additional areas were exposed to soil erosion through wind and water movement.</p>		

<p>Nature: The following construction activities can result in the chemical pollution of the soil:</p> <ol style="list-style-type: none"> Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site. The accidental spills from temporary chemical toilets used by construction workers. The generation of domestic waste by construction workers. Spills from fuel storage tanks during construction. Pollution from concrete mixing. Any construction material remaining within the construction area once construction is completed. <p>During the operational phase of the power line, maintenance and repairs can result in waste generation within the servitude area.</p>		
	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Short-term (2)	Short-term (2)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Low (4)	Improbable (2)

Significance	Medium (36)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A
Mitigation:		
<ul style="list-style-type: none"> Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills; Any waste generated during construction, must be stored into designated containers and removed from the site by the construction teams. Any left-over construction materials must be removed from site. 		
Residual Impacts:		
The residual impact from the construction and operation of the proposed project will be low to negligible.		
Cumulative Impacts:		
Any additional power lines and substations that are built in the area where waste is not removed to designated waste sites, will increase the cumulative impacts associated with soil pollution in the area.		

Operational phase

Nature: During the operational phase, there can be potential spills and leaks from maintenance vehicles that transport maintenance workers and equipment. Also, any waste generated during maintenance and repairs on site can result in soil pollution.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Low (4)	Improbable (2)
Significance	Medium (36)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A
Mitigation:		

- Maintenance must be undertaken regularly on all vehicles used for maintenance work to prevent hydrocarbon spills;
- No domestic and other waste must be left within the grid assessment corridor by maintenance and repair workers.

Residual Impacts:

The residual impact from the operation of the Msenge grid infrastructure will be low to negligible.

Cumulative Impacts:

The operation of any additional infrastructure to strengthen and support the operation of the Msenge grid infrastructure and waste not removed to designated waste sites will increase the cumulative impacts associated with soil pollution in the area.

Decommissioning phase

The decommissioning phase will have the same impacts as the construction phase i.e. soil erosion, soil compaction and soil pollution. It is anticipated that the risk of soil erosion will especially remain until the vegetation growth has re-established in the area where the project infrastructure was decommissioned.

6.5.4. Recommended mitigation measures

The availability of grazing land for livestock and game farming will be reduced during the construction phase. It is anticipated that the significance of the impact will gradually reduce as vegetation re-establishes during the operational phase and animals can graze again around the pylons.

All areas where vegetation is removed from the soil surface in preparation for the powerline construction, will result in exposed soil surfaces that will be prone to erosion. Both wind and water erosion are a risk. Once the soil particles are removed, vegetation will have difficulty establishing itself on the rock, lithic and hard carbonate material in the area.

During the construction phase, construction workers will access the different farm portions for the preparation of the terrain and the installation of the pylons. Both potential spills and leaks from construction vehicles and equipment as well as waste generation on site, can result in soil pollution. During the operational phase, there can be potential spills and leaks from maintenance vehicles that transport maintenance workers and equipment. Also, any waste generated during maintenance and repairs on site can result in soil pollution.

- » Vegetation clearance must be restricted to areas within the servitude where the power line will be constructed.
- » Plan vegetation clearance activities for dry seasons (late autumn, winter and early spring).
- » Removal of obstacles to allow for access of construction vehicles must be kept to only where essential.
- » Prior arrangements must be made with the landowners to ensure that livestock and game are moved to areas where they cannot be injured by vehicles traversing the area.
- » No boundary fence must be opened without the landowners' permission.
- » All left-over construction material must be removed from site once construction on a land portion is completed.
- » No open fires made by the construction teams are allowable during the construction phase.
- » Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;
- » Unnecessary land clearance must be avoided;
- » Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.
- » Where possible, conduct the construction activities outside of the rainy season.

- » Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;
- » Any waste generated during construction, must be stored into designated containers and removed from the site by the construction teams.
- » Any left-over construction materials must be removed from site.
- » Maintenance must be undertaken regularly on all vehicles used for maintenance work to prevent hydrocarbon spills;
- » No domestic and other waste must be left within the grid assessment corridor by maintenance and repair workers.
- » Avoid parking of vehicles and equipment outside of designated parking areas.

6.5.5 Implications of Project Implementation

Based on the land type data assessed there remains the possibility of sensitive soils occur within the project area. It is possible that the areas of land potential would be classified as high sensitivity. The significance of impacts on agricultural soils is low. It is however expected that these impacts can be avoided with proper implementation of the recommended mitigation measures. The project may be considered provided all prescribed mitigation measures and recommendations are implemented.

6.6 Assessment of Impacts on Heritage (including archaeological and palaeontological resources)

Based on the field assessment completed, the overall archaeological sensitivity of the development area is low. As per the findings of Binneman (2014) and Halkett (2010), this field assessment identified that stone artefacts seem to be concentrated along the floodplains of the non-perennial river systems. As such, potential impacts to archaeological heritage can be avoided through the careful placement of pylons on higher ground and not in valleys or close to river systems and in sandy plains.

None of the archaeological observations noted in the field assessment were determined to have sufficient scientific significance to be conservation-worthy and their recording in this report is considered sufficient. One of the archaeological findings from a previous assessment completed here, SAHRIS ID 87039, a stone kraal graded III B (of moderate local significance, is located within the 300m grid corridor. The location of this stone kraal is described as "next to the service track under the power line. The age of the stone kraal is not known, but it is not as high and well constructed as the other stone walls in the area and may not be of similar age." It is recommended that no-go 30m buffer must be implemented around this kraal to ensure that no impact takes place. The DHL can pass over the kraal if necessary.

Based on this field assessment and on the findings of previous assessments in the area, it is not anticipated that the proposed DHL development will negatively impact on significant archaeological heritage on condition that the recommendations articulated below are implemented.

Based on the fossil record but confirmed by the site visit and walk through there are no visible rocky outcrops and NO FOSSILS on the land surface of the Cistecephalus Assemblage Zone (upper Middleton Formation, Adelaide Subgroup, Karoo Supergroup) even though fossils have been recorded from rocks of a similar age and type in South Africa.

It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the mudstones of the Middleton Formation so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the contractor, environmental officer, or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample. There is no preferred route or no-go area for the DHL.

6.6.1 Results of the Heritage and Palaeontological Impact Assessment

Archaeology and Built Environment

The relative absence of archaeological material on the high ground observed when surveying the neighbouring turbine locations continued in this proposed alignment with stone artefacts concentrated along the floodplains of the non-perennial systems. There was also material lining the lower slopes of the rock hill ridge in the middle segment. There are no rock shelters or large boulders holding potential engravings in this area and the main river system (Great Fish River) runs further to the west and north west.

Around 20 observations were made primarily of weathered Middle Stone Age flakes and radial cores. The raw materials were locally sourced quartzites and siltstones which displayed very little evidence of large transport distances as access to the bedrock and river cobbles is readily available. Later Stone Age evidence was also present and higher grade hornfels cores and flakes were found that were most likely brought into the area from a number of possible karoo sources. The OHL route avoids all the main homesteads and historical werfs and overall had a very low archaeological sensitivity.

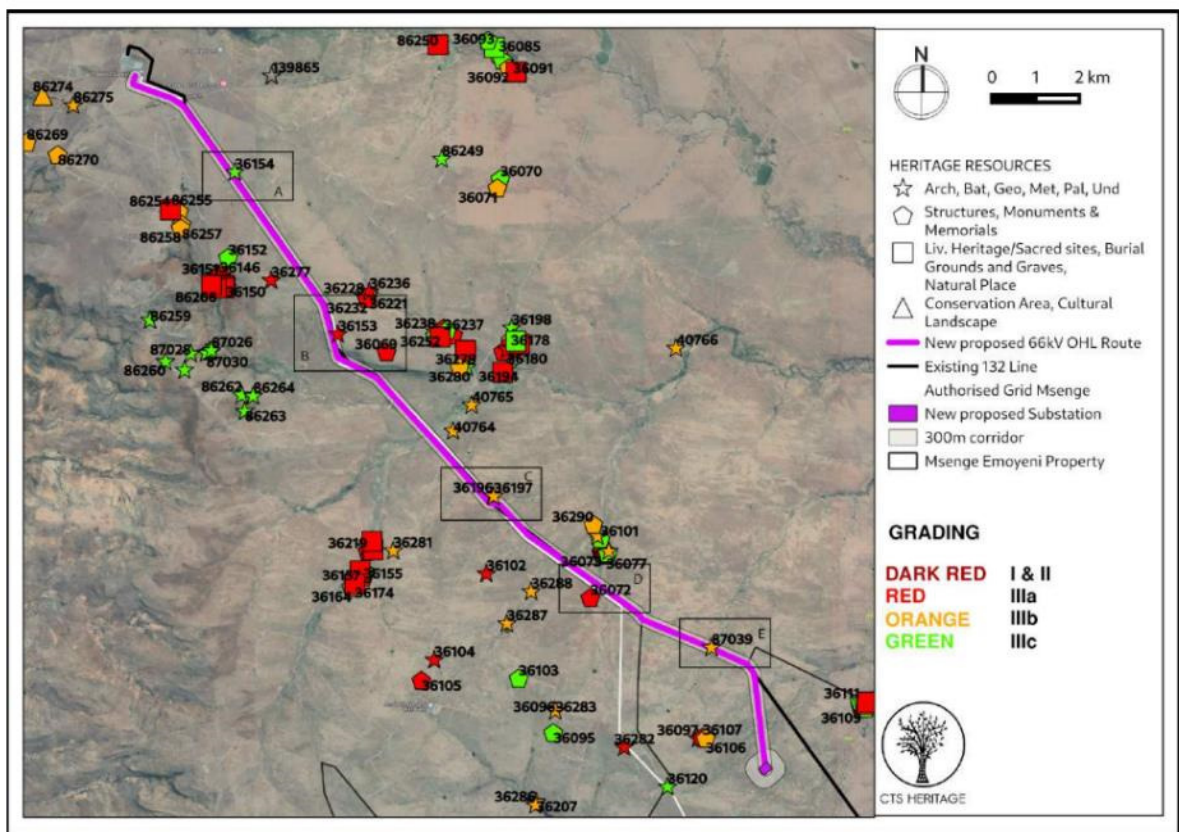


Figure 6.14: Heritage Resources previously identified within the study area / Known heritage resources located in close proximity to the proposed grid infrastructure for the Msenge Emoyeni WEF site.

Palaeontology

Based on the geology of the area and the palaeontological record as known by the specialist, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit confirmed that there are NO FOSSILS visible on the surface and there are no visible rocky outcrops that potentially could have vertebrate fossils. A representative section of the ridges was surveyed and according to the geological map and satellite imagery, there did not appear to be any anomalous areas. It is not known what lies below the soils.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO FOSSILS in the project footprint.

Since there is a small chance that fossils from the *Cistecephalus* Assemblage Zone (AZ) might occur below the surface and soils and may be disturbed, a Fossil Chance Find Protocol is available in the EMPR (Appendix L(M)) for use. Taking account of the defined criteria, the potential impact to fossil heritage resources is EXTREMELY LOW.

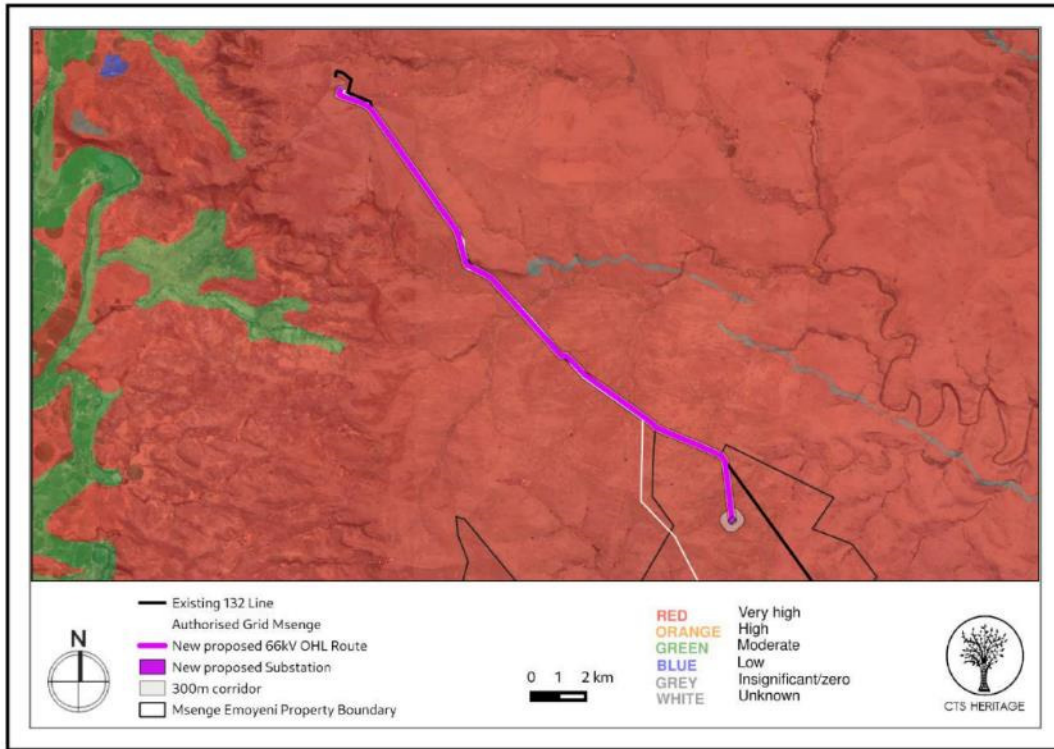


Figure 6.15: Palaeosensitivity of project development area

6.6.2. Description of Heritage Impacts (Including Archaeology and Palaeontology)

No archaeological resources of significance were identified within the area proposed for development during the field assessment although one site of heritage value was previously identified within the 300m corridor. No impacts to significant archaeological heritage resources are anticipated from the proposed development on condition that the recommended mitigation measures are implemented.

No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact.

6.6.3. Assessment of Potential Impacts

Nature: The area proposed for development is known to conserve heritage resources of palaeontological significance that may be impacted by the proposed development.

	Without mitigation	With mitigation

Extent	Localised within the site boundary (L(1))	Localised within the site boundary (L(1))
Duration	Where manifest, the impact will be permanent. (H(5))	Where manifest, the impact will be permanent. (H(5))
Magnitude	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is very sensitive for impacts to significant fossils (H(8))	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is very sensitive for impacts to significant fossils (H(8))
Probability	It is extremely likely that significant palaeontological resources will be negatively impacted (H(5))	It is extremely likely that significant palaeontological resources will be negatively impacted (L(1))
Significance	High (70)	Low (14)
Status (positive or negative)	Neutral	Neutral
Reversibility	Any impacts to heritage resources that do occur are irreversible (L)	Any impacts to heritage resources that do occur are irreversible (L)
Irreplaceable loss of resources?	Likely (H)	Unlikely (L)
Can impacts be mitigated?	Yes	
Mitigation:	The attached Chance Fossil Finds Procedure must be implemented for the duration of construction activities	
Residual Impacts:	Should any significant palaeontological resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources.	

Nature: The area proposed for development is known to conserve heritage resources of archaeological significance that may be impacted by the proposed development.		
	Without mitigation	With mitigation
Extent	L: (1) Localised within the site boundary	L: (1) Localised within the site boundary
Duration	H: (5) Where manifest, the impact will be permanent.	H: (5) Where manifest, the impact will be permanent.
Magnitude	M: (5) No significant archaeological resources were identified within the development area 300m corridor other than one stone kraal	L: (2) No significant archaeological resources were identified within the development area 300m corridor other than one stone kraal
Probability	M: (3) It is extremely unlikely that any significant archaeological resources will be impacted	L: (1) It is extremely unlikely that any significant archaeological resources will be impacted
Significance	Medium (33)	Low (8)
Status (positive or negative)	Neutral	Neutral
Reversibility	L: Any impacts to heritage resources that do occur are irreversible	L: Any impacts to heritage resources that do occur are irreversible
Irreplaceable loss of resources?	M: Possible	L: Unlikely

Can impacts be mitigated?	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> • A no-go 30m buffer must be implemented around this kraal to ensure that no impact takes place. The OHL can pass over the kraal if necessary • The pylon footings of the proposed OHL are not located within any kloofs or river valleys to mitigate the likelihood of impact to significant archaeological heritage • Should any significant archaeological resources be uncovered during the course of the construction phase, work must cease in the area of the find and SAHRA must be contacted regarding an appropriate way forward. 	
<p>Residual Impacts:</p> <p>Should any significant archaeological resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources</p>	

6.6.4. Recommended mitigation measures

The area proposed for development is known to conserve heritage resources of archaeological significance that may be impacted by the proposed development

- » A no-go 30m buffer must be implemented around this kraal to ensure that no impact takes place. The OHL can pass over the kraal if necessary
- » The pylon footings of the proposed OHL are not located within any kloofs or river valleys to mitigate the likelihood of impact to significant archaeological heritage Should any significant archaeological resources be uncovered during the course of the construction phase, work must cease in the area of the find and SAHRA must be contacted regarding an appropriate way forward
- » The attached Chance Fossil Finds Procedure must be implemented for the duration of construction activities.

