

Basic Assessment for the proposed construction of a 132 kV Overhead Powerline between the proposed Kwagga Wind Energy Facility 1 and the proposed Kwagga Wind Energy Facility 2, near Beaufort West in the Western Cape Province

FINAL BASIC ASSESSMENT REPORT

October 2022



Prepared for:
ABO Wind Renewable
Energies (Pty) Ltd

Prepared by:
CSIR Environmental
Management Services,
PO Box 320, Stellenbosch
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BASIC ASSESSMENT PROCESS

for the

Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 1 and the proposed authorised Kwagga Wind Energy Facility 2 (i.e., Kwagga EGI Section 5), near Beaufort West in the Western Cape Province

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REPORT DETAILS



Title:	Basic Assessment for the Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 1 and the proposed authorised Kwagga Wind Energy Facility 2 (i.e., Kwagga EGI Section 5), near Beaufort West in the Western Cape Province: FINAL BASIC ASSESSMENT (BA) REPORT
Purpose of this report:	<p>The purpose of this Final BA Report is to:</p> <ul style="list-style-type: none"> • Present the details of and the need for the proposed project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the potential positive and negative impacts of the proposed project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and • Provide an Environmental Management Programme (EMPr) for the proposed project. <p>The Draft BA Report was made available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from 11 July 2022 to 11 August 2022, excluding public holidays. All comments submitted during the 30-day review have been incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, into this Final BA Report. This Final BA Report has been submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.</p>
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KEY CHANGES MADE FROM THE DRAFT BA REPORT THAT WAS ISSUED FOR I&AP, STAKEHOLDER AND ORGAN OF STATE REVIEW FROM 11 JULY 2022 TO 11 AUGUST 2022

Section of Report	Key Change
BA Report and Appendices	<ul style="list-style-type: none"> The term “BA Report” has been updated to “Final BA Report”, where applicable. The report date has been updated from “July 2022” to “October 2022”.
Executive Summary	<ul style="list-style-type: none"> The DFFE reference number for the proposed authorised Eskom 132 kV Switching Substation was updated to reflect the Amendment Process it is currently subjected to. Project titles for the proposed Kwagga EGI Sections 2-4 have been updated to reflect the proposed re-alignment of the powerline route now connecting to the proposed authorised Beaufort West 132 kV-400 kV Linking Station instead of the proposed authorised Eskom 132 kV Switching Substation¹. Table 2 was updated with the centroid coordinates of the proposed authorized substations relevant to this BA Process, in a degrees, minutes and seconds format. Table 2 was updated with a description of the external site access and the coordinates (start, middle and end) of the proposed external access road, in a degrees, minutes and seconds format as requested by the DFFE 30-day public comment period.
BA Report – Section A	<ul style="list-style-type: none"> The DFFE reference number for the proposed authorised Eskom 132 kV Switching Substation was updated to reflect the Amendment Process it is currently subjected to. Project titles for the proposed Kwagga EGI Sections 2-4 have been updated to reflect the proposed re-alignment of the powerline route now connecting to the proposed authorised Beaufort West 132 kV-400 kV Linking Station instead of the proposed authorised Eskom 132 kV Switching Substation¹. Updated Section A.11 with additional information regarding the applicability of listed activities included in the Draft BA Report. An amended application form has been submitted to the DFFE. Updated the map legend of Figure A.1 and A.2 to reflect updates regarding the Environmental Authorization received for the proposed authorized Eskom 132 kV Switching Substation. Updated Table A.1 to reflect the revised project titles for the BA Processes being undertaken for the proposed Kwagga EGI Sections 2-4¹. Figure A.1 was updated to reflect the proposed site access roads. Table A.4 which describes the start, middle and end points of the access road for the proposed 132 kV overhead transmission powerline route, was added in Section A.6.

¹ Following receipt of comments from Mainstream Renewable Power South Africa during the 30-day public comment period on the Draft Basic Assessment Reports for the proposed Kwagga EGI Section 2 (DFFE Ref: 14/12/16/3/3/1/2579), Kwagga EGI Section 3 (DFFE Ref: 14/12/16/3/3/1/2580) and Kwagga EGI Section 4 (DFFE Ref: 14/12/16/3/3/1/2581), the Project Applicant was requested to re-align the proposed powerline route within the already assessed corridor i.e., to connect the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects directly to the authorised Beaufort West 132 kV-400 kV Linking Station (“MTS”) (DFFE Ref: 14-12-16-3-3-2-925-1). Following from liaison with DFFE on 4 October 2022 regarding these changes, written notification was submitted in terms of Regulation 19(1)(b) of the 2014 NEMA EIA Regulations (as amended) that these revised Draft BA Reports, inclusive of specialist reports and the EMPr will be subjected to another public participation process of 30 days after which the Final BA Reports will be submitted to DFFE for decision-making within 140 days of receipt of the application by the DFFE.

Section of Report	Key Change
	<ul style="list-style-type: none"> Table A.5 in Section A.7 was updated with the centroid coordinates of the proposed authorized substations relevant to this BA Process, in a degrees, minutes and seconds format. Table A.5 in Section A.7 was updated with a description of the external site access and the coordinates (start, middle and end) of the proposed external access road, in a degrees, minutes and seconds format as requested by the DFFE 30-day public comment period. Table A. 6 in Section A.11 was updated based on comments received from the DFFE during the 30-day public comment period.
BA Report – Section C	<ul style="list-style-type: none"> Updated with additional information regarding the status and progress made on the BA Report, the submission of the Application for Environmental Authorisation to the DFFE, as well as DFFE’s acknowledgment of receipt of the BA Report, and the assignment of reference numbers for the BA projects. Updated with details of the Public Participation Process undertaken thus far. Updated with a description of feedback received from the Heritage Western Cape (HWC).
BA Report – Section D	<ul style="list-style-type: none"> Updated Section D.1 will additional information on the process flow for the assessment of cumulative impacts.
Comments and Responses Report	<ul style="list-style-type: none"> The comments and/or issues raised by stakeholders and Interested and Affected Parties (I&APs) following the release of the Draft BA Report for the 30-day public comment period, extending from 11 July 2022 to 11 August 2022 (excluding public holidays), together with the responses from the Basic Assessment (BA) project team were collated into a Comments and Responses Report (CRR) that was compiled in terms of Annexure 1 of the DFFE comments letter (DFFE Reference No: 14-12-16-3-3-1-2582), and which was submitted separately from the main Final BA Report as per the requirements from the DFFE. Note that comments received from I&APs after the closure date of the public comment period have been considered and included in the CRR.
Appendix C	<ul style="list-style-type: none"> Updated Figure C.1 to reflect the proposed site access roads and updates regarding the Environmental Authorization received for the proposed authorized Eskom 132 kV Switching Substation.
Appendix E	<ul style="list-style-type: none"> Separated Appendix E. 1 - “Copies and Proof of placement of Site Notice Board” into Appendix E.1 – “Copy of site notice Board – Afrikaans”; Appendix E.2 – “Copy of site notice Board – English”, and Appendix E.3 – “Proof of placement of site notice boards”. Updated with proof of placement of the newspaper advertisements for the release of the Draft BA Reports for comment (Appendix E.4). Updated/added Appendix E.5 (Stakeholder database). Updated the database of I&APs, Stakeholders and Organs of State to reflect stages of consultation, commenting, as well as additions to the database. The approach followed for this I&AP database was guided by sections 3(3), 9, 12(1) and (2), 11 as well as 18 of the Protection of Personal Information Act, 2013 (Act No. 14 of 2013) (POPIA). Erring on the side of caution as recommended by the DFFE, the names and affiliations of non-governmental I&APs are represented by an ‘XXX’ in the I&AP database (Appendix E.5).

Section of Report	Key Change
	<ul style="list-style-type: none"> • Added Appendix E. 8 (Proof of submission of the integrated heritage impact assessment (HIA) to Heritage Western Cape (HWC) and local authorities for a 30-day consultation period) • Added proof of submission of the integrated Heritage Impact Assessment (HIA) to Heritage Western Cape (HWC) and local authorities for a 30-day consultation period (Appendix E.8) • Added the copies and proof of correspondence sent to stakeholders for the release of the draft basic assessment report for comment (Appendix E.9) • Added copies of the correspondence received from stakeholders and proof thereof during the 30-day public comment period of the draft basic assessment report (Appendix E.10) • Added copies of the correspondence received from HWC and local authorities on the HIA following the 30-day consultation period (Appendix E.11)
Appendix G	<ul style="list-style-type: none"> • Updated the Environmental Management Programme (EMPr) for the powerline based on comments received from I&APs and Organs of State, following the 30-day public comment period on the Draft BA Report, with additional mitigation measures and management actions as recommended by these authorities and stakeholders. • Table 2 in Section 1.2 was updated with the centroid coordinates of the proposed authorized substations relevant to this BA Process, in a degrees, minutes and seconds format. • Table 2 in Section 1.2 was updated with a description of the external site access and the coordinates (start, middle and end) of the proposed external access road, in a degrees, minutes and seconds format as requested by the DFFE 30-day public comment period. • Updated Figure 1 and Figure 3 to reflect the proposed site access roads and updates regarding the Environmental Authorization received for the proposed authorized Eskom 132 kV Switching Substation.

Note from the CSIR: If sections are not mentioned in the above table, this means that either there have been no changes or no major changes to these sections.

EXECUTIVE SUMMARY



INTRODUCTION AND PROJECT BACKGROUND

The National DFFE has granted Environmental Authorisation (EA) for the proposed Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects on 7 April 2022 i.e. one for each WEF and its associated infrastructure. The Scoping and EIA (S&EIA) processes that were undertaken for the abovementioned three WEFs extended from May 2021 to April 2022. The three Kwagga WEFs and its supporting electrical grid infrastructure is situated approximately 60 km south of Beaufort West in the Western Cape Province.

In order to facilitate the connection of the proposed authorised Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3 projects to the national electrical grid network, the Project Applicant, ABO Wind renewable energies (Pty) Ltd (“ABO Wind”) is proposing the construction of seven 132 kV overhead transmission powerlines and its associated electrical grid infrastructure between the proposed authorised Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1) and the aforementioned WEFs, via the proposed authorised Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1). It is anticipated that the electricity generated by the proposed authorised Kwagga WEFs will be evacuated via these proposed 132 kV overhead transmission powerlines into the existing Droërivier–Proteus 400 kV overhead transmission powerline that runs parallel to the N12 in a north-south direction.

It is understood that the proposed authorised Eskom 132 kV Switching Substation and the proposed authorised Beaufort West 132 kV-400 kV Linking Station will be constructed by South Africa Mainstream Renewable Power Developments (Pty) Ltd (“Mainstream”) in support of their proposed authorised Beaufort West WEF and Trakas WEF that are to be located on land directly adjacent to the proposed authorised Kwagga WEFs 1-3 (refer to Figure A below).

The Project Applicant has signed a servitude agreement and relevant powers of attorney with the landowner of the relevant Beaufort West and Trakas WEFs affected land portions and obtained agreement with Mainstream to facilitate the connection of the proposed authorised Kwagga WEFs 1-3 via 132 kV overhead transmission powerlines, via the aforementioned Eskom 132 kV Switching Substation and the Beaufort West 132 kV-400 kV Linking Station, to the existing Droërivier–Proteus 400 kV overhead transmission powerline that is located westwardly of the N12.

Important to note is that both the Beaufort West WEF (DFFE Ref: 12-12-20-1784-1-AM2; 12-12-20-1784-1-AM3) and the Trakas WEF (DFFE Ref: 12-12-20-1784-2-AM2; 12-12-20-1784-2-AM3), and their supporting powerline and substation infrastructure [Beaufort West 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-1) and Trakas 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-2)], collectively referred to as “the Beaufort West Cluster”, have all received EA and were successful bidders in Round 5 of the Renewable Energy Independent Power Producer Programme (REIPPPP).

The electrical grid infrastructure (EGI) component i.e. the application for these proposed 132 kV overhead transmission powerlines required for the three proposed authorised Kwagga WEF projects

did not form part of the S&EIA processes that were undertaken for each of the three WEFs during 2021. Therefore, in order to facilitate the connection of the Kwagga WEFs 1-3 to the Droërivier–Proteus 400 kV, the following **seven** 132 kV overhead transmission powerlines and associated infrastructure, located near Beaufort West in the Western Cape, are being proposed and assessed (Also referred to as **Section 1 to 7** of the proposed Kwagga EGI Corridor):

- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the proposed authorised Eskom 132 kV Switching Station (i.e., **Kwagga EGI Section 1**) – this powerline facilitates connection of Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 1 (i.e., **Kwagga EGI Section 2**) – this powerline facilitates connection of Kwagga WEF 1, as well as Kwagga WEF 2 and Kwagga WEF 3 (where Kwagga WEF 1 on-site substation is used as collector)²;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 2 (i.e., **Kwagga EGI Section 3**) – this powerline facilitates connection of Kwagga WEF 2, as well as Kwagga WEF 3 (where Kwagga WEF 2 on-site substation is used as a collector)²;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 3 (i.e., **Kwagga EGI Section 4**) – this powerline facilitates connection of Kwagga WEF 3²;
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 1 and Kwagga WEF 2 (i.e., **Kwagga EGI Section 5**) – this powerline facilitates connection of Kwagga WEF 2;
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 1 and Kwagga WEF 3 (i.e., **Kwagga EGI Section 6**) – this powerline facilitates connection Kwagga WEF 3; and
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 2 and Kwagga WEF 3 (i.e., **Kwagga EGI Section 7**) – this powerline facilitates connection Kwagga WEF 3.

It is proposed that each of the three Kwagga WEFs will have a dedicated 132 kV powerline that will connect each WEF to the Droërivier–Proteus 400 kV powerline via the authorised Eskom Switching Substation and the authorised Beaufort West 132 kV-400 kV Linking Station. Overhead powerlines between each of the Kwagga WEFs have also been proposed. This will ensure that each WEF is a viable stand-alone project. The above approach also ensures that any two of the three proposed Kwagga WEFs can connect to the Droërivier–Proteus 400 kV powerline, as this approach accommodates for the potential scenario in the event that only one or two of the three proposed Kwagga WEFs receive preferred bidder status in terms of the REIPPPP and therefore will materialise from a construction perspective. This approach is based on the worst-case scenario (i.e., assessment of seven

² Following receipt of comments from Mainstream Renewable Power South Africa during the 30-day public comment period on the Draft Basic Assessment Reports for the proposed Kwagga EGI Section 2 (DFFE Ref: 14/12/16/3/3/1/2579, Kwagga EGI Section 3 (DFFE Ref: 14/12/16/3/3/1/2580) and Kwagga EGI Section 4 (DFFE Ref: 14/12/16/3/3/1/2581), the Project Applicant was requested to re-align the proposed powerline route within the already assessed corridor i.e., to connect the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects directly to the authorised Beaufort West 132 kV-400 kV Linking Station (“MTS”) (DFFE Ref: 14-12-16-3-3-2-925-1). Following from liaison with DFFE on 4 October 2022 regarding these changes, written notification was submitted in terms of Regulation 19(1)(b) of the 2014 NEMA EIA Regulations (as amended) that these revised Draft BA Reports, inclusive of specialist reports and the EMPr will be subjected to another public participation process of 30 days after which the Final BA Reports will be submitted to DFFE for decision-making within 140 days of receipt of the application by the DFFE.

separate 132 kV overhead transmission powerlines). It has also been structured accordingly to meet the requirements of the REIPPPP which requires issuing of seven separate EAs for these proposed powerline projects.

An integrated Public Participation Process is being undertaken for the proposed projects.

The Draft BA Reports were released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period, extending from **11 July 2022 to 11 August 2022**, excluding public holidays. All comments submitted during the 30-day review have been incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and appended to this Final BA Report. This Final BA Report has been submitted to the DFFE, in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20.

PROJECT LOCATION

The seven proposed Kwagga 132 kV overhead transmission powerlines projects (i.e., Kwagga EGI Sections 1 to 7) will be located approximately 60 km south of the Beaufort West town in the Western Cape Province. The entire powerline corridor traverses both the Prince Albert Local Municipality and the Beaufort West Local Municipality, with the exception of the Kwagga EGI Section 1, which is only located in the Prince Albert Local Municipality. The locality of the Kwagga EGI corridor and the proposed 132 kV powerline projects is depicted in Figure A below.

The 132 kV overhead transmission powerline project that is the subject of this BA Report, is represented by the section of the Kwagga EGI Corridor indicated between Point C and Point D in Figure A below. For purposes of this BA process, this proposed powerline project is referred to as **Section 5 of the Kwagga EGI Corridor**.

The farm portions that will be affected by this proposed powerline project are:

- Remainder of the Farm Dwaalfontein No. 379 (Surveyor General 21 Digit Code: C0090000000037900000);
- Portion 3 of the Farm Tyger Poort No. 376 (Surveyor General 21 Digit Code: C0090000000037600003); and
- Remainder of the Farm Wolve Kraal No. 17 (Surveyor General 21 Digit Code: C0610000000001700000).

FINAL BASIC ASSESSMENT REPORT: Basic Assessment for the Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 1 and the proposed authorised Kwagga Wind Energy Facility 2 (i.e., **Kwagga EGI Section 5**), near Beaufort West in the Western Cape Province

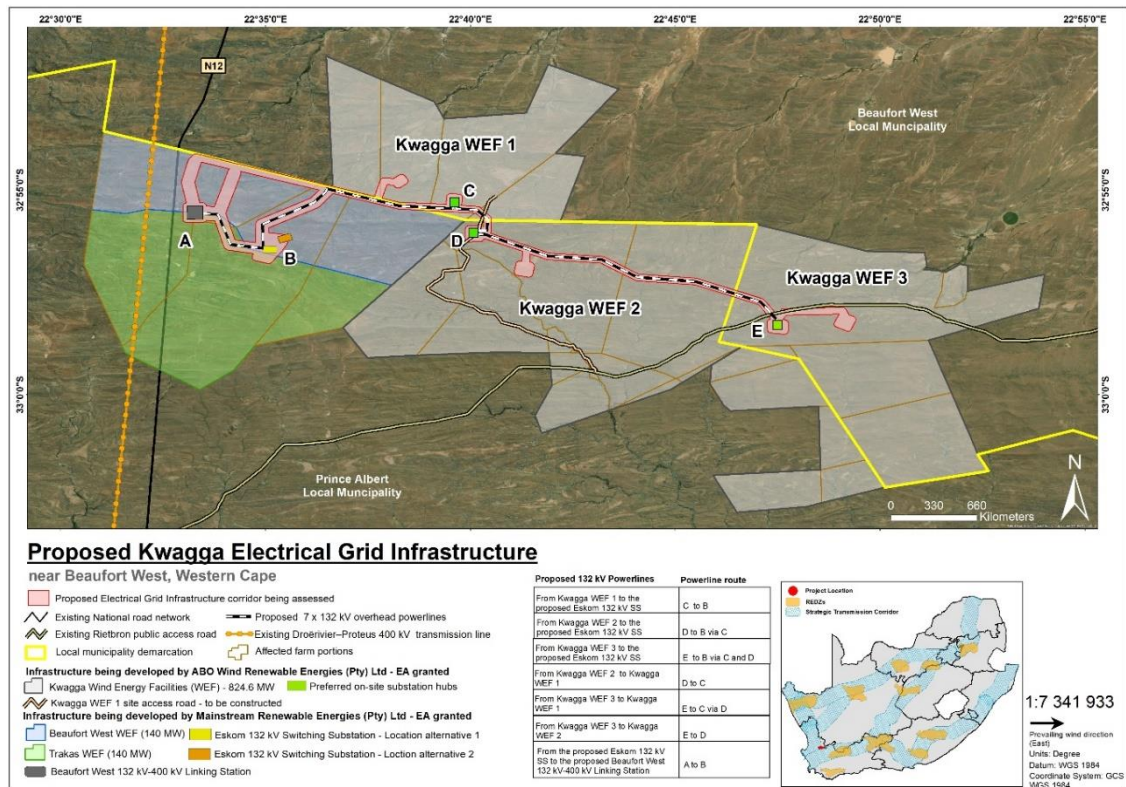


Figure A. Locality of the Kwagga EGI Corridor comprising the seven proposed 132 kV overhead transmission powerline projects (i.e., Kwagga EGI Section 1 – 7)

PROJECT BASIC ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required BA Processes in order to determine the biophysical, social and economic impacts associated with undertaking the proposed development. The project team, including the relevant specialists, is indicated in Table A below.

Table A. Project Team for the Kwagga Powerline BA Processes

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	EAP and Project Leader
Rohaida Abed (<i>Pr.Sci.Nat.</i>)	CSIR	Project Review
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Project Manager
Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Project Officer
Specialists		
Johann Lanz (<i>Pr.Sci.Nat.</i>)	Private	Agricultural Compliance Statement
Menno Klapwijk	Bapela Cave Klapwijk cc	Visual Impact Assessment
Dr Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology)
Dr. John Almond	Natura Viva cc	

Name	Organisation	Role/ Specialist Study
Dr Noel van Rooyen (<i>Pr.Sci.Nat.</i>) and Prof Gretel van Rooyen (<i>Pr.Sci.Nat.</i>)	Ekotrust cc	Terrestrial Biodiversity and Species Impact Assessment
Antonia Belcher (<i>Pr.Sci.Nat.</i>)	Private	Aquatic Biodiversity Impact Assessment
Chris van Rooyen and Albert Froneman (<i>Pr.Sci.Nat.</i>)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Lizande Kellerman (<i>Pr.Sci.Nat.</i>) and Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman (<i>Pr.Sci.Nat.</i>) and Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Defence Site Sensitivity Verification

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EAs, should they be granted for the proposed projects). As noted above, seven separate BA Reports have been compiled for the seven proposed 132 kV overhead transmission powerlines that are required to facilitate the connection of the three proposed authorised Kwagga WEFs to the national electrical grid network, via the aforementioned Eskom 132 kV Switching Substation and the Beaufort West 132 kV-400 kV Linking Station, to the existing Droërivier–Proteus 400 kV overhead transmission powerline that is located westwardly of the N12.

This BA Report only addresses the 132 kV overhead transmission powerline and associated EGI between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 2 (i.e., **Kwagga EGI Section 5**) – this powerline facilitates connection of Kwagga WEF 2 (Figure B).

The proposed powerline project will make use electricity transmission and distribution technology generated from wind energy and transmit it to the National Grid. Once the proposed authorised Kwagga WEF projects are awarded a Power Purchase Agreement (PPA), the proposed powerline project will transmit electricity for a minimum period of 20 years. The construction phase for the proposed project is expected to extend 12 to 18 months. A description of the key components relevant to this proposed powerline project is provided in Table B below.