6.6.5. Implications of Project Implementation

Based on the outcomes of the impact assessment, it is not anticipated that the proposed development of the 66kV Overhead Powerline corridor, on-site substation, associated access tracks and watercourse crossings associated with the Msenge Emoyeni WEF will negatively impact on significant heritage resources on condition that all recommended mitigation measures are implemented.

6.7. Assessment of Visual Impacts

The visual assessment of the proposed Msenge Emoyeni 66 kV Overhead Powerline indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. The proposed infrastructure will be visible within an area that is generally characterized by low growing shrubland and wide-open undeveloped spaces. The infrastructure would thus be highly visible and impossible to hide within an area that incorporates potentially various sensitive visual receptors that may consider visual exposure to this type of infrastructure to be intrusive. The low occurrence of such sensitive visual receptors within this environment, specifically in close proximity to the proposed infrastructure, as well as, the presence of existing high voltage overhead powerlines and Wind Energy Facilities, is of relevance however, and has affected the significance rating of the anticipated visual impacts.

In general, the severity of the visual impact on visual receptors decreases with increased distance from the proposed infrastructure. Therefore, in order to refine the visual exposure of the facility on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence for the Msenge Emoyeni 66kV Overhead Powerline. Proximity offsets for the proposed development footprint are thus established in order to indicate the scale and viewing distance of the facility and to determine the prominence of the structures in relation to their environment.

These proximity offsets are based on the anticipated visual experience of the observer over varying distances. The distances are adjusted upwards for larger facilities and downwards for smaller facilities (i.e., depending on the size and nature of the proposed infrastructure). Therefore, for the purpose of this study, proximity offsets have been calculated from the centre line of the power line alignment, as indicated below and as follows:

- 0 – 0.5km. Short distance view where the infrastructure would dominate the frame of vision and constitute a very high to high visual prominence.
- 0.5 – 1.5km. Medium distance view where the infrastructure would be easily and comfortably visible and constitute a high to moderate visual prominence.
- 1.5 – 3km. Medium to longer distance view where the infrastructure would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a medium visual prominence.
- Greater than 3km. Long distance view where the structures may still be visible though not as easily recognisable.

This zone constitutes a low visual prominence for the power line.

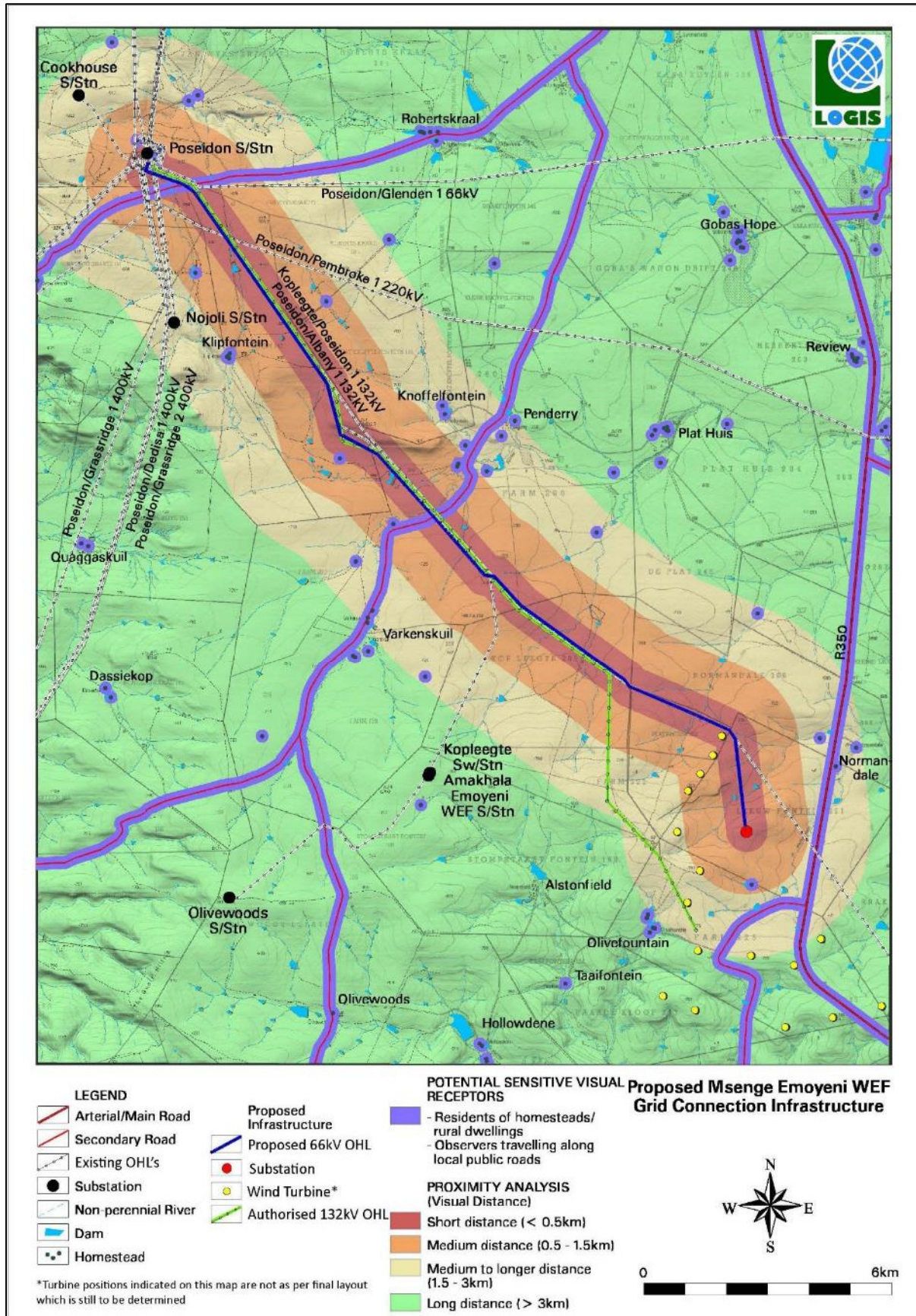


Figure 6.16: Visual proximity analysis, observer sensitivity and proximity of the proposed Msenge Emoyeni 66 kV Overhead Powerline

Since the number of potential sensitive receptors and their perception of the development in question ultimately determines the concept of a visual impact (i.e., without receptors there would be no impact), the visual distance theory and the receptors proximity to the development works hand in hand, and is especially relevant, when considered from areas with a high viewer incidence and a potentially negative visual perception of the proposed facility. It is, therefore, necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed infrastructure.

Viewer incidence is calculated to be the highest along the secondary roads within the study area, as well as homesteads/dwellings within the area. Commuters and possible tourists (though unlikely) using these roads may be negatively impacted upon by the visual exposure to the proposed infrastructure.

Homesteads and farmsteads, by virtue of their visually exposed nature, are also considered to be sensitive visual receptors. Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Receptors within built up areas are less sensitive to potential visual impact due to the presence of structures, infrastructure and general visual clutter. However, due to the extremely low density of homesteads/dwellings within the immediate area (within 1 Km), it is highly unlikely that any residents would be negatively impacted.

The potential sensitive visual receptors within a 0.5km, 1.5km and 3km radius as identified above are as follows:

- < 0.5km – Short Distance : Observers travelling along the secondary roads and residents of unknown dwellings/homesteads.
- 0.5 – 1.5km – Short to Medium Distance : Residents of Klipfontein and observers travelling along the secondary roads.
- 1.5 - 3km – Medium to Long Distance : Residents of Normandale, Varkenskuil, Penderry, Knoffelfontein and Klipfontein, as well as, observers travelling along the secondary roads and a small portion of the R350.
- > 3km – Long Distance : Residents of homesteads/dwellings within the area, along with observers travelling along the secondary roads.

Visual Absorption Capacity (VAC) is the capacity of the receiving environment to absorb the potential visual impact of the proposed infrastructure. VAC is primarily a function of the vegetation and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC. The VAC would also be high where the environment can readily absorb the development in terms of texture, colour, form and light / shade characteristics. On the other hand, the VAC for a development contrasting markedly with one or more of the characteristics of the environment would be low. The VAC also generally increases with distance, where discernible detail in visual characteristics of both environment and development decreases.

The land cover within the study area is predominately low grassland with small scattered areas of tree clumps. As a result, the landscape is characterised by wide-open expanses of landscape. Overall, the Visual Absorption Capacity (VAC) of the receiving environment is deemed to be low by virtue of the low growing vegetation and sparsely populated/limited development overall.

The significant height of power line structures adds to the potential visual intrusion of the power lines, with the tall towers (pylons) against the background of the horizon. In addition, the scale and form of the structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics.

Overall, the Visual Absorption Capacity (VAC) of the receiving environment and the areas in close proximity to the proposed substation and powerline alignment is deemed to be low by virtue of the low-growing vegetation.

Where homesteads do occur, some more significant vegetation and trees may have been planted, which would contribute to the visual absorption. As this is not a consistent occurrence and majority of the settlements are informal in nature, VAC will not be taken into account for any of the homesteads or settlements, again assuming a worst-case scenario.

As a result of the low-lying vegetation, undeveloped nature of the study area, and the high contrast of the infrastructure within the surrounding receiving environment, VAC will not be taken into account for the visual impact assessment of the Msenge Emoyeni 66kV Overhead Powerline.

The result of the viewshed analyses for the proposed Msenge Emoyeni 66kV Overhead Powerline is shown on Figure 6.17 below that follows. An analysis has been undertaken within the proposed infrastructure alignment in order to determine the general visual exposure (visibility) of the area under investigation. A height of 30m was used in order to illustrate the anticipated visual exposure of the proposed infrastructure (i.e., the approximate maximum height of the power line structures of a 66kV powerline). This also represents the absolute worst-case scenario. The visibility analysis for each alignment was generated from a number of points along the alignment, spaced at intervals of approximately 400m. Receptor height was set at eye level.

The height of the substation will not exceed two storeys (i.e., 6m), therefore the visual exposure of this component will fall within the viewshed generated for the powerline alignment.

The viewshed analysis does not include the effect of vegetation cover or existing structures on the exposure of the proposed facility, therefore signifying a worst-case scenario.

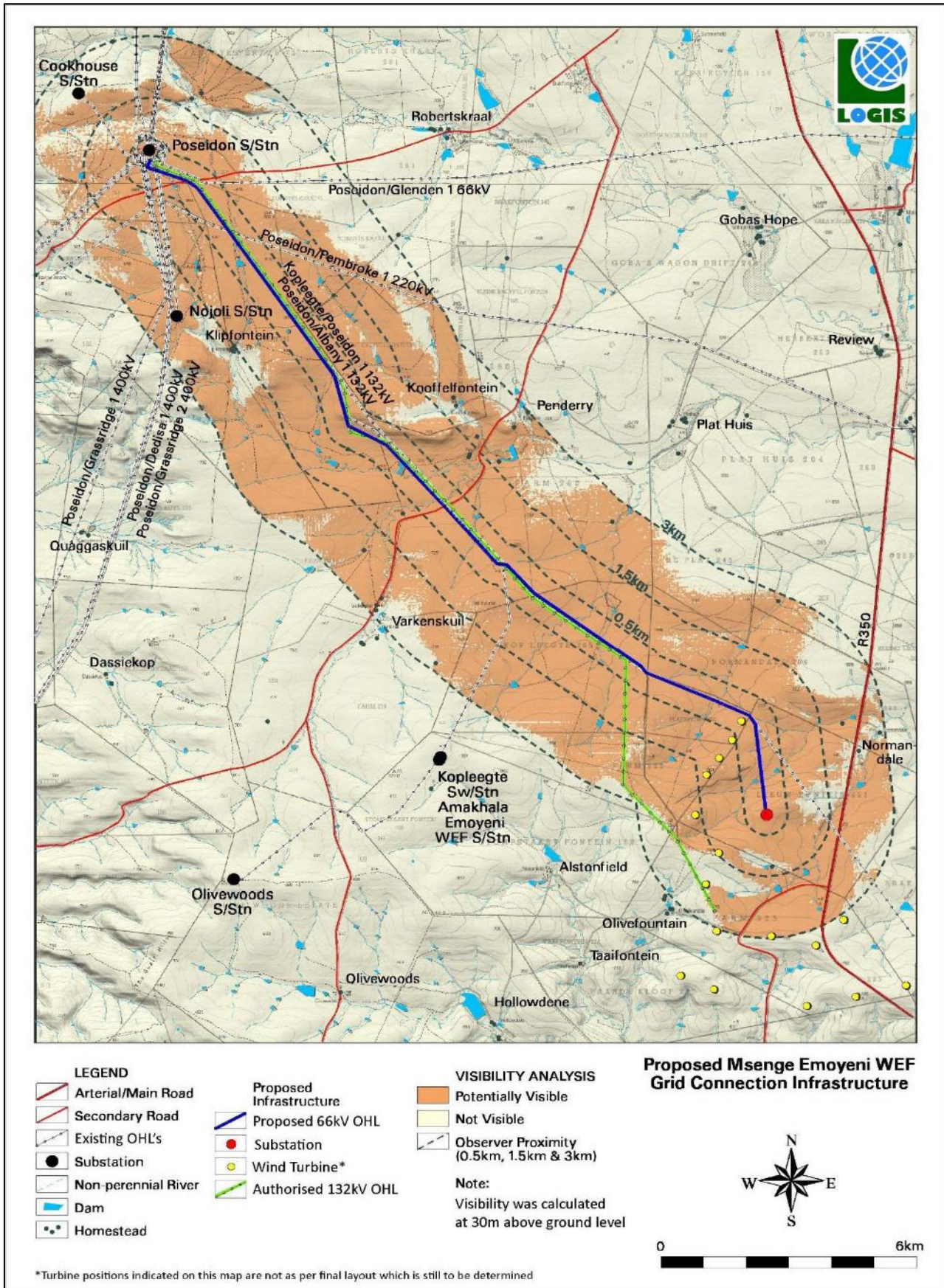


Figure 6.17: Potential visual exposure (viewshed analysis) of the proposed Msenge Emoyeni 66kV Overhead Powerline

The results of visual exposure, viewer incidence / perception and visual distance of the proposed facility are displayed on Figure 6.18 below. Here the weighted impact and the likely areas of impact have been indicated as a visual impact index. Values have been assigned for each potential visual impact per data category and merged in order to calculate the visual impact index. An area with short distance, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact when evaluating the issues related to the visual impact. The visual impact index for the proposed infrastructure is further described as follows.

- The visual impact index map indicates a core zone of high visual impact within 0.5km of the proposed infrastructure. Users of the secondary road (1 & 2) and residents of unknown dwellings/homesteads are likely to experience a very high visual impact.
- Visual impact is predominantly moderate between 0.5km and 1.5km of the proposed infrastructure. The identified receptors between 0.5km and 1.5km of the proposed infrastructure, as listed below, are likely to experience high visual impact should no mitigation be undertaken. Sensitive visual receptors within this zone comprise mainly of the following:
 - o Users traveling along a small portion of the three secondary roads (1, 2), it is expected that the visual intrusion where possible will be brief o Residents of Klipfontein (3) located to the north
- Visual impact is prominently low between 1.5 km and 3 km of the proposed infrastructure. The identified receptors between 1.5km and 3km of the proposed infrastructure, as listed below, are likely to experience moderate visual impact, should no mitigation be undertaken. Sensitive visual receptors within this zone comprise mainly of the following users:
 - o Users traveling along the arterial road R350 (7) and various secondary roads (1, 2 & 6), potential visibility is however scattered along the length of the roads and visual intrusion where possible will be brief
 - o Residents of Knoffelfontein (4) and Penderry (5)
- Beyond the 3 km of the proposed infrastructure, the extent of potential visual impact is greatly reduced, and the magnitude is predominantly very low to negligible. It is not expected that sensitive receptors, if any, will be impacted visually by the proposed infrastructure.