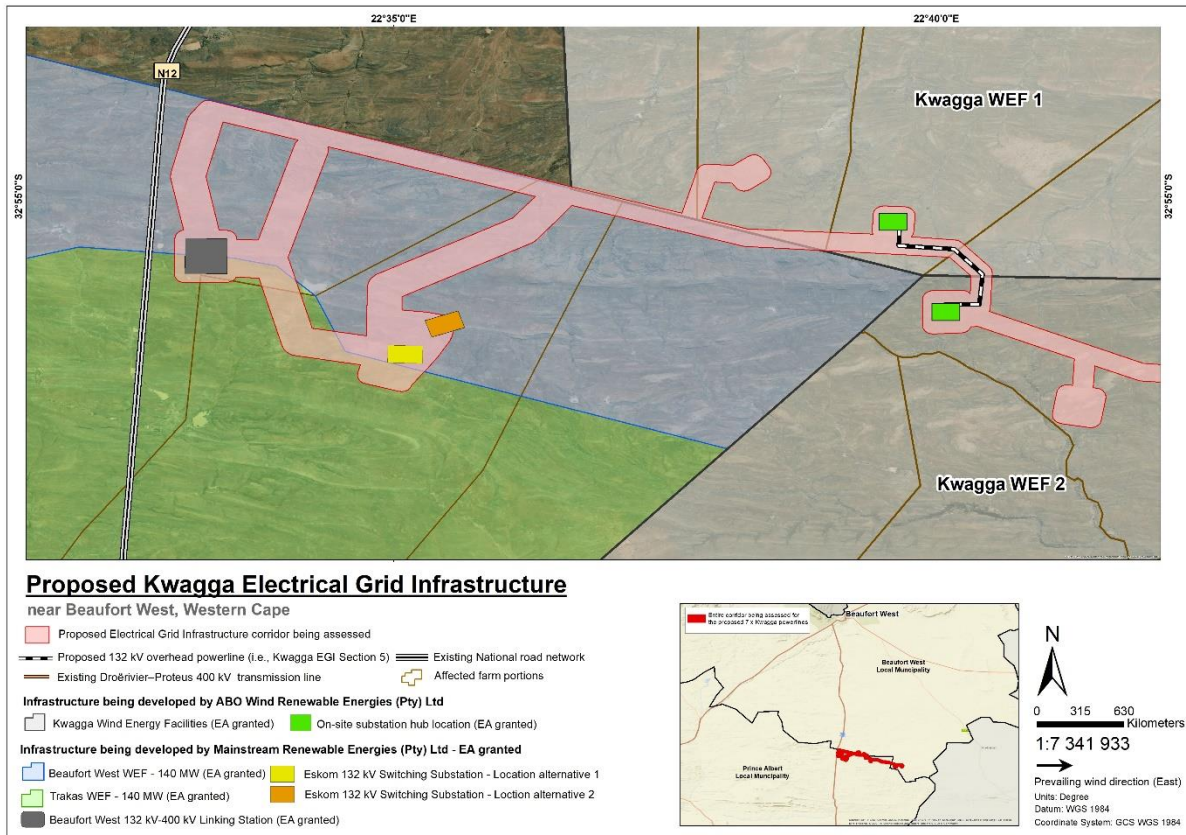


Figure B. Locality map showing the proposed 132 kV overhead powerline in relation to the Kwagga EGI Corridor (i.e., Kwagga EGI Section 5 that is the subject of this BA Report), which extends between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 2

Table B. Project Components for the proposed 132 kV Overhead Powerline

Component	Description
Line/pylon height	Up to 30 m
Line capacity	Up to 132 kV
Pylon type	Self-supporting suspension structures or guyed monopoles. Insulators will be used to connect the conductors to the towers
Servitude length	3 km
Servitude width	<p>The registered servitude will be up to 50 m wide, or where multiple adjacent powerlines occur, in line with guideline and requirements for 132 kV powerlines stipulated in the 2011 Eskom Distribution Guide Part 19.</p> <p><u>Note</u> that the entire servitude will <u>not</u> be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications.</p> <p>Specialists were required to assess an approximately 300 m wide corridor for the portion of the proposed powerline route that traverses the proposed authorised Kwagga WEFs 1-3 project sites, and an approximately 500 m wide corridor for the proposed powerline route that traverses the neighbouring Mainstream Beaufort West and Trakas WEF project sites.</p>
Associated Infrastructure	
Associated electrical infrastructure including but not limited to feeder bays, busbars, new transformer bays (up to 500 MVA) and possible extension to the existing footprint at the proposed	<p>The following substations are relevant to this BA project:</p> <ul style="list-style-type: none"> ○ Proposed authorised Kwagga WEF 1 On-site Substation Hub (Footprint: approximately 5.21 ha); <ul style="list-style-type: none"> ○ Centroid: 32° 55' 14.588" S (Latitude); 22° 39' 36.310" E (Longitude)

Component	Description
authorised Eskom 132 kV Switching Substation.	<ul style="list-style-type: none"> ○ Proposed authorised Kwagga WEF 2 On-site Substation Hub (Footprint: approximately 18.5 ha); <ul style="list-style-type: none"> ○ Centroid: 32° 56' 3.926" S (Latitude); 22° 40' 6.0708" E (Longitude)
Service roads	There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 5 m located around and within the proposed Kwagga powerline corridor. It is anticipated that a service road of approximately 4 m wide (usually only jeep tracks) will be required below the powerline.
External Access Road	<p>The proposed powerline corridor can be accessed via the N12 main road, which is situated to the west of the Kwagga Wind Energy Facility (WEF) 1 site, as well as from the R308 Rietbron bound public access gravel road that is located to the south of the Kwagga WEF 1 site. The R308 Rietbron bound public access road is a well-maintained gravel road that will be widened where necessary, for purposes of constructing the WEFs. A new access road will be constructed to facilitate the connection between the Kwagga WEF 1 project site and the existing R308 Rietbron bound public access gravel road located to the south. Note that this proposed new access road as well as the potential widening/upgrade of the existing R308 gravel road were assessed as part of the S&EIA processes undertaken for the Kwagga WEFs, which received EA on 7 April 2022, and therefore does not form part of this BA process. The coordinates for the abovementioned proposed authorised external access road that will be constructed are as follows:</p> <ul style="list-style-type: none"> • Start: 32° 59' 26.8008" S (Latitude); 22° 43' 3.4248" E (Longitude) • Middle: 32° 57' 39.7296" S (Latitude); 22° 39' 21.9276" E (Longitude) • End: 32° 55' 8.184" S (Latitude); 22° 40' 37.218" E (Longitude)
Proximity to grid connection	As mentioned in Section A.1 above, this proposed 132 kV overhead powerline will facilitate the connection of the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 to the existing Droërivier–Proteus 400 kV overhead transmission powerline, via the proposed authorised Eskom 132 kV Switching Station and the proposed authorised Beaufort West 132 kV-400 kV Linking Station. The proposed 132 kV powerline is located approximately 11 km east of the existing Droërivier–Proteus 400 kV overhead transmission powerline.

NEED FOR THE BA

As noted above, in terms of the 2014 NEMA EIA Regulations published in GN R326, R327, R325 and R324, a BA process is required for the proposed powerline project. The need for the BA is triggered by, amongst others, the inclusion of Activity 11 listed in GN R327 (Listing Notice 1):

- *“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”.*

Section A of this Final BA Report contains the detailed list of activities contained in GN R327 and R324 which are triggered by the various project components and thus form part of this BA Process.

The purpose of the BA is to identify, assess and report on any potential impacts relating to the proposed project, if implemented, may have on the receiving environment. The BA therefore needs to show the Competent Authority, the DFFE; and the Project Applicant, ABO Wind renewable energies (Pty) Ltd, what the consequences of their choices will be in terms of impacts on the biophysical and socio-

economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

IMPACT ASSESSMENT

As indicated in Table A above, a total of seven specialist studies were undertaken as part of the BA Process. Two site sensitivity verification assessments were also undertaken for Civil Aviation and Defence.

The full specialist studies are provided in Appendix D of this Final BA Report. Section B of this report provides a summary of the affected environment associated with these studies; and Section D provides a summary of the impact assessments conducted by the specialists.

A summary of the specialist studies is outlined below.

Agriculture

The Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statement is included in Appendix D.1 of the BA Report.

The proposed electrical grid infrastructure has insignificant agricultural impact for two reasons:

- There is no loss of future agricultural production potential under transmission powerlines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission powerlines. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, including a service track below the lines, is insignificantly small within an agricultural environment of large farms with low density grazing.
- The affected land across the entire corridor has very limited agricultural production potential, anyway.

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to these proposed powerline projects, and other associated infrastructure:

- Minimal disturbance to agricultural land use activities - This impact is relevant mainly in the construction and decommissioning phases. No further disturbance of agricultural land use occurs in the operational phase.
- Soil degradation - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. There are a number of renewable energy developments that are leading to loss of agricultural grazing land in the area. However, because this overhead powerline itself leads to insignificant agricultural land loss, its cumulative impact must also logically be insignificant. It therefore does not make sense to conduct a more formal assessment of the development's cumulative impacts as per DFFE requirements for

cumulative impacts. Much more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change in terms of loss of production potential are exceeded. In reality, the landscape in this environment could be covered with powerlines and agricultural production potential would not be affected.

Due to the considerations discussed above, the cumulative impact of loss of future agricultural production potential can confidently be assessed as not having an unacceptable negative impact on the area. In terms of cumulative impact, the proposed development is therefore acceptable, and it is therefore recommended that it be approved.

Therefore, from an agricultural impact point of view, it is recommended that the proposed powerline development be approved.

Visual Impact Assessment

The Visual Impact Assessment was undertaken by Menno Klapwijk to inform the outcome of this BA from a visual perspective. The complete Visual Impact Assessment is included in Appendix D.2 of this BA Report.

The potential visual impacts resulting from the proposed powerline projects on landscape features and receptors are listed below for each of the project phases, including cumulative impacts. The potential visual impacts would be identical for each of the seven proposed powerlines. The impacts identified are direct and cumulative impacts. No indirect impacts have been identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Low risk (Level 4)	Low risk (Level 4)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Moderate risk (Level 3)	Moderate risk (Level 3)
<i>DIRECT IMPACTS - DECOMMISSIONING PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Low risk (Level 4)	Very low risk (Level 5)
<i>CUMULATIVE IMPACTS - CONSTRUCTION PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Moderate risk (Level 3)	Low risk (Level 4)
<i>CUMULATIVE IMPACTS - OPERATIONAL PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Moderate risk (Level 3)	Moderate risk (Level 3)
<i>CUMULATIVE IMPACTS - DECOMMISSIONING PHASE</i>		
<ul style="list-style-type: none"> Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors 	Low risk (Level 4)	Very low risk (Level 5)

Overall, the Visual Impact Assessment concluded that there are no fatal flaws from a visual perspective arising from the proposed project, and it is therefore recommended that the proposed powerline project should receive authorisation, provided the mitigation measures are implemented as a condition of approval.

Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by Dr Jayson Orton to inform the outcome of this BA from an archaeology and cultural landscape perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete Heritage Impact Assessment is included in Appendix D.3 of this BA Report.

The potential impacts identified in the Heritage Impact Assessment include direct and cumulative impacts during the construction, operational and decommissioning phases. No indirect impacts are anticipated. The impacts identified are listed below.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
• Impact 1: Potential damage or destruction of archaeological materials/sites	Low risk (Level 4)	Very low risk (Level 5)
• Impact 2: Potential damage or destruction of graves	Low risk (Level 4)	Very low risk (Level 5)
• Impact 3: Intrusion of powerlines and electrical equipment into the cultural landscape	Very low risk (Level 5)	Very low risk (Level 5)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
• Impact 4: Intrusion of powerlines and electrical equipment into the cultural landscape	Very low risk (Level 5)	Very low risk (Level 5)
<i>DIRECT IMPACTS - DECOMMISSIONING PHASE</i>		
• Impact 5: Intrusion of powerlines and electrical equipment into the cultural landscape	Very low risk (Level 5)	Very low risk (Level 5)
<i>CUMULATIVE IMPACTS – CONSTRUCTION; OPERATIONAL AND DECOMMISSIONING PHASES</i>		
• Impact 6: Potential damage or destruction of archaeological materials/sites, buildings and graves	Low risk (Level 4)	Very low risk (Level 5)
• Impact 7: Intrusion of powerlines and electrical equipment into the cultural landscape	Moderate (Level 3)	Moderate (Level 3)

The Heritage Impact Assessment concluded that there are no significant concerns for this project and, based on current information, there are no areas located within the assessed powerline corridor that require protection. Because no significant impacts to culturally significant heritage resources are anticipated and impacts of low significance can be easily managed or mitigated, it is recommended that the proposed powerline project be authorised in full.

Heritage Impact Assessment (Palaeontology)

The Palaeontology Impact Assessment was undertaken by Dr John Almond to inform the outcome of this BA from a palaeontological perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Palaeontology. The complete Heritage Impact Assessment is included in Appendix D.3 of this BA Report.

The potential impacts identified during the Palaeontology Impact Assessment are the same for all seven proposed powerline projects. The key impacts on local palaeontological heritage resources identified are direct and relate to the potential disturbance, damage, destruction or sealing-in of scientifically-important and legally-protected fossils preserved at or beneath the surface of the ground due to

construction phase excavations, and ground clearance. The impacts identified only apply to the construction phase of the proposed developments since further significant impacts on fossil heritage during the planning, operational and decommissioning phases of the powerlines are not anticipated. Cumulative impacts are also identified, as indicated below.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
• Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	Low risk (Level 4)	Very low risk (Level 5)
<i>CUMULATIVE IMPACTS - CONSTRUCTION PHASE</i>		
• Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	Moderate risk (Level 3)	Low risk (Level 4)

As a consequence of (1) the paucity of irreplaceable, unique or rare fossil remains within the development footprint, as well as (2) the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks within the proposed powerline corridor, the overall impact significance of the construction phase of the proposed powerlines regarding legally-protected palaeontological heritage resources is assessed as very low (negative status) with mitigation, and low (negative status) without mitigation. Confidence levels for this assessment are medium, given the generally low exposure levels of potentially-fossiliferous bedrocks.

In terms of cumulative impacts, it is concluded that as far as fossil heritage resources are concerned, the proposed powerline projects, whether considered individually or together, will not result in an unacceptable loss or unacceptable additional impacts, considering all the renewable energy projects and its associated electrical grid infrastructure proposed in the area. This analysis only applies provided that all the proposed monitoring and mitigation recommendations made for all these various projects are consistently and fully implemented.

Therefore, there are no identified fatal flaws and no objections on palaeontological heritage grounds to authorisation of the proposed powerline projects.

Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity and Species Assessment was undertaken by Dr Noel van Rooyen and Prof Gretel van Rooyen to inform the outcome of this BA from a terrestrial biodiversity and species perspective. The complete Terrestrial Biodiversity and Species Assessment is included in Appendix D.4 of this BA Report.

The potential impacts identified as part of the Terrestrial Biodiversity and Species Assessment are the same for all seven proposed powerline projects. A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. These impacts are noted below.

Construction Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 1: The clearing of natural vegetation	Low risk (Level 4)	Low risk (Level 4)
• Impact 2: The loss of threatened, protected & endemic plant and animal species	Low risk (Level 4)	Low risk (Level 4)
• Impact 3: Loss of faunal habitat	Low risk (Level 4)	Very Low risk (Level 5)

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 4: Direct faunal mortalities	Low risk (Level 4)	Very Low risk (Level 5)
• Impact 5: Increased dust deposition	Low risk (Level 4)	Very Low risk (Level 5)
• Impact 6: Increased human activity and noise levels	Moderate risk (Level 3)	Very Low risk (Level 5)

Operational Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 7: Direct faunal mortalities	Very Low risk (Level 5)	Very Low risk (Level 5)

Decommissioning Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 8: Direct faunal mortalities	Low risk (Level 4)	Very Low risk (Level 5)
• Impact 9: Increased dust deposition	Low risk (Level 4)	Very Low risk (Level 5)

Construction Phase - Indirect Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 10: Establishment of alien vegetation	Low risk (Level 4)	Very Low risk (Level 5)
• Impact 11: Increased erosion and water run-off	Low risk (Level 4)	Very Low risk (Level 5)

Operational Phase - Indirect Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 12: Establishment of alien vegetation	Low risk (Level 4)	Very Low risk (Level 5)
• Impact 13: Increased erosion and water run-off	Low risk (Level 4)	Very Low risk (Level 5)

Construction and Operational Phases – Cumulative Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 14: Loss of vegetation, habitat and threatened species	Moderate risk (Level 3)	Low risk (Level 4)
• Impact 15: Compromising integrity of CBA, ESA and NPAES	Moderate risk (Level 3)	Low risk (Level 4)
• Impact 16: Reduced ability to meet conservation obligations & targets	Moderate risk (Level 3)	Low risk (Level 4)
• Impact 17: Loss of landscape connectivity and disruption of broad-scale ecological processes	Low risk (Level 4)	Low risk (Level 4)

The overall impact significance (with the implementation of mitigation measures) associated with the proposed powerline project was rated as low to very low during the construction, operational and decommissioning phases for direct impacts. The same trend applies to the cumulative and indirect impacts.

Given the low impact significance and low sensitivity rating for many of the habitats means the project could go ahead without major constraints, provided the mitigation measures and management actions proposed to conserve protected fauna and flora on the site are taken into consideration. The specialists thus recommend authorisation of the project provided all mitigation measures are implemented.

Aquatic Biodiversity Impact Assessment

The Aquatic Biodiversity Impact Assessment was undertaken by Antonia Belcher to inform the outcome of this BA from an aquatic biodiversity perspective. The complete Aquatic Biodiversity Assessment is included in Appendix D.5 of this BA Report.

The potential impacts identified as part of the Aquatic Biodiversity Impact Assessment are the same for all seven proposed powerline projects. A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. These impacts are noted below.

Construction Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 1: Disturbance of aquatic habitats within the watercourses with the associated impact to sensitive aquatic biota	Very Low (Level 5)	Very Low (Level 5)
• Impact 2: Increased sedimentation and risks of contamination of surface water runoff during construction	Very Low (Level 5)	Very Low (Level 5)
• Impact 3: Demand for water for construction could place stress on the existing available water resources	Very Low (Level 5)	Very Low (Level 5)

Operational Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 4: Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained	Very Low (Level 5)	Very Low (Level 5)
• Impact 5: Disturbance of cover vegetation and soil and modified runoff characteristics that have the potential to result in erosion of hillslopes and watercourses and invasion of disturbed areas with alien vegetation	Very Low (Level 5)	Very Low (Level 5)

Decommissioning Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 6: Increased disturbance of aquatic habitat due to the increased activity on the site	Very Low (Level 5)	Very Low (Level 5)
• Impact 7: Increased sedimentation and risks of contamination of surface water runoff	Very Low (Level 5)	Very Low (Level 5)

Construction, Operational and Decommissioning Phases – Cumulative Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 8: Increased disturbance of aquatic habitat due to the increased activity in the wider area	Very Low (Level 5)	Very Low (Level 5)
• Impact 9: Degradation of ecological condition of aquatic ecosystems	Very Low (Level 5)	Very Low (Level 5)
• Impact 10: Increased disturbance of aquatic habitat due to the increased activity in the wider area	Very Low (Level 5)	Very Low (Level 5)

The Aquatic Biodiversity Impact Assessment has concluded that there is no reason from a freshwater perspective, why the proposed activity (with the implementation of the above-mentioned mitigation measures) should not be authorized. The proposed powerline is located in high-lying areas where limited aquatic features occur. It is also possible to span the watercourses where the proposed powerline needs to cross them.

Therefore, the potential aquatic ecosystem impacts of the proposed powerline are thus likely to be Very Low in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer area.

Avifauna Assessment

The Avifauna Impact Assessment was undertaken by Chris van Rooyen and Albert Froneman to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessment is included in Appendix D.6 of this BA Report.

The potential impacts identified during the Avifauna Impact Assessment are the same for all seven proposed powerline projects. The following direct and cumulative impacts for the construction, operational and decommissioning phases were identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Impact 1: Displacement due to disturbance associated with the construction of the 132 kV grid connection and associated substations	Moderate risk (Level 3)	Low risk (Level 4)
• Impact 2: Displacement due to habitat transformation associated with the construction of the 132 kV grid connection and associated substations	Low risk (Level 4)	Low risk (Level 4)
DIRECT IMPACTS - OPERATIONAL PHASE		
• Impact 1: Mortality of powerline sensitive avifauna through electrocution in the on-site substations	Low risk (Level 4)	Very low risk (Level 5)
• Impact 2: Collision mortality of powerline sensitive species due to the 132 kV grid connections	High risk (Level 2)	Moderate risk (Level 3)
DIRECT IMPACTS - DECOMMISSIONING PHASE		
• Impact 1: The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area	Moderate risk (Level 3)	Low risk (Level 4)
CUMULATIVE IMPACTS - CONSTRUCTION PHASE		
• Impact 1: Displacement due to disturbance associated with the construction of the 132 kV grid connection and associated substations	Moderate risk (Level 3)	Low risk (Level 4)
• Impact 2: Displacement due to habitat transformation associated with the construction of the 132 kV grid connection and associated substations	Moderate risk (Level 3)	Low risk (Level 4)
CUMULATIVE IMPACTS - OPERATIONAL PHASE		

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
• Impact 3: Mortality of powerline sensitive avifauna through electrocution in the on-site substations	Low risk (Level 4)	Very low risk (Level 5)
• Impact 4: Collision mortality of powerline sensitive species due to the 132 kV grid connections	High risk (Level 2)	Moderate risk (Level 3)
<i>CUMULATIVE IMPACTS - DECOMMISSIONING PHASE</i>		
• Impact 5: The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area	Moderate risk (Level 3)	Low risk (Level 4)

The expected impacts of the proposed powerline construction were rated to be **Low to Moderate negative pre-mitigation**. However, with appropriate mitigation, the overall post-mitigation significance of all the identified impacts for should be reduced to **Low** for all phases of the project. It is therefore recommended that the activity is authorised, on condition that the proposed mitigation measures as detailed in the Avifauna Impact Assessment and included in the Environmental Management Programme (EMPr) are strictly implemented.

EAP'S RECOMMENDATION

No negative impacts have been identified within this BA that, in the opinion of the EAPs who have conducted this BA Process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. This echoes the findings of the specialists as summarised above.

Section 24 of the Constitutional Act states that “everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the Environmental Management Programme (EMPr) included in Appendix G of this BA Report).

It is understood that the information contained in this Final BA Report and appendices is sufficient to make a decision in respect of the activity applied for.

SUMMARY OF KEY IMPACT ASSESSMENT FINDINGS

Based on the findings of the specialist assessments, the proposed powerline project is considered to have an overall **Low to Very Low** negative environmental impact (with the implementation of respective mitigation and enhancement measures). Table C below provides a summary of the impact assessment for the proposed project post-mitigation for direct negative impacts. Table D provides the same information for the cumulative impacts.

As indicated in Table C, it is clear that all of the direct negative impacts were rated with a **Low to Very Low** post-mitigation impact significance for the construction phase. In terms of the operational phase, the majority of the direct negative impacts were rated with a **Low to Very Low** post mitigation impact significance, with only the Visual impacts being rated as **Moderate**. All of the direct negative impacts were rated with a **Low to Very Low** post-mitigation impact significance for the decommissioning phase.

Based on Table D, the majority of the cumulative negative impacts were rated with a **Low to Very Low** post mitigation impact significance for the construction phase, with only the Heritage impacts (Archaeology and Cultural Landscape) and Palaeontology impacts being rated as **Moderate**. A similar trend is applicable to the operational phase, with Heritage impacts (Archaeology and Cultural Landscape) and Visual impacts being rated as **Moderate**. During the decommissioning phase, the majority of cumulative impacts were rated with a **Low to Very Low** post mitigation impact significance, with only the Heritage impacts (Archaeology and Cultural Landscape) being rated as **Moderate**.

Table C. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative Impacts for the Kwagga EGI Projects

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
DIRECT NEGATIVE IMPACTS			
Visual	Low	Moderate	Very Low
Heritage (Archaeology and Cultural Landscape)	Very Low	Very Low	Very Low
Palaeontology	Low	Insignificant	Insignificant
Terrestrial Biodiversity and Species	Low	Very Low	Very Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Low	Low

Table D. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative Impacts for the Kwagga EGI Projects

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Visual	Low	Moderate	Very Low
Heritage (Archaeology and Cultural Landscape)	Moderate	Moderate	Moderate
Palaeontology	Moderate	Insignificant	Insignificant
Terrestrial Biodiversity and Species	Low	Low	Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Low	Low

All of the specialists have recommended that the proposed project receives EA if the recommended mitigation measures are implemented.

OVERALL ENVIRONMENTAL IMPACT STATEMENT

Taking into consideration the findings of this BA process, as well as the location of the proposed powerline project (i.e., 132 kV Overhead Powerline Section 5 of the Kwagga EGI corridor) in close proximity to the Beaufort West REDZ, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Gamka Karoo, and Beaufort West and Prince Albert regions.

Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed powerline project receive EA in terms of the 2014 EIA Regulations (as amended) promulgated under the NEMA.

CUMULATIVE ENVIRONMENTAL IMPACT STATEMENT

The cumulative impacts have been assessed by all the specialists on the project team. The cumulative assessment included approved renewable energy projects within a 50 km radius of the powerline corridor, as well as existing and planned transmission lines, as well as the three proposed authorised Kwagga WEF 1-3 projects. No cumulative impacts have been identified that were considered to be fatal flaws. The specialists recommended that the powerline project receive EA in terms of the EIA Regulations promulgated under the NEMA, including consideration of cumulative impacts. It is also important to note that the proposed powerline corridor is located in close proximity to the gazetted Beaufort West REDZ, which supports the development of large-scale wind and solar energy developments. The proposed powerline corridor is also located in close proximity to the gazetted Central Strategic Transmission Corridor, as well as the existing Droërivier-Proteus 400 kV Overhead Transmission Powerline. The proposed powerline project is therefore in line with the national planning vision for wind and solar development, as well as electricity transmission and distribution expansion in South Africa.

Summary of where requirements of Appendix 1 of the 2014 NEMA EIA Regulations (as amended, GN R326) are provided in this BA Report

<u>Appendix 1</u>	YES / NO	<u>SECTION IN BA REPORT</u>
<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>	Yes	<p>Section A of the report includes the Introduction, legislative review, alternatives assessment and needs and desirability</p> <p>Section D of the report includes a summary of the specialist studies and associated impact assessments undertaken</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>(i) the EAP who prepared the report; and</p> <p>(ii) the expertise of the EAP, including a curriculum vitae;</p>	Yes	Section A.4 and Appendix A
<p>(b) the location of the activity, including:</p> <p>(i) the 21-digit Surveyor General code of each cadastral land parcel;</p> <p>(ii) where available, the physical address and farm name;</p> <p>(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;</p>	Yes	Section A.1, Section A.6, Section A.7 and Section B.1
<p>(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-</p> <p>(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</p> <p>(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;</p>	Yes	Section A.1, Section A.6 and Appendix C
<p>(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;</p>	Yes	Section A.5, Section A.7 and Section A.11
<p>(e) a description of the policy and legislative context within which the development is proposed including-</p>	Yes	Section A.10

Appendix 1	YES / NO	SECTION IN BA REPORT
(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;		
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 A.5 and Section A.14
(g) a motivation for the preferred site, activity and technology alternative;	Yes	Section A.13
(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 A.13
(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 C and Appendix E
(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 C
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Yes	Section A.13 and Section B
(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 A.13 and Section D
(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	
(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	
(viii) the possible mitigation measures that could be applied and level of residual risk;	Yes	
(ix) the outcome of the site selection matrix;	Yes	
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Yes	
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	Yes	Section A.13
(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 A.13
(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;	Yes	Section D and Appendix C

Appendix 1	YES / NO	SECTION IN BA REPORT
(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;		
(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 D and Section E
(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 E
(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 D and Appendix G
(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 E
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Yes	Please refer to each specialist study included in Appendix D
(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 E
(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;	X	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 I&APs; (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; and	Yes	Appendix A
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	X	N/A
(t) any specific information that may be required by the competent authority; and	X	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	X	N/A
2) Where a government notice <i>gazetted</i> by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply.	Yes	Refer to Section A.10 for a breakdown of the relevant gazettes that are applicable.

SECTION A. INTRODUCTION, PROJECT DESCRIPTION; ALTERNATIVES; LEGISLATION; SCREENING TOOL

A.1 Introduction

The National DFFE has granted Environmental Authorisation (EA) for the proposed Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects on 7 April 2022 i.e. one for each WEF and its associated infrastructure. The Scoping and EIA (S&EIA) processes that were undertaken for the abovementioned three WEFs extended from May 2021 to April 2022. The three Kwagga WEFs and its supporting electrical grid infrastructure is situated approximately 60 km south of Beaufort West in the Western Cape Province.

In order to facilitate the connection of the proposed authorised Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3 projects to the national electrical grid network, the Project Applicant, ABO Wind renewable energies (Pty) Ltd (“ABO Wind”) is proposing the construction of seven 132 kV overhead transmission powerlines and its associated electrical grid infrastructure between the proposed authorised Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1) and the aforementioned WEFs, via the proposed authorised Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1). It is anticipated that the electricity generated by the proposed authorised Kwagga WEFs will be evacuated via these proposed 132 kV overhead transmission powerlines into the existing Droërvier–Proteus 400 kV overhead transmission powerline that runs parallel to the N12 in a north-south direction.

It is understood that the proposed authorised Eskom 132 kV Switching Substation and the proposed authorised Beaufort West 132 kV-400 kV Linking Station will be constructed by South Africa Mainstream Renewable Power Developments (Pty) Ltd (“Mainstream”) in support of their proposed authorised Beaufort West WEF and Trakas WEF that are to be located on land directly adjacent to the proposed authorised Kwagga WEFs 1-3 (refer to Figure A.1 below).

The Project Applicant has signed a servitude agreement and relevant powers of attorney with the landowner of the relevant Beaufort West and Trakas WEFs affected land portions and obtained agreement with Mainstream to facilitate the connection of the proposed authorised Kwagga WEFs 1-3 via 132 kV overhead transmission powerlines, via the aforementioned Eskom 132 kV Switching Substation and the Beaufort West 132 kV-400 kV Linking Station, to the existing Droërvier–Proteus 400 kV overhead transmission powerline that is located westwardly of the N12.

Important to note is that both the Beaufort West WEF (DFFE Ref: 12-12-20-1784-1-AM2; 12-12-20-1784-1-AM3) and the Trakas WEF (DFFE Ref: 12-12-20-1784-2-AM2; 12-12-20-1784-2-AM3), and their supporting powerline and substation infrastructure [Beaufort West 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-1) and Trakas 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-2)], collectively referred to as “the Beaufort West Cluster”, have all received EA and were successful bidders in Round 5 of the Renewable Energy Independent Power Producer Programme (REIPPPP).

The electrical grid infrastructure (EGI) component i.e. the application for these proposed 132 kV overhead transmission powerlines required for the three proposed authorised Kwagga WEF projects did not form part of the S&EIA processes that were undertaken for each of the three WEFs during 2021. Therefore, in order to facilitate the connection of the Kwagga WEFs 1-3 to the Droërivier–Proteus 400 kV, the following **seven** 132 kV overhead transmission powerlines and associated infrastructure, located near Beaufort West in the Western Cape, are being proposed and assessed (Also referred to as **Section 1 to 7** of the proposed Kwagga EGI Corridor):

- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the proposed Eskom 132 kV Switching Station (i.e., **Kwagga EGI Section 1**) – this powerline facilitates connection of Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 1 (i.e., **Kwagga EGI Section 2**) – this powerline facilitates connection of Kwagga WEF 1, as well as Kwagga WEF 2 and Kwagga WEF 3 (where Kwagga WEF 1 on-site substation is used as collector)³;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 2 (i.e., **Kwagga EGI Section 3**) – this powerline facilitates connection of Kwagga WEF 2, as well as Kwagga WEF 3 (where Kwagga WEF 2 on-site substation is used as a collector)³;
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the Kwagga WEF 3 (i.e., **Kwagga EGI Section 4**) – this powerline facilitates connection of Kwagga WEF 3³;
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 1 and Kwagga WEF 2 (i.e., **Kwagga EGI Section 5**) – this powerline facilitates connection of Kwagga WEF 2;
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 1 and Kwagga WEF 3 (i.e., **Kwagga EGI Section 6**) – this powerline facilitates connection Kwagga WEF 3; and
- Proposed Construction of a 132 kV overhead transmission powerline between Kwagga WEF 2 and Kwagga WEF 3 (i.e., **Kwagga EGI Section 7**) – this powerline facilitates connection Kwagga WEF 3.

It is proposed that each of the three Kwagga WEFs will have a dedicated 132 kV powerline that will connect each WEF to the Droërivier–Proteus 400 kV powerline via the authorised Eskom Switching Substation and the authorised Beaufort West 132 kV-400 kV Linking Station. Overhead powerlines between each of the Kwagga WEFs have also been proposed. This will ensure that each WEF is a viable stand-alone project. The above approach also ensures that any two of the three proposed Kwagga WEFs can connect to the Droërivier–Proteus 400 kV powerline, as this approach accommodates for the potential scenario in the event that only one or two of the three proposed Kwagga WEFs receive preferred bidder status in terms of the REIPPPP and therefore

³ Following receipt of comments from Mainstream Renewable Power South Africa during the 30-day public comment period on the Draft Basic Assessment Reports for the proposed Kwagga EGI Section 2 (DFFE Ref: 14/12/16/3/3/1/2579, Kwagga EGI Section 3 (DFFE Ref: 14/12/16/3/3/1/2580) and Kwagga EGI Section 4 (DFFE Ref: 14/12/16/3/3/1/2581), the Project Applicant was requested to re-align the proposed powerline route within the already assessed corridor i.e., to connect the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects directly to the authorised Beaufort West 132 kV-400 kV Linking Station (“MTS”) (DFFE Ref: 14-12-16-3-3-2-925-1). Following from liaison with DFFE on 4 October 2022 regarding these changes, written notification was submitted in terms of Regulation 19(1)(b) of the 2014 NEMA EIA Regulations (as amended) that these revised Draft BA Reports, inclusive of specialist reports and the EMPr will be subjected to another public participation process of 30 days after which the Final BA Reports will be submitted to DFFE for decision-making within 140 days of receipt of the application by the DFFE.

will materialise from a construction perspective. This approach is based on the worst-case scenario (i.e., assessment of seven separate 132 kV overhead transmission powerlines). It has also been structured accordingly to meet the requirements of the REIPPPP which requires issuing of seven separate EAs for these proposed powerline projects.

In terms of the best-case scenario, the number of powerlines to be constructed may be reduced, if all three of the proposed authorised Kwagga WEFs receive preferred bidder status in terms of the REIPPPP (i.e. the issuing of a PPA from the Department of Mineral Resources and Energy (DMRE)) or a similar procurement process. Should all three of the Kwagga WEFs materialise from a construction perspective, then the Project Applicant will opt to construct one continuous powerline that connects all the proposed authorised WEFs to the Beaufort West 132 kV-400 kV Linking Station via the Eskom 132 kV Switching Substation; however, this is also subjected to the requirements of Eskom. It is also necessary to assess all seven of the separate powerlines as part of these seven BA processes because of the uncertainties of the requirements of the REIPPPP, as well as the uncertainties around whether the projects will receive preferred status, and if so, which one will receive it first and be constructed first.

The seven proposed Kwagga 132 kV overhead transmission powerlines projects (i.e., Kwagga EGI Sections 1 to 7) will be located approximately 60 km south of the Beaufort West town in the Western Cape Province. The entire powerline corridor traverses both the Prince Albert Local Municipality and the Beaufort West Local Municipality, with the exception of the Kwagga EGI Section 1, which is only located in the Prince Albert Local Municipality. The locality of the Kwagga EGI corridor and the proposed 132 kV powerline projects is depicted in Figure A.1 below.

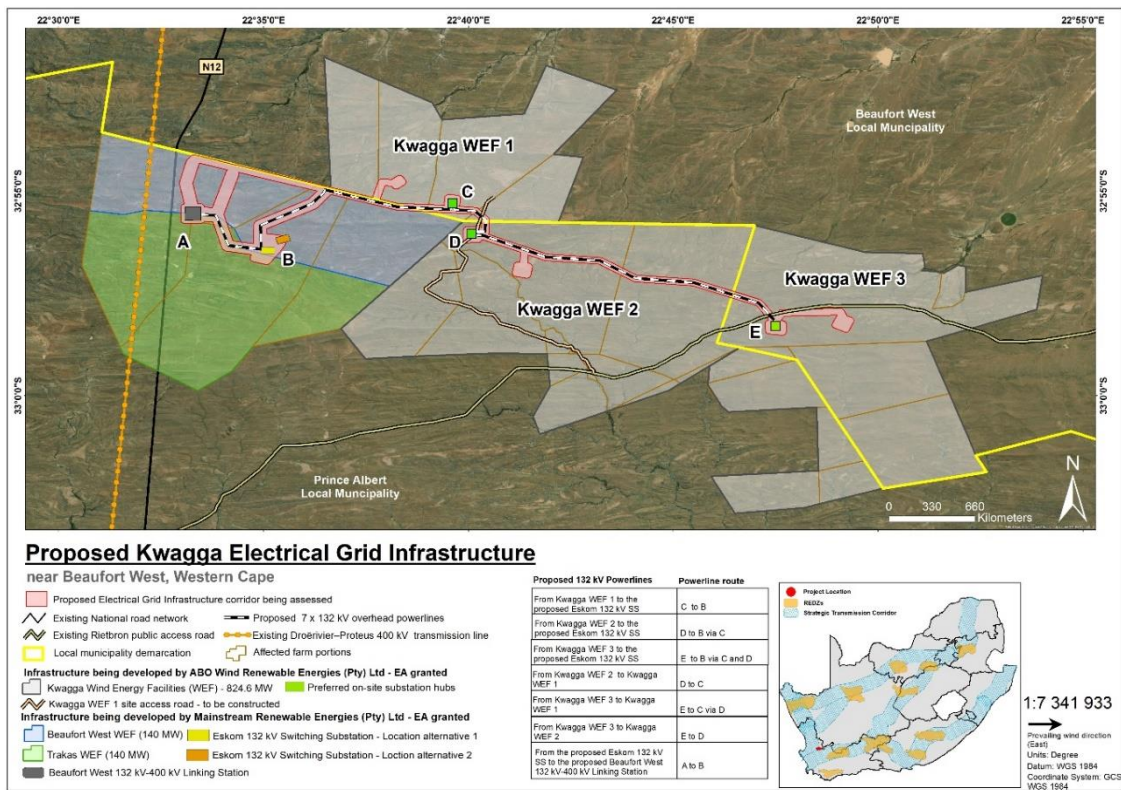


Figure A.1. Locality of the Kwagga EGI Corridor comprising the seven proposed 132 kV overhead transmission powerline projects (i.e., Kwagga EGI Section 1 – 7)

The EAs received for each of the three Kwagga WEFs included the authorised location of the preferred on-site substation hub (represented by solid green squares in Figure A.1). The authorised on-site substation hub at Point C, Point D and Point E in Figure A.1 have been authorised under the EAs received for Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3, respectively. Therefore, Section 5 of the Kwagga EGI corridor comprises the proposed 132 kV overhead transmission powerline that connects between the authorised on-site substation at the Kwagga WEF 1 site (i.e., Point C) and the authorised on-site substation at the Kwagga WEF 2 site (i.e., Point D).

The Project Applicant has requested that the specialist assessments include an approximately 300 m wide corridor for the portion of the proposed powerline route that traverses the proposed authorised Kwagga WEFs 1-3 project sites, and an approximately 500 m wide corridor for the proposed powerline route that traverses the neighbouring Mainstream Beaufort West and Trakas Wind Farm project sites. Note however that the proposed Kwagga EGI corridor, as shown in Figure A.1 and assessed by the specialist team, has made provision for the possibility of the proposed powerline connecting via a selected on-site substation hub alternative at each of the Kwagga WEFs should the need arise in future; however, such an application for authorisation will be assessed separately under the relevant Amendment Process and does not form part of this BA process.

The seven proposed powerline projects comprising the Kwagga EGI Corridor and the respective farm portions affected by each of the seven proposed 132 kV overhead powerlines and associated infrastructure, are shown in Table A.1 below. The cells highlighted in orange in Table A.1 indicates the powerline that is the subject of this BA Report i.e., **Section 5 of the Kwagga EGI Corridor**.

Table A.1. Proposed Powerline Project Sections comprising the Kwagga EGI Corridor and the main Affected Farm Portions

132 kV Powerline Sections comprising the Kwagga EGI Corridor	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7
Affected farm portion	Between the Eskom 132 kV Switching Station (SS) and the Beaufort West 132 kV-400 kV Linking Station [Figure A.1: B to A]	Between Kwagga WEF 1 and the Beaufort West 132 kV-400 kV Linking Station [Figure A.1: C to D]	Between Kwagga WEF 2 and the Beaufort West 132 kV-400 kV Linking Station [Figure A.1: C to B via C]	Between Kwagga WEF 3 and the Beaufort West 132 kV-400 kV Linking Station [Figure A.1: E to B via C and D]	Between Kwagga WEF 2 and Kwagga WEF 1 [Figure A.1: D to C]	Between Kwagga WEF 3 and Kwagga WEF 1 [Figure A.1: E to C via D]	Between Kwagga WEF 3 and Kwagga WEF 2 [Figure A.1: E to D]
Farm portions which are traversed by each proposed powerline							
Remainder of the Farm Dwaalfontein Wes No. 377 [SG Code: C00900000000037700000]		✓	✓	✓			
Portion 3 of the Farm Tyger Poort No. 376 [SG: C00900000000037600003]			✓	✓	✓	✓	
Portion 1 of the Farm Dwaalfontein Wes No. 377 [SG code: C00900000000037700001]		✓	✓	✓			
Remainder of the Farm Dwaalfontein No. 379 [SG code: C00900000000037900000]		✓	✓	✓	✓	✓	
Remainder of the Farm Wolve Kraal No. 17 [SG: C0610000000001700009]			✓	✓	✓	✓	✓
Portion 9 of the Farm Wolve Kraal No.17 [SG: C0610000000001700009]				✓		✓	✓
Portion 7 of the Farm Muis Kraal No. 373 [SG: C00900000000037300007]				✓		✓	✓
Portion 1 of the Farm Witpoortje No. 16 [SG code: C0610000000001600001]	✓	✓	✓	✓			
Portion 1 of the Farm Trakas Kuilen No. 15 [SG code: C0610000000001500001]		✓	✓	✓			
Remainder of the Farm Trakas Kuilen No. 15 [SG code: C0610000000001500000]	✓						

The seven proposed Kwagga 132 kV overhead transmission powerlines are not located within any of the Renewable Energy Development Zones (REDZs) gazetted in Gazette 41445, GN R114 on 16 February 2018; and Gazette 44191, GN R144 on 26 February 2021. The proposed Kwagga powerlines are also not located within any of the strategic power corridors gazetted in Gazette 41445, GN R113 on 16 February 2018. However, the need for the Basic Assessment process is triggered by, amongst others, the inclusion of Activity 11 (i) listed in GN R327 (Listing Notice 1):

“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”.

Therefore, a Basic Assessment process is being undertaken for each of the seven proposed 132 kV overhead transmission powerlines with a 107-day decision-making timeframe, as opposed to a 57-day decision-making timeframe allowed for in the REDZs and strategic power corridors.

The Draft BA Report was released to all registered Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from **11 July 2022 to 11 August 2022**, excluding public holidays. All comments received during the 30-day comment period have been incorporated into this Final BA Report (where relevant) and captured in the Comments and Responses Report in line with Regulation 24 of GN R326. This Final BA Report and Comments and Responses Report have been submitted to the DFFE, in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20.

Since the proposed seven Kwagga 132 kV overhead powerlines and associated infrastructure are located within the same geographical area (i.e., forming one continuous powerline situated on adjoining farm properties) and constitute the same type of activity (i.e. distribution and transmission of electricity generated from a wind resource), an integrated Public Participation Process (PPP) is being undertaken for these BA projects. This approach was confirmed with the DFFE at the pre-application meeting (refer to Appendix F of this Final BA Report).

A.2 Project Developer

ABO Wind AG is a Europe based company, which was formed in 1996. The company has since established subsidiaries in 13 countries. ABO Wind renewable energies (Pty) Ltd (“ABO Wind”), the South African subsidiary, was founded in 2017. The company focuses on solar, wind and biogas technologies and works with landowners, technology providers, regulators and investors to source and develop renewable energy projects. ABO Wind acts as the project developer and project interface, coordinating the research and studies, the site identification, the project structure, EIAs, selecting the strategic partners and arranging financing.

The company, since inception, has developed and sold wind energy, solar and biogas projects with a total capacity of more than 3 500 MW. A significant portion of these projects are turnkey projects. ABO Wind has not been involved in the South African REIPPPP bidding process as yet; however, the company intends to bid this project (should EA be granted), in support of the proposed authorised Kwagga WEFs 1-3 in a future bidding program such as the REIPPPP under the DMRE, or another suitable tender process.

ABO Wind is proposing the construction of a 132 kV overhead transmission powerline between the proposed authorised Kwagga WEF 1-3 and the proposed authorised Beaufort West 132 kV-400 kV Linking Station, via the proposed authorised Eskom 132 kV Switching Substation, to facilitate the connection of the Kwagga WEFs to the existing Droërivier–Proteus 400 kV overhead transmission powerline that runs parallel to the N12 in a north-south direction and which is located to the west of the Kwagga WEFs. Once a Power Purchase Agreement (PPA) is awarded to the proposed authorised Kwagga WEFs, the proposed powerline will facilitate the transmission and distribution of electricity that is generated by the Kwagga WEFs into the national electrical grid network via the Droërivier–Proteus 400 kV overhead transmission powerline for a minimum period of 20 years.

A.3 Project Applicant

The Project Applicant seeking EA for the proposed powerline project is ABO Wind renewable energies (Pty) Ltd with registration number 2018/062901/07.

A.4 Project Team

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the separate BA Processes in order to determine the biophysical, social and economic impacts associated with undertaking the proposed development.

Paul Lochner (Technical Advisor and Quality Assurance)

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 30 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners and engineers, with offices in Stellenbosch, Cape Town and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020.

Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Lizande Kellerman (Project Manager)

Lizande Kellerman is a Principal EAP and scientist at the CSIR in Stellenbosch, with more than 10 years of experience in environmental impact studies, primarily in the planning, preparation and

management of BAs, EIAs, and SEAs, as well as EMPs, Screening/Fatal Flaw Studies, Biodiversity Risk Assessments, Biodiversity Resource Assessments and license applications for agriculture, atmospheric emissions, water use, waste management, mining, bioprospecting and biodiversity permitting, for numerous projects in the agricultural (including aquaculture), construction, conservation, mining and renewable energy sectors. Lizande holds a BSc degree in Zoology and Entomology, with an Honours and Masters in Botany both at the University of Pretoria. She is currently working towards completing her PhD in Conservation Ecology. She commenced work at the CSIR in 2012 after spending three years working as an environmental scientist in the private sector. She has published several articles, both peer reviewed scientific and popular, and presented at five international conferences. She has also lectured on biodiversity, ecological and EIA at various universities in South Africa. Her training and experience as a qualified terrestrial ecologist has enabled her to provide expert input into ecological impact assessments and to perform specialist reviews of various terrestrial biodiversity and ecology impact assessments as part of BAs, EIAs and SEA.

Lizande is a registered Professional Natural Scientist (400046/10) with the South African Council for Natural Scientific Professions (SACNASP).

Dhiveshni Moodley (Project Officer)

Dhiveshni Moodley is a Junior EAP in the EMS group of the CSIR. Dhiveshni holds a BSc, BSc Honours (cum laude) and MSc (cum laude) degrees in Environmental Science from the University of KwaZulu-Natal. She has three year's work and research experience in flood risk, hydrogeological- and wetland functional assessment specialist studies, as well as conducting BAs and Scoping/EIAs in the Renewable Energy sector. Her key interest lies in using GIS analyses to apply the formation of accurate, feasible solutions to complex environmental challenges.

Dhiveshni is registered as a Candidate Natural Scientist with the SACNASP (1472997/19).

Various specialists and additional members from the CSIR have contributed to these BAs. The team which is involved in this BA Process is listed in Table A.2 below.

Table A.2. Details of the BA Project Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	EAP and Project Leader
Rohaida Abed (<i>Pr.Sci.Nat.</i>)	CSIR	Project Review
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Project Manager
Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Project Officer
Specialists		
Johann Lanz (<i>Pr.Sci.Nat.</i>)	Private	Agricultural Compliance Statement
Menno Klapwijk	Bapela Cave Klapwijk cc	Visual Impact Assessment
Dr Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology)
Dr. John Almond	Natura Viva cc	
Dr Noel van Rooyen (<i>Pr.Sci.Nat.</i>) and Prof Gretel van Rooyen (<i>Pr.Sci.Nat.</i>)	Ekotruster cc	Terrestrial Biodiversity and Species Impact Assessment
Antonia Belcher (<i>Pr.Sci.Nat.</i>)	Private	Aquatic Biodiversity Impact Assessment

Name	Organisation	Role/ Specialist Study
Chris van Rooyen and Albert Froneman (<i>Pr.Sci.Nat.</i>)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Lizande Kellerman (<i>Pr.Sci.Nat.</i>) and Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman (<i>Pr.Sci.Nat.</i>) and Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Defence Site Sensitivity Verification

A.5 Project Motivation

The need for renewable energy is becoming increasingly apparent, in both local and international context, with South Africa becoming an integral part of the global transition towards renewable sources of electricity generation. The urgency behind this evolution can be appreciated considering that South Africa is one of the largest emitters of greenhouse gases in Africa and is also estimated to rank amongst the top 20 largest emitters of greenhouse gases in the world. These emissions are largely a result of an energy-intensive economy and high dependence on coal-based electricity generation. The South African government is therefore committed to supplementing the existing generation capacity of thermal and nuclear power plants with renewable energy power generation, thus creating the framework that will lead to an increase in the supply of clean energy for the nation. The development of renewable energy is important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability.

The Integrated Resource Plan (IRP) for South Africa for the period 2010 to 2030 (referred to as “IRP2010”) was released by government in 2010, and a draft of an updated report was published in 2013, which proposes to secure 17 800 MW of renewable energy capacity by 2030 (including wind, solar and other energy sources). In August 2011, the Department of Energy (DoE) (currently operating as the Department of Mineral Resources and Energy (DMRE)) launched the REIPPPP and invited potential Independent Power Producers (IPPs) to submit proposals for the financing, construction, operation and maintenance of the first 3 725 MW of onshore wind, solar thermal, PV, biomass, biogas, landfill gas or small hydropower projects. On 18 August 2015, an additional procurement target of 6 300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in Government Gazette 39111. Of this, the additional target allocated for wind energy is 3 040 MW.

The most recent update to the IRP, the Integrated Resource Plan 2019 (IRP 2019), was gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, in October 2019, updating the energy forecast for South Africa from the current period to the year 2030. Provision has been made for new additional capacity by 2030 including in particular 14 400 MW of wind (which is based on a consistent annual allocation of 1 600 MW commencing in the year 2022 up to 2030), 6 000 MW of solar PV, and 2 088 MW for storage. The IRP 2019 also notes that for wind energy, 1 980 MW is installed capacity, and 1 362 MW is committed/already contracted capacity. In terms of the REIPPPP, submitted proposals are then evaluated according to a Request for Proposal (RfP). Based on previous bidding windows of the REIPPPP, the two main evaluation criteria for compliant proposals are price and economic development with a point allocation of 70/30 (DoE, 2013), with other selection criteria including technical feasibility and grid connectivity, environmental acceptability, black economic empowerment, community development, and local economic and manufacturing propositions. The bidders whose responses rank the highest (according to the aforementioned criteria) generally have the greatest potential to be appointed as “Preferred Bidders” by the DMRE. It is intended that this project will be bid into a future bidding

program such as the REIPPPP or another suitable tender process. According to the State of the Nation Address delivered by President Cyril Ramaphosa on 11 February 2021, Bid Window 5 called for 2 600 MW from wind and solar energy, and the preferred bidders for Bid Window 5 were announced on 28 October 2021. According to the amended RFP published on 9 September 2022, in terms of the REIPPPP, Bid Window 6 called for the generation capacity procurement of up to 4 200 MW, comprising 3 200 MW of wind energy and 1 000 MW of solar energy⁴.

Additionally, the proposed seven Kwagga 132 kV powerline projects would support the proposed authorised Kwagga WEFs 1-3 in contributing towards meeting the national energy target as set by the DMRE and assist the government in achieving its proposed renewable energy targets.

Should the proposed 132 kV powerline (i.e. Section 5 of 7 of the Kwagga EGI corridor) identified by the Project Applicant be acceptable and authorised, it will increase the potential for the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 to be appointed as a “Preferred Bidder” by the DMRE. It is considered viable that long-term benefits for the community and society in the Beaufort West and Prince Albert areas would be realised should the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 receives Preferred Bidder status. These two Kwagga WEF projects will provide an opportunity for additional employment in an area where job creation is identified as a key priority.