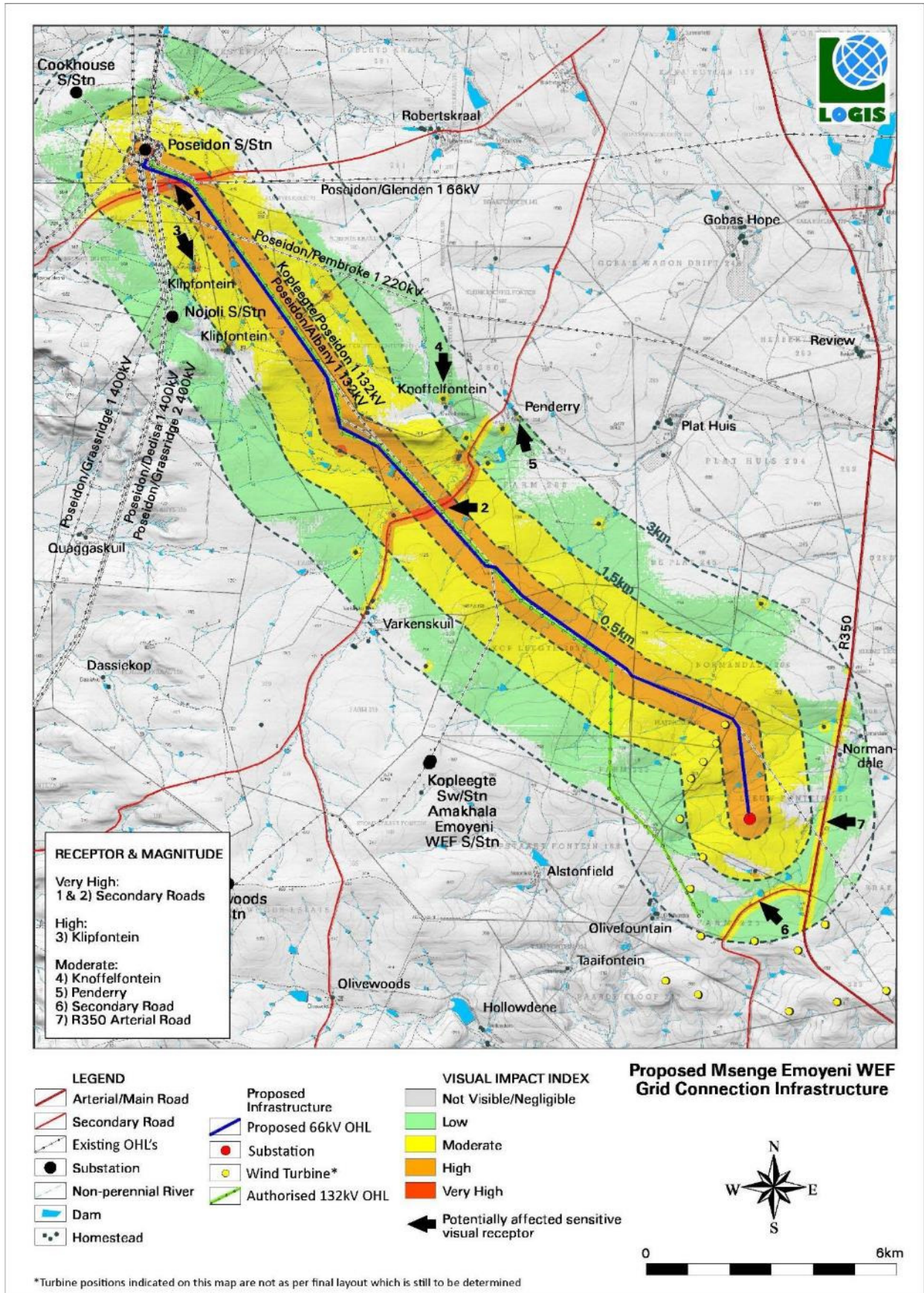


Figure 6.18: Visibility Index illustrating the frequency of exposure of the proposed Msenge Emoyeni 66 kV Overhead Powerline

6.7.1. Results of Visual Impact Assessment

Overall, the post mitigation significance of the visual impacts is predominately **moderate** to **low**. A high significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced.

6.7.2. Description of Visual Impacts

The visual impacts on sensitive visual receptors (i.e., residents of homesteads and users of secondary roads) in close proximity to the proposed infrastructure (i.e., within 0.5km) is expected to be of **high** significance. A mitigating factor within this scenario is the very low occurrence of receptors within the receiving environment. Additionally, observers traveling along the secondary road will only be exposed to the visual intrusion for a short period of time. This reduces the probability of this impact occurring. The visual impact on sensitive visual receptors (i.e., residents of homesteads and users of roads.) within the region (i.e., beyond the 0.5km offset) is expected to be of **moderate** significance. The low occurrence of visual receptors reduces the probability of this impact occurring.

The height of the proposed new on-site substation will not exceed two storeys (i.e., 6m), therefore the visual exposure of this component will fall within the viewsheds generated for the power line infrastructure (which is not expected to exceed 32m). Other associated infrastructure would include access roads and cleared servitudes along the alignments. Servitudes will need to be maintained along the length of the proposed power lines for their entire operational life and access roads will be required both to construct the power lines, and to maintain the servitudes (operational phase). These servitudes and access roads have the potential of manifesting as landscape scarring, and thus represent a potential visual impact within the viewshed areas. This is especially relevant for steep slopes where erosion could occur over time. Such erosion and landscape scarring could represent a visual impact. As access roads, watercourse crossings and servitudes have no elevation or height, so the visual impact of this associated infrastructure will be absorbed by the visual impact of the primary infrastructure. The potential visual impact of the associated infrastructure on sensitive visual receptors in close proximity thereto is expected to be of **moderate** significance pre-mitigation and may be mitigated to **low** post mitigation.

During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction site that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity. Mitigation entails proper planning, management and rehabilitation of all construction sites to forego visual impacts.

The visual impacts as a result of lighting at night on sensitive visual receptors in the region is likely to be of **moderate** significance and may be mitigated to **low**.

The anticipated visual impact on the visual character and sense of place of the study area is expected to be of **moderate** significance. The presence of existing electrical infrastructure and Wind Energy Facilities within the region this is likely to reduce the probability of this impact occurring. Additionally, the low occurrence of visual receptors and the remote location of the study area relative to tourism areas further reduces the probability of this impact occurring.

6.7.3. Assessment of Potential Impacts

Planning, Construction & Operation phases

Nature: Visual impact on the users of secondary roads and residents of homesteads in close proximity to the proposed infrastructure.

	<i>No mitigation</i>	<i>Mitigation considered</i>
<i>Extent</i>	High (4)	High (4)
<i>Duration</i>	Long term (4)	Long term (4)
<i>Magnitude</i>	Very high (10)	Very high (10)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	Moderate (54)	Moderate (54)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Recoverable (3)	Recoverable (3)
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	No	
<i>Mitigation / Management:</i>		
<u>Planning:</u>		
<ul style="list-style-type: none"> • Respond to the natural environment during the planning of buildings and infrastructure. • Consolidate development and make use of already disturbed sites rather than pristine areas. • Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. • Wherever possible, use materials, coatings, or paints that have little or no reflectivity. • Commercial messages, symbols and/logos are not permitted on structures. 		
<u>Construction:</u>		
<ul style="list-style-type: none"> • Ensure that vegetation is not unnecessarily removed during the construction period. • Reduce the construction period through careful logistical planning and productive implementation of resources. • Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. • Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent). • Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. • Rehabilitate all disturbed areas immediately after the completion of construction works. 		
<i>Cumulative impacts:</i>		
<p>The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is specifically relevant in light of the existing power lines in the area and the Poseidon Substation present in the study area.</p>		
<i>Residual impacts:</i>		

The visual impact will be removed after decommissioning, provided the power line infrastructure is removed. Failing this, the visual impact will remain

Nature: Visual impact on the residents of farm and homesteads and users of secondary road on the periphery of the 0.5km offset and within the region beyond

	<i>No mitigation</i>	<i>Mitigation considered</i>
Extent	Low (2)	Low (2)
Duration	Long (4)	Long (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable (3)	Recoverable (3)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	

Mitigation / Management:

Planning:

- Respond to the natural environment during the planning of buildings and infrastructure.
- Consolidate development and make use of already disturbed sites rather than pristine areas.
- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Wherever possible, use materials, coatings, or paints that have little or no reflectivity.
- Commercial messages, symbols and/logos are not permitted on structures.

Operations:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Maintain the general appearance of the facility as a whole.
- Monitor rehabilitated areas, and implement remedial action as and when required.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is specifically relevant in light of the existing power lines in the area and the Poseidon Substation present in the study area.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature: Visual impact of the associated infrastructure located on site on residents of farm and homesteads and users of the secondary road within close proximity to the proposed facility (within the 0.5 Km offset)

	<i>No mitigation</i>	<i>Mitigation considered</i>
Extent	High (4)	High (4)
Duration	Long (4)	Long (4)
Magnitude	Very High (10)	Moderate (3)
Probability	Probable (3)	Improbable (2)
Significance	Medium (54)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable (3)	Recoverable (3)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation / Management:

Site development & Operation:

- Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.
- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required, these should be planned carefully, taking due cognisance of the local topography. All efforts should be employed to try and align roads along the landscape contours wherever possible. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Keeping infrastructure at minimum heights.
- Introducing landscaping measures such as vegetating berms.
- Avoid the use of highly reflective material.
- Maintain the general appearance of the site as a whole.

Lighting

- Lighting should be kept to a minimum wherever possible.
- Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.

- Wherever possible, lights should be directed downwards to avoid illuminating the sky.
- Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.

Construction:

- Rehabilitate all construction areas, when no longer required.
- Keep vegetation clearing to a minimum.

Operations:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Maintain the general appearance of the facility as a whole.
- Monitor rehabilitated areas, and implement remedial action as and when required.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.

Cumulative impacts:

The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is specifically relevant in light of the existing power lines in the area and the Poseidon Substation present in the study area.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature: Visual impact of construction on sensitive visual receptors in close proximity to the proposed facility

	<i>No mitigation</i>	<i>Mitigation considered</i>
<i>Extent</i>	High (4)	High (4)
<i>Duration</i>	Short term (1)	Short term (1)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Probable (3)	Improbable (2)
<i>Significance</i>	Medium (45)	Low (18)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Recoverable (3)	Recoverable (3)
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	

Mitigation / Management:

Lighting

- Lighting should be kept to a minimum wherever possible.
- Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.
- Wherever possible, lights should be directed downwards to avoid illuminating the sky.
- Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.

Construction:

- Keep vegetation removal to a minimum where possible.
- If possible, keep the construction period to a minimum.
- Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed regularly at licensed waste facilities.
- Employ dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.
- Rehabilitate all disturbed areas as per the rehabilitation plan and schedule.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.

Cumulative impacts:

N/A

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature: Visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed facility

	<i>No mitigation</i>	<i>Mitigation considered</i>
<i>Extent</i>	High (4)	High (4)
<i>Duration</i>	Long term (4)	Long term (4)
<i>Magnitude</i>	High (8)	Low (4)
<i>Probability</i>	Probable (3)	Improbable (2)
<i>Significance</i>	Medium (48)	Low (24)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Recoverable (3)	Recoverable (3)

<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
Mitigation:		
<u>Planning & operation:</u>		
<ul style="list-style-type: none"> Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights. Make use of minimum lumen or wattage in fixtures. Make use of down-lighters, or shielded fixtures. Make use of Low-Pressure Sodium lighting or other types of low impact lighting. Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. 		
Cumulative impacts:		
The light generated at night locally is minimal. The impact of the proposed substation infrastructure although in line with current development and land use trends in the region, will certainly will contribute to a regional increase in lighting impact.		
Residual impacts:		
The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Visual impact of the proposed development on the visual quality of the landscape and sense of place of the region		
	<i>No mitigation</i>	<i>Mitigation considered</i>
<i>Extent</i>	Low (2)	Low (2)
<i>Duration</i>	Long (4)	Long (4)
<i>Magnitude</i>	High (8)	High (8)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	Medium (42)	Medium (42)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Recoverable (3)	Recoverable (3)
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
Mitigation / Management:		
<u>Planning:</u>		
<ul style="list-style-type: none"> Respond to the natural environment during the planning of buildings and infrastructure. 		

- Consolidate development and make use of already disturbed sites rather than pristine areas.
- Retain vegetation in all areas outside of actual built footprints wherever possible.
- Visually break up large bulky buildings into smaller, subtler, less prominent shapes and planes.
- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Wherever possible, use materials, coatings, or paints that have little or no reflectivity.
- Commercial messages, symbols and/logos are not permitted on structures.

Construction:

- Rehabilitate all construction areas.
- Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.

Operations:

- Maintain the general appearance of the facility as a whole.
- Monitor rehabilitated areas, and implement remedial action as and when required.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is specifically relevant in light of the existing power lines in the area and the Poseidon Substation present in the study area.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

6.7.4. Implications of Project Implementation

The findings of the Visual Impact Assessment undertaken for the proposed Msenge Emoyeni 66 kV Overhead Powerline corridor, on-site substation, associated access track and watercourse crossings indicate that these visual impacts are not considered to be fatal flaws for a development of this nature particularly due to the remote location of the study area and very low density of visual receptors. It is, therefore, suggested that the proposed Msenge Emoyeni 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in this report.; subject to the implementation of the recommended mitigation measures and management programme.

6.8. Assessment of the 'Do Nothing' Alternative

The "do-nothing" alternative (i.e. no go alternative) is the option of not constructing the 66kV Overhead Powerline 300m development corridor, on-site substation within a 300m development radius, associated access track and watercourse crossings for the Msenge Emoyeni WEF. This means that the status quo of the environment would remain unchanged and no additional impacts would occur other than those associated with the Msenge Emoyeni WEF and already authorised associated infrastructure. As the current authorised grid connection infrastructure is no longer deemed viable by Eskom, the implementation of the 'do-nothing' alternative will however result in Msenge Emoyeni Wind Energy Facility being unable to evacuate electricity generated to the National Grid and render the development of the WEF and the operation thereof not technically feasible. This will result in the loss of the opportunity to develop the Msenge Emoyeni WEF, which could have impacts at a national scale.

In addition, the Eastern Cape Province will not benefit from additional generated power from a renewable source being evacuated through the proposed grid infrastructure directly into the Province's grid. There will also be a potential loss for development of renewable energy which is detailed in the local, regional and national policies to be of great importance for economic development (refer to Section 2). Therefore, from a regional perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of benefits for the regional area.

This would result in negative impacts at a local, regional and national scale from a socio-economic and economic perspective and is not considered desirable. The negative impacts of the "Do Nothing" alternative are considered to outweigh the positive impacts of this alternative. The 'Do nothing' alternative is, therefore, not a preferred alternative.

SECTION 7: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

As identified and assessed in Section 6, the development of the 66kV Overhead Powerline corridor, on-site substation development radius, associated access track and watercourse crossings may have impacts (positive and negative) on natural resources, the social environment and on the people living in the area surrounding the project. The preceding impact assessment Section has reported on the assessment of the impacts associated with the proposed infrastructure development in isolation. This Section assesses the potential for the impacts associated with proposed development to become more significant when considered in combination with the other known or proposed similar projects within the area.

The authorised Msenge Emoyeni WEF and proposed grid infrastructure and associated access tracks and watercourse crossings development is located within the Cookhouse REDZ and the Eastern Strategic Transmission Corridor. The location of the proposed grid infrastructure and associated access tracks and watercourse crossings is in close proximity to a number of other proposed, approved, and operational powerlines and renewable energy developments within the area. (See **Fig 7.1**). Each of these projects includes access roads, watercourse crossings and turbine positions.