The proposed powerline project would also have international significance as it facilitates the connectivity of the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 which will contribute to South Africa being able to meet some of its international obligations by aligning domestic policy with internationally agreed strategies and standards as set by the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement on Climate Change, Kyoto Protocol, and United Nations Convention on Biological Diversity (UNCBD), all of which South Africa is a signatory to. Renewable energy is critical to South Africa as this source of energy is recognised as a major contributor to climate protection, has a much lower environmental impact significance, as well as advancing economic and social development.

A.6 Project Co-ordinates

The co-ordinates of the start, middle and end points of this proposed 132 kV overhead powerline (i.e. Kwagga EGI Section 5) is detailed in Table A.3 below. The co-ordinates of the start, middle and end points of the access road for the proposed 132 kV overhead powerline (i.e. Kwagga EGI Section 5) is detailed in Table A.4 below.

Table A.3. Co-ordinate Points along the start, middle and end points of the proposed 132 kV overhead transmission powerline route i.e. Section 5 of the Kwagga EGI Corridor

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
KWG-EGI-S	-32.934823	22.668226	32° 56' 5.3628"S	22° 40' 5.6136"E
KWG-EGI-M	-32.926109	22.67093	32° 55' 33.9924"S	22° 40' 15.348"E
KWG-EGI-E	-32.920736	22.659686	32° 55' 14.6496"S	22° 39' 34.8696"E

⁴<https://www.dmr.gov.za/news-room/post/1989>

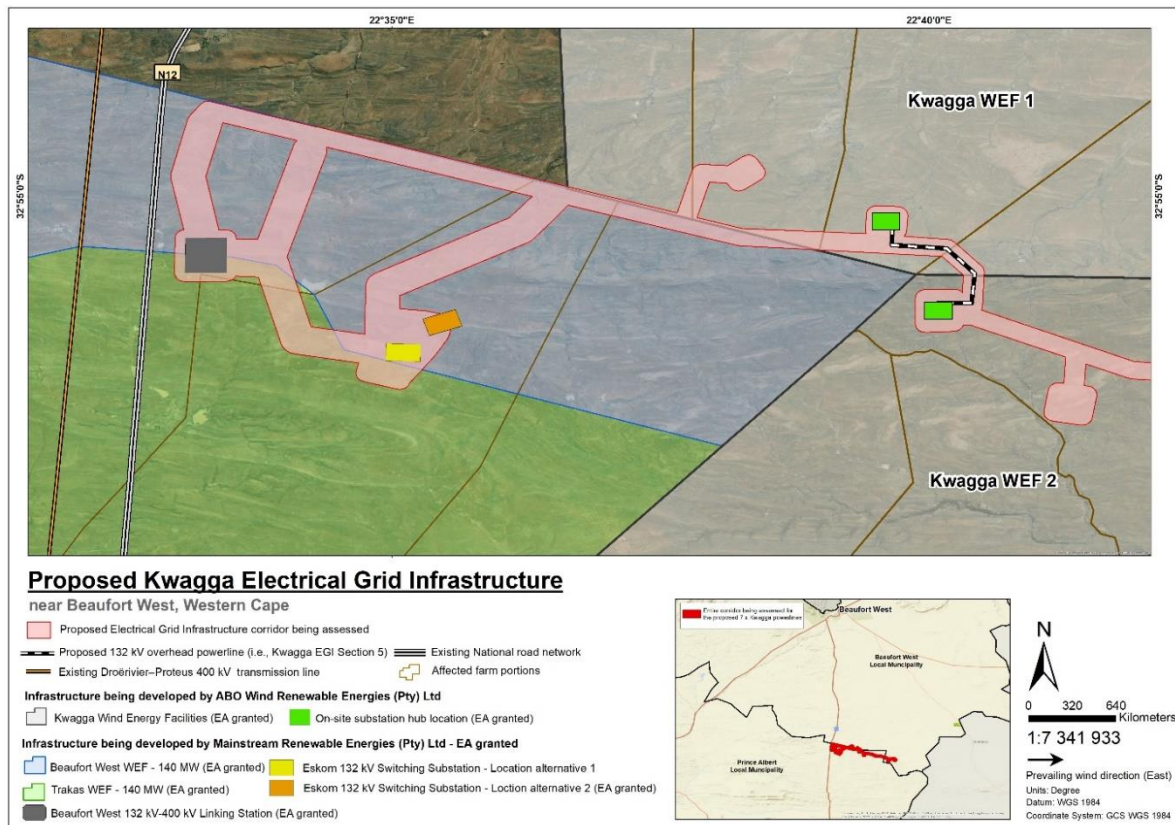
Table A.4. Co-ordinate Points along the start, middle and end points of the access road for the proposed 132 kV overhead transmission powerline route i.e. Section 5 of the Kwagga EGI Corridor

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
KWG-EGI-ACC-S	-32.934823	22.668226	32° 56' 5.3628"S	22° 40' 5.6136"E
KWG-EGI-ACC- M	-32.926109	22.67093	32° 55' 33.9924"S	22° 40' 15.348"E
KWG-EGI-ACC-E	-32.920736	22.659686	32° 55' 14.6496"S	22° 39' 34.8696"E

A.7 Project Description

As noted in Section A.1 of this BA Report, the Project Applicant is proposing the construction of seven 132 kV overhead transmission powerlines to support the connection of the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects into the national electrical grid network. Seven separate BA Reports have been compiled for the proposed Kwagga powerline corridor, one for each of the seven separate 132 kV overhead powerlines (i.e. referred to as Section 1 – 7 as described in Figure A.1 above). The proposed powerlines will enable connection of the proposed authorised Kwagga WEFs to the existing Droërivier–Proteus 400 kV overhead transmission powerline via the proposed authorised Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1) and the proposed authorised Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1).

Note that this BA Report specifically addresses the 132 kV overhead powerline that is referred to as Section 5 of the Kwagga EGI Corridor, which extends between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 2 (Figure A.2). A description of the key components of the proposed project is described below in Table A.5.



The technical information on these components is also discussed within this sub-section. It is however important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EA, should such authorisation be granted for the proposed powerline project) but that the information provided below is seen as the worst-case scenario for the proposed powerline project.

Table A.5. Description of the Project Components for the proposed 132 kV Overhead powerline (i.e. Section 5 of the Kwagga EGI Corridor)

Component	Description
Line/pylon height	Up to 30 m
Line capacity	Up to 132 kV
Pylon type	Self-supporting suspension structures or guyed monopoles. Insulators will be used to connect the conductors to the towers
Servitude length	3 km
Servitude width	The registered servitude will be up to 50 m wide, or where multiple adjacent powerlines occur, in line with guideline and requirements for 132 kV powerlines stipulated in the 2011 Eskom Distribution Guide Part 19. <u>Note</u> that the entire servitude will <u>not</u> be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications.

Component	Description
	Specialists were required to assess an approximately 300 m wide corridor for the portion of the proposed powerline route that traverses the proposed authorised Kwagga WEFs 1-3 project sites, and an approximately 500 m wide corridor for the proposed powerline route that traverses the neighbouring Mainstream Beaufort West and Trakas WEF project sites.
Associated Infrastructure	
Associated electrical infrastructure including but not limited to feeder bays, busbars, new transformer bays (up to 500 MVA) and possible extension to the existing footprint at the proposed authorised Eskom 132 kV Switching Substation.	<p>The following substations are relevant to this BA project:</p> <ul style="list-style-type: none"> ○ Proposed authorised Kwagga WEF 1 On-site Substation Hub (Footprint: approximately 5.21 ha); <ul style="list-style-type: none"> ○ Centroid: 32° 55' 14.588" S (Latitude); 22° 39' 36.310" E (Longitude) ○ Proposed authorised Kwagga WEF 2 On-site Substation Hub (Footprint: approximately 18.5 ha); <ul style="list-style-type: none"> ○ Centroid: 32° 56' 3.926" S (Latitude); 22° 40' 6.0708" E (Longitude)
Service roads	There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 5 m located around and within the proposed Kwagga powerline corridor. It is anticipated that a service road of approximately 4 m wide (usually only jeep tracks) will be required below the powerline.
External Access Road	<p>The proposed powerline corridor can be accessed via the N12 main road, which is situated to the west of the Kwagga Wind Energy Facility (WEF) 1 site, as well as from the R308 Rietbron bound public access gravel road that is located to the south of the Kwagga WEF 1 site. The R308 Rietbron bound public access road is a well-maintained gravel road that will be widened where necessary, for purposes of constructing the WEFs. A new access road will be constructed to facilitate the connection between the Kwagga WEF 1 project site and the existing R308 Rietbron bound public access gravel road located to the south. Note that this proposed new access road as well as the potential widening/upgrade of the existing R308 gravel road were assessed as part of the S&EIA processes undertaken for the Kwagga WEFs, which received EA on 7 April 2022, and therefore does not form part of this BA process. The coordinates for the abovementioned proposed authorised external access road that will be constructed are as follows:</p> <ul style="list-style-type: none"> • Start: 32° 59' 26.8008" S (Latitude); 22° 43' 3.4248" E (Longitude) • Middle: 32° 57' 39.7296" S (Latitude); 22° 39' 21.9276" E (Longitude) • End: 32° 55' 8.184" S (Latitude); 22° 40' 37.218" E (Longitude)
Proximity to grid connection	This proposed 132 kV overhead powerline will facilitate the connection of the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 to the existing Droërivier–Proteus 400 kV overhead transmission powerline, via the proposed authorised Eskom 132 kV Switching Station and the proposed authorised Beaufort West 132 kV-400 kV Linking Station. The proposed 132 kV powerline is located approximately 11 km east of the existing Droërivier–Proteus 400 kV overhead transmission powerline.

A.7.1 On-site Substations

The proposed powerline project will facilitate the connection of the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 to the existing Droërivier–Proteus 400 kV overhead transmission powerline, via Kwagga WEF 1, the proposed authorised Eskom 132 kV Switching Substation and the proposed authorised Beaufort West 132 kV-400 kV Linking Station.

During 2021, four on-site substation hub alternatives were assessed as part of the S&EIA processes undertaken for the Kwagga WEF 2. The preferred on-site substation location i.e. Alternative 1 was authorised and included in the EA granted on 7 April 2022 (DFFE Ref: 14-12-16-3-3-2-2070). It is proposed that Section 5 of the 132 kV Kwagga EGI Corridor (the subject of this BA Report) will connect at the proposed authorised Kwagga WEF 2 on-site substation and extends approximately 3 km in a north-westerly direction to connect at the proposed authorised Kwagga WEF 1, which received EA on 7 April 2022.

The coordinates for the centre point location of the authorised on-site substation at the Kwagga WEF 2 is noted in Table A.5 above. The on-site substation will have a maximum development footprint of 18.5 ha and built infrastructure will not exceed 10 m in height. There is also the requirement for the installation of a lightning mast within the substation yards, which will not be higher than 21 m.

A.7.2 Associated Infrastructure

Service roads will also be constructed below the powerlines for maintenance purposes. The service roads are expected to be composed of gravel and extend approximately 4 m wide. The road length may vary slightly, depending on the final design.

Associated electrical infrastructure may also be installed or be upgraded at the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the proposed authorised Eskom 132 kV Switching Substation (including but not limited to feeder bays, busbars, a new transformer bay (up to 500 MVA), if needed. This will be confirmed during the detailed engineering design phase, post-EA, prior to the construction of the powerline project.

A.7.3 External Access Roads

The proposed Kwagga EGI Corridor can be accessed via the N12 main road, which is situated to the west of the Kwagga WEF 1 site, as well as from the R308 Rietbron bound public access gravel road that is located to the south of the Kwagga WEF 1 site. The N12 is a surfaced national road that connects Beaufort West and the N1 main road in the north with Klaarstroom, De Rust, Oudtshoorn and other Garden Route towns to the south. The R308 Rietbron bound public access road is a well-maintained gravel road with widths ranging between 6 m and 8 m and will be widened to a maximum width of 10 m, where necessary, for purposes of constructing the WEFs. A new access road with a maximum width of 10 m will be constructed to facilitate the connection between the Kwagga WEF 1 project site and the existing R308 Rietbron bound public access gravel road located to the south. Note that this proposed new access road as well as the potential widening/upgrade of the existing R308 gravel road were assessed as part of the S&EIA processes undertaken for the Kwagga WEFs, which received EA on 7 April 2022, and therefore does not form part of this BA Process. The coordinates (start, middle and end point) of the proposed internal

access road to the proposed 132 kV overhead transmission powerline (i.e., Section 5), via the Kwagga WEF project sites as described above, are provided in Table A.5.

A.8 Overview of the Project Development Cycle

The proposed project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and has therefore been assessed by the specialist assessments (summarised in Section D and full studies included in Appendix D of this BA Report).

A.8.1 Construction Phase

The construction phase will take place subsequent to the issuing of an EA from the Competent Authority (i.e. National DFFE) and once a power purchase agreement (PPA) with a suitable energy off-taker, which could be either the national government or private investors, is signed for the proposed authorised Kwagga WEFs. The construction phase for the proposed 132 kV overhead powerline project is expected to extend approximately 12-18 months.

The main activities that are proposed to take place during the construction phase will entail:

- Site preparations, construction of servitude access and detailed geotechnical investigations of the powerline servitude and grid corridor footprint;
- Preparation of a detailed layout of the grid connection infrastructure as per the Eskom grid connection requirements;
- Removal of vegetation within the powerline servitude for the placement of pylon infrastructure, where necessary;
- Stockpiling of topsoil and cleared vegetation, where possible;
- Establishment of a temporary laydown area for storage of construction equipment and machinery;
- Excavations of pylon infrastructure and associated anchorage, as well as busbar foundations;
- On site assembly and erection of pylon tower sections and stringing of the powerline cables;
- Rehabilitation of disturbed areas and removal of equipment and machinery following completion of powerline construction.

The construction phase will also involve the transportation of personnel, construction materials and equipment to and from the site. 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 approved EMPr that has been compiled and included in Appendix G of this BA Report. An independent Environmental Control Officer (ECO) will be appointed during the construction phase and will monitor compliance with the recommendations and conditions of the EMPr and EA, respectively.

A.8.2 Operational Phase

The following key activities will occur during the operational phase of the proposed project:

- Transmission of electricity generated by the proposed authorised Kwagga WEFs when it becomes operational;
- On-going maintenance of the grid connection infrastructure; and
- Bush clearing within the powerline servitude in accordance with Eskom's safety requirements.

During the life span of the proposed project (at least 20 years), on-going maintenance will be required on a scheduled basis. In general, maintenance on the structures will involve visual inspection, and only equipment that fails will be replaced in a manner similar to that of construction activities. The EMPr (Appendix G of this BA Report) includes the requirement for method statements to be compiled prior to the operational phase to describe the manner in which maintenance will be undertaken.

A.8.3 Decommissioning Phase

The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning of the proposed powerline arise, the decommissioning procedures will be undertaken in line with the EMPr and the site will be rehabilitated. All decommissioned materials will be recycled, or else be disposed of in accordance with local regulations and international best practice, where possible.

A.9 Service Provision: Water Usage, Sewage, Solid Waste and Electricity Requirements

A.9.1 Water Usage

During the construction phase of the proposed powerline project, water will be sourced from a registered service provider or from existing boreholes within the WEF site. Water use during the construction phase will mainly be required for:

- Human consumption (potable drinking water);
- Ablution facilities;
- Road construction;
- Road compaction and dust suppression; and
- Concrete production and curing for the construction of foundations for the powerline infrastructure, i.e. pylons, etc.

A.9.2 Sewage or Liquid Effluent

The proposed powerline project will require sewage services during the construction phase. The generation of small volumes of sewage or liquid effluent are estimated as liquid effluent will be limited to the ablution facilities during the construction phase. Portable sanitation facilities (i.e. chemical toilets) will be used during the construction phase, which will be regularly serviced and emptied by a registered contractor on a regular basis. References and requirements of Sections

22 and 40 of the National Water Act of 1998, (Act 36 of 1998) have been included in the EMPr (refer to Appendix G of this BA Report).

A.9.3 Solid Waste Generation

Solid waste which comprises hazardous and non-hazardous (or general) waste will be generated mainly during the construction phase of the proposed powerline project. Non-hazardous solid waste materials could include the following:

- Office and general waste material such as cardboard, plastic and wooden packaging;
- Electrical grid waste components such as cable off-cuts and derelict transformers, etc;
- Building rubble, discarded bricks, wood and concrete;
- Domestic waste generated by on-site construction staff; and
- Vegetation waste generated from the clearing of vegetation.

Minimal hazardous waste materials are expected to be generated during the construction and operational phases. Hazardous waste components could include fuels, oils, lubricants, chemicals and contaminated soils (in the event of accidental spillages).

Solid waste will be managed via the EMPr during the construction and operational phases, which incorporates proper waste management principles (see Appendix G of the BA Report). During the construction phase, general solid waste will be collected and temporarily stockpiled in skips in a designated area on site and thereafter removed and disposed of at a registered waste disposal facility on a regular basis by an approved waste disposal Contractor (i.e. a suitable Contractor) or the local municipality. Any hazardous waste will be temporarily stockpiled (for less than 90 days) in a designated area on site (i.e. placed in leak-proof storage skips), and thereafter removed off site by a suitable service provider for safe disposal at a registered hazardous waste disposal facility.

Waste disposal slips and waybills will be obtained for the collection and disposal of the general and hazardous waste. These disposal slips (i.e. safe disposal certificates) will be kept on file for auditing purposes as proof of disposal. The waste disposal facility selected will be suitable and able to receive the specified waste stream (i.e. hazardous waste will only be disposed of at a registered/licenced waste disposal facility). The details of the disposal facility will be finalised during the contracting process, prior to the commencement of construction. Where possible, recycling and re-use of material will be encouraged.

A.9.4 Electricity Requirements

In terms of electricity supply for the construction and operational phase, since there are no existing Eskom or municipal infrastructure supply services in the area, the project developer will make use of generators on site during construction.

A.10 Applicable Legislation

The scope and content of this BA Report has been informed by the legislation, guidelines and information series documents listed below. It is important to note that the specialist studies included in Appendix D of this BA Report also include a description of the relevant applicable legislation.

A.10.1 National Legislation

A.10.1.1 The Constitution of the Republic of South Africa (Act 108 of 1996)

The Constitution, which is the supreme law of the Republic of South Africa, provides the legal framework for legislation regulating environmental management in general, against the backdrop of the fundamental human rights. Section 24 of the Constitution states that:

- “Everyone has the right:
 - to an environment that is not harmful to their health or well-being; and
 - to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that –
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

Section 24 of the Bill of Rights therefore guarantees the people of South Africa the right to an environment that is not detrimental to human health or well-being, and specifically imposes a duty on the State to promulgate legislation and take other steps that ensure that the right is upheld and that, among other things, ecological degradation and pollution are prevented.

In support of the above rights, the environmental management objectives of the proposed project are to protect ecologically sensitive areas and support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site.

A.10.1.2 NEMA and EIA Regulations published on 8 December 2014 (as amended on 7 April 2017 and 11 June 2021; GN R327, GN R326, GN R325 and GN R324)

Chapter 1, Section 2 of the NEMA sets out a number of principles to give guidance to developers, private landowners, members of the public and authorities. The proclamation of the NEMA gives expression to an overarching environmental law. Various mechanisms, such as cooperative environmental governance, compliance and non-compliance, enforcement, and regulating government and business impacts on the environment, underpin NEMA. NEMA, as the primary environmental legislation, is complemented by a number of sectoral laws governing marine living resources, mining, forestry, biodiversity, protected areas, pollution, air quality, waste and integrated coastal management. Principle number 3 determines that a development must be socially, environmentally and economically sustainable. Principle Number 4(a) states that all relevant factors must be considered, *inter alia* i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and viii) that negative impacts on the environment and on peoples’ environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

GN R327 contains the relevant listed activities that are triggered, thus requiring a BA. Please refer to Section A.11 of this BA Report for the complete list of listed activities.

A.10.1.3 Government Notice (GN) R960 (published 5 July 2019)

GN R960 was published on 5 July 2019 and came into effect for compulsory use of the National Web Based Environmental Screening Tool from 4 October 2019. The notice outlines the requirement to submit a report generated by the National Web Based Environmental Screening Tool, in terms of Section 24(5)(h) of the NEMA and Regulation 16(1)(b)(v) of the 2014 NEMA EIA Regulations (as amended) when submitting an Application for EA in terms of Regulations 19 and 21 of the 2014 NEMA EIA Regulations (as amended). As such, the Application for EA for the proposed powerline project has been run through the National Web Based Environmental Screening Tool, and the associated report generated and attached to the Application for EA, which has been submitted to the DFFE with this Final BA Report).

A.10.1.4 Government Notice (GN) R320 (20 March 2020)

GN R320 prescribes the general requirements for undertaking site sensitivity verification and protocols for the assessment and minimum report content requirements for identified environmental impacts for environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, when applying for EA.

The Specialist Assessments undertaken as part of this BA Process comply with GN R320, where applicable, including Agriculture, Aquatic Biodiversity and Terrestrial Biodiversity. The remaining specialist assessments comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended), and where relevant, Part A of GN R320 which contains site sensitivity verification requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed. The site sensitivity verifications required for Defence, as well as the Civil Aviation also comply with GN R320. The protocols were enforced within 50 days of publication of the notice i.e., on 9 May 2020.

A.10.1.5 Government Notice (GN) R1150 (30 October 2020)

GN R1150 prescribes procedures and protocols in respect of specific environmental themes for the assessment of, as well as the minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the NEMA, when applying for EA. GN R1150 includes a protocol for the specialist assessment and minimum report content requirements for environmental impacts on a) terrestrial animal species and b) terrestrial plant species. The requirements of these protocols apply from the date of publication (i.e. from 30 October 2020), except where the Project Applicant provides proof to the Competent Authority that the specialist assessment affected by these protocols had been commissioned prior to the date of publication of these protocols in the Government Gazette, in which case Appendix 6 of the 2014 NEMA EIA Regulations (as amended) will apply to such applications. The Terrestrial Biodiversity Specialist Assessment undertaken as part of this BA Process was commissioned in May 2022. Therefore, the Terrestrial Impact Assessment (included in Appendix D.4) was undertaken in adherence to the protocol.

A.10.1.6 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for “the management and conservation of South Africa’s biodiversity within the framework of the NEMA, the protection of species and ecosystems that warrant national protection, and the use of indigenous biological resources in a sustainable manner, amongst other provisions”. The Act states that the state is the custodian of South Africa’s biological diversity and is committed to respect, protect, promote and fulfil the constitutional rights of its citizens.

Chapter 1 sets out the objectives of the Act, and they are aligned with the objectives of the Convention on Biological Diversity, which are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the use of genetic resources. The Act also gives effect to CITES, the Ramsar Convention, and the Bonn Convention on Migratory Species of Wild Animals. The State is endowed with the trusteeship of biodiversity and has the responsibility to manage, conserve and sustain the biodiversity of South Africa.

This Act therefore serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. Effective disturbance and removal of threatened or protected species encountered on or around the sites, will require specific permission from the applicable authorities.

Furthermore, NEMBA states that the loss of biodiversity through habitat loss, degradation or fragmentation must be avoided, minimised or remedied. The loss of biodiversity includes inter alia the loss of endangered, threatened or protected plant and animal species.

Chapter 5 of NEMBA (Sections 73 to 75) regulates activities involving invasive species, and lists duty of care as follows:

the landowner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or re-establishment;

- take all required steps to prevent or minimise harm to biodiversity; and
- ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

An amendment to the NEMBA has been promulgated in 2011, which lists about 225 threatened or protected ecosystems based on vegetation types present within these ecosystems. Should a project fall within a vegetation type or ecosystem that is listed as being threatened or protected, actions in terms of NEMBA are triggered. Based on the preliminary sensitivity screening, site sensitivity verifications and detailed impact assessment that was undertaken for the proposed development site, none of the listed threatened ecosystems was found to occur within the proposed powerline corridor. In addition, no terrestrial animal and plant species of conservation concern (SCC) were identified within the proposed development site (refer to Section D of this BA Report for a summary of the Terrestrial Biodiversity and Species Impact Assessment findings).

A.10.1.7 The National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) (NHRA) introduces an integrated and interactive system for the management of national heritage, archaeological and palaeontological resources (which include landscapes and natural features of cultural significance).

Parts of sections 35(4), 36(3) (a) and 38(1) of the NHRA apply to the proposed project:

Archaeology, palaeontology and meteorites

Section 35 (4) – No person may, without a permit issued by the responsible heritage resources authority:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves

Section 36 (3) (a) No person may, without a permit issued by South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority:

- destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management

38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as:

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of the site –
 - (i) exceeding 5 000 m² in extent, or
 - (ii) involving three or more 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 resources authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent; or
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources 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.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a

place or object may have cultural heritage value. Section 38 (2a) of the NHRA states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted.

The Heritage Western Cape (HWC) is required to provide comment on the proposed project. In line with HWC requirements, a Notification of Intent to Develop (NID) has been submitted to the HWC for the proposed project (see Appendix E.6). The response from HWC on the NID received on 14 June 2022 has determined the requirements for the assessment phase from a heritage perspective (Case No. 20220518SB0519E) (see Appendix E.7). As per the requirements of the HWC, an integrated Heritage Impact Assessment (HIA) including archaeology, cultural landscape and palaeontology was undertaken, and an integrated HIA report compiled. The integrated HIA was submitted to HWC and released to registered conservation bodies and the relevant local municipalities for a 30-day consultation period as per the requirements of the HWC (see Appendix E.8). These relevant specialist assessments are also included in Appendix D.3 of this BA Report which was released to Interested and Affected Parties (I&APs) for a 30-day public comment period which extended from 11 July 2022 to 11 August 2022 (excluding public holidays).

The final comments and recommendations received from HWC on 31 August 2022 (Appendix E.11) is included in the Comments and Responses Report and was incorporated in the conditions of the EA (should it be granted). This essentially gives 'permission' from the HWC to the Project Applicant to proceed from a heritage perspective.

The proposed project may require a permit in terms of the NHRA prior to any fossils or artefacts being removed by professional palaeontologists and archaeologists. If archaeological mitigation is needed, then the appointed archaeologist will need to submit a Work Plan to the HWC to conduct the work. This must be carried out well in advance of construction to ensure that there is enough time for HWC to approve the mitigation work before construction commences.

Should professional palaeontological mitigation be necessary during the construction phase, the palaeontologist concerned will need to apply for a Fossil Collection Permit from HWC. Palaeontological collection should comply with international best practice. All fossil material collected must be deposited, together with key collection data, in an approved depository (museum / university). Palaeontological mitigation work including the ensuing Fossil Collection reports should comply with the minimum standards specified by Heritage Western Cape (2016) and SAHRA (2013).

A.10.1.8 National Forests Act (Act 84 of 1998)

The National Forests Act (Act 84 of 1998) (NFA) allows for the protection of certain tree species of conservation concern. The Minister has the power to declare a particular tree to be a protected tree. According to Section 12 (1) d (read with Sections (5) 1 and 62 (2) (c)) of the NFA, a licence is required to remove, cut, disturb, damage or destroy any of the listed protected trees. The most recent list of protected tree species was published in 2019. The Department of Agriculture, Land Reform and Rural Development (DALRRD) is authorised to issue licences for any removal, cutting, disturbance, damage to or destruction of any protected trees. Therefore, the removal of any protected tree species listed within the NFA will require a tree removal permit, which can be obtained from the DALRRD.

A.10.1.9 Conservation of Agricultural Resources Act (Act 43 of 1983)

The objectives of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) are to provide for the conservation of the natural agricultural resources of South Africa by the:

- maintenance of the production potential of land;
- combating and prevention of erosion and weakening or destruction of the water sources; and
- protection of the vegetation and the combating of weeds and invader plants.

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource. The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

- Category 1 may not be grown and must be eradicated and controlled,
- Category 2 may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled, and
- Category 3 plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or land owner to control invasive alien plants occurring on the land under their control.

Should alien plant species occur within the development footprint, it will be managed in line with the Environmental Management Programme (EMPr) (included as Appendix G of this BA Report). Rehabilitation after disturbance to agricultural land is also managed by CARA. The DALRRD reviews and approves applications in terms of these Acts according to their Guidelines for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011.

A.10.1.10 National Water Act (Act 36 of 1998)

One of the important objectives of the National Water Act (Act 36 of 1998) (NWA) is to ensure the protection of the aquatic ecosystems of South Africa's water resources. Section 21 of this Act identifies certain land uses, infrastructural developments, water supply/demand and waste disposal as 'water uses' that require authorisation (licensing) by the Department of Water and Sanitation (DWS). Chapter 4 (Part 1) of the NWA sets out general principles for the regulation of water use. Water use is defined broadly in the NWA, 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 the bed, banks, course or characteristics of a watercourse, removing water found underground for certain purposes, and recreation. In general, a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas.

All water users who are using water for agriculture: aquaculture, agriculture: irrigation, agriculture: watering livestock, industrial, mining, power generation, recreation, urban and water supply service must register their water use. This covers the use of surface- and groundwater.

Section 21 of the NWA lists the following water uses that need to be licensed:

- a) taking water from a water resource;
- b) storing water;
- c) impeding or diverting the flow of water in a watercourse;
- d) engaging in a stream flow reduction activity contemplated in section 36;
- e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) disposing of waste in a manner which may detrimentally impact on a water resource;
- h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) altering the bed, banks, course or characteristics of a watercourse;
- j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) using water for recreational purposes.

Any activities that take place within a watercourse, or within 100 m of the edge of a watercourse, or within 500 m of a delineated wetland boundary, will require a water use authorisation in terms of Section 21 (c) and Section 21 (i) of the NWA.

The risk assessment that was undertaken as part of the Aquatic Biodiversity Specialist Assessment determined that the proposed powerline poses a low risk of impacting aquatic habitat, water flow and water quality within the servitude corridor. The water use activities associated with the proposed project could potentially be authorised through the general authorisations for Section 21(c) and (i) water uses. Also, a water use authorisation in terms of Section 21(a) might be required for the proposed groundwater abstraction from boreholes for construction purposes, which would however be highly unlikely to impact on any surface water ecosystem in the area.

A.10.1.11 Water Services Act (Act 108 of 1997)

It is anticipated that there will be limited water requirements during the construction phase. Water will mainly be required for concrete production and curing for pylon foundations, road compaction, dust control and drinking water for staff. The Project Applicant has obtained non-binding letters from the Breede-Gouritz Catchment Management Agency (BGCMA) confirming the availability of sufficient water in the relevant catchment area for construction and operations of the proposed Kwagga WEFs and its associated electrical grid infrastructure as it is planned that water will be sourced from boreholes for this purpose. Therefore, the Project Applicant is currently in the process of applying for a water use license in terms of Section 21(a) of the NWA that authorises the taking of water from a water resource (i.e. abstraction of groundwater from boreholes).

A.10.1.12 Hazardous Substances Act (Act 15 of 1973)

During the construction phase of the proposed project, fuel, oils and relevant chemicals would be utilised to power and/or operate vehicles, generators and construction equipment. In addition, potential spills of hazardous materials could occur during the construction and operational phases. Such management actions are recommended in the EMPr, which has been included as Appendix G to this BA Report.

A.10.1.13 Subdivision of Agricultural Land Act (Act 70 of 1970)

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long-term lease associated with the renewable energy facility be approved by the DALRRD. The SALA consent is separate from the Application for EA and needs to be applied for and obtained separately. An application for the change of land use (re-zoning) for the development on agricultural land will be lodged by the Project Applicant for approval in terms of the SALA, as required.

A.10.1.14 National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)

General and hazardous waste will be generated during the construction, operational and decommissioning phases, which will require proper management. Such management actions are recommended in the EMPr, which has been included as Appendix G to this BA Report.

A.10.1.15 National Environmental Management: Air Quality Act (Act 39 of 2004)

The proposed vegetation clearance and stockpiling activities, including earthworks and the use of construction machinery and vehicle traffic, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be applied. Such management actions are recommended in the EMPr, which has been included as Appendix G to this BA Report.

A.10.1.16 Development Facilitation Act (Act 67 of 1995)

The Development Facilitation Act (Act 67 of 1995) (DFA) sets out a number of key planning principles which have a bearing on assessing proposed developments in light of the national planning requirements. The planning principles most applicable to the study area include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;
- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Promoting the establishment of viable communities; and
- Promoting sustained protection of the environment.

A.10.2 Provincial Legislation

A.10.2.1 Western Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974) and the Western Cape Nature Conservation Laws Amendment Act (Act No. 3 of 2000)

This Act should be given consideration following issuing of EA, should such EA be granted, with particular respect to its Chapters IV (The protection of wild animals other than fish) and Chapter VI (The protection of flora). The requirement for permits when removing and relocating specific flora that may be encountered or alternatively addressing fauna that may be encountered around the sites would require due consideration.

The Western Cape Nature Conservation Laws Amendment Act (2000) provides for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board, which includes various regulations pertaining to wild plants and animals including avifauna.

A.10.2.2 Draft Western Cape Biodiversity Bill (7 May 2019)

The purpose of the Draft Western Cape Biodiversity Bill, 2019 is to provide for the framework and institutions for nature conservation and the protection, management and sustainable use of biodiversity and ecosystems in the Province; and for matters incidental thereto. This law has not been promulgated however some aspects of its Chapter 7 (Protection of Ecosystems, Ecological Infrastructure and Species), in particular, may apply to the affected sites, once promulgated.

A.10.2.3 Western Cape Land Use Planning Act (Act No. 3 of 2014)

The purpose of the Western Cape Land Use Planning Act (Act No. 3 of 2014) is to consolidate legislation in the Province pertaining to provincial planning, regional planning and development, urban and rural development, regulation, support and monitoring of municipal planning and regulation of public places and municipal roads arising from subdivisions; to make provision for provincial spatial development frameworks; to provide for minimum standards for, and the efficient coordination of, spatial development frameworks; to provide for minimum norms and standards for effective municipal development management; to regulate provincial development management; to regulate the effect of land development on agriculture; to provide for land use planning principles; to repeal certain old-order laws; and to provide for matters incidental thereto. Several aspects of this Act may apply to the affected sites, in particular the regulation of the effect of land development on agriculture.

A.10.3 Local Planning Legislation

A.10.3.1 Environmental Management Framework

Research indicates that there is no Environmental Management Framework (EMF) for the Central Karoo District Municipality. The Screening Tool also notes that no intersections with EMF areas have been found.

A.10.3.2 Beaufort West Local Municipality Integrated Development Plan (Beaufort West Local Municipality 2017-2022)

The **vision** of the Beaufort West Local Municipality Integrated Development Plan (BWLM IDP) 2017-2022 is to be the *economic gateway in the Central Karoo, where people are developed and live in harmony together.*

Further unpacking of the vision indicates the provision of directives regarding the growth of the economy and ensuring financial sustainability among other areas in which development is required.

The five priority areas of the IDP are:

1. Service to the people – seeking to improve and maintain basic service delivery through infrastructure development;
2. Sustainable economic growth by leveraging competitive advantages of the region (The IDP identifies low economic growth as one of the main reasons for the lack of new labour entrants into the economy);
3. A well-run administration that is efficient, effective and has the right skills mix;
4. Ensure financial sustainability; and
5. Be a transparent organisation.

A.10.3.3 Prince Albert Local Municipality Integrated Development Plan (Prince Albert Local Municipality 2017-2022)

The **vision** of the Prince Albert Local Municipality Integrated Development Plan (PALM IDP) 2017-2022 is to be, *an area characterised by high quality of living and service delivery.*

Further unpacking of the vision indicates the provision of directives regarding the growth of the economy and ensuring financial sustainability among other areas in which development is required. The PALM IDP (2017-2022) recognises renewable energy projects as having the potential to improve and stimulate sustainable growth and development of the economy.

The following points are provided in the PALM, outlining the Development strategy of the local municipality:

- *“To ensure a sustainable Prince Albert, where all sectors are aligned for the betterment and benefit of the municipal area as a whole.*
- *To create an enabling environment for the inhabitants of Prince Albert towards guaranteed job opportunities and thus a better livelihood and citizen satisfaction.*
- *To harness social, technical, economic, and environmental innovation to the benefit of Prince Albert.*
- *To enable, promote and facilitate the education of our community in order to establish a high level of knowledge economy in Prince Albert.*
- *To enable the facilitation of an employable, citizen centric, responsible and caring community.*
- *To encourage responsible account payment in order to maintain and improve communal equity.*
- *To establish partnerships with stakeholders in the municipal space, including the community and ward representatives, sector departments and private sector.*

- *To continuously upskill staff in order to maintain levels of service and ensure expert attention to municipal activities.”*

In addition, the PALM developed five Strategic Focus Areas (SFAs), which comprise of seven Strategic Objectives and 16 Performance Areas. The five SFAs are:

1. Basic service delivery;
2. Local Economic Development;
3. Municipal financial viability and transformation;
4. Municipal transformation and organisational development; and
5. Good governance and public participation.

The main priority issues identified within the PALM IDP (2017-2022) can be summarized under the umbrellas of; improvement of service delivery and sustainable economic development. Majority of residents within the PALM are involved in low-skilled and semi-skilled employment (~84%)⁵. High job losses were recorded in the low-skilled and semi-skilled employment levels due to the mechanisation of tasks in the agricultural and construction sectors⁶.

Household income within the PALM were recorded as being highest in Ward 2 (i.e. in which the Kwagga WEF 1 is located), where 11% of households earn more than R12 500 per month. However, the majority of the households in Ward 2 (67.5%) earn below R 3 300. This indicates a relatively high level of income inequality in the Ward⁷. In addition, the PALM is recorded as having the lowest the per capita income amongst all local municipalities in the Central Karoo District Municipality. Small increases in the per capita income between 2011 and 2013 were well below inflation, therefore represents a decline in real terms⁸.

The proposed powerline will support the Kwagga WEF 1 project which is expected to create numerous job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE). The proposed Kwagga WEF 1 project and its supporting electrical grid connection would help to address the need for sustainable economic growth by leveraging competitive advantages of the region, in terms of harnessing the characteristic strong winds in the area to generate electricity. The proposed project will also help to address the need to improve basic service delivery and infrastructure development through increased electricity supply while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area. The proposed project will therefore be supportive of the IDP's priority areas of facilitating job creation to address the high unemployment rate, improving infrastructure development and promoting financial sustainability.

A.10.4 International Finance Corporation Performance Standards

In order to promote responsible environmental stewardship and socially responsible development, the proposed powerline project will as far as practicable incorporate the environmental and social policies of the International Finance Corporation (IFC). These policies provide a frame of reference

⁵ MERO. (2018). Municipality Economic Review and Outlook. Cape Town: Western Cape Government Provincial Treasury.

⁶ Prince Albert Local Municipality. (2017-2022). Prince Albert Local Municipality Integrated Development Plan.

⁷ StatsSA. (2016, October 14). Statistics South Africa. Retrieved from http://www.statssa.gov.za/?page_id=964

⁸ Prince Albert Municipality. (2017). Prince Albert Municipality Annual Report Performance report 205/2016.

for lending institutions to review environmental and social risks of projects, particularly those undertaken in developing countries.

Through the Equator Principles, the IFC's standards are now recognised as international best practice in project finance. The IFC screening process categorises projects into A, B or C in order to indicate relative degrees of environmental and social risk. The categories are:

- Category A - Projects expected to have significant adverse social and/or environmental impacts that are diverse, irreversible, or unprecedented;
- Category B - Projects expected to have limited adverse social and/or environmental impacts that can be readily addressed through mitigation measures; and
- Category C - Projects expected to have minimal or no adverse impacts, including certain financial intermediary projects.

Accordingly, projects such as this proposed powerline are categorised as Category B projects. The EIA Process for Category B projects examines the project's potential negative and positive environmental impacts. As required for Category B projects, a BA process is being undertaken for the proposed powerline project.

A.11 Listed Activities Associated with the Proposed Projects

Section 24(1) of the NEMA states: "*In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant environmental authorization*".

The reference to "listed activities" in Section 24 of the NEMA relates to the regulations promulgated in GN R326, R327, R325 and R324, dated 7 April 2017. The relevant GN published in terms of the NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a BA, or Scoping and EIA to be conducted. As noted previously, the proposed powerline project required a BA process to be undertaken in order to obtain EA.

All the listed activities triggered by the proposed powerline and therefore requiring Environmental Authorisation (EA) are included in the Application Form for EA that has been prepared and submitted to the DFFE with the Final BA Report. These listed activities are indicated in Table A.6 below.

Table A.6 provides a list of the applicable listed activities associated with the proposed project in terms of Listing Notice 1 (GN R 327), Listing Notice 2 (GN R325) and Listing Notice 3 (GN R324) in terms of the 2014 NEMA EIA Regulations (as amended).

Table A.6. Applicable Listed Activities for the Proposed Powerline Projects

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in GN R327 (Listing Notice (LN) 1) and GN R324 (LN 3) of the 2014 NEMA EIA Regulations, as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
LN 1 Activity 11 (i)	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.	<p>The proposed project will entail the construction of a 132 kV overhead transmission powerline connecting the proposed authorised Kwagga WEF 1 to the proposed authorised Eskom 132 kV Switching Substation.</p> <p>The proposed project will be constructed on adjoining farm portions located approximately 60 km south of Beaufort West within the Beaufort West and Prince Albert Local Municipalities, Western Cape Province and is therefore situated outside of the urban edge. This activity would therefore be triggered.</p>
LN 1 Activity 12 (ii) (a) (c)	The development of: (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed Kwagga Overhead Transmission Powerline projects will entail the construction of built infrastructure and structures for the 132 kV powerlines and are expected to exceed a footprint of 100 m ² and some may occur within small drainage features and within 32 m of the watercourses. This activity would therefore be triggered.
LN 1 Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 cubic metres from a watercourse.	<p>Based on the inputs provided by the aquatic- and terrestrial biodiversity specialists, several watercourses including the Swartbakens River, some of its associated tributaries and several drainage lines have been identified within the vicinity of the proposed powerline corridor. The Aquatic Impact Assessment further noted that the potential aquatic ecosystem impacts of the proposed powerline are likely to be very low in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.</p> <p>Existing tracks and roads will be used as far as possible to minimise any new</p>

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in GN R327 (Listing Notice (LN) 1) and GN R324 (LN 3) of the 2014 NEMA EIA Regulations, as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
		<p>impacts on these systems. However, the proposed project may entail the excavation, removal and moving of more than 10 m³ of soil, sand, pebbles or rock from nearby watercourses on site mainly for purposes of access roads to enable access to the powerline. As a result, the proposed project could potentially also entail the infilling of more than 10 m³ of material into watercourses crossed by access road.</p> <p>Details of the infilling of and excavations from the to be affected watercourses / drainage features will be confirmed during the detailed design phase prior to construction. This activity would therefore be triggered.</p>
LN 1 Activity 27	The clearance of an area of 1 hectare (ha) or more, but less than 20 ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed powerline will entail the construction of pylon foundations, and the installation and potential upgrade of electrical grid infrastructure such as feeder bays, busbars, etc. located at the proposed authorised substations, as discussed, that could have a total combined physical footprint of more than 1 ha which will require clearance of indigenous vegetation. This activity would therefore be triggered.
LN 3 Activity 4 (i) (ii)(aa)	The development of a road wider than 4 metres with a reserve less than 13,5 metres in the (i) Western Cape (ii) within areas outside urban areas and within (aa) areas containing indigenous vegetation.	Existing tracks and/or gravel roads will be used as far as possible to facilitate access to the powerline. However, a new service road/track underneath the proposed powerline with a width wider than 4 m with a reserve less than 13,5 m will be constructed where needed. The powerline servitude is located outside urban areas and mostly constitutes indigenous vegetation in the Western Cape Province. In addition, Critical Biodiversity Areas (CBAs) can be found within parts of the project corridor. This activity would therefore be triggered.

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in GN R327 (Listing Notice (LN) 1) and GN R324 (LN 3) of the 2014 NEMA EIA Regulations, as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
LN 3 Activity 12 (i) (ii)	The clearance of an area of 300 square metres or more of indigenous vegetation in the (i) Western Cape (ii) within critical biodiversity areas identified in bioregional plans.	In some areas, development of powerline infrastructure will require the clearance of more than 300 m ² of indigenous vegetation. The powerline servitude is located within the Western Cape Province and part of the project corridor contains Critical Biodiversity Areas (CBAs). This activity would therefore be triggered.
LN 3 Activity 14 (a)(c)(i)(i)(ff)	The development of infrastructure or structures with (ii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs (a) within a watercourse; and (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse in the (i) Western Cape (i) outside urban areas within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	The development of the overhead powerline infrastructure and associated access roads will have a physical footprint in excess of 10 m ² and will be located within the Western Cape Province, outside the urban edge. In addition, proposed development will be required within and adjacent to watercourses and will also traverse CBAs in certain places. This activity would therefore be triggered.
LN 3 Activity 18 (i)(ii)(aa)	The widening of a road by more than 4 metres and the lengthening of a road by more than 1 kilometre in the (i) Western Cape (ii) all areas outside urban areas (aa) areas containing indigenous vegetation.	Existing farm roads may require widening of up to 8 m and/or lengthening by more than 1 km, to accommodate construction vehicles, in areas containing indigenous vegetation. The widening of the roads will take place within the Western Cape Province, outside urban areas, and will require the clearance of indigenous vegetation. This activity would therefore be triggered.

A.12 National Web-Based Environmental Screening Tool

As noted above, GN 960 (dated 5 July 2019) published a notice of the requirement to submit a report generated by the National Web Based Environmental Screening Tool, in terms of Section 24(5)(h) of the NEMA and Regulation 16(1)(b)(v) of the 2014 NEMA EIA Regulations (as amended), when submitting an Application for EA in terms of Regulations 19 and 21 of the 2014 NEMA EIA Regulations (as amended). GN 960 came into effect for compulsory use of the National Web Based Environmental Screening Tool from 4 October 2019. As such, the Applications for EA for the proposed project has been run through the National Web Based Environmental Screening Tool, and the associated report generated and attached to the Application for EA.

Based on the selected classification, the National Web Based Environmental Screening Tool provides a list of specialist studies that should be undertaken as part of the BA process, as well as

identifies the sensitivities on site that need to be verified by either the EAP or the specialists, where relevant, as noted in the Assessment Protocols of 20 March 2020 (GN 320). The classification that applies to the proposed projects is Utilities Infrastructure; Electricity; Distribution and Transmission; Powerline.

The following list of Specialist Assessments have been identified by the National Web Based Environmental Screening Tool for inclusion in the BA Report (Table A.7). The National Web Based Environmental Screening Tool Report notes that it is the responsibility of the EAP to confirm this list and to motivate in the BA Report, the reason for not including any of the identified specialist studies.

Table A.7. List of Specialist Assessments identified by the Screening Tool

	Specialist Study Required by the Screening Tool	Assessment undertaken in BA	Type of Assessment undertaken in BA	Appendix of BA Report
1	Agriculture and Soils	Yes	Protocol GN 320 – Part B - Protocol for the specialist assessment and minimum report content requirements for environmental impacts on agricultural resources.: Compliance Statement	D.1
2	Landscape / Visual Impact Assessment	Yes	Protocol GN R320 – Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): Impact Assessment	D.2
3	Archaeological and Cultural Heritage Impact Assessment	Yes	Protocol GN R320 – Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): Impact Assessment An integrated Heritage Impact Assessment including Archaeology, Cultural Landscape and Palaeontology was undertaken.	D.3
4	Palaeontology Impact Assessment			
5	Terrestrial Biodiversity Impact Assessment	Yes	Protocol GN R320 – Part B – Terrestrial Biodiversity (Protocol for the specialist assessment and impacts on terrestrial biodiversity): Impact Assessment Species Protocol, Government Gazette 43855, GN R1150 (Protocol for the specialist assessment and impacts on terrestrial plant species and terrestrial animal species): Impact Assessment	D.4
6	Plant Species Assessment			
7	Animal Species Assessment			

	Specialist Required by the Screening Tool	Study by the	Assessment undertaken in BA	Type of Assessment undertaken in BA	Appendix of BA Report
				The Impact Assessment that was undertaken as part of this BA Process is referred to as a Terrestrial Biodiversity and Species Impact Assessment.	
8	Aquatic Biodiversity Impact Assessment		Yes	Protocol GN R320 – Part B – Aquatic Biodiversity (Protocol for the specialist assessment and impacts on aquatic biodiversity): Impact Assessment	D.5
9	Avifauna Impact Assessment		Yes	Protocol GN R320 – Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): Impact Assessment	D.6
10	Civil Aviation Assessment		Yes	Protocol GN R320 – Part B – Civil Aviation (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations): Site Sensitivity Verification (No further requirements for low sensitivity in terms of GN R320)	D.7
11	Defense Assessment		Yes	Protocol GN R320 – Part B - Defence (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on defence installations): Site Sensitivity Verification (No further requirements for low sensitivity in terms of GN R320)	D.8
12	Radio Frequency Interference Assessment (RFI)		No	Motivation was provided to DFFE not to undertake this specialist assessment. This motivation was discussed and approved by the DFFE at the pre-application meeting that took place on 18 May 2022. Refer to Section A.12.1 below for further clarification.	N/A

A.12.1 Square Kilometre Array and Radio Frequency Interference

In 2012, South Africa and eight (8) partner countries (Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia) were selected as the preferred site for hosting the Square Kilometre Array (SKA), the world's largest and most sensitive radio telescope. Five

countries submitted responded to an invitation to submit proposals to host the SKA in 2003. The original bid proposal was submitted and endorsed by South African Cabinet in 2003 in line with the national research and development strategy, published in 2002 and the Government's Astronomy Geographic Advantage Programme (AGA) ((DFFE, 2019: Part 3, Page 2).

The Astronomy Geographic Advantage (AGA) Act (Act 21 of 2007) aims to provide for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy; to provide for intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and to provide for matters connected therewith. The purpose of the AGA Act is to preserve the geographic advantage areas that attract investment in astronomy. The AGA Act also notes that declared astronomy advantage areas are to be protected and properly maintained in terms of Radio Frequency Interference (RFI). The AGA Act is administered by the Department of Higher Education, Science and Technology (previously the Department of Science and Technology).

According to the CSIR Wind and Solar Phase 2 SEA (DFFE, 2019: Part 3, Page 2), the majority of the mid-frequency dish array of the Square Kilometre Array (SKA) will be constructed in the core which is located in the Northern Cape; with dish antennas being located in the spiral arms. The South African component of the SKA will consist of approximately 3 000 receptors comprising dish antennas, each with a diameter of 15 m, and radio receptors known as dense aperture-arrays. The outer stations in the spiral arms will extend beyond the borders of South Africa and at least 3 000 km from the core area. About 80% of the receptors, including a dense core and up to 5 spiral arms, will be located in the Karoo Central Astronomy Advantage Area (KCAAA) (DFFE, 2019: Part 3, Page 2).