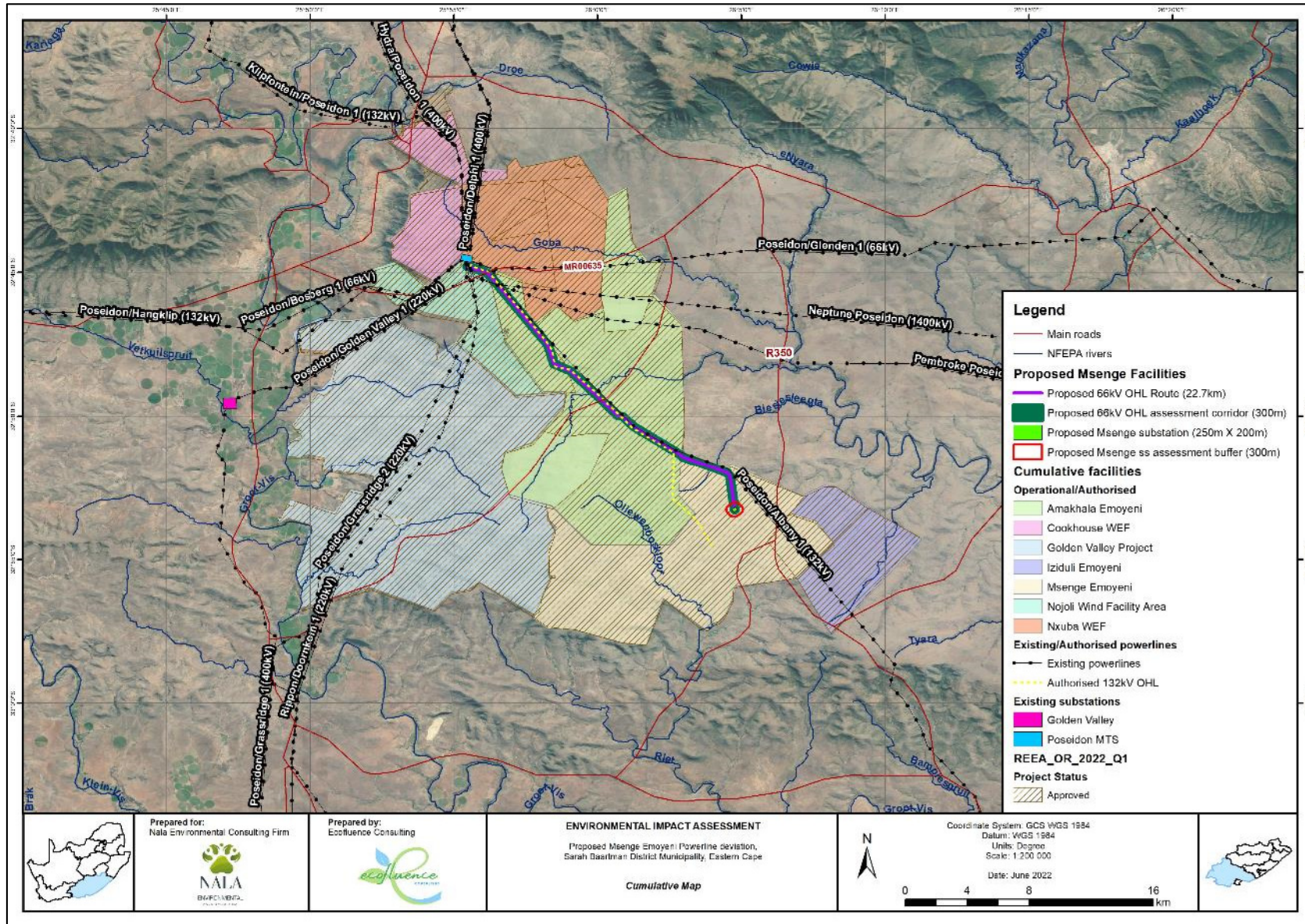


Figure 7.1: Proposed Msenge Facilities In relation to other cumulative facilities surrounding the project area.

7.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This Section of the Basic Assessment Report includes the following information required in terms of Appendix I: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(j)(i) an assessment of each identified potentially significant impact and risk, including cumulative impacts.	The cumulative impacts associated with the development of the various supporting infrastructure are included and assessed within this Section.

7.2. Approach taken to Assess Cumulative Impacts

The cumulative impacts of the proposed 66kV Overhead Powerline, on-site substation, associated access track and watercourse crossings have been assessed through the consideration of other industrial type infrastructure which have resulted in vertical and/or horizontal disturbance within the landscape surrounding the proposed project within a 30km radius.

It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For the development of the proposed infrastructure, the existing infrastructure and transformation in the directly surrounding areas will be considered which includes the following operational/authorised facilities (refer to **Figure 7.1 and Table 7.1**):

- » The operational Amakhala Emoyeni WEF
- » The operational Cookhouse WEF
- » The operational Najoli WEF
- » The operational Golden Valley WEF
- » The authorised Msenge Emoyeni WEF
- » The authorised Izidluli Emoyeni WEF
- » The operational Nxuba WEF
- » The existing Poseidon and Golden Valley Substations
- » The Poseidon/Albany I (132kV) powerline
- » The Pembroke Poseidon powerline
- » The Neptune Poseidon I(400kv) powerline
- » The Poseidon/Glenden I (66kv) powerline
- » The Poseidon/Delphi (400kv) powerline
- » The Hydra/Poseidon I (400kv) powerline
- » The Klipfontein/Poseidon I (132kv) powerline
- » The Poseidon/Bosberg I (66kv) powerline
- » The Poseidon/Golden Valley I (220kv) powerline
- » The Poseidon/Grassridge 2 (220kv)
- » The Rippon/Doornkom I (220kv)

Table 7.1: Grid connection developments located within the surrounding area of the Msenge Emoyeni WEF proposed new 662kV power line corridor

Project Name	Project Status
The Poseidon/Albany I (132kV) powerline	Existing

The Pembroke Poseidon I (220kV)powerline	Existing
The Neptune Poseidon I(400 kV) powerline	Existing
The Poseidon/Glenden I (66 kV) powerline	Existing
The Poseidon/Delphi (400 kV) powerline	Existing
The Hydra/Poseidon I (400 kV) powerline	Existing
The Klipfontein/Poseidon I (132 kV) powerline	Existing
The Poseidon/Bosberg I (66 kV) powerline	Existing
The Poseidon/Golden Valley I (220 kV) powerline	Existing
The Poseidon/Grassridge 2 (220 kV)	Existing
The Rippon/Doornkom I (220 kV)	Existing

The cumulative impacts of the other known existing grid infrastructure, renewable energy developments and the proposed supporting infrastructure are qualitatively assessed in this Section and have been considered within the specialist studies (refer to **Appendices D - I**). The following potential impacts are considered for assessment:

- » Cumulative impacts on ecological processes;
- » Cumulative impacts on avifauna;
- » Cumulative impacts on aquatic resources; and
- » Cumulative impacts on soils and agricultural potential.
- » Cumulative impacts on heritages resources
- » Cumulative impacts on visual aspects

Based on the findings of specialist studies cumulative impacts were not assessed for the following impacts:

- » **Heritage Resources:** The proposed OHL and substation will form part of the infrastructure required for the Msenge Emoyeni WEF and is located immediately adjacent to the approved substation associated with the Msenge Emoyeni WEF. Furthermore, the majority of the proposed OHL is located within an already approved WEF which is also located within a belt of approved renewable energy facilities. In terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise culturally significant landscape. The construction of the proposed OHL development and substation are therefore unlikely to result in unacceptable risk or loss, nor will the proposed development result in a complete change to the sense of place of the area or result in an unacceptable increase in impact. As the majority of the proposed OHL is located within an already approved WEF, no additional cumulative impacts are anticipated to archaeological, palaeontological or cultural landscape heritage resources.

7.3. Cumulative impacts on Ecology

The estimated impact for the cumulative impacts on the terrestrial flora is summarised below. Despite the large number of WTGs in the Cookhouse-Bedford area together with the associated road network – the cumulative impacts are still low. It could be argued convincingly that overstocking with livestock and recently game animals in the area has caused vastly more damage. Provided overstocking does not occur in tandem with the WEF development, the vegetation, productive capacity of the land and the vigour of SCC populations will increase steadily.

Cumulative Impacts (Flora)

Nature: Demise of SCC plants from a combination of overstocking with livestock, uncontrolled bush encroachment, high density of AIPs and the illegal poaching of plants for the plant collecting trade		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Low (1)	Low (1)
Duration	Medium-term (4)	Medium-term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Low (44)	Medium (27)
Status (positive or negative)	Negative	Negative
Reversibility	High ⁹ to Low	High to Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes, unless active mitigation is not followed up with compliance monitoring	Yes, unless active mitigation is not followed up with compliance monitoring
Mitigation:		
<p>The security of the WEF and grid corridor needs to restrict access with a controlled access point and locked gates along the R350 and other district roads. The location of key SCC needs to be carefully guarded and documents containing locality information must not be made freely available to the public. For selected key species such as <i>E. melafarmis</i>, <i>Faucaria tuberculosa</i>, and <i>Huernia</i> spp., permits are needed from DEDEAT to collect specimens (in the construction footprint and possibly outside the buffers), for mass propagation and rewilding back to the site to prevent numbers of plants falling below a threshold for a Minimum Viable Population (MVP).</p> <p>The Alien Invasive Management Plan requires implementation and monitoring.</p> <p>The Bush Encroachment Management plan requires implementation and monitoring.</p> <p>Veld condition assessments from a professional rangeland ecologist are required as per management plans.</p>		
Residual Impacts:		
Same as above for the same Nature.		

⁹ Reversibility can be applied to SCC up to a point where a threshold is crossed for an Minimum Viable Population, after which the probability % drops off rapidly to zero (the point of local species extinction).

Cumulative impacts (Fauna)

<p>Nature: This refers to the loss of natural habitat on the property either directly or indirectly over the course of the project and in conjunction with neighbouring windfarms and commercial farms. Direct effects include habitat loss as a result of bush clearing, heavy machinery and chemical use and infrastructure development. Indirect effects refer to the indirect loss of habitat through soil erosion, sedimentation, and alien plant invasions. These direct and indirect effects are considered in relation to the wind farm under consideration, the wind farms in the immediate area and the livestock farming that takes place between and on the same properties as the wind farms.</p>		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Low (2)	Medium (3)
Duration	Medium-term (3)	Long Term (4)
Magnitude	Medium (5)	High (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (40)	High (65)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> • Limit construction to the immediate footprint of the project. • Reduce the overall burden on the ecosystems by decreasing livestock grazing pressure which exacerbates the deleterious and homogenizing effects of construction. • Rewild the buffer zones post-construction using similar species assemblages of fauna and flora. • Carefully dismantle rocky outcrops (avoid crushing fauna and flora) and relocate and recreate rocky habitats, as best as possible, outside of the footprint of the project. • Move rocks away from the road, and not just to the side of the road, as they present ideal micro habits for fauna and flora. • Ensure that all excess wastewater and chemicals from the construction process are appropriately managed so that they don't overflow into local wetlands and drainage lines. • Monitor the buffer zones to ensure that the rewilding process is successful and is not negatively impacted by livestock and alien plant species. • Develop a management plan for all by products of the construction and operation process to ensure they are not exported into neighbouring habitats. • Monitor the area for alien fauna and flora and remove where necessary. 		
<p>Residual Impacts:</p>		

There will be an irreparable loss of habitat irrespective of the mitigations. There is a cumulative effect between all the infrastructure on the property and all neighboring wind farms combined. Because of this cumulative impact, the negative impact on the environment is inevitable. This negative impact needs to be mitigated as much as possible, using all the mitigations to ensure that the WEF in question is not contributing to the habitat degradation, fragmentation and destruction that is found throughout the neighbouring properties. This project does not constitute an unacceptable risk provided all the aforementioned mitigations are implemented.

Nature: The construction and operation of the proposed grid infrastructure introduces the threat of faunal mortality and displacement. What's important to note here is that this is not isolated threat but rather a cumulative threat as we must consider the impact of neighbouring wind farms and commercial farms on the biodiversity of the region. Increased foot traffic from larger numbers of workers, farmers, labourers, hunters, and builders working in the Bedford region results in more human- fauna encounters. These encounters can either be direct or indirect and can result in the reduction of biodiversity through poaching, roadkill, and indiscriminate killing by humans.

	<i>Overall impact of the proposed project considered in isolation</i>	<i>Cumulative impact of the project and other projects in the area</i>
<i>Extent</i>	Low (2)	Medium (3)
<i>Duration</i>	Medium-term (3)	Long Term (4)
<i>Magnitude</i>	Low (3)	High (6)
<i>Probability</i>	Probable (3)	Definite (5)
<i>Significance</i>	Low (24)	High (65)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Medium	Low
<i>Irreplaceable loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	Yes

Mitigation:

- Limit construction and operations to the immediate footprint of the project.
- Restrict the access of personnel using the facility to reduce human/fauna interactions (no driving off road, no walking outside of the infrastructure footprint).
- Erect signs that warn all personnel against poaching and killing wildlife (enforce legal action where this not obeyed).
- Walkthroughs and search and rescues must be utilised as the neighbouring properties are heavily overgrazed and contain windfarms. Animals utilizing this property may very well have relocated from adjoining properties to escape the unfavorable conditions brought about the construction and operation of neighbouring livestock and windfarms. Habitat is thus contracting the area because of the cumulative operations of all neighbouring properties in the area and the animal's wellbeing needs to be prioritized here.
- Minimize light and noise pollution by sticking to a specific schedule that omits construction work at dawn, dusk and in the evening.
- Reduce operational lights in the evening and use red lights where possible.
- Restrict access to the road networks at night to protect nocturnal animals. The same can be said for dusk and dawn.
- Create a schedule for construction with intermittent periods of rest to allow for a break-up of noise pollution that may affect the behaviour of nearby fauna.
- Erect speed-limits signs, animal crossing signs and speeds bumps to reduce the speed of drivers.
- Erect speed cameras at strategical sites to reduce speed of motorists (Enforce fines where speed limits are not obeyed).

- Induct all personnel using facilities, informing them about the wildlife that are found on the property and the potential negative impacts that they can have on them when using the facilities.

Residual Impacts:

There will be an irreparable loss of biodiversity irrespective of the mitigations. There is a cumulative effect between all the infrastructure on the property and all neighboring wind farms combined. While roadkill, faunal mortality and faunal displacement are inevitable, the impact can be mitigated, at least on the proposed WEF, using the aforementioned mitigations. Intentional faunal mortality is virtually completely avoidable provided the mitigations are adhered to. This project does not constitute an unacceptable risk provided all the aforementioned mitigations are implemented.

7.4. Cumulative Impacts on Avifauna

The combined length of the grid connections associated with the surrounding renewable energy facilities could not be established despite extensive internet searches, but it can be assumed to exceed 100km. The Msenge Emoyeni WEF 66kV OHL grid connection deviation will increase the total number of existing and planned high voltage lines by a very small percentage. The contribution of the proposed grid connection deviation to the cumulative impact of all the high voltage lines is thus LOW. However, the combined cumulative impact of the existing and proposed powerlines on avifauna within a 30km radius is considered to be MODERATE to HIGH.

The cumulative impact of displacement due to disturbance and habitat transformation at the on-site substation, occupying an area of 250m x 200m is considered to be LOW, due to the small size of the footprint and the availability of similar habitat within the 30km radius. The cumulative impact of potential electrocutions within the on-site substation yard is also likely to be LOW as it is expected to be a rare event.

Nature: Displacement of priority avifauna due to disturbance and habitat transformation of priority avifauna due to the construction of the on-site substation

	Overall impact of the proposed on-site substation (post mitigation) within a 30km radius (post mitigation).	Cumulative impact of the proposed on-site substation and other planned and existing substations within a 30km radius (post mitigation)
Extent	1 local	2 regional
Duration	4 long term	4 long term
Magnitude	2 minor	4 low
Probability	2 improbable	2 improbable
Significance	Low (14)	Low (20)
Status	negative	negative
Reversibility	low	low
Loss of resources?	yes	Yes
Can impacts	yes, but only to some extent	yes, but only to some extent

<i>be mitigated?</i>		
<i>Confidence in findings:</i> Medium.		

<i>Nature: Powerline collision mortality of priority avifauna due to the construction of the overhead power line.</i>		
	Cumulative impact of the proposed grid connection (post mitigation) within a 30km radius (post mitigation).	The combined cumulative impact of the proposed grid connection and all the other planned and existing high voltage lines within a 30km radius (post mitigation)
<i>Extent</i>	1 local	2 regional
<i>Duration</i>	4 long term	4 long term
<i>Magnitude</i>	2 minor	6 moderate
<i>Probability</i>	4 highly probable	4 highly probable
<i>Significance</i>	Low (28)	Medium (48)
<i>Status</i>	negative	negative
<i>Reversibility</i>	medium	medium
<i>Loss of resources?</i>	yes	yes
<i>Can impacts be mitigated?</i>	yes	yes
<i>Confidence in findings:</i> Medium.		