The KCAAA, which is located between Brandvlei, Van Wyksvlei, Carnarvon and Williston in the Northern Cape Province, was officially declared in 2014 by the Minister of Science and Technology in terms of the AGA Act for the purposes of protection RFI and Electromagnetic Interference (EMI). The declaration of the KCAAA ensures the long-term viability of the area to be used for astronomical installations (DFFE, 2019: Part 3, Page 2).

Table A.8. SKA sensitivity distance guidelines (Source: DFFE, 2019: Part 3, Page 2)

Colour	Sensitivity	Distance from SKA Facility	
		Wind	Other Solar PV
Dark Red	Very High	Less than 18 km	Less than 8 km
Red	High	Between 18 and 26 km	Between 8 and 14 km
Orange	Medium	Between 26 and 48 km	Between 14 and 32 km
Green	Low	Greater than 48 km	Greater than 32 km

The location of the proposed powerline project does not pose an EMI or RFI risk to the SKA, as the proposed project is located outside of the Northern Cape as well as the KCAAA. Refer to Figure A.3 for the location of the proposed project in relation to the SKA and KCAAA. Furthermore, the proposed project powerline corridor falls within an area of low sensitivity in terms of SKA sensitivity for the development of electricity generation and transmission (Table A.8).

During the pre-application consultation undertaken with DFFE on 18 May 2022, it was explained that it is not intended to commission a RFI study for the proposed project due to (i) the location of

the proposed project being entirely within the Western Cape and far away from the SKA and KCAA; (ii) the findings of the Screening Tool; (iii) the findings of the Wind and Solar Phase 1 SEA (DEA, 2015) and (iv) the Wind and Solar Phase 2 SEA (DFFE, 2019).

Also, the South African Radio Astronomy Observatory (SARAO) is registered on the project I&AP database as a key stakeholder and was informed of the availability of the Draft BA Report for a 30-day comment period. Proof of correspondence sent to SARAO has been included in Appendix E.10 of this Final BA Report.

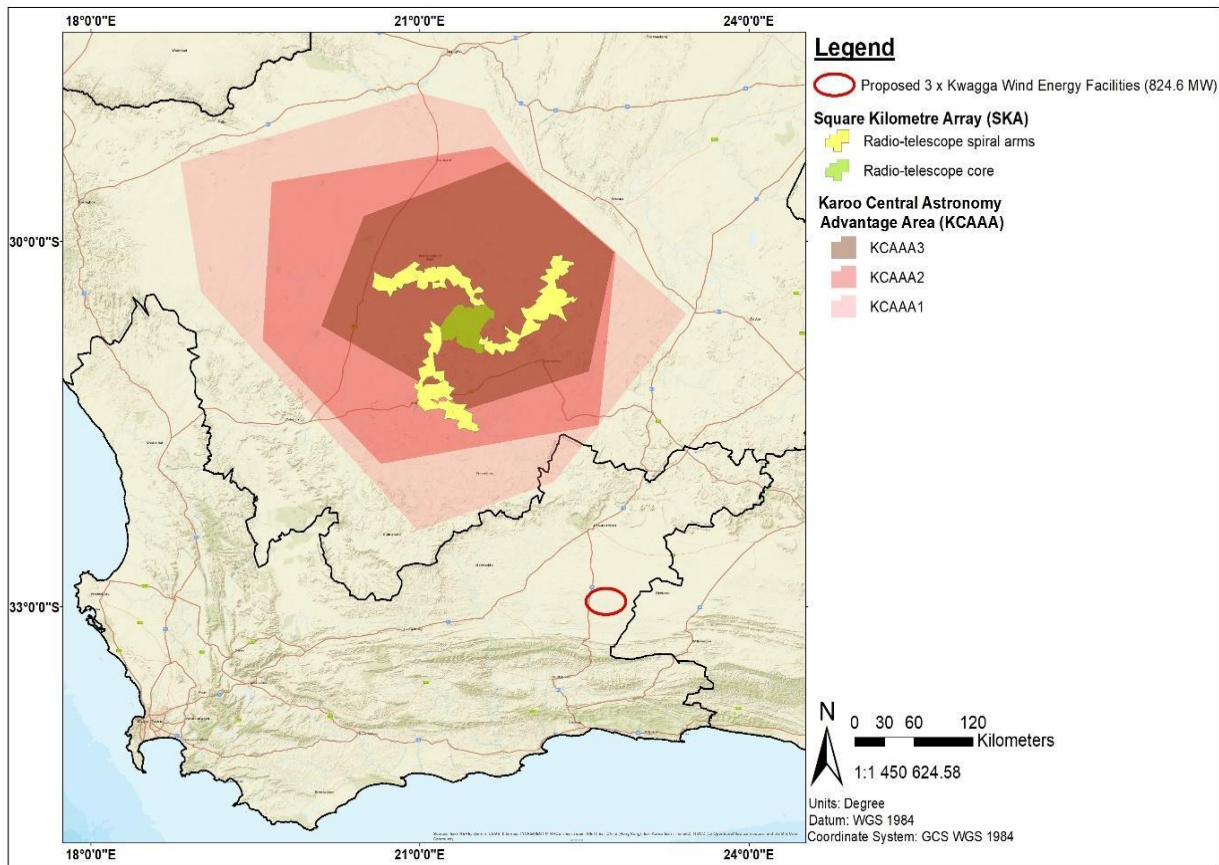


Figure A.3. Location of the proposed projects in relation to the SKA and KCAA

A.13 Description of Alternatives

This section discusses the alternatives that have been considered as part of the BA process. Sections 24(4) (b) (i) and 24(4A) of the NEMA require an Environmental Assessment to include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24O (1)(b)(iv) also requires that the Competent Authority, when considering an application for EA, takes into account “where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment”.

Therefore, the assessment of alternatives should, as a minimum, include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and

- Providing a methodology for the elimination of an alternative.

The 2014 NEMA EIA Regulations (as amended) defines alternatives, in relation to a proposed activity, as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity;
- operational aspects of the activity; or
- and includes the option of not implementing the activity”.

Regulation 2 (e) of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) states that one of the objectives of the BA process is to, through a consultative process, and 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 (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

A.13.1 No-go Alternative

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not developing the proposed 132 kV overhead transmission powerline and its associated infrastructure. This alternative would result in no environmental impacts on the site or surrounding local area as a result of the proposed powerline project. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

The following implications will occur if the “no-go” alternative is implemented (i.e. the proposed project does not proceed):

- No benefits will be derived from the implementation of an additional land-use;
- No additional power will be supplied through means of renewable energy resources by this project at this location;
- The “no-go” alternative will not contribute to and assist the government in achieving its renewable energy target of 26 630 MW total installed capacity by 2030 (for Wind, Solar PV and Concentrated Solar Power);
- Electricity generation on the proposed development site will remain at zero and as a result the local economy will not be diversified, while existing electricity generation sources nationally will age and degrade over time, with maintenance requirements potentially leading to outages;
- There will be lost opportunity for skills transfer and education/training of local communities;
- The positive socio-economic impacts likely to result from the project such as increased local spending and the creation of local employment opportunities will not be realised;
- There will be no opportunity for additional employment in an area, where job creation is identified as a key priority; and
- The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realised.

Converse to the above, the following benefits could occur if the “no-go” alternative is implemented:

- No biodiversity (fauna and flora) will be removed or disturbed during the development of this proposed powerline;
- No aquatic resources will be impacted upon during the construction of the proposed powerline and associated infrastructure;
- No avifaunal impacts will occur due to the establishment of the project;
- No change to the current landscape will occur – the visual character of the area will remain unchanged; and
- No heritage artefacts or palaeontological resources will be impacted on.

The no-go alternative would result in the Kwagga WEF 2 and Kwagga WEF 3 not being able to supply the national electrical grid network, therefore no further addition of renewable energy and thus continued reliance on fossil fuels that will continue to have a negative environmental impact. While the no-go alternative i.e. not developing the proposed powerline will not result in any negative environmental impacts in the area, it will also not have any positive community development or socio-economic benefits. In addition, it will not assist government in addressing climate change, reaching its set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. **Hence, the no-go alternative is not the preferred alternative.**

A.13.2 Type of Activity Alternatives

In terms of the type of activity, this relates to the distribution and transmission of electricity generated from a renewable energy source, and in this particular case, from wind. As indicated in Section A.2 of this BA Report, the South African subsidiary of ABO Wind focuses on solar, wind and biogas technologies and works with landowners, technology providers, regulators and investors to source and develop renewable energy projects. The proposed powerline will facilitate the connection of the Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) to the national grid network, via Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), the Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1), the Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1) and the existing Droërvier–Proteus 400 kV line. **Therefore, no other activity types were considered or deemed appropriate.**

A.13.3 Technology Alternatives

No technology alternatives exist to date for the distribution and transmission of electricity from renewable energy sources to grid networks. **Therefore, no technology alternatives have been considered or assessed as part of this BA process**

A.13.4 Site Alternatives

The powerline corridor is located approximately 60 km south from the town of Beaufort West in the Western Cape Province. The powerline corridor traverses the Beaufort West and Prince Albert Local Municipalities that are located within the Central Karoo District Municipality. Section 5 of the proposed Kwagga 132 kV powerline servitude (the subject of this BA Report) is located on the following farm portions;

- Portion 3 of the Farm Tyger Poort No. 376 (Surveyor General 21 Digit Code: C00900000000037600003);
- Remainder of the Farm Wolve Kraal No. 17 (Surveyor General 21 Digit Code: C0610000000001700000); and
- Remainder of the Farm Dwaalfontein No. 379 (Surveyor General 21 Digit Code: C00900000000037900000).

As discussed in Section A.1 above, the proposed powerline will facilitate the connection of the Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) to the national grid network, via the Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), the proposed authorised Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1) and the proposed authorised Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1) into the existing Droërvier–Proteus 400 kV line. The proposed authorised Kwagga WEF 2 and Kwagga WEF 3 form part of a cluster of three WEFs which were proposed by the Project Applicant, ABO Wind and which have been granted EA from the National DFFE on 7 April 2022.

The main determining points for ABO Wind was to find suitable, developable land in one contiguous block to optimise design, minimise costs, and minimise sprawling development and impact footprints. In addition, the proximity to the Eskom 132 kV Switching Substation, the Beaufort West 132 kV-400 kV Linking Station and the existing Droërvier–Proteus 400 kV line, as well as sufficient wind resource were major determinants for identifying a suitable site for the development of the proposed authorised WEF.

Therefore, considering the primary function of the proposed powerline (i.e. to facilitate the connection of the Kwagga WEF 2 and Kwagga WEF 3, via the authorised locations of the on-site substations at the Kwagga WEF 1 and the Kwagga WEF 2 sites, no other site alternatives were considered as part of this BA process.

A.13.5 Development Footprint Location and Layout Alternatives

As an initial step, the Project Applicant consulted the National Web-Based Environmental Screening Tool (<https://screening.environment.gov.za/screeningtool/#/pages/welcome>) to determine a baseline description of the prevalent environmental sensitivities within the proposed project study area. Subsequent consultation with the affected landowners was then also undertaken in order to identify possible areas within the proposed project study area that should be excluded from development. This then guided the selection of the best suitable developable footprint i.e. powerline corridor to be assessed by the specialists from an environmental sensitivities and practical/technical perspective. The powerline corridor that was subjected to specialist assessment for purposes of this BA process comprises the aforementioned affected farm portions (see Section A.6), which covers approximately 450 ha in total.

The main project components are the monopole pylons with a height of up to 30 m, which inform the layout of associated infrastructure such as roads and construction compound and laydown areas. Detailed consideration was given to selecting areas that would be suitable for the project infrastructure.

Detailed specialist assessment of the powerline corridor through desktop-based analysis and fieldwork methodologies (where required) resulted in the verification of environmental sensitivities

present on site. Specialists assessed a corridor of approximately 300 m wide for the portion of the proposed powerline route that traverses the proposed Kwagga WEF 1-3 project sites, and an approximately 500 m wide corridor for the proposed powerline route that traverses the neighbouring Mainstream Beaufort West and Trakas Wind Farm project sites (i.e. a corridor of approximately 450 ha which is approximately 5.1% of the total study area). The registered servitude for the proposed overhead transmission powerline will be up to 50 m wide, or where multiple adjacent powerlines occur, in line with the Eskom Distribution Guide Part 19: Building Line Restrictions, Servitude Widths, Line Separations and Clearances from Power Lines (dated 2011).

Findings from the specialist assessments were investigated for purposes of identifying whether the proposed powerline route intersected sensitive features. This investigation confirmed that the proposed powerline route avoids (where possible) the most sensitive features that were identified by the specialists within the original assessed study area. The specialists have, based on their impact assessment of the proposed development footprint of the proposed project refined their sensitivity mapping of the proposed project layout with recommendations regarding micro siting and selection of infrastructure location alternatives, as well as required mitigation measures and management actions.

Based on the findings of the specialist studies, a combined environmental sensitivity map showing the project layout and combined environmental sensitivity map has been produced and is included in Section D as well as Appendix B of this BA Report. This map shows the sensitivities on site (e.g. terrestrial ecology, watercourse features, and sensitive heritage features, etc.) within the identified and assessed powerline corridor. The combined sensitivity map therefore indicates that the inherent sensitivity of the preferred powerline route is generally medium to low and is therefore more than suited for the development of the proposed powerline project given that all measures be taken to avoid, manage or mitigate potential impacts that may be imposed by the proposed development.

The sensitive environmental features found within the powerline corridor, as described in the specialist studies (Appendix D) and discussed in Sections B and D of this BA Report, are able to be avoided by the location, layout and design of the proposed powerline project. Therefore, following the exclusion of the sensitive areas, sufficient developable area is still available within the powerline corridor which does not compromise the current ecological integrity of the site or go against the requirements of the landowners.

A.13.6 Concluding Statement for Alternatives

The following alternatives were considered in the BA process:

- **No-go Alternative:**

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed 132 kV powerline. The no-go alternative would result in the Kwagga WEFs 2-3 not being able to supply the national grid network which therefore means no addition of renewable energy and further reliance on fossil fuels that will continue to have a negative environmental impact. While the no-go alternative i.e. not developing the proposed powerline will not result in any negative environmental impacts in the area, it will also not have any positive community development or socio-economic benefits. In addition, it will not assist government in addressing climate change, reaching its set targets for renewable energy, nor will it assist in

supplying the increasing electricity demand within the country. **Hence, the no-go alternative is not the preferred alternative.**

▪ **Type of Activity**

This relates to the distribution and transmission of electricity generated from a renewable energy source, and in this particular case, from wind resource. The distribution and transmission electricity generated from a renewable energy source was the only activity considered by the Project Applicant, and thus considered in this BA Report. No other activity types were considered or deemed appropriate based on the expertise of the Project Applicant and the context of the Kwagga WEFs.

▪ **Technology Alternatives:**

No technology alternatives exist to date for the distribution and transmission of electricity from renewable energy sources to electrical grid networks. Therefore, no technology alternatives have been considered or assessed as part of this BA process.

▪ **Preferred Site and Development Footprint within the Site:**

The proposed powerline will traverse the following farm portions:

- Portion 3 of the Farm Tyger Poort No. 376 (Surveyor General 21 Digit Code: C00900000000037600003);
- Remainder of the Farm Wolve Kraal No. 17 (Surveyor General 21 Digit Code: C0610000000001700000); and
- Remainder of the Farm Dwaalfontein No. 379 (Surveyor General 21 Digit Code: C00900000000037900000).

The development footprint of the preferred powerline routing within the assessed corridor was determined through a screening exercise of the project study area by the specialist team (Site Sensitivity Verifications Reports were provided by specialists) as well as through consultation with the affected landowners to identify sensitive areas that should preferably be avoided and thus are excluded from development (i.e. 'no-go' areas). The proposed development footprint of the entire Kwagga powerline corridor will comprise approximately 450 ha.

Given the proposed powerline route is dependent on the location of the proposed authorised Kwagga WEF 1 and Kwagga WEF 2 on-site substations, as well as the suitability of the land available on the aforementioned affected farm portions and that fact that no initial fatal flaws being present, **no other site alternatives were considered as part of the BA Process.**

▪ **Location and Layout Alternatives:**

Specialists have assessed a corridor of approximately 300 m wide across the portion of the proposed powerline route corridor that traverses the proposed authorised Kwagga WEFs project site, and an approximately 500 m wide corridor for the proposed powerline route corridor that traverses the neighbouring Mainstream Beaufort West and Trakas Wind Farm project sites (i.e. a corridor comprising a total of approximately 450 ha). However, the registered servitude for the proposed powerline will be up to 50 m wide, or where multiple adjacent powerlines occur, in line with the Eskom Distribution Guide Part 19: Building Line Restrictions, Servitude Widths, Line

Separations and Clearances from Power Lines. Based on the specialists' inputs, the preferred powerline route as proposed does not require revision to avoid environmentally sensitive areas (specifically any no-go areas), while still retaining technical and financial viability, as well as the requirements of landowners (as applicable). The current proposed layout is the preferred layout that was assessed by all the specialists on the project team (Appendix C and D of this BA Report).

▪ **Summary Statement:**

Based on the aforementioned, the preferred activity is the development of a 132 kV overhead transmission powerline to facilitate the connection of the Kwagga WEF 2 and Kwagga WEF 3 to the national electrical grid network. The abovementioned farm portions comprise the preferred project site and the preferred routing of the powerline within the assessed corridor is largely dependent on the location of the proposed authorised Kwagga WEFs 2-3 on-site substations. The location and layout of the preferred activity have also been informed by the outcomes of the specialist assessments and technical feasibility, as well as landowner requirements. The preferred layout is further discussed in Section D of this BA Report.

A.14 Need and Desirability

It is an important requirement in the BA Process to review the need and desirability of the proposed project. Guidelines on Need and Desirability were published by the DEA (now operating as the DFFE) in 2017⁹. These guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. Need and desirability answer the question of whether the activity is being proposed at the right time and in the right place.

Table A.9 includes a list of questions based on the DFFE's Guideline to determine the need and desirability of the proposed project. It should be noted this table was informed by the outcomes of this BA Process.

Table A.9. The Guideline on the Need and Desirability's list of questions to determine the "Need and Desirability" of a proposed project

NEED	
Question	Response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	
1.1. How were the following ecological integrity considerations taken into account?:	The environmental sensitivities, in particular the aquatic and terrestrial biodiversity and ecological sensitivities present on site were assessed in detail within the Aquatic and Terrestrial Biodiversity and Species Impact Assessments. Please refer to Appendix D.4 and D.5 of this BA Report.
1.1.1. Threatened Ecosystems,	
1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific	
	The specialists have identified all aquatic and terrestrial biodiversity sensitive areas on site that

⁹ DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa. ISBN: 978-0-9802694-4-4

NEED	
Question	Response
<p>attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure,</p> <p>1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),</p> <p>1.1.4. Conservation targets,</p> <p>1.1.5. Ecological drivers of the ecosystem,</p> <p>1.1.6. Environmental Management Framework,</p> <p>1.1.7. Spatial Development Framework, and</p> <p>1.1.8 Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).</p>	<p>should be avoided by the proposed development, as well as any other ecologically sensitive areas and how to suitably develop within these areas so that the ecological integrity of the areas is maintained.</p> <p>It is noted that the majority of the proposed powerline corridor has been identified as Other Natural Areas (ONAs) i.e. areas not required to meet biodiversity targets. The corridor is traversed by smaller water courses which are mapped as Aquatic ESAs that are not essential for meeting biodiversity targets, but that play an important role in delivering ecosystem services.</p> <p>Due to the fact that the watercourses in the study area are non-perennial and are dry for large parts of the year, no indigenous fishes occur within the rivers and the amphibian diversity within the study area is likely to be relatively low. No species of conservation concern are known to occur in the study area from an aquatic perspective.</p> <p>It is the specialists' opinion that the potential aquatic ecosystem impacts of the proposed powerline are likely to be very low in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.</p>
<p>1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>Detailed Aquatic and Terrestrial Biodiversity and Species Impact Assessments were undertaken and are included in Appendix D.4 and D.5 of this BA Report.</p> <p>Based on the screening, assessment and fine scale mapping that was done for the site, the specialists confirmed that the site falls mostly within ONAs with small parts of the larger tributaries identified as CBAs, and with several of the smaller watercourses as ESAs. The Aquatic and Terrestrial Biodiversity and Species specialists have also identified all ecological sensitive areas including appropriate buffer zones on site that should be avoided by the proposed development and propose mitigation measures to reduce or minimise impacts to ensure that the ecological integrity of the areas is maintained. The combined environmental sensitivity map is included in Section D of this BA Report.</p> <p>Based on these findings, it is the specialists' opinion that the potential aquatic ecosystem impacts of the proposed powerline are likely to be very low in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.</p>

NEED	
Question	Response
	Measures to avoid, remedy, mitigate and manage impacts are included in the Environmental Management Programme (EMPr) that was compiled and included within appendix G of this BA Report.
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Measures to avoid, remedy, mitigate or manage biophysical impacts are included in the EMPr. The EMPr is included within Appendix G of this BA Report.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether; what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will mostly be generated during the construction and decommissioning phases of the project. Measures to avoid, remedy, mitigate or manage waste are included within the EMPr. The EMPr is included within Appendix G of this BA Report. Waste generated on site will be disposed of at a licenced landfill site.
1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	An integrated Heritage Impact Assessment (HIA) was undertaken to assess potential archaeological, palaeontological and cultural impacts resulting from the proposed development. Please refer to Appendix D.3 of this BA Report for the full HIA. The HIA concluded that all known significant heritage resources (aside from the visual landscape) have been avoided by the proposed powerline corridor. As per the requirements of the HWC, the integrated HIA was submitted to HWC and released to registered conservation bodies and the relevant local municipalities for a 30-days comment period (see Appendix E.8 and E.9).
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Measures to avoid, remedy, mitigate or manage biophysical impacts are included in the EMPr. The EMPr is included within Appendix G of this BA Report.
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What	South Africa has heavily relied on coal as a source of electricity for decades. Due to the nature of coal as a non-renewable resource that causes major environmental degradation, there is therefore a need to identify alternative resources that could promote sustainable energy sources as well as cleaner energy production mechanisms. The proposed projects aim

NEED	
Question	Response
<p>measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</p> <p>1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. dematerialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</p> <p>1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources of the proposed development alternative?)</p> <p>1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?</p>	<p>to facilitate the connection of the authorised Kwagga WEF 1-3 to the national electrical grid network. This project is seen as supporting a source of 'clean energy' and therefore reduces the dependence on non-renewable sources.</p> <p>The proposed project is a sustainable option for the area and the final proposed powerline corridor will avoid all areas of high and very high environmental sensitivity. Where impacts to medium sensitivity areas cannot be avoided, potential impacts to the receiving environment will be appropriately minimised, mitigated or managed.</p>
<p>1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts?</p> <p>1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</p> <p>1.8.2. What is the level of risk associated with the limits of current knowledge?</p> <p>1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</p>	<p>The precautionary approach has been adopted for this study, i.e. assuming the worst-case scenario will occur and then identifying ways to mitigate or manage these impacts.</p> <p>A corridor of approximately 300 m wide corridor for the portion of the proposed powerline route that traverse the proposed Kwagga WEFs project sites, and an approximately 500 m wide corridor for the proposed powerline route that traverse the neighbouring Mainstream Beaufort West and Trakas Wind Farm project sites (i.e. a corridor of approximately 450 ha). However, the registered servitude for proposed powerline will be up to 50 m wide (i.e., approximately 155 ha), or where multiple adjacent powerlines occur, in line with the Eskom Distribution Guide Part 19: Building Line Restrictions, Servitude Widths, Line Separations and Clearances from Power Lines.</p>

NEED	
Question	Response
	Current gaps in knowledge include confirmation of the exact placement of the powerline route within the 50 m corridor. Ways in which these gaps are addressed are to consider the worst-case scenarios as noted above in terms of the width of the corridor assessed. Please refer to Section A.1 and A.7 for the specific project description and proposed powerline corridor that was assessed.
<p>1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following:</p> <p>1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</p> <p>1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</p>	<p>Detailed Socio-Economic Impact Assessments were conducted as part of the S&EIA Processes undertaken for the proposed Kwagga WEFs 1-3 during 2021. Linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area were considered as part of the Socio-Economic Impact Assessment.</p> <p>The assessments concluded that the proposed Kwagga WEFs 1-3 projects have acceptable socio-economic impacts and desirable benefits related to economic growth and employment, financial contributions to and upliftment of HDIs in rural local communities and increased, more secure power generation (reducing the probability of load shedding and the many socio-economic costs of such outages). This subsequently contributes to improved service delivery and socio-economic development. As discussed throughout Section A, the proposed 132 kV powerline projects (subject of this BA Report) will facilitate the connection of the authorised Kwagga WEFs to the national grid via the Eskom 132 kV Switching Substation, the Beaufort West 132kV-400kV Linking Station, and the existing Droërivier–Proteus 400 kV overhead powerline.</p> <p>The proposed powerline will therefore contribute toward the realisation of the socio-economic benefits identified during the detailed Socio-Economic Impact Assessment that was conducted for the Kwagga WEFs.</p>
<p>1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?</p>	<p>The proposed powerline will therefore contribute toward the realisation of the socio-economic benefits identified during the detailed Socio-Economic Impact Assessment that was conducted for the Kwagga WEFs.</p>
<p>1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?</p>	<p>The impacts on ecological integrity objectives of the area were considered as part of the Aquatic and Terrestrial Biodiversity and Species Impact Assessments undertaken for this project and have been included in Appendix D.4 and D.5 of this BA Report.</p>
<p>1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?</p>	<p>Please refer to Section A.13 of this BA Report where the preferred alternatives considered as part of this BA Process are discussed.</p>

NEED	
Question	Response
1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Each specialist assessment has taken into consideration and has assessed the potential cumulative impacts of this proposed development. Please refer to Appendix D and Section D of this BA Report where the potential cumulative impacts are discussed for this project.
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:	
2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	<p>The proposed powerline is located in the Beaufort West Local Municipality (BWLM), and the Prince Albert Local Municipality (PALM).</p> <p>Both the PALM and the BWLM Integrated Development Plans (IDP) (2017-2022), recognises renewable energy projects as potential sustainable economic development opportunities. The proposed powerlines will facilitate the connection of the authorised Kwagga WEF 1-3 to the national energy grid therefore the project will also be in line with the vision of the PALM and the BWLM to diversify the job market by creating and supporting sustainable economic growth and development opportunities.</p> <p>One of the economic priority issues identified within the PALM and BWLM IDPs (2017-2022) is the fairly high level of unemployment. The IDPs identifies low economic growth as one of the main reasons for the lack of new labour entrants into the economy. Although the BWLM has experienced a slight increase in average growth in employment across all labour cohorts, between 2013 and 2017 (1.4%), the unemployment rate of 26.2% is significantly higher than the provincial average unemployment rate (18.2%) (Quantec Research Data, 2018; BWLM IDP, 2019/2020).</p> <p>The PALM's unemployment rate of 20.3% in 2017 was lower than that of the Central Karoo District Municipality (CKDM) but higher than the provincial average unemployment rate (18.2%). Most jobs in the PALM (55.2%) are within the tertiary sector, followed by the primary (37.0%) and secondary (7.8%) sectors (MERO, 2018). Despite the relatively high rate of employment, the per capita income in the PALM was lowest of all local municipalities within the CKDM, and has increased by 2% between 2011 and 2012 and by only 1% between 2012 and 2013. During 2016, a high level of income equality was identified in Ward 2 (i.e. in which the powerline is located) (StatsSA, 2016).</p> <p>The proposed project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE).</p> <p>Therefore, the proposed project would help to address the need for increased electricity supply to the national grid while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in</p>

NEED	
Question	Response
	the area. The proposed project will therefore be supportive of the IDP's objective of facilitating job creation to address the high unemployment rate.
2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	This is not applicable as the proposed project is located within a rural area and the site is zoned for agricultural use.
2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.)	<p>As indicated above, the current land use on the proposed site is agriculture, predominantly livestock farming.</p> <p>The impact of the proposed project on cultural or heritage areas (including archaeology and palaeontology) was assessed as part of the HIA in the BA Process. Please refer to Appendix D.3 Report of this BA Report for the full integrated HIA.</p> <p>Should the proposed projects proceed, no average less than 2 % of the total farming area that constitutes the properties relevant to the proposed powerlines will be developed on and it is not expected that this will significantly threaten the agricultural activities present on site. It is also the Agricultural specialist's opinion that the agricultural impact (loss of future agricultural production potential) resulting from the proposed powerline power lines is totally insignificant in the context of the agricultural environment. This is because an insignificantly small amount of land will be excluded from agricultural production and that land has very limited production potential. An Agricultural Compliance Statement is included in Appendix D.1 of this BA Report to reflect the impact of the proposed project in terms of the land capability and agricultural potential.</p> <p>As noted, an EMPr was compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced. The EMPr has been included in Appendix G of this BA Report. The impact on the sense of place is difficult to predict and would potentially be ambiguous. This is due to the subjective nature of perceptions regarding the relative attraction or disturbance of the powerline in a rural landscape. The visual impact and considerations have been further assessed as part of the Visual Impact Assessment and is included in Appendix D.2 of this BA Report. The preliminary environmental sensitivity data received in addition to the refined environmental sensitivity data received from the specialists was used to ensure that sensitive</p>

NEED	
Question	Response
	features have been identified and avoided by the project layout, as best as possible.
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	This was not available for the municipalities affected by the proposed development.
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposed powerline is located in the Beaufort West Local Municipality (BWLM), and the Prince Albert Local Municipality (PALM).
2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	<p>Both the PALM and the BWLM Integrated Development Plans (IDP) (2017-2022), recognises renewable energy projects as potential sustainable economic development opportunities. The proposed powerlines will facilitate the connection of the authorised Kwagga WEF 1-3 to the national energy grid therefore the project will also be in line with the vision of the PALM and the BWLM to diversify the job market by creating and supporting sustainable economic growth and development opportunities.</p> <p>One of the economic priority issues identified within the PALM and BWLM IDPs (2017-2022) is the fairly high level of unemployment. The IDPs identifies low economic growth as one of the main reasons for the lack of new labour entrants into the economy. Although the BWLM has experienced a slight increase in average growth in employment across all labour cohorts, between 2013 and 2017 (1.4%), the unemployment rate of 26.2% is significantly higher than the provincial average unemployment rate (18.2%) (Quantec Research Data, 2018; BWLM IDP, 2019/2020).</p> <p>The PALM's unemployment rate of 20.3% in 2017 was lower than that of the Central Karoo District Municipality (CKDM) but higher than the provincial average unemployment rate (18.2%). Most jobs in the PALM (55.2%) are within the tertiary sector, followed by the primary (37.0%) and secondary (7.8%) sectors (MERO, 2018). Despite the relatively high rate of employment, the per capita income in the PALM was lowest of all local municipalities within the CKDM, and has increased by 2% between 2011 and 2012 and by only 1% between 2012 and 2013. During 2016, a high level of income equality was identified in Ward 2 (i.e. in which some of the powerlines are located) (StatsSA, 2016).</p> <p>The proposed project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE).</p> <p>Therefore, the proposed project would help to address the need for increased electricity supply to the national grid while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area. The proposed project will therefore be</p>

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Question	Response
	supportive of the IDP's objective of facilitating job creation to address the high unemployment rate.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	<p>The needs and interests of the relevant communities were addressed in a detailed Socio-Economic Impact Assessment that was undertaken as part of the S&EIA Processes for the authorised Kwagga WEFs. The proposed powerlines traverse the authorised Kwagga WEF sites as it will facilitate the connection of the Kwagga WEF 1-3 to the national grid. Therefore, the proposed powerline will contribute toward addressing the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities by aiding the functioning of the Kwagga WEFs should construction materialize.</p> <p>It is important to note that a socio-economic impact assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects.</p>
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term? Will the impact be socially and economically sustainable in the short- and long-term?	<p>The equitable (intra- and inter-generational) impact distribution, in the short- and long term and economical sustainability was addressed in a detailed Socio-Economic Impact Assessment that was undertaken as part of the S&EIA Processes for the authorised Kwagga WEFs. The proposed powerlines traverse the authorised Kwagga WEF sites as it will facilitate the connection of the Kwagga WEF 1-3 to the national grid. Therefore, the proposed powerline will contribute toward addressing the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities by aiding the functioning of the Kwagga WEFs should construction materialize.</p> <p>It is important to note that a socio-economic impact assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects.</p>
2.5. In terms of location, describe how the placement of the proposed development will:	
2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Local employment opportunities will be provided as far as possible. Where possible, the construction of the powerlines will utilise contractors who employ labourers from the local community and therefore encourage socio-economic development at a local scale, as is encouraged under the REIPPPP.
2.5.2. reduce the need for transport of people and goods,	This is not applicable as the proposed project is located within a remote rural area and the development site is zoned for agricultural use. In addition, this project is proposed for the distribution

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Question	Response
	and transmission of electricity generated from a renewable energy facility.
2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	This is not applicable as the proposed project is located within a remote rural area and the site is zoned for agricultural use. In addition, this project is proposed for the distribution and transmission of electricity generated from a renewable energy facility.
2.5.4. compliment other uses in the area,	An Agricultural Compliance Statement is included in Appendix D.1 of this BA Report to reflect the impact of the proposed project in terms of the land capability and agricultural potential. The Agricultural Compliance Statement concludes that the agricultural impact (loss of future agricultural production potential) resulting from the proposed powerline power line is totally insignificant in the context of the agricultural environment. This is because an insignificantly small amount of land will be excluded from agricultural production and that land has very limited production potential. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is very low, the proposed development poses a very low risk in terms of causing soil degradation, and the development offers some positive impact on agriculture as well as wider, societal benefits.
2.5.5. be in line with the planning for the area,	
2.5.6. for urban related development, make use of the underutilised land available with the urban edge,	This is not applicable as the proposed project is located within a remote rural area and the site is zoned for agricultural use.
2.5.7. optimise the use of existing resources and infrastructure,	<p>It is anticipated that the electricity generated from the proposed Kwagga WEFs (DFFE Ref: 14-12-16-3-3-2-2070/71/72) will be evacuated into the existing Droërvier–Proteus 400 kV line that runs parallel to the N12 in a north-south direction via 132 kV overhead transmission powerlines. Connection to the existing Droërvier–Proteus 400 kV line will take place via the proposed Eskom 132 kV Switching Substation (DFFE Ref: 14-12-16-3-3-1-2465/AM1) and the proposed Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1).</p> <p>It is understood that the proposed Eskom 132 kV Switching Substation and the proposed Beaufort West 132 kV-400 kV Linking Station will be constructed by South Africa Mainstream Renewable Power Developments (Pty) Ltd (“Mainstream”) in support of their Beaufort West and Trakas WEFs that are to be located on land directly adjacent to the proposed Kwagga WEFs. ABO Wind has a servitude agreement and relevant powers of attorney with the landowner of the relevant Beaufort West and Trakas WEFs affected land portions and obtained agreement</p>

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Question	Response
	<p>with Mainstream to facilitate the connection of the proposed Kwagga WEFs 1-3 via 132 kV overhead powerlines, via the aforementioned Eskom Switching Substation and the Beaufort West 132kV-400kV Linking Station, to the existing Droërivier–Proteus 400 kV overhead powerline.</p> <p>Both the Beaufort West WEF (DFFE Ref: 12-12-20-1784-1-AM2) and the Trakas WEF (DFFE Ref: 12-12-20-1784-2-AM2), and their supporting powerline and substation infrastructure [Beaufort West 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-1) and Trakas 132 kV-400 kV Linking Station, 132 kV Powerline and onsite 132 kV Substation (DFFE Ref: 14-12-16-3-3-2-925-2)], collectively referred to as “the Beaufort West Cluster”, have all received EA and were successful bidders in Round 5 of the Renewable Energy Independent Power Producer Programme (REIPPPP).</p>
<p>2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),</p>	<p>The project is proposed for the distribution and transmission of electricity generated from a renewable energy facility and is not related to bulk infrastructure expansion.</p>
<p>2.5.9. discourage "urban sprawl" and contribute to compaction/densification,</p>	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes. The proposed powerlines will be located within the footprint of the authorised Kwagga WEF 1-3. The remaining portion of the proposed powerlines will traverse the neighbouring Beaufort West and Trakas WEFs which have been granted EA by the DFFE. Considering that the proposed powerline development will traverse WEF sites which have been authorised by the DFFE it is understood that the powerlines will not contribute to urban sprawl.</p>
<p>2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</p>	<p>This is not applicable as the proposed project is located within a remote rural area and the site is zoned for agricultural use.</p>
<p>2.5.11. encourage environmentally sustainable land development practices and processes,</p>	<p>The proposed powerlines will facilitate the connection of three renewable energy facilities. Such a facility is a sustainable land development practice provided it is constructed and operated in an environmentally friendly manner. The proposed overhead powerline pylons (monopoles) have an extremely small footprint and are therefore considered as environmentally sustainable land development practices.</p>

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Question	Response
<p>2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),</p>	<p>Please refer to Section A.13 of this BA Report for a description of the process undertaken to identify the site as a preferred site for the proposed powerline.</p>
<p>2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),</p>	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes.</p> <p>The proposed powerlines are located in the Beaufort West Local Municipality (BWLM), and the Prince Albert Local Municipality (PALM).</p> <p>Both the PALM and the BWLM Integrated Development Plans (IDP) (2017-2022), recognises renewable energy projects as potential sustainable economic development opportunities. The proposed powerlines will facilitate the connection of the authorised Kwagga WEFs to the national energy grid therefore the project will also be in line with the vision of the PALM and the BWLM to diversify the job market by creating and supporting sustainable economic growth and development opportunities.</p> <p>One of the economic priority issues identified within the PALM and BWLM IDPs (2017-2022) is the fairly high level of unemployment. The IDPs identifies low economic growth as one of the main reasons for the lack of new labour entrants into the economy. Although the BWLM has experienced a slight increase in average growth in employment across all labour cohorts, between 2013 and 2017 (1.4%), the unemployment rate of 26.2% is significantly higher than the provincial average unemployment rate (18.2%) (Quantec Research Data, 2018; BWLM IDP, 2019/2020).</p> <p>The PALM's unemployment rate of 20.3% in 2017 was lower than that of the Central Karoo District Municipality (CKDM) but higher than the provincial average unemployment rate (18.2%). Most jobs in the PALM (55.2%) are within the tertiary sector, followed by the primary (37.0%) and secondary (7.8%) sectors (MERO, 2018). Despite the relatively high rate of employment, the per capita income in the PALM was lowest of all local municipalities within the CKDM, and has increased by 2% between 2011 and 2012 and by only 1% between 2012 and 2013. During 2016, a high level of income equality was identified in Ward 2 (i.e. in which some of the powerlines are located) (StatsSA, 2016).</p> <p>The proposed project will therefore contribute toward generating socio-economic benefits.</p> <p>The proposed project would also help to address the need for increased electricity supply to the national grid while also providing advanced skills transfer and</p>

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Question	Response
	<p>training to the local communities and creating contractual and permanent employment in the area.</p> <p>It is important to note that a socio-economic impact assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects.</p>
2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	<p>The impact of the proposed project on cultural areas and heritage resources (archaeology and palaeontology), as well as on the sense of place was assessed in the HIA and Visual Impact Assessment (VIA) that was undertaken to inform the BA Process. Please refer to Appendices D.2 and D. 3 and of this BA Report for the detailed impact assessments.</p>
2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	<p>Several Renewable Energy projects (particularly wind energy facilities) are being proposed and have been granted Environmental Authorisation in the vicinity of Beaufort West and surrounds.</p> <p>On 26 February 2021, Minister Barbara D. Creecy published Government Gazette 44191, GN R144 for notification of the identification of three new Renewable Energy Development Zones (REDZs) additional to the eight existing REDZs that were gazetted under GN R114 in Government Gazette 41445 of 16 February 2018. One of these newly proposed REDZ comprises the town of Beaufort West and immediate surrounds.</p> <p><u>Note</u> that the proposed powerline corridor is not located within any of the gazetted REDZs or Strategic Transmission Corridors.</p>
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes.</p>
2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	<p>Each Socio-Economic Impact Assessment included the following assumptions and limitations:</p> <ul style="list-style-type: none"> It is assumed that owners of the affected farms are appropriately compensated for any loss in income, crops, infrastructure or land incurred as a result of the project. The SIA does therefore not focus on impacts on private landowners. It is assumed that landowners have communicated any constraints associated with the placement of wind turbines and infrastructure, due to e.g. homesteads, during project planning and development; The report is based largely on secondary data gathered during a desktop analysis. Limited primary data was also collected via phone interviews or email engagement with landowners and local councillors;
2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	

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	<ul style="list-style-type: none"> • The report is based on the most recent available census data that is from Census 2011 (full census) and the 2016 Community Survey (limited census). Given the low population growth rates recorded in the past and the remoteness of the area, the data is considered sufficient to paint a socio-economic picture of the region; and • It is assumed that no significant developments or changes in the socio-economic characteristics will take place in the area of influence between data collection and submission of the report. <p>Neither the assumptions nor limitations were highlighted to negatively affect the assessment findings of the Socio-Economic Impact Assessment.</p> <p>It is important to note that a socio-economic impact assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects.</p>
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes.</p> <p>Although a Socio-Economic Impact Assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects, it is understood that the development of the proposed powerline is necessary for the evacuation of the power generated from the Kwagga WEFs. The proposed powerlines will traverse the Kwagga WEF 1, and 3 project sites. Therefore, the proposed powerlines will assist in the realisation of socio-economic benefits identified by the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes and local socio-economic characteristics identified for the Kwagga WEFs may also be relevant to the proposed powerlines.</p>
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best	

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Question	Response
<p>practicable environmental option" to be selected, or is there a need for other alternatives to be considered?</p>	
<p>2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?</p>	
<p>2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?</p>	
<p>2.13. What measures were taken to:</p>	
<p>2.13.1. ensure the participation of all interested and affected parties,</p>	<p>On 5 June 2020, the Minister of Forestry, Fisheries and the Environment issued Directions in terms of regulation 4 (10) of the Regulations issued by the Minister of Cooperative Governance and Traditional Affairs in terms of section 27(2) of the Disaster Management Act, 2002 (Act 57 of 2002). These Directions were published in Government Gazette 43412, GN 650 on 5 June 2020, regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences.</p> <p>Regulation 5.1 of GN 650 states that Authorities responsible for the processing of applications contemplated in the EIA Regulations, will be receiving such applications from 5 June 2020 and will receive and process applications and issue decisions in the manner as set out in Annexure 2 of GN 650. Regulation 5.2 of GN 650 states that Annexure 3 includes additional requirements in respect of the provision, supporting or obtaining of services contemplated in Regulation 5.1.</p> <p>GN R650 is applicable to Alert Level 3 and was repealed by GN R970. GN R970, published on 9 September 2020, contains directions regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences, and it applied for the period of the national state of disaster. However, it is understood that even though GN R650 is repealed, it may be used as a guideline to inform the public participation process.</p> <p>On 22 March 2022, the withdrawal of various directions regarding measures to address, prevent and combat the spread of COVID-19 (including GN</p>
<p>2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,</p>	
<p>2.13.3. ensure participation by vulnerable and disadvantaged persons,</p>	

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Question	Response
	<p>R650 and GN R970) was published in Government Gazette 46075, and confirms the full repeal of GN R650, GN R970 and GN R649.</p> <p>Although the Government Notices and Gazette Numbers mentioned in Table 5 were repealed, a Pre-Application meeting request was submitted to the Competent Authority, the National DFFE in order to discuss and confirm the approach regarding various aspects prior to the release of the Draft BA Report.</p> <p>A Pre-Application Meeting took place with the National DFFE, on 18 May 2022 (Reference Number: 2022-05-0008). It was confirmed during the Pre-Application meeting that a Public Participation Plan is not required to be submitted and approved by the National DFFE. The National DFFE also confirmed that digital copies of the Application Forms for EA and the corresponding BA Reports must still be submitted to the National DFFE via the DFFE Novell Filr System.</p> <p>Refer to Appendix F.3 for a copy of the Pre-Application Meeting Notes; as well as Appendix F.4 with a copy of correspondence from the DFFE with approval of the Pre-Application Meeting Notes.</p>
2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	The BA Process has taken cognisance of all interests, needs, and values espoused by all I&APs. Opportunity for public participation has been provided to all I&APs throughout the BA Process in terms of the 2014 NEMA EIA Regulations (as amended).
2.13.5. ensure openness and transparency, and access to information in terms of the process,	The Public Participation Process that is planned to be undertaken as part of the BA Process is included in Section C of this BA Report. Various methods were employed to notify potential I&APs of the proposed project and the opportunity to comment on the Draft BA Report, namely, through notices in the local newspaper, sites notices, emails, as well as SMS text messages. All comments received during the 30-days comment period have been included in the Comments and Responses Report which has been submitted to the DFFE with the Final BA Report. Proof of public participation undertaken to date is included in Appendix E of this BA Report.
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	The BA Process has taken cognisance of all interests, needs and values adopted by all I&APs.

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Question	Response
2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was promoted.	Public participation of all I&APs has been promoted and opportunities for engagement has been provided during the BA Process.
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes.</p> <p>Although a Socio-Economic Impact Assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects, it is understood that the development of the proposed powerlines is necessary for the evacuation of the power generated from the Kwagga WEFs 1-3. The proposed powerlines will traverse Kwagga WEF 1, 2 and 3 project sites. Therefore, the proposed powerlines will assist in the realisation of socio-economic benefits identified by the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEFs 1-3 as part of the S&EIA Processes and local socio-economic characteristics identified for the Kwagga WEFs may also be relevant to the proposed powerlines.</p>
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	An EMPr was developed to address health and safety concerns. An Environmental Control Officer (ECO) will be appointed to monitor compliance with the EMPr and EA (should such authorisation be granted) during the construction and operational phases. The EMPr is included as Appendix G of this BA Report.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1. the number of temporary versus permanent jobs that will be created,	<p>This was addressed in the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEF 1-3 as part of the S&EIA Processes.</p> <p>Although a Socio-Economic Impact Assessment was not identified by the National Web-Based Screening Tool as a study that is required for powerline projects, it is understood that the development of the proposed powerlines is necessary for the evacuation of the power generated from the Kwagga WEFs 1-3. The proposed powerlines will traverse Kwagga WEF 1, 2 and 3 project sites. Therefore, the proposed powerlines will assist in the realisation of socio-economic benefits identified by the detailed Socio-Economic Impact Assessments that were undertaken for the authorised Kwagga WEFs 1-3 as part of the S&EIA Processes and local socio-economic characteristics identified for the Kwagga WEFs may also be relevant to the proposed powerlines.</p>
2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
2.16.3. the distance from where labourers will have to travel,	
2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits),	
2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100	

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Question	Response
jobs, but impact on 1000 agricultural jobs, etc.).	In addition, local employment opportunities will be provided as far as possible. Where possible, the construction of the powerlines will utilise contractors who employ labourers from the local community and therefore encourage socio-economic development at a local scale, as is encouraged under the REIPPPP.
2.17. What measures were taken to ensure:	
2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment,	The different government departments have been listed as I&APs and were given the opportunity to comment on the Draft BA Reports during the 30-days public review period. Comments received during the 30-days review period have been included in the Comments and Responses Reports which has been submitted to the DFFE with the Final BA Report.
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The proposed powerlines will adhere to the principles of environmental management. Measures taken to ensure adherence to the principles of NEMA have been determined during the BA Processes.
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The proposed mitigation measures included in the EMPr, that is included as Appendix G of this BA Report, were informed by the specialist assessments undertaken. This includes detailed assessment of the environment as well as the impacts associated with the proposed development. Detailed specialist assessments have all concluded that the project can proceed, with no fatal flaws or unacceptable impacts identified as part of the project's proposal. Therefore, the mitigation measures are deemed to be realistic. Further, powerlines can be dismantled and completely removed from the site leased for the development and do not permanently prevent alternative land-uses on the same land parcel.
2.20. What measures were taken to ensure that he costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The EMPr (included in Appendix G of this BA Report) of this proposed project must form part of the contractual agreement and be adhered to by both the contractors/workers and the Project Applicant.
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Agriculture on site is influenced by climatic variables and limitations. Renewable energy development is a suitable and preferred land-use option for the site. The proposed powerlines are required for the evacuation of the electricity generated by the authorised Kwagga WEFs. Should the proposed project proceed, on average less than 2 % of the total farming area that constitutes the properties relevant

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Question	Response
	<p>to the proposed powerlines will be developed on and it is not expected that this will significantly threaten the agricultural activities present on site. It is also the Agricultural specialist's opinion that the agricultural impact (loss of future agricultural production potential) resulting from the proposed powerline development is totally insignificant in the context of the agricultural environment. This is because an insignificantly small amount of land will be excluded from agricultural production and that land has very limited production potential.</p> <p>It is anticipated that the proposed authorised Kwagga WEFs 1-3 would be more robust in terms of economic viability and profitability while also being largely uninfluenced by climate change variables. The proposed authorised Kwagga WEF (should the WEF be able to supply the national grid via the proposed powerline project that is the subject of this BA Report) would also provide the farm owners with additional income by way of lease agreements and will also contribute to local socio-economic upliftment through job creation. The proposed WEF can also co-exist with the current land-use of low-density small stock farming.</p>
<p>2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and other planned developments in the area?</p>	<p>The potential cumulative impacts resulting from the proposed project were objectively determined. The cumulative impacts of similar types of projects that have received EA or whose EA status is pending (e.g. other renewable energy projects within a 50 km radius of the proposed project) were assessed and are included in Appendix D and Section D of this BA Report.</p>

SECTION B. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section of the Basic Assessment (BA) Report provides a broad overview of the affected environment for the proposed overhead transmission powerline corridor and the surrounding area. The receiving environment is understood to include biophysical, socio-economic and heritage aspects, which could be affected by the proposed development or which in turn might impact on the proposed development.

This information is provided to identify the potential issues and impacts of the proposed project on the environment and vice versa. The information presented within this section has been sourced from:

- Inputs from the specialists that form part of the project team;
- Feedback from the Screening Tool, where applicable;
- Review of inter alia information sources available on the South African National Biodiversity Institute (SANBI) Biodiversity Geographical Information System (BGIS), Agricultural Geo-Referenced Information System (AGIS); and the Western Cape Department of Agriculture (DoA) CapeFarmMapper;
- The Beaufort West Local Municipality Integrated Development Plan (IDP) (2017-2022), and the Prince Albert Local Municipality IDP (2017-2022); and
- The Central Karoo District Municipality Spatial Development Framework (SDF) (2019, draft) and the Western Cape Provincial SDF (2014).