7.5. Cumulative Impacts on Aquatic Resources

This section addresses whether the construction of the proposed development will result in:

- Unacceptable risk
- Unacceptable loss
- Complete or whole-scale changes to the environment or sense of place
- Unacceptable increase in impact

<i>Nature: Fragmentation and loss of connectivity of streams in the development area. The scores are impacted by the ephemeral nature of the streams, current fragmentation and modified current state.</i>		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Site (2)	Regional (4)
<i>Duration</i>	Long (4)	Long (4)

Magnitude	Moderate (6)	Low (4)
Probability	Improbable (2)	Probable (3)
Significance	Low (24)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Reduce the number of crossings as far as practically possible by utilizing existing tracks. • Use crossing designs which will allow minimal change in streamflow. • No unnecessary activities, e.g. stockpiles, within the drainage lines or minimum of 100m buffer on either side of the active channel. • Silt traps must be in place to prevent sedimentation. • Appropriate stormwater management structures should be in place, according to the Stormwater Management Plan. • Conduct activities on site according to the Environmental Management Programme and Management Plans set up for the activity. 		
Residual Impacts:		
None anticipated. The development of the project will not result in unacceptable risk, unacceptable loss, complete or whole-scale changes to the environment or sense of place, or an unacceptable increase in impact. There is a <i>medium cumulative impact</i> of the project and other projects in the area, but that impact is related much more to farming practices and the extensive number of instream dams, than to the windfarm projects.		

7.6. Cumulative Impacts on Agricultural Potential and Soils

The proposed Msenge grid infrastructure will be located within a larger area with seven authorised renewable energy facilities and two existing substations. The cumulative impacts of the proposed project in addition to the authorised developments are shown below:

Nature: Decrease in areas with suitable land capability for cattle and game farming.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Regional (2)
Duration	Very short duration - 0-1 years (1)	Short duration - 2 - 5 years (2)
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (12)	Low (24)
Status (positive/negative)	Negative	Negative
Reversibility	High	Low

<i>Loss of resources?</i>	No	Yes
<i>Can impacts be mitigated?</i>	N/A	No
Confidence in findings:		
High.		
Mitigation:		
The only mitigation measure for this impact is to keep the footprints of all grid infrastructure as small as possible and to manage the soil quality by avoiding far-reaching soil degradation such as erosion.		

Nature: Increase in areas susceptible to soil erosion		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Local (1)	Regional (2)
<i>Duration</i>	Medium-term (3)	Medium-term (3)
<i>Magnitude</i>	Moderate (6)	Moderate (6)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	Medium (30)	Medium (33)
<i>Status (positive/negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	No
Confidence in findings:		
High.		
Mitigation:		
Each of the projects should adhere to the highest standards for soil erosion prevention and management, as defined in Sections 10.2. above.		

Nature: Increase in areas susceptible to soil erosion		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Local (1)	Regional (2)
<i>Duration</i>	Medium-term (3)	Medium-term (3)
<i>Magnitude</i>	Low (4)	Low (4)
<i>Probability</i>	Improbable (2)	Probable (3)
<i>Significance</i>	Low (16)	Low (27)
<i>Status (positive/negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	Yes
Confidence in findings:		
High.		

Mitigation:

Each of the projects should adhere to the highest standards for soil compaction prevention and management, as defined in Section 10.2 above.

Nature: Increase in areas susceptible to soil pollution		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Local (1)	Regional (2)
<i>Duration</i>	Short-term (2)	Short-term (2)
<i>Magnitude</i>	Moderate (6)	Moderate (6)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	Low (27)	Medium (30)
<i>Status (positive/negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil pollution prevention and management, as defined in Sections 10.2 of the soil and agricultural potential impact assessment.		

7.7. Conclusion regarding Cumulative Impacts

The assessment of the cumulative impacts was undertaken through the consideration of the grid connection infrastructure (i.e 66kV overhead powerline 300m corridor, on-site substation 300m development radius, associated access track and watercourse crossings) establishment in isolation and compared to the cumulative impacts of the proposed infrastructure and other similar developments surrounding the assessed footprint. Cumulative impacts are expected to occur with the development of the infrastructure throughout all phases of the project life cycle and within the ecological, visual, avifauna and aquatic aspects of study considered as part of this BA Report. The main aim for the assessment of cumulative impacts considering the new grid connection infrastructure for the Msenge Emoyeni WEF is to determine whether the cumulative impact will be acceptable within the landscape proposed for the development, and whether the cumulative loss, from an environmental and social perspective, will be acceptable without whole-scale change.

The significance of the cumulative impacts associated with the development of the new 66kV overhead powerline, on-site substation, associated access track and watercourse crossings are relatively medium to high.

A summary of the cumulative impacts is included in **Table 7.2** below.

Table 7.2: Summary of the cumulative impact significance for the various infrastructure proposed within the Msenge Emoyeni WEF development area.

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology - Terrestrial	Low	Medium
Ecology - Fauna	Medium	High

Avifauna	Low	Low
Aquatic resources	Low	Medium
Agricultural Potential and Soils	Low	Low& Medium
Visual	Moderate	Moderate
Heritage and Palaeontological Resources	Low	Low

The following can be summarised and concluded regarding the cumulative impacts for the proposed supporting infrastructure development:

- » **Ecological processes:** Despite the large number of WTGs in the Cookhouse-Bedford area together with the associated road networks and existing grid connection infrastructure – the cumulative impacts are still low. It could be argued convincingly that overstocking with livestock and recently game animals in the area has caused vastly more damage. Provided overstocking does not occur in tandem with the development, the vegetation, productive capacity of the land and the vigour of SCC populations will increase steadily. There will be an irreparable loss of habitat irrespective of the mitigations. There is a cumulative effect between all the infrastructure on the properties and all neighboring wind farms combined. Because of this cumulative impact, the negative impact on the environment is inevitable. This negative impact needs to be mitigated as much as possible, using all the mitigations to ensure that the proposed powerline and associated infrastructure WEF in question is not contributing to the habitat degradation, fragmentation and destruction that is found throughout the neighbouring properties. This project does not constitute an unacceptable risk provided all the aforementioned mitigations are implemented.
- » **Avifauna:** Long-term cumulative impacts due to extensive wind farm footprint, powerlines and substations can lead to the loss of endemic species and threatened species, loss of habitat and vegetation types and even degradation of well conserved areas. Several WEFs and powerlines can already be found in the project area, this combination of obstacles increases the risk of bird collisions and habitat loss. Cumulative impacts are expected to be of high significance.
- » **Aquatic resources:** The development of the project will not result in unacceptable risk, unacceptable loss, complete or whole-scale changes to the environment or sense of place, or an unacceptable increase in impact. There is a medium cumulative impact of the project and other projects in the area, but that impact is related much more to farming practices and the extensive number of instream dams, than to the windfarm projects.
- » **Agricultural Potential and Soils:** Soil particles can be removed from the area through wind and water erosion due to the construction activities. Cumulative impacts are expected to be of medium significance in terms of areas susceptible to soil erosion.
- » **Heritage Resources:** terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise culturally significant landscape. The construction of the proposed OHL development and substation are therefore unlikely to result in unacceptable risk or loss, nor will the proposed development result in a complete change to the sense of place of the area or result in an unacceptable increase in impact. As the majority of the proposed OHL is located within an already approved WEF, no additional cumulative impacts are anticipated to archaeological, palaeontological or cultural landscape heritage resources.
- » **Visual Resources:** There are already existing high voltage power lines that traverse the study area. The addition of the proposed Msenge Emoyeni 66 kV overhead powerline will result in an increase in this type of infrastructure within the region and could result in a cumulative visual impact.

Based on the specialist cumulative assessments and findings for the development of the proposed grid connection infrastructure, it can be concluded that the project’s cumulative impacts will be of a medium-high significance. This cumulative impact rating is however largely attributable to the existing and proposed developments in the area. The contribution of the proposed grid infrastructure development to the cumulative impact is expected to be of medium significance as a result of the number powerlines and turbines in the area. However, due to impacts associated with sensitive ecological, visual, avifaunal and aquatic features all specialist mitigation and recommendations are essential and must be implemented.

SECTION 8: CONCLUSIONS AND RECOMMENDATIONS

Msenge Emoyeni Wind Farm (Pty) Ltd proposes the deviation of the authorised 132kV powerline with a 66kV overhead powerline, development of an on-site substation associated access tracks and watercourse crossings for the authorised Msenge Emoyeni Wind Energy Facility (DEA Ref. 12/12/20/1754/2), in the Eastern Cape Province. In order to comply with financial close activities, the Developer has liaised with Eskom regarding the authorised 132kV powerline routing (DFFE Ref. 12/12/20/1754/2) to the Poseidon Main Transmission Substation (“MTS”). It was determined that in order to provide suitable setbacks to the existing Amakhala and Njololi WEFs’ turbines and to follow the existing Albany-Poseidon 132kV powerline as closely as possible, while reducing/optimizing crossing points, the authorised 132kV powerline routing would need to be deviated with a 66kV overhead power line. In addition, due to the available grid connection capacity at the Poseidon MTS the applicant will construct a 66kV powerline to take up the available capacity at point of connection. It is envisaged that the new grid connection infrastructure establishment will become integral components of the authorised Msenge Emoyeni WEF to evacuate power to the National Grid, and includes the following:

- Deviation of the authorised a 132kV overhead powerline with a new 66kV single circuit powerline from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon MTS within a 300m development corridor (150m on either side)
- Development of water crossings along the powerline routing; and
- Development of access tracks up to 7m wide to facilitate construction and maintenance activities. 33kV/132kV on-site substation with a footprint occupying an area of 250m x 200m, within a 300m radius.

Specialist studies undertaken in support of this application were required to be in accordance with the recently promulgated Specialist Protocols. The proposed grid connection infrastructure was assessed within a 300m development corridor (150m on either side), and the onsite substation has a clearance area of (250m x 200m) assessed within a 300m development radius. This included access tracks and watercourse crossings along the powerline to allow for construction and maintenance activities.

The properties affected by the development, include:

- » Remainder of Farm Leeuw Fontein No. 221
- » Portion 1 of Farm Normandale No. 206
- » Portion 3 of Farm Plat House No. 203
- » Remaining Extent of Farm Kop Leegte No. 205
- » Remainder of Farm 260 No. 260
- » Remainder of Farm 242 No. 242
- » Remainder of Farm 148 No. 148
- » Portion 3 of Farm 148 No. 148
- » Portion 5 of the Farm Van Wyks Kraal No. 73

A summary of the recommendations and conclusions for the proposed development as determined through the BA process is provided in this Section.

8.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This Section of the BA Report includes the following information required in terms of Appendix I: Content of the BA Report:

Requirement	Relevant Section
-------------	------------------

3(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	A summary of the findings of the specialist studies undertaken for the grid infrastructure establishment has been included in section 8.2.
3(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts has been included as section 8.4. Sensitive environmental features located within the grid corridor and substation study area and development area, overlain with the proposed development footprint have been identified and are shown in Figure 8.1. A summary of the positive and negative impacts associated with the grid infrastructure has been included in section 8.2.
h (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	A concluding statement indicating the preferred alternatives and the preferred location of the activity is included in section 8.4 and 8.5.
h (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	A concluding statement indicating the preferred alternatives and the preferred location of the activity is included in section 8.4 and 8.5.
3(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation of the grid infrastructure have been included in section 8.5.
3(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	A reasoned opinion as to whether the grid infrastructure should be authorised has been included in section 8.5.

8.2. Evaluation of the proposed grid connection infrastructure establishment

The preceding Sections of this BA Report together with the specialist studies contained within **Appendices D - I** provide a detailed assessment of the potential impacts that may result from the deviation of the authorised 132kV powerline with a 66kV overhead powerline within a 300m development corridor, development of an on-site substation within a 300m development radius, associated access tracks and watercourse crossings for the authorised Msenge Emoyeni WEF footprint. This Section concludes the environmental assessment of the project by providing a summary of the results and conclusions of the assessment. In doing so, it draws on the information gathered as part of the BA process, the knowledge gained by the environmental specialists and the Environmental Assessment Practitioner (EAP) and presents a combined and informed opinion of the environmental impacts associated with the development.

No environmental fatal flaws were identified in the detailed specialist studies conducted however, impacts of medium-high significance are expected to occur regarding sensitive terrestrial, visual, aquatic resources and avifaunal features and the implementation of the specialist mitigation measures are key. These measures include, amongst others, the avoidance of sensitive features such as flora and fauna of concern, sensitive riparian habitats, implementation of no-go areas and implementation of buffers.

Impacts identified to be associated with the proposed project and assessed within this report include:

- » Impacts on ecology (including flora, fauna).
- » Impacts on aquatic resources.
- » Impacts on avifauna.

- » Impacts on heritage resources, including archaeology and palaeontology.
- » Impacts on agricultural potential and soils
- » Impacts of Visual aspects

8.2.1. Impacts on Ecology

The impacts of the proposed grid infrastructure establishment on the floral habitat, diversity and species of concern, as a result of clearance of vegetation and degradation are considered LOW – MEDIUM prior to the implementation of mitigation measures. It could be argued convincingly that overstocking with livestock and recently game animals in the area has caused vastly more damage. Provided overstocking does not occur in tandem with the WEF development, the vegetation, productive capacity of the land and the vigour of SCC populations will increase steadily. (**Appendix G**). The estimated impact of the proposed grid infrastructure establishment on the terrestrial fauna and fragmentation of terrestrial habitat is considered MEDIUM to HIGH prior to the implementation of mitigation measures. The project does not constitute an unacceptable risk provided all the aforementioned mitigations are implemented.

8.2.2. Impacts on Avifauna

The expected impacts of the proposed Msenge Emoyeni 66kV OHL grid connection deviation and on-site substation project range from MEDIUM to HIGH significance and negative status pre-mitigation. However, with appropriate mitigation, the post-mitigation significance of the identified impacts should be reduced to MEDIUM and LOW negative. No fatal flaws were discovered in the course of the investigation. It is therefore recommended the opinion of the specialist that the activity is authorised, on condition that the proposed mitigation measures as detailed in the EMPs (Appendices J to L) of this BAR) are strictly implemented. (See also the Avifauna Impact Assessment **Appendix E** of this BAR)

8.2.3. Impacts on Aquatic Resources

The impact assessment showed that most impacts were MEDIUM and can be mitigated to LOW. Due to the extensive number of instream farm dams across all the properties assessed during the site survey of March and April 2022, resulting in highly fragmented drainage systems, it is recommended that 100m buffers be applied across the area. Implementation of a 100m buffer along drainage lines, many which may include large instream artificial dams, may provide some protection for severely impacted drainage systems in the study area. Should infrastructure be required within this buffer, a site-specific assessment should be conducted to consider whether the 100m "protection" buffer can be downgraded to a 32m regulatory/planning buffer. Based on the findings of the specialist surveys, previous reports, and relevant literature, the specialist believes that the following developments will not have an irreversible and substantial negative effect on the aquatic ecology in the area and can go ahead provided the necessary mitigations described above are implemented (**Appendix F**).

8.2.4. Assessment of Agricultural Potential and Soils Impacts

Following the data analysis and impact assessment above, the proposed Msenge grid deviation is considered an acceptable grid infrastructure development within the area of the grid deviation. The soil forms present within the development area consist mostly of shallow soils underlain by hard rock, lithic and hard carbonate material that has severe limitations to rainfed crop production. These soils are of the Mispah, Coega, Spioensberg and Swartland soil forms. The soils in the study area mostly have shallow depths of between 300-400 mm that are not suitable for rainfed crop production. Most of the area have Low agricultural sensitivity (645.6 ha), while the north-western part associated with the Swartland soil form have Medium agricultural sensitivity. The land use for these soils is livestock and game farming. No irrigation infrastructure, such as centre pivots, are present within the project. The Msenge grid deviation area is currently used for livestock and game farming and can support approximately 91 head of cattle at the long-term grazing capacity of 8ha/LSU (DALRRD, 2018). However, it is not anticipated that livestock and game farming will be excluded from the

area and livestock that animals will be allowed to graze in the areas around the power line pylons. It is anticipated that the construction phase will have impacts that range from MEDIUM to LOW and that through the consistent implementation of the recommendation mitigation measures, these impacts can all be reduced to LOW. Impacts during the operational phase are associated with possible repairs that may be required to maintain the power line. It is the opinion of the specialists that this application be considered favourably as the grid deviation and collector substation are acceptable, permitting that the mitigation measures are followed to prevent soil erosion and soil pollution and to minimize impacts on the veld quality of the farm portions that will be affected. The project infrastructure should also remain within the assessed 300m corridor within which the powerline will be constructed.

8.2.5 Impacts on Heritage (including archaeology and palaeontology)

No archaeological resources of significance were identified within the area proposed for development during this field assessment although one site of heritage value was previously identified within the 300m corridor. No impacts to significant archaeological heritage resources are anticipated from the proposed development on condition that the recommended mitigation measures are implemented. No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact. From a heritage perspective, there is no objection to the proposed power line development and the onsite Substation, on condition that all recommended mitigation measures are implemented (**Appendix I**).

8.2.5 Impacts on Visual Resources

In general, the post mitigation significance of the visual impacts is predominately moderate to low.

The visual assessment of the proposed Msenge Emoyeni 66kV Overhead Powerline indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. The proposed infrastructure will be visible within an area that is generally characterized by low growing shrubland and wide-open undeveloped spaces. The infrastructure would thus be highly visible and impossible to hide within an area that incorporates potentially various sensitive visual receptors that may consider visual exposure to this type of infrastructure to be intrusive. The low occurrence of such sensitive visual receptors within this environment, specifically in close proximity to the proposed infrastructure, as well as, the presence of existing high voltage overhead powerlines and Wind Energy Facilities, is of relevance however, and has affected the significance rating of the anticipated visual impacts.

In terms of the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005) and to the knowledge of the specialist, the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions and only one impact of high significance have been evaluated post mitigation though it is not deemed to be unacceptable.

These visual impacts are not considered to be fatal flaws for a development of this nature from a visual perspective, particularly due to the remote location of the study area and very low density of visual receptors, as well as, the presence of existing infrastructure of this nature in the study area. It is, therefore, suggested that the proposed Msenge Emoyeni 66kV overhead powerline, on-site substation, associated access track and watercourse

crossings, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in this report.

8.2.6. Assessment of Cumulative Impacts

The significance of the cumulative impacts associated with the development of the grid connection infrastructure are medium-high, and dependent on the impacts being considered, as potential low impacts in terms of heritage resources, avifauna and soil potential have been identified (refer to **Section 7**). This cumulative impact rating is however largely attributable to the existing and proposed developments in the area. Given the cumulative impacts associated with sensitive ecological aquatic and visual features all specialist mitigation and recommendations are essential and must be implemented for the proposed project.

8.3. Environmental Sensitivity Mapping

As part of the specialist investigations undertaken within the infrastructure development footprint, specific environmental features and areas were identified which will be impacted by the placement of the grid infrastructure. The current condition of the features identified (i.e. intact or disturbed) informed the sensitivity of the environmental features and the capacity for disturbance and change associated with the proposed grid infrastructure development. The environmental sensitive features and areas identified within the development footprint are illustrated in **Figure 8.1 and 8.2**. The sensitive features identified specifically relate to ecological, freshwater, soil and heritage resources are detailed below:

- » Several riparian areas have been delineated within the development footprint and will be impacted by the development of the 66kV overhead power line development, including the construction of access tracks and watercourse crossings and proposed on-site substation. Due to the extensive number of instream farm dams across all the properties assessed during the site survey of March and April 2022, resulting in highly fragmented drainage systems, it is recommended that 100m buffers be applied across the area.
- » The majority of terrestrial habitat is regarded as medium to high sensitivity due to the presence of several fauna and flora species of concern located within the development footprint and several rocky outcrops along the grid corridor.
- » The pylon footings of the proposed OHL are not located within any kloofs or river valleys to mitigate the likelihood of impact to significant archaeological heritage a 30m buffer has been proposed around a stone kraal along the 300m corridor to ensure that no impact takes place.
- » Approximately 645,6 ha along the grid corridor including the proposed substation location was identified as low sensitivity and approximately 85,2 ha of the northern grid corridor was identified to be of medium soil sensitivity.

The assessment of the entire 300m grid corridor and 300m substation development radius will allow for the micro-siting of infrastructure outside of high sensitivity areas, buffer zones and no-go zones.

8.4. Environmental Costs Benefits of the Proposed Grid Connection Infrastructure

Environmental costs (including those to the natural environment, economic and social environment) can be anticipated at a local and site-specific level and are considered acceptable provided the mitigation measures, as outlined in the BA Report and the EMPr's, are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

- » A loss of biodiversity, flora and fauna due to the clearing of land for the construction and utilisation of land for the powerline corridor and the radius of the on-site substation. Infrastructure for the authorised Msenge Emoyeni WEF - The cost of loss of biodiversity is considered to be high due to the combined footprint of the infrastructure (i.e. pylons, on-site substation, watercourses crossings and access tracks) and the placement of it within the authorised WEF and outside of the WEF as well as vegetation and features considered of a high sensitivity. However, impacts can

be minimised through the avoidance of sensitive features and the implementation of mitigation measures within the proposed grid corridor (which traverse the existing Albany- Poseidon 132kV powerline and the proposed on-site substation located within the authorised Msenge Emoyeni WEF site.

- » A potential cumulative visual impact of infrastructure on visual receptors within the region.

Benefits of the supporting infrastructure establishment include the following:

- » The project will facilitate the connection of the authorised Msenge Emoyeni WEF to the national grid, allowing for the distribution of up to 140MW of electricity.
- » The project contributes towards the Provincial and Local IDP objectives for the provision of electricity.

The benefits of the infrastructure development are expected to occur at a national, regional and local level. If the costs to the environment can be largely limited to a site-specific level through the appropriate placement of the grid infrastructure within the assessed 300m development corridor and the on-site substation infrastructure within the assessed 300m development radius areas considered to be acceptable for the development, the benefits of the project are expected to outweigh the environmental costs of the development.

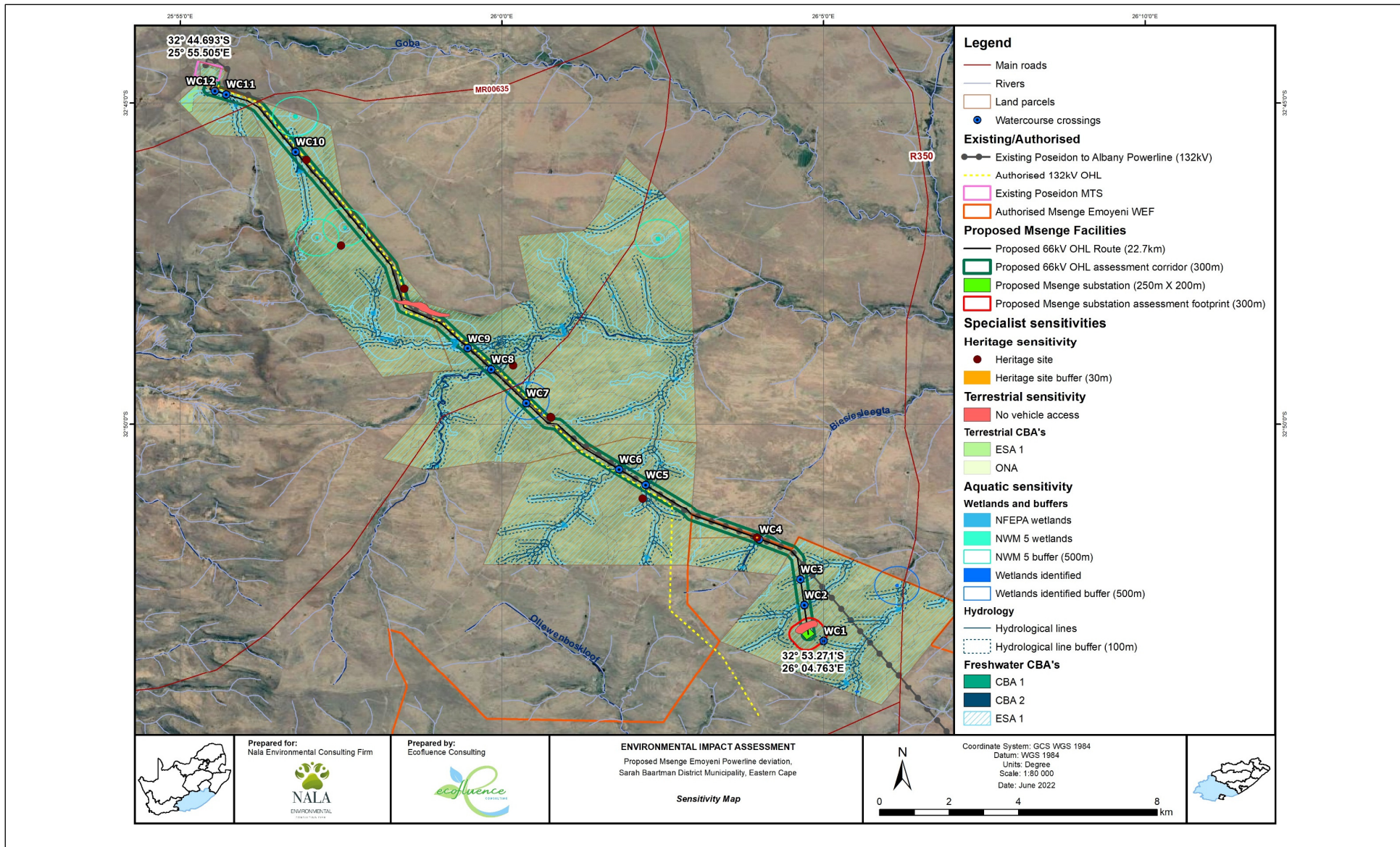


Figure 8.1 Environmental sensitivity and layout map of the proposed infrastructure development footprint (A3 map is included in Appendix B).

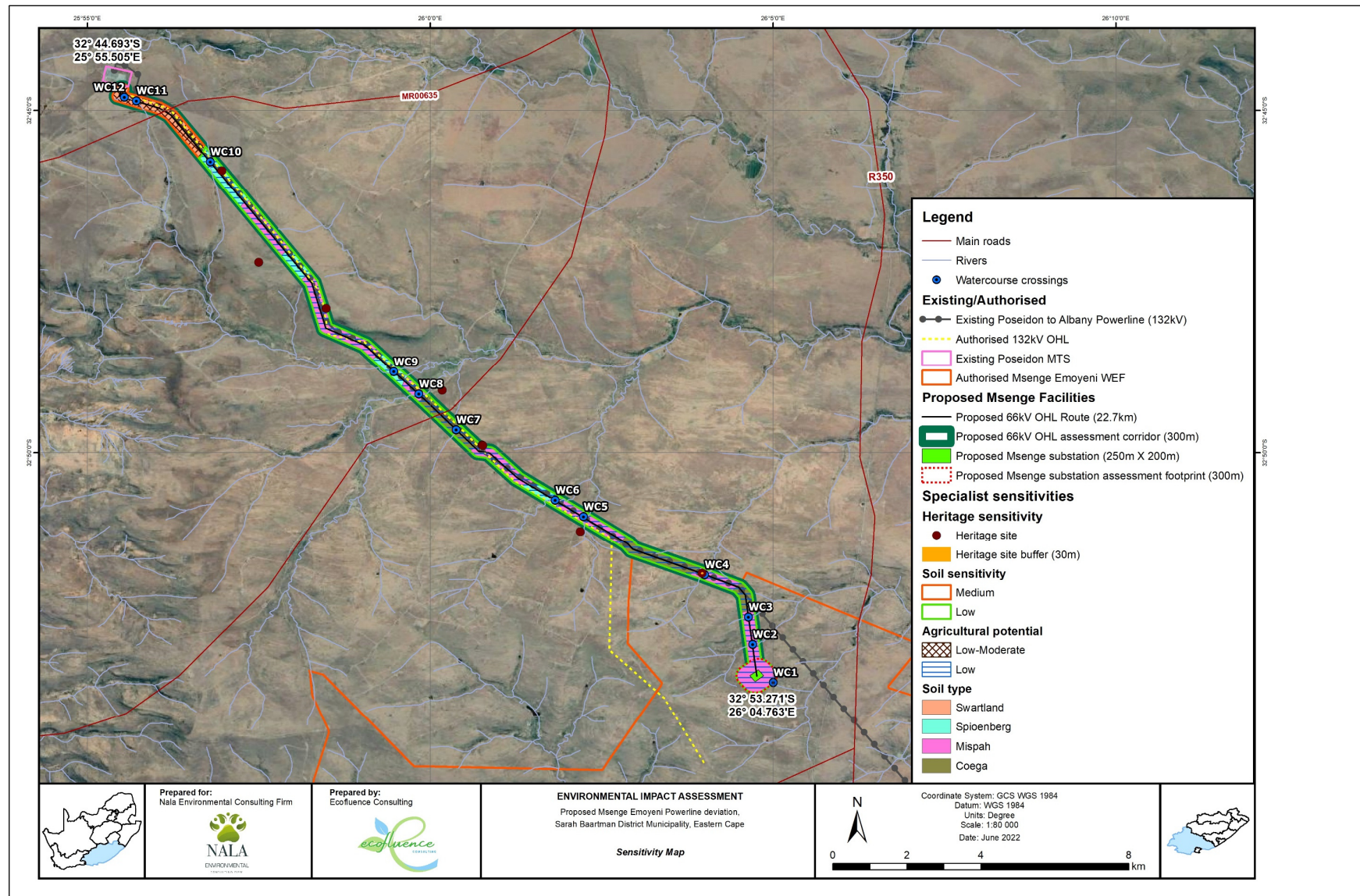


Figure 8.2 Environmental sensitivity and layout map of the proposed infrastructure development footprint including soil sensitivity (A3 map is included in Appendix B).

8.4. Overall Conclusion (Impact Statement)

The construction and operation of the 66kV overhead powerline within a 300m development corridor, development of an on-site substation within a 300m development radius, associated access tracks and watercourse crossings for the authorised Msenge Emoyeni WEF in the Blue Crane Route Local Municipality and the Sarah Baartman District Municipality has been proposed by Msenge Emoyeni Wind Farm (Pty) Ltd. The assessment of the infrastructure establishment at the Msenge Emoyeni WEF and powerline corridor was undertaken by independent specialists and their findings have informed the results of this BA Report.

As a fast-emerging economy, South Africa needs to balance the need for continued economic growth with its social demands and the protection of the natural environment. South Africa is growing its energy supply to support economic expansion and in so doing, alleviates supply blockages and supply-demand deficits. It is essential that South Africa's citizens are provided with clean and modern forms of energy at an affordable price. Approximately 80% of South African electricity comes from coal-fired power stations, with Eskom being the main electricity producing company (<https://www.usaid.gov/powerafrica/south-africa>). The authorised Msenge Emoyeni WEF and the proposed grid connection infrastructure is proposed by Msenge Emoyeni Wind Farm (Pty) Ltd has been selected as a preferred bidder via a private offtaker.

Through specialist studies that have been undertaken for the grid infrastructure for the Msenge Emoyeni WEF, the viability of establishing the infrastructure (powerline, onsite substation, access tracks and watercourse crossings) for the authorised WEF development footprint has been established by Msenge Emoyeni Wind Farm (Pty) Ltd. The positive implications of establishing the infrastructure for the Msenge Emoyeni WEF include:

- » The National electricity grid in the Eastern Cape would benefit from the additional generated power.
- » Promotion of clean, renewable energy in South Africa.
- » Creation of local employment and business opportunities for the project area.

The findings of the specialist studies undertaken within this BA to assess the impacts anticipated as a result of 66kV overhead power line, development of an on-site substation associated access tracks and watercourse crossings for the authorised Msenge Emoyeni WEF and conclude that:

- » There are no environmental fatal flaws that should prevent the proposed grid connection infrastructure establishment from proceeding for the authorised Msenge Emoyeni WEF, provided that the recommended mitigation and management measures are implemented and given due consideration during the process of finalising the wind energy facility layout.
- » The proposed 66kV overhead powerline, 300m development corridor (150m on either side) are considered to be acceptable from an environmental perspective, provided that the recommended buffer zones, high-sensitivity areas, no-go areas, mitigation and management measures are implemented.
- » The proposed 33kV/132kV on-site substation clearance footprint of 250m x 200m within a 300m development radius is considered to be acceptable from an environmental perspective, provided that the recommended, buffer zones, high-sensitivity areas, no-go areas, mitigation and management measures are implemented.
- » The proposed development of access tracks up to 7m wide following the powerline route from the authorised Msenge Emoyeni WEF onsite substation to the Poseidon MTS to facilitate construction and maintenance activities are considered to be acceptable from an environmental perspective, provided that the recommended mitigation and management measures including the areas specified as no-go areas and buffer zones are implemented
- » The proposed watercourse crossing to facilitate construction and maintenance activities are considered acceptable from an environmental perspective provided that all recommended mitigation measures are implemented and the appropriate water use licensing permits are acquire prior to commencement of construction.
- » The proposed addition of the grid connection infrastructure which contributes to the realisation of the WEF will represents an investment in clean, renewable energy, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

The significance levels of the majority of identified negative impacts can be reduced to acceptable levels by implementing the recommended mitigation measures. With reference to the information available at this stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

Based on the studies undertaken for this project, it is concluded that the impacts associated with the facility as proposed are acceptable from an environmental perspective, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

8.5. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the 66kV overhead powerline within the 300m development corridor, development of an on-site substation within the 300m development radius, associated access tracks and watercourse crossings proposed for Msenge Emoyeni WEF by the proponent, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the Environmental Assessment Practitioner (EAP) that the development of the grid connection infrastructure for the already authorised Msenge Emoyeni WEF site development area is acceptable within the landscape and can reasonably be authorised. The following infrastructure should be included within the authorisation issued for the project:

- 66kV overhead single circuit powerline approximately 22.7 km long is to be deviated within a 300m wide assessment corridor (150m on either side), from the proposed Msenge Emoyeni WEF onsite substation to the Poseidon Main Transmission Substation.
- Access tracks of up to 7m in width along the powerline route from the proposed on-site substation located within the Msenge Emoyeni WEF to the Poseidon Main Transmission Substation.
- Water course crossings along the deviated powerline route from the proposed onsite substation to the Poseidon Main Transmission Substation.
- 33kV/132kV on-site substation with a footprint occupying an area of 250m x 200m, within a 300m radius to allow movement where possible.

The following key conditions would be required to be included within the environmental authorisation issued for the 66kV overhead power line development corridor, an on-site substation within the 300m development radius associated access tracks and watercourse crossings for the Msenge Emoyeni WEF:

- » All mitigation measures detailed within this BAR, as well as the specialist reports contained within **Appendices D to I**, are to be implemented.
- » The EMPs as contained within **Appendix J to L** of this BAR should form part of the contract with the Contractor appointed to construct and maintain the proposed infrastructure in order to ensure compliance with environmental specifications and management measures. The implementation of these EMPs for all life cycle phases of the supporting infrastructure is considered key in achieving the appropriate environmental management standards as detailed for this project.
- » The 300m development corridor is authorised for the placement of the 66kV single circuit power line to allow for micro-siting of pylons, access track and watercourse crossing infrastructure within the corridor provided that all buffers, high sensitivity area and no-go areas as identified in the Final Basic Assessment report and specialist assessments are implemented.
- » The 300m development radius footprint associated with the proposed on-site substation is authorised to allow for micro-siting of the substation within the assessed radius provided that all buffers, high sensitivity area and no-go areas as identified in the Final Basic Assessment report and specialist assessments are implemented.
- » This authorisation will constitute the final design and final layout/route, access track and watercourse crossings to be located within the 300m development corridor and the placement of the substation within the 300m development radius footprint of, as submitted to the DFFE for review and approval with the Final Basic Assessment report.

- » Permits from the relevant national and provincial authorities, i.e. the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEA&T) and the Department of Forestry, Fisheries and the Environment (DFFE), must be obtained before the individuals are disturbed.
- » The necessary water use authorisation must be obtained from the Department of Water and Sanitation (DWS) for impacts to a watercourse (i.e. where infrastructure is within a delineated riparian area, in this case) prior to construction.
- » The rehabilitation plan as per the EMPr for the watercourse crossings and access tracks must be implemented from the project onset within watercourse areas to ensure a net benefit to the aquatic environment.

SECTION 9: REFERENCES

Aquatic Assessment

Berliner, D. & Desmet, P. 2007. Eastern Cape Biodiversity Conservation Plan: Technical Report. Department of Water Affairs and Forestry (DWAF). Project No. 2005-012. Pretoria. 1 August 2007.

Berliner, D., Desmet, P. and Hayes, R. 2007. Eastern Cape Biodiversity Conservation Plan Handbook. Department of Water Affairs and Forestry Project No 2005-012. Compiled by Amanda Younge Hayes, August 2017.

Birkhead, A., Uys, A., Scherman, P-A., Bok, A., Colloty, B. and Chalmers, R. 2013. Review and update of the 1999 EIS/PES of South African rivers, including expansion to priority tributaries and wetlands, according to quaternary catchments for the Water Management Areas 12 and 15. Prepared for the Department of Water Affairs and the Water Research Commission, South Africa. Water Research Commission Project No. K5/2045.

Colloty, B. 2013. Aquatic Sensitivity Assessment: Msenge Emoyeni Wind Farm Project. Prepared for Windlab Developments South Africa by Scherman Colloty & Associates. July 2013.

Department of Water and Sanitation (DWS). 2014. A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub-Quaternary Reaches for Secondary Catchments in South Africa. Secondary: N4. Compiled by RQIS-RDM: <https://www.dwa.gov.za/iwqs/rhp/eco/peseismodel.aspx>. Technical team led by Scherman Colloty and Associates cc.

DEA. 2016. National Protected Area Expansion Strategy for South Africa. Department of Environmental Affairs, Pretoria, South Africa.

ECBGP. 2019. Eastern Cape Biodiversity Conservation Plan Handbook. Department of Economic Development and Environmental Affairs (King Williams Town). Compiled by G. Hawley, P. Desmet and D. Berliner.

Le Maitre, D.C., Seyler, H., Holland, M., Smith-Adao, L., Nel, J.L., Maherry, A. and Witthüser, K. 2018a. Identification, Delineation and Importance of the Strategic Water Source Areas of South Africa, Lesotho and Swaziland for Surface Water and Groundwater. Report No. TT 743/1/18, Water Research Commission, Pretoria, South Africa

Le Maitre, D.C., Walsdorff, A., Cape, L., Seyler, H., Audouin, M., Smith-Adao, L., Nel, J.A., Holland, M. and Witthüser, K. 2018b. Strategic Water Source Areas: Management Framework and Implementation Guidelines for Planners and Managers. Water Research Commission Report No. TT 754/2/18, Pretoria, South Africa.

Nala Environmental. 2022. Scope of Work document: Msenge Emoyeni Powerline Deviation.

Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux, D.J., Driver, A., Hill, L., van Deventer, H., Funke, N., Swartz, E.R., Smith-Adao, L.B., Mbona, N., Downsborough, L. & Nienaber, S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas Project. Water Research Commission Report No. 1801/2/11, Pretoria, South Africa.

Scherman Environmental. 2022. Ecological (Terrestrial and Aquatic) Specialist Report for the layout of the proposed Msenge Emoyeni Energy Facility: Walkthrough Report. Prepared for Nala Environmental (Pty). Ltd. in June 2022 by Powell, M; Keates, C; Scherman, P-A and Huchzermeyer, N.

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. 214 pp.

The Biodiversity Company. 2020. The Aquatic Ecology Baseline and Impact Assessments for the Msenge Emoyeni Project, Bedford, Eastern Cape. Prepared for Savannah Environmental, October 2020.

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

Avifauna Assessment

ANIMAL DEMOGRAPHY UNIT. 2020. The southern African Bird Atlas Project 2. University of Cape Town.

ALONSO, J. A. AND ALONSO, J. C. 1999 Collision of birds with overhead transmission lines in Spain. Pp. 57-82 in Ferrer, M. and Janss, G. F. E., eds. Birds and powerlines: Collision, electrocution and breeding. Madrid, Spain: Quercus.Google Scholar

AVIAN POWERLINE INTERACTION COMMITTEE (APLIC). 2012. Mitigating Bird Collisions with Powerlines: The State of the Art in 2012. Edison Electric Institute, Washington D.C

BAMFORD AJ, DIEKMANN M, MONADJEM A, and J MENDELSON. 2007. Ranging behaviour of Cape Vultures Gyps coprotheres from an endangered population in Namibia. Bird Conservation International 17: 331-339.

BARRIENTOS R, PONCE C, PALACIN C, MARTÍN CA, MARTÍN B, ET AL. 2012. Wire marking results in a small but significant reduction in avian mortality at powerlines: A BACI Designed Study. PLoS ONE 7(3): e32569. doi:10.1371/journal.pone.0032569.

BARRIENTOS, R., ALONSO, J.C., PONCE, C., PALACÍN, C. 2011. Meta-Analysis of the effectiveness of marked wire in reducing avian collisions with powerlines. Conservation Biology 25: 893-903.

BEAULAUQUIER, D.L. 1981. Mitigation of bird collisions with transmission lines. Bonneville Power Administration. U.S. Dept. of Energy.

BERNARDINO, J., BEVANGER, K., BARRIENTOS, R., DWYER, J.F. MARQUES, A.T., MARTINS, R.C., SHAW, J.M., SILVA, J.P., MOREIRA, F. 2018. Bird collisions with powerlines: State of the art and priority areas for research. <https://doi.org/10.1016/j.biocon.2018.02.029>. Biological Conservation 222 (2018) 1 – 13

BENSON PC. 2015. A survey of Cape vulture breeding colonies in South Africa's northern provinces (Transvaal Region) – an update 2013 Ornithological Observations. 6: 31-36.

BOSHOFF, A., PIPER, S. & MICHAEL, M. 2009a. On the distribution and breeding status of the Cape Griffon Gyps coprotheres in the Eastern Cape, province, South Africa. Ostrich 80: 85-92.

- BOSHOFF, A., MINNIE, J., TAMBLING, C. & MICHAEL, M. 2011. The impact of power line-related mortality on the Cape Griffon Gyps coprotheres in a part of its range. Bird Conservation International, Published online July 2011.
- DERMODY BJ, TANNER C.J, and AL JACKSON. 2011. The evolutionary pathway to obligate scavenging in Gyps vultures. PLoS One 6: e24635.
- ENDANGERED WILDLIFE TRUST. 2014. Central incident register for powerline incidents. Unpublished data.
- HARRISON, J.A., ALLAN, D.G., UNDERHILL, L.G., HERREMANS, M., TREE, A.J., PARKER, V & BROWN, C.J. (eds). 1997. The atlas of southern African birds. Vol 1 & 2. BirdLife South Africa, Johannesburg.
- HOBBS, J.C.A. & LEDGER J.A. 1986a. The Environmental Impact of Linear Developments; Powerlines and Avifauna. Proceedings of the Third International Conference on Environmental Quality and Ecosystem Stability. Israel, June 1986.
- HOBBS, J.C.A. & LEDGER J.A. 1986b. Powerlines, Birdlife and the Golden Mean. Fauna and Flora, 44:23-27.
- HOCKEY P.A.R., DEAN W.R.J., AND RYAN P.G. 2005. Robert's Birds of Southern Africa, seventh edition. Trustees of the John Voelcker Bird Book Fund, Cape Town.
- HUGH JONES M.E. and DE VOS, V., 2002. Anthrax and Wildlife. Revue scientifique et technique (International Office of Epizootics) 21, 359-383.
- JENKINS, A. & SMALLIE, J. 2009. Terminal velocity: the end of the line for Ludwig's Bustard? Africa Birds and Birding. Vol 14, No 2.
- JENKINS, A., DE GOEDE, J.H. & VAN ROOYEN, C.S. 2006. Improving the products of the Eskom Electric Eagle Project. Unpublished report to Eskom. Endangered Wildlife Trust.
- JENKINS, A.R., DE GOEDE, J.H., SEBELE, L. & DIAMOND, M. 2013. Brokering a settlement between eagles and industry: sustainable management of large raptors nesting on power infrastructure. Bird Conservation International 23: 232-246.
- JENKINS, A.R., SMALLIE, J.J. & DIAMOND, M. 2010. Avian collisions with powerlines: a global review of causes and mitigation with a South African perspective. Bird Conservation International 20: 263-278.
- KOOPS, F.B.J. & DE JONG, J. 1982. Vermindering van draadslachtoffers door markering van hoogspanningsleidingen in de omgeving van Heerenveen. Electrotechniek 60 (12): 641 – 646.
- KRUGER, R. & VAN ROOYEN, C.S. 1998. Evaluating the risk that existing powerlines pose to large raptors by using risk assessment methodology: The Molopo Case Study. Proceedings of the 5th World Conference on Birds of Prey and Owls. August 4-8, 1998. Midrand, South Africa.
- KRUGER, R. 1999. Towards solving raptor electrocutions on Eskom Distribution Structures in South Africa. Bloemfontein (South Africa): University of the Orange Free State. (M. Phil. Mini-thesis)
- LEDGER, J. 1983. Guidelines for Dealing with Bird Problems of Transmission Lines and Towers. Eskom Test and Research Division. (Technical Note TRR/N83/005).

- LEDGER, J.A. & ANNEGARN H.J. 1981. Electrocution Hazards to the Cape Vulture (*Gyps coprotheres*) in South Africa. *Biological Conservation* 20:15-24.
- LEDGER, J.A. 1984. Engineering Solutions to the Problem of Vulture Electrocutions on Electricity Towers. *The Certificated Engineer*, 57:92-95.
- LEDGER, J.A., J.C.A. HOBBS & SMITH T.V. 1992. Avian Interactions with Utility Structures: Southern African Experiences. *Proceedings of the International Workshop on Avian Interactions with Utility Structures*. Miami (Florida), Sept. 13-15, 1992. *Electric Power Research Institute*.
- MARNEWICK, M.D., RETIEF E.F., THERON N.T., WRIGHT D.R., ANDERSON T.A. 2015. Important Bird and Biodiversity Areas of South Africa. *Johannesburg: Birdlife South Africa*.
- MARTIN, G., SHAW, J., SMALLIE J. & DIAMOND, M. 2010. Bird's eye view – How birds see is key to avoiding powerline collisions. Eskom Research Report. Report Nr: RES/RR/09/31613.
- MUCINA, L. & RUTHERFORD, M.C. (Eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. *South African National Biodiversity Institute, Pretoria*.
- MUDUR, G., 2001. Human anthrax in India may be linked to vulture decline. *British Medical Journal* 322, 320.
- MUNDY P, BUTCHART D, LEDGER J, and S PIPER. 1992. The vultures of Africa. Acorn Books. Randburg
- PALMER, A.R. and HOFFMAN, M.T. 1997. Nama Karoo. Pages 167-186 in R.M. Cowling, D.M. Richardson, and S.M. Pierce, editors. *Vegetation of Southern Africa*. Cambridge University Press, Cambridge
- PFEIFFER MB, VENTER JA, and CT DOWNS. 2015. Foraging range and habitat use by Cape vulture *Gyps coprotheres* from the Msikaba colony, Eastern Cape province, South Africa. *Koedoe* 57: 1-11.
- PHIPPS WL, WILLIS SG, WOLTER K, and V NAIDOO. 2013b. Foraging ranges of immature African white-backed vultures (*Gyps africanus*) and their use of protected areas in Southern Africa. *PLoS One* 8: e52813.
- PHIPPS WL, WOLTER K, MICHAEL MD, MACTAVISH LM, and RW YARNELL. 2013a. Do power lines and protected areas present a catch-22 situation for Cape vultures (*Gyps coprotheres*)? *PLoS One* 8: e76794
- SHAW, J.M. 2013. Powerline collisions in the Karoo: Conserving Ludwig's Bustard. Unpublished PhD thesis. Percy FitzPatrick Institute of African Ornithology, Department of Biological Sciences, Faculty of Science University of Cape Town May 2013.
- SHARP, D., 2001. Meloxicam to prevent rabies? *The Lancet* 367, 887-888.
- SHAW, J.M., PRETORIUS, M.D., GIBBONS, B., MOHALE, O., VISAGIE, R., LEEUWNER, J.L.& RYAN, P.G. 2017. The effectiveness of line markers in reducing powerline collisions of large terrestrial birds at De Aar, Northern Cape. Eskom Research, Testing and Development. Research Report. RES/RR/17/1939422.

- SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE. 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.
- SPORER, M.K., DWYER, J.F., GERBER, B.D, HARNESS, R.E, PANDEY, A.K. 2013. Marking Powerlines to Reduce Avian Collisions Near the Audubon National Wildlife Refuge, North Dakota. Wildlife Society Bulletin 37(4):796–804; 2013; DOI: 10.1002/wsb.329
- TAYLOR, M.R., PEACOCK F, & WANLESS R.W (eds.) 2015. The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg, South Africa.
- VAN ROOYEN, C.S. & LEDGER, J.A. 1999. Birds and utility structures: Developments in southern Africa. Pp 205-230, in Ferrer, M. & G.F.M. Janns. (eds.). Birds and Powerlines. Quercus, Madrid (Spain). Pp 238.
- VAN ROOYEN, C.S. & TAYLOR, P.V. 1999. Bird Streamers as probable cause of electrocutions in South Africa. EPRI Workshop on Avian Interactions with Utility Structures 2-3 December 1999. Charleston, South Carolina.
- VAN ROOYEN, C.S. 1998. Raptor mortality on powerlines in South Africa. Proceedings of the 5th World Conference on Birds of Prey and Owls. Midrand (South Africa), Aug.4 – 8, 1998.
- VAN ROOYEN, C.S. 1999. An overview of the Eskom-EWT Strategic Partnership in South Africa. EPRI Workshop on Avian Interactions with Utility Structures Charleston (South Carolina), Dec. 2-3 1999.
- VAN ROOYEN, C.S. 2004. The Management of Wildlife Interactions with overhead lines. In: The fundamentals and practice of Overhead Line Maintenance (132kV and above), pp217-245. Eskom Technology, Services International, Johannesburg.
- VAN ROOYEN, C.S. 2000. An overview of Vulture Electrocutions in South Africa. Vulture News, 43: 5-22. (Vulture Study Group, Johannesburg, South Africa).
- VAN ROOYEN, C.S. 2007. Eskom-EWT Strategic Partnership: Progress Report April-September 2007. Endangered Wildlife Trust, Johannesburg.
- VAN ROOYEN, C.S. VOSLOO, H.F. & R.E. HARNESS. 2002. Eliminating bird streamers as a cause of faulting on transmission lines in South Africa. Proceedings of the IEEE 46th Rural Electric Power Conference. Colorado Springs (Colorado), May. 2002.
- VENTER JA, MARTENS FR, and WOLTER K. 2018. Recommended conservation buffer sizes derived from movement data of breeding adult Cape (Gyps coprotheres) in South Africa. Nelson Mandela University unpublished report
- VERDOORN, G.H. 1996. Mortality of Cape Griffons Gyps coprotheres and African Whitebacked Vultures Pseudogyps africanus on 88kV and 132kV powerlines in Western Transvaal, South Africa, and mitigation measures to prevent future problems. Proceedings of the 2nd International Conference on Raptors: Urbino (Italy), Oct. 2-5, 1996.
- WOLTER, K. PHIPPS, L. & NAIDOO, V. 2010. Foraging and distribution ranges of Cape Vultures (Gyps coprotheres) in the Greater Pilanesberg region. Report NR: RES/RR/09/31609. Eskom Research and Innovation Department
- WOLTER, K., GUEGNARD, A., NESER, W., BOEMANS, B., and WHITTINGTON-JONES, C. 2013. Vulture Restaurant Monitoring Protocol. VulPro.

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

Terrestrial Assessment

Acocks, J.P.H. 1988. Veld Types of South Africa. Memoirs of the Botanical Survey of South Africa, No 40. Botanical Research Institute, Department of Agricultural Technical Services, Pretoria, South Africa.

Avenant, N., Wilson, B., Power, J., Palmer, G. & Child, M.F. 2019. *Mystromys albicaudatus*. The IUCN Red List of Threatened Species 2019: e.T14262A22237378. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T14262A22237378.en>. Accessed on 03 June 2022

Bates, M. F., Branch, W. R., Bauer, A. M., Burger, M., Marais, J., Alesander, G. J., & De Villiers, M. S. 2014. Atlas and red list of the reptiles of South Africa, Lesotho and Swaziland. South African National Biodiversity Institute.

Branch, B. 1998. Field guide to snakes and other reptiles of southern Africa. Struik.

Dold, A.P. & Victor, J.E. 2005. *Bergeranthus artus* L.Bolus. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/06/04 Department of Forestry, Fisheries and Environment, 2021. Red List of Terrestrial Ecosystems of South Africa Assessment details per ecosystem type version: 20210823. SANBI, Pretoria, South Africa.

Dold, T. 2022. Curator of the Schonland Herbarium. T.dold@ru.ac.za

de Castro, A., Vlok, J.H., Newton, D., Motjotji, L. & Raimondo, D. 2012. *Pelargonium sidoides* DC. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/04/22

DEA, 2016. National Protected Area Expansion Strategy for South Africa. Department of Environmental Affairs, Pretoria, South Africa.

DEDEAT, 2003. Operational Guideline 7 – 2003. Utilization of plants, amphibians and reptiles from future development sites. Province of the Eastern Cape, Bisha, South Africa.

Department of Forestry, Fisheries and Environment, 2021. Red List of Terrestrial Ecosystems of South Africa Assessment details per ecosystem type version: 20210823. SANBI, Pretoria, South Africa.

Dyer, R.A. 1975. The Genera of Southern African Plants. Volume 1 Dicotyledons. Department of Agricultural Technical Services, Botanical Research Institute, Pretoria, South Africa

Dyer, R.A. 1976. The Genera of Southern African Plants. Volume 2 Monocotyledons. Department of Agricultural Technical Services, Botanical Research Institute, Pretoria, South Africa.

ECBCP 2019. Eastern Cape Biodiversity Conservation Plan Handbook. Department of Economic Development and Environmental Affairs (King Williams Town). Compiled by G. Hawley, P. Desmet and D. Berliner

Foden, W. & Potter, L. 2005. *Diascia cuneata* E.Mey. ex Benth. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/06/10

- FrogMap. 2021. Fitzpatrick Institute of African Ornithology. Accessed at: <http://vmus.adu.org.za/?vm=FrogMap> on 2021-12-02
- Goldblatt, P. & Anderson, F. 1986, the Moraeas of Southern Africa. National Botanical Institute, Pretoria, South Africa.
- Golding, J. (ed) 2002. Southern African Plant Red Data Lists. South African Biodiversity Network Report no 14. SABONET, Pretoria.
- Grobler, A., Vlok, J., Cowling, R., van der Merwe, S., Skowno, A.L., Dayaram, A. 2018. Technical Report: Integration of the Subtropical Thicket Ecosystem Project (STEP) vegetation types into the VEGMAP national vegetation map 2018.
- Hilton-Taylor, C. 1996. Red Data List of Southern African Plants. Strelitzia 4. National Botanical Institute, Pretoria.
- Hoare, D., Mucina, L., Rutherford, M.C., Vlok, J.H.J., Euston-Brown, D.I.W., Palmer, A.R., Powrie, L.W., Lechemere-Dertel, R.G., Procheş, Ş.M., Dold, A.P., Ward, R.A. 2006. Albany Thicket Biome. In: Mucina, L. & Rutherford, M.C. (eds). The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria. Pg. 541–567.
- Hoare, D. 2010. EIA Report. Specialist ecological study on the potential impacts of the proposed Amakhala Emoyeni Wind Energy Facility Project, Eastern Cape. Report prepared for Savannah Environmental Pty Ltd.
- iNaturalist. 2022. Accessed at <http://iNaturalist.org> on 2022-06-03
- IUCN. 2017. The IUCN Red List of Threatened Species. www.iucnredlist.org (Accessed: June 2022).
- IUCN SSC Antelope Specialist Group. 2019. Syncerus caffer. The IUCN Red List of Threatened Species 2019: e.T21251A50195031. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T21251A50195031.en>. Accessed on 03 June 2022.
- Kamundi, D.A. 2006. Dyschoriste setigera (Pers.) J.C.Manning & Goldblatt. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/06/10
- Low, A.B. & Rebelo, A.G. (eds). 1996. The Vegetation of South Africa, Lesotho and Swaziland. Department of Environmental Affairs and Tourism, Pretoria.
- MammalMap. 2022. Fitzpatrick Institute of African Ornithology. Accessed at: <http://vmus.adu.org.za/?vm=MammalMap> on 2022-06-03
- Marais, J. 2004. A complete guide to the snakes of southern Africa. Penguin Random House South Africa.
- Möller, A. & Becker, R., 2019. Field guide to the Succulent Euphorbias of Southern Africa. Briza, Pretoria, South Africa.
- Mtshali, H. 2018. Aloisampelos tenuior (Haw.) Klopper & Gideon F.Sm. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/06/10
- Mucina, L. & Rutherford, M.C. (eds) 2006 . The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria. Pg. 541–567.

Mucina, L., Hoare, D., Mucina, L., Hoare, D.B., Lotter, M.C., du Preez, J., Rutherford, M.C., Scott-Shaw, R., Bredenkamp, G., Powrie, L., Scott, L., Camp, K.G.T., Gilliers, S.S., Bezuidenhout, H., Mostert, T.H., Siebert, S.J., Winter, P.J.D., Burrows, J.E., Dobson, L., Ward, R.A., Stalmans, M., Oliver, E.G.H., Siebert, F., Schmidt, E., Kobisi, K. & Kose, L. 2006. Grassland Biome. In: Mucina, L. & Rutherford, M.C. (eds). *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria. Pg. 348 – 437.

Nkurenkuru. 2018. Ecological comments: Proposed Amendment to the Authorised Msenge Wind Energy Facility Wind
Rebela, A. 2022. HerpDistributionSA. Accessed on 2022-06-03.

ReptileMap. 2022. Fitzpatrick Institute of African Ornithology. Accessed at: <http://vmus.adu.org.za/?vm=ReptileMap> on 2022-06-03.

SANBI. 2016. Red List of South African Plants version 2017.1. Redlist.sanbi.org (Accessed: 2022-06-03).

SANBI. 2018. The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <http://bgis.sanbi.org/Projects/Detail/186>, Version 2018.

Savannah Environmental 2010. Environmental Impact Process: Draft EIA Report. Proposed Amakhala Emoyeni Wind Energy Facility, Eastern Cape Province (DEA Ref No: 12/12/20/1754). Report prepared for Wind Lab Developments South Africa Pty Ltd

Savannah Environmental 2014. Pre-commencement Ecological Footprint Investigation – Msenge Emoyeni Wind Energy Facility Near Cookhouse, Eastern Cape, Eastern Cape Province. Report prepared for Amakhala Emoyeni Renewable Energy (Pty) Ltd.

Savannah Environmental 2020b. Establishment of various supporting infrastructure within the Authorised Msenge Emoyeni Wind Energy Facility, Eastern Cape Province: Basic Assessment Report November 2020.

ScorpionMap. 2022. Fitzpatrick Institute of African Ornithology. Accessed at: <http://vmus.adu.org.za/?vm=ScorpionMap> on 2022-06-03.

Sherman Colloty & Associates, 2017. Ecological and Aquatic Impact Assessment: Izidluli Emoyeni Wind Farm, Eastern Cape Province. Report Prepared for Savannah Environmental Pty Ltd.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019a. South African National Biodiversity Assessment 2018 Technical Report Volume I: Terrestrial Realm. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6370>

Skowno, A.L., Matlala M., Slingsby J., Kirkwood D., Raimondo D.C., von Staden L., Holness S.D., Lotter M., Pence G., Daniels F., Driver A., Desmet P.G., & Dayaram, A. 2019b. Terrestrial ecosystem threat status assessment 2018 - comparison with 2011 assessment for provincial agencies. National Biodiversity Assessment 2018 Technical Report. South African National Biodiversity Institute, Pretoria.

Skowno, A.L.; Monyeke, M.S. 2021. South Africa's Red List of Terrestrial Ecosystems (RLEs). Land 2021, 10, 1048. <https://doi.org/TBC> 2020a. The Terrestrial Ecology and Desktop Soil Assessments for the Msenge Emoyeni Project. Report prepared for Savannah Environmental Pty Ltd.

TBC 2020b. The Aquatic Ecology Baseline and Impact Assessments for the Msenge Emoyeni Project, Bedford, Eastern Cape. Prepared for Savannah Environmental, October 2020.

Vlok, J.H.J., and Euston-Brown, D.I.W. 2002. The patterns within, and the ecological processes that sustain, the subtropical thicket vegetation in the planning domain of the Subtropical Thicket Ecosystem Planning (STEP) project. Terrestrial Ecology Research Unit Report No. 40, University of Port Elizabeth. Port Elizabeth, South Africa.

Vlok, J.H.J., Euston-Brown, D.I.W. & Cowling, R.M. 2003. Acocks' Valley Bushveld 50 years on: new perspectives on the delimitation, characterisation and origin of subtropical thicket vegetation. South African Journal of Botany 69 (1): 27-51.

Williams, V.L., Raimondo, D., Crouch, N.R., Brueton, V.J., Cunningham, A.B., Scott-Shaw, C.R., Lötter, M. & Ngwenya, A.M. 2016. Drimia altissima (L.f.) Ker Gawl. National Assessment: Red List of South African Plants version 2020.1. Accessed on 2022/05

Heritage Assessment

Dave Halkett, Lita Webley 28/03/2010 Heritage Scoping Assessment of a Proposed Wind Energy Facility to be situated on farms in the Cookhouse District, Eastern Cape.

Frans Prins 05/02/2011 DRAFT Technical Report in support of the EMP for the South Western Karoo Basin Gas Exploration Application Project: CULTURAL HERITAGE: EASTERN PRECINCT

Dave Halkett, Lita Webley, Jayson Orton, Hugo Pinto 17/10/2010 Heritage Impact Assessment of the proposed Amakhala-Emoyeni Wind Energy Facility, Cookhouse District, Eastern Cape

Billy De Klerk 01/09/2010 Palaeontological Impact Assessment of a proposed wind energy facility to be situated on a site south-east of Cookhouse and south of Bedford in the Eastern Cape province. The Amakhala-Emoyeni Wind Energy Facility

Johan Binneman 01/08/2013 An archaeological walkthrough survey of the turbine footprint for the proposed Phase 1 Amakhala Emoyeni Wind Energy Facility, Cookhouse District, Blue Crane Route Municipality, Eastern Cape Province

Johan Binneman 31/07/2014 A PHASE I ARCHAEOLOGICAL IMPACT ASSESSMENTS OF THE PROPOSED SUBSTATION, SWITCHING STATION AND POWER LINE GRID CONNECTION FOR THE IZIDULI EMOYENI WIND FARM, BLUE CRANE ROUTE LOCAL MUNICIPALITY, SARAH BAARTMAN DISTRICT, EASTERN CAPE

Johan Binneman 24/03/2014 An Archaeological Walk through Survey of the proposed turbine footprint and infrastructure for the Msenge Emoyeni Wind Energy Facility, Bedford District, Blue Crane Route Municipality, Eastern Cape Province

Visual Impact Assessment

DEADP, Provincial Government of the Western Cape, 2011. Guideline on Generic Terms of Reference for EAPS and Project Schedules.

Oberholzer, B. (2005). Guideline for involving visual and aesthetic specialists in EIA processes: Edition 1.

Soils and Agricultural Potential Assessment

Crop Estimates Consortium, 2019. Field crop boundary data layer (EC province), 2019. Pretoria. Department of Agriculture, Land Reform and Rural Development.

Department of Agriculture, Land Reform and Rural Development, 2018. Long-term grazing capacity for South Africa: Data layer. Government Gazette Vol. 638, No. 41870. 31 August 2018. Regulation 10 of the Conservation of Agricultural Resources Act (CARA): Act 43 of 1983. Pretoria. Government Printing Works.

Department of Agriculture, Land Reform and Rural Development, 2016. National land capability evaluation raster data: Land capability data layer, 2016. Pretoria.

Land Type Survey Staff, 1972 – 2006. Land Types of South Africa data set. ARC – Institute for Soil, Climate and Water. Pretoria.

The Soil Classification Working Group, 2018. Soil Classification – Taxonomic System for South Africa. Dept. of Agric., Pretoria.