It is important to note that this section intends to provide a broad overview and does not represent a detailed environmental study. Detailed descriptions of the assessed Kwagga EGI Corridor and the proposed powerline route that focused on significant environmental aspects of this proposed project are provided in the relevant specialist assessments, which are included in Appendix D of this BA Report.

B.1 Project Background

The farm portions traversed by Section 5 of the proposed Kwagga EGI Corridor, that is the subject of this BA Report (i.e., **Section 5** of 7, between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 2) are listed below. These farm portions are located approximately 60 km to the south of Beaufort West in the Western Cape Province:

- Remainder of the Farm Dwaalfontein No. 379 (Surveyor General 21 Digit Code: C00900000000037900000);
- Portion 3 of the Farm Tyger Poort No. 376 (Surveyor General 21 Digit Code: C00900000000037600003); and
- Remainder of the Farm Wolve Kraal No. 17 (Surveyor General 21 Digit Code: C0610000000001700000).

As noted in Section A of this BA Report, the specialists have assessed an approximately 300 m wide corridor across the portion of the proposed powerline route that traverses the proposed authorised Kwagga WEFs 1-3 project sites, and an approximately 500 m wide corridor for the

proposed powerline route that traverses the neighbouring Mainstream Beaufort West and Trakas WEF project sites.

Note, however, that the registered servitude for the proposed powerline will only be a maximum of 50 m wide and totaling approximately 3 km in length, or where multiple adjacent powerlines occur, in line with guideline and requirements for 132 kV powerlines stipulated in the 2011 Eskom Distribution Guide Part 19. As previously noted, the proposed project is located within the Beaufort West Local Municipality and the Prince Albert Local Municipality, which falls within the Central Karoo District Municipality, and is situated to the east of the N12 main road. Figure A.2 in Section A of this report provides a locality map of the proposed project area.

B.2 Biophysical Environment

B.2.1 Climate Conditions

The Central Karoo region, and more specifically the Gamka Karoo vegetation type in which the proposed project site is located, is considered one of the most arid regions within the Nama Karoo Biome. According to the Köppen-Geiger climate classification method the area is classified “BWk”, which is indicative of an arid, cold desert environment (Figure B.1). Such extremes, a dry prevailing climate with very low relative humidity, freezing cold winter nights and extremely hot summer days, have given rise to a regionally unique environment both from an aquatic and terrestrial perspective.

This harsh, arid region is characteristic of a summer to autumn rainfall regime, usually peaking between January and March each year. The mean annual rainfall of the area varies between 100 mm and 200 mm with an annual evaporation rate of 1 400 mm. Figure B.2 shows the average monthly distribution of rainfall within the Beaufort West area, including the proposed powerline corridor for the period 2009 – 2022. The past five years however have been typified by significantly below average annual rainfall due to the severe and prolonged drought experienced in the region (Figure B.3). Temperatures in the region can be considered to be extreme, with the mean monthly maximum temperature being recorded as 38.7°C in January and the mean July minimum temperature is -3.2°C. The highest average maximum temperatures occur from November to March with the hottest months being January and February (Figure B.4). The area is characteristic of strong, gusty winds prevailing for most of the year, with the average gust falling within the 20 to 30 km/hr range, with the highest wind speeds recorded from October to March (Figure B.5).

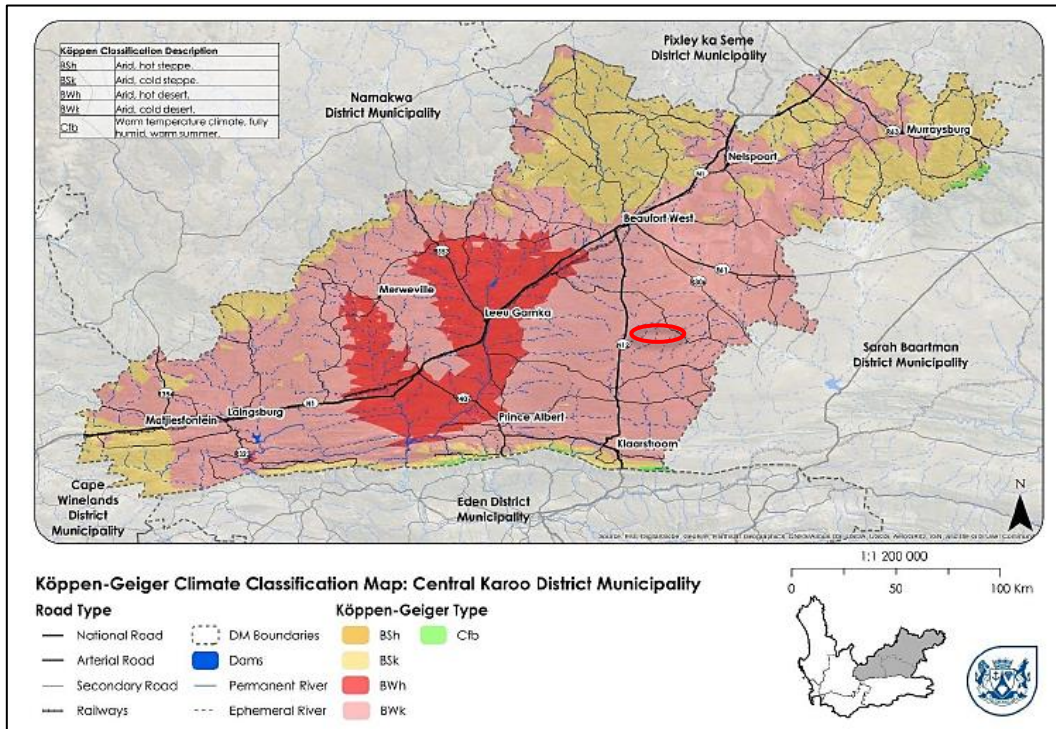


Figure B.1: Köppen-Geiger Climate Classification of the Central Karoo District Municipality, including the proposed Kwagga EGI Corridor (indicated in red circle) (Source: Western Cape Department of Environmental Affairs, and Development Planning (DEA&DP), 2019)

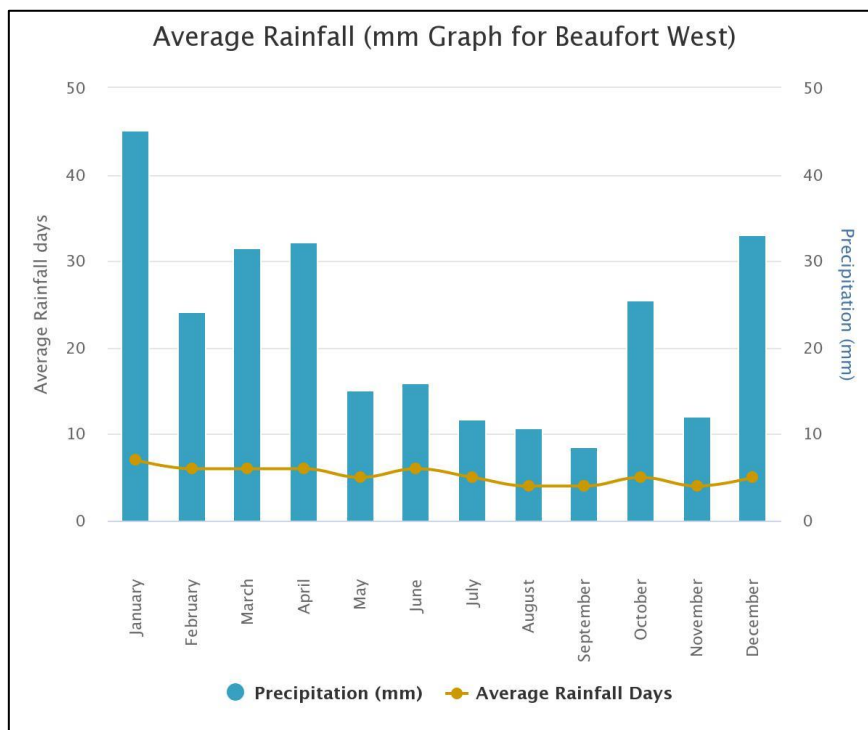


Figure B.2: The average monthly distribution of rainfall within the Beaufort West area, including the proposed powerline corridor for the period 2010 – 2020 (Source: <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za>, 2022)

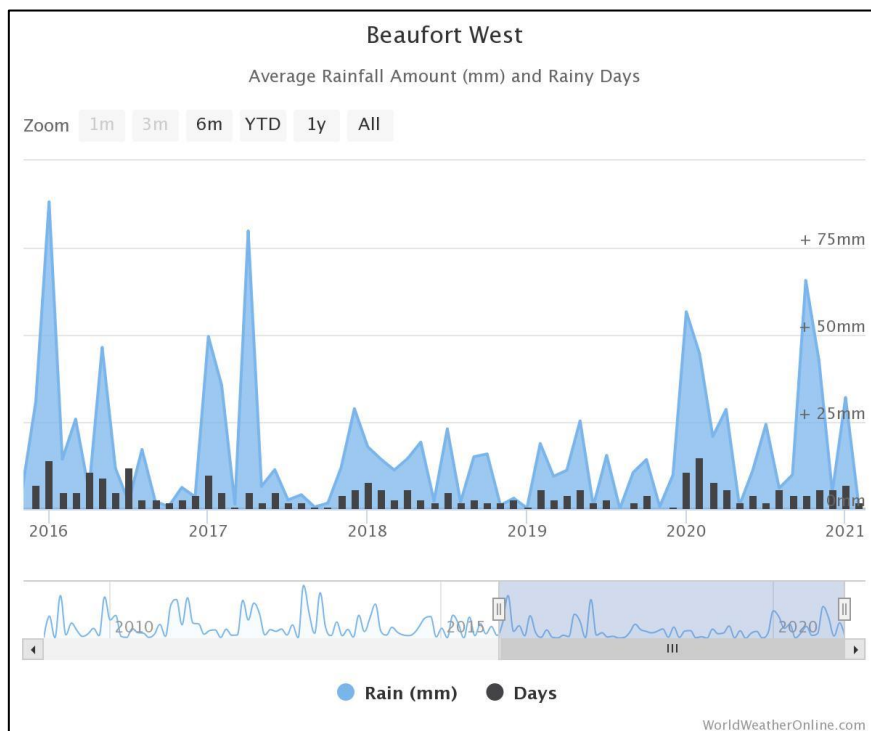


Figure B.3. The average annual rainfall within the Beaufort West area, including the proposed powerline corridor for the drought-stricken period 2016 – 2021 (Source: <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za, 2022>)

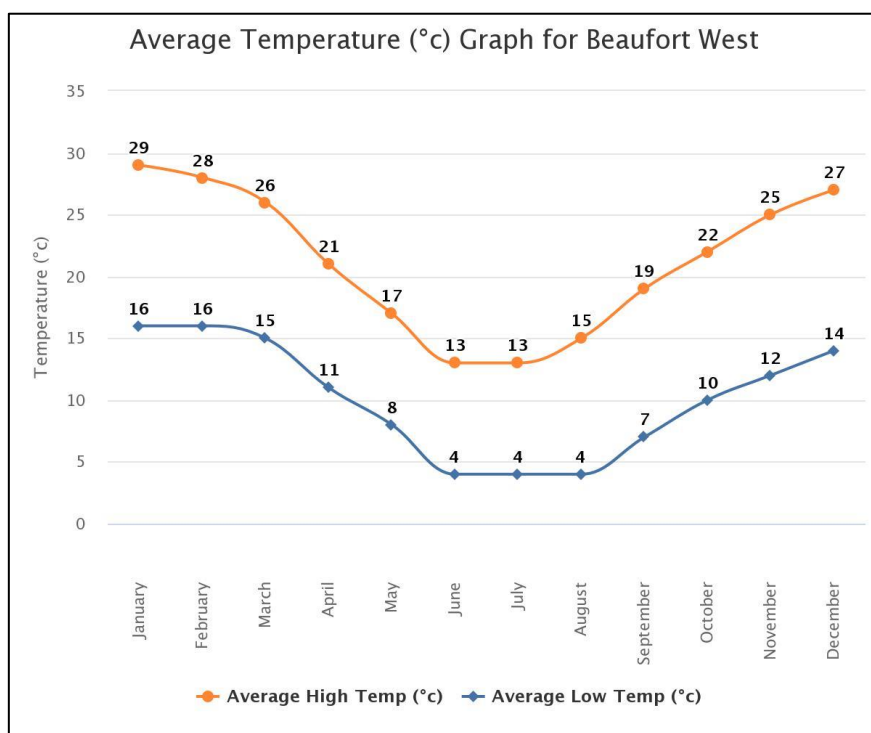


Figure B.4. The average monthly maximum and minimum temperature for the Beaufort West area, including the proposed powerline corridor for the period 2010 – 2020 (Source: <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za, 2022>).

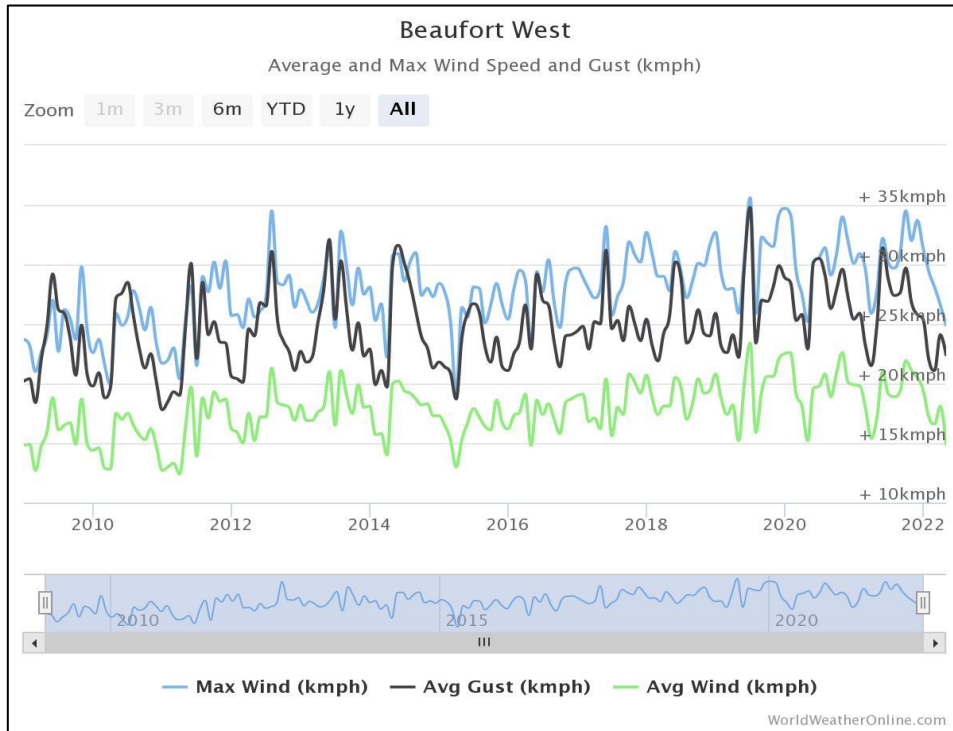


Figure B.5. The average and maximum annual wind speeds and gusts for the Beaufort West area, including the proposed powerline corridor for the period 2010 – 2020 (Source: <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za>, 2022)

The specialist studies included in Appendix D of this BA Report provide additional details regarding the climatic conditions on site.

B.2.1.1 Climate Change

Temperatures in the Central Karoo region are anticipated to rise with resulting lower annual rainfall in the medium to long term, although it is uncertain what impact increasing climate change will have on rainfall patterns in the region, as some research is suggesting that parts of the Western Cape Province may even receive greater annual precipitation. Lower rainfall will also mean higher levels of evaporation and average wind velocities are expected to increase as well. As a result, these increasingly hot, arid conditions will cause the Karoo vegetation to become less resilient with an overall reduction in carrying capacity and a potential increase in veld fires. In addition, agricultural potential of the region is expected to be severely impacted with a further decline in productivity and yield, which is undoubtedly exacerbated by the ongoing drought prevailing in the area. This will ultimately require the adoption of more drought-tolerant farming practices or the implementation of alternative land uses such as renewable energy generation developments, in particular solar and wind to ensure economic growth¹⁰.

B.2.2 Topography and Landscape

The landscape character of the proposed powerline corridor is relatively flat to slightly undulating with low ridges and covered with sparse, low-growing vegetation dominated by dwarf, spiny Karoo

¹⁰ Central Karoo District Municipality Spatial Development Framework (Draft), Western Cape Department of Environmental Affairs, and Development Planning (DEA&DP), 2019

shrubs. The study site is situated in the Central or ‘Great’ Karoo, an area that forms part of the Nama Karoo Biome and that is typified by dry, hot plains (i.e. ‘Die Vlakte’) at altitudes varying between 700 m and 1 100 m (Figure B.6). The peripheral boundaries to the north and south of the study area are truncated by the Swartberg Mountains in the south, providing a natural barrier between the Karoo interior and the southern Cape coast, and the Nuweveld Mountains to the north of Beaufort West (Figure B.7).

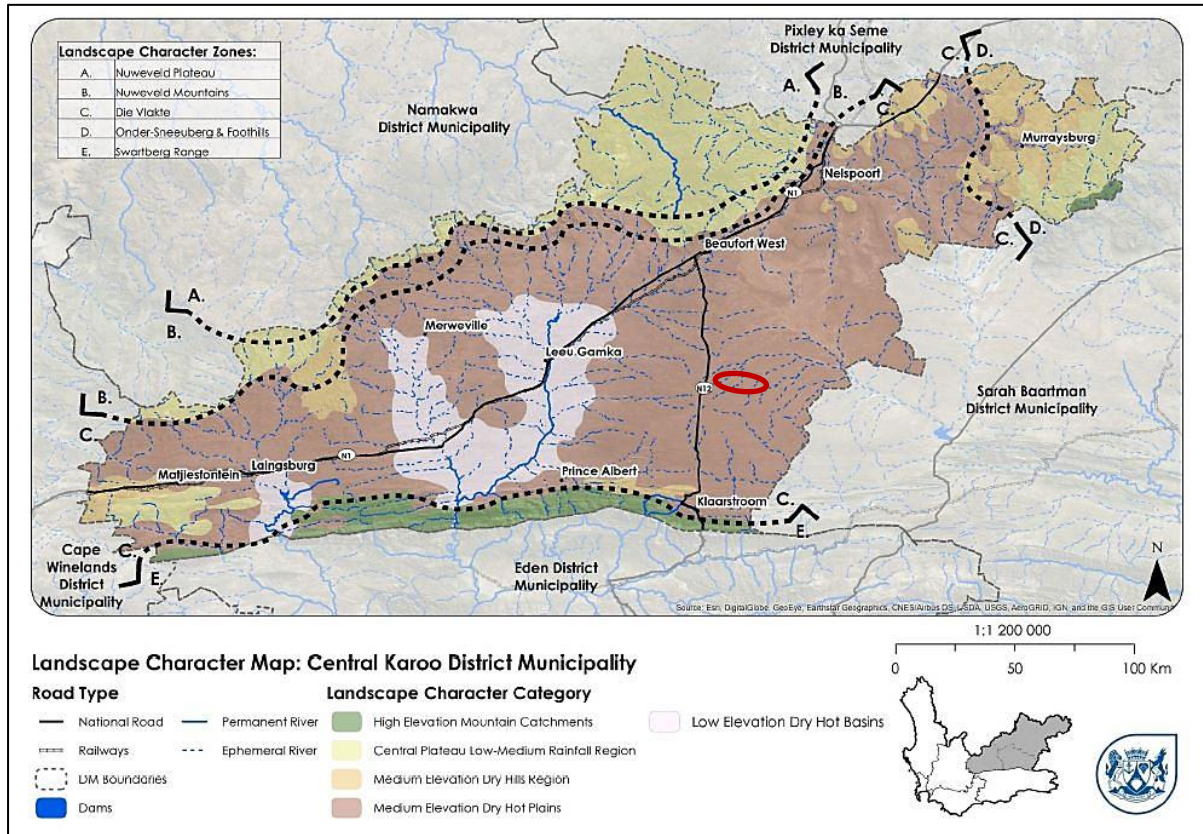


Figure B.6. The landscape character of the Central Karoo District Municipality, including the proposed powerline study area (indicated in red oval) (Source: DEA&DP, 2019)

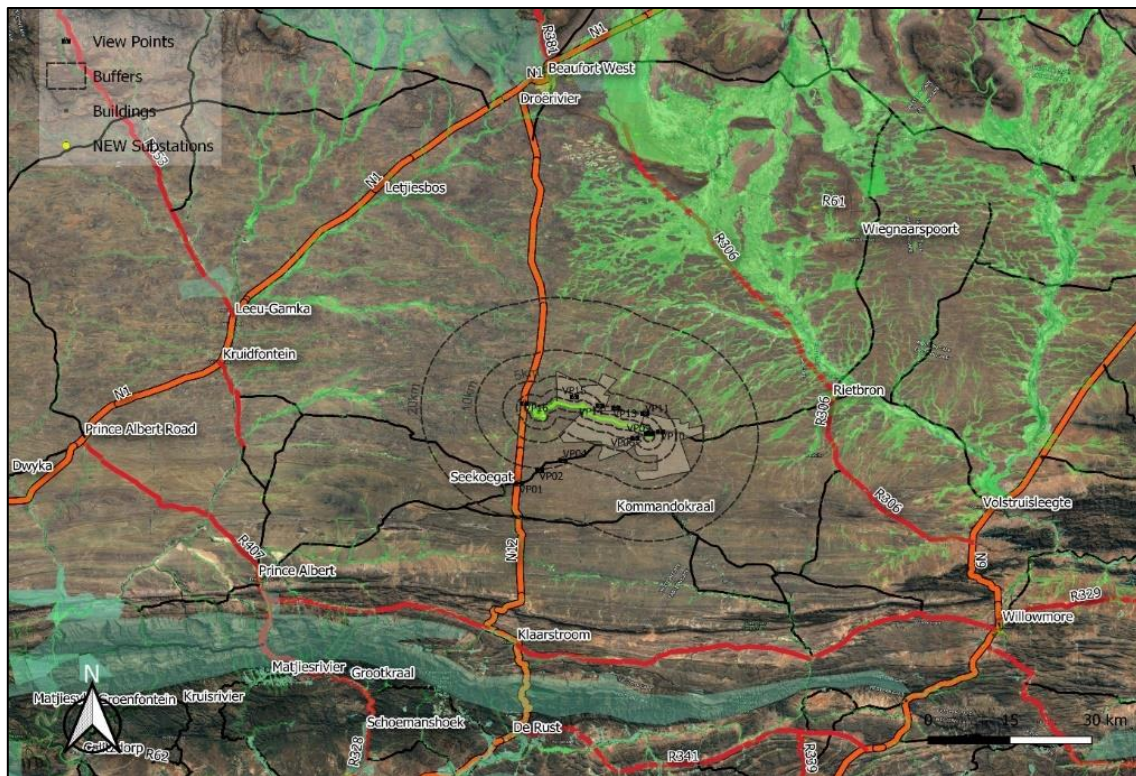


Figure B.7. The regional topographical setting of the proposed powerline study area (indicated in green) (Source: Klapwijk, 2022)

A detailed description of the landscape character of the region is provided in the Visual Impact Assessment (Appendix D.2) and the Terrestrial Biodiversity Impact Assessment (Appendix D.4) of this BA Report.

B.2.3 Regional Geology

The underlying geology of the proposed powerline study area and surrounds is depicted in the geological map 3222 Beaufort West and 3322 Oudtshoorn (Council for Geoscience, 1:250 000 Maps (3222 – Beaufort West, and 3322 Oudtshoorn), 1979) (Figure B.8). Noteworthy are numerous west-east trending fold axes in the region, which fall within the northern margins of the Cape Fold Belt.

The dominant geology consists of mudstone (red in places) with sandstone and thin greenish cherty beds (Pa - pale green) of the Abrahamskraal Formation (Adelaide Subgroup, Lower Beaufort Group) of Middle Permian age. Some of the hills consist of very similar substrates and are described as mudstone (red in places) with siltstone and sandstone and thin greenish cherty beds near the base and thin pink tuff beds (Pt – dark green) of the Teekloof Formation (Adelaide Subgroup, Lower Beaufort Group) (Figure B.8). Low west to east trending topographic ridges in the north-western sector of the study area (e.g. the Vaarsfontein se Kop – Dwaalberg Ridge) are built by sandstone-packages of the Middle Permian Poortjie Member at the base of the Teekloof Formation. The Beaufort Group bedrocks within the study area are extensively overlain by unconsolidated Late Caenozoic superficial deposits such as colluvial and eluvial gravels, gravelly to silty stream alluvium as well as various sandy to gravelly skeletal soils and pedocretes (e.g.

calcrete). Late Caenozoic / Quaternary superficial sediments, including alluvium, sheet wash, colluvium, soils, locally cemented by pedocretes such as calcrete occurs along the drainage lines (indicated in yellow in Figure B.8). The land type is classified as Fc where lime occurs regularly in both upland and valley bottom soils.

A detailed description of the geology of the study area is provided in the Palaeontological Impact Assessment (Appendix D.3) of this BA Report.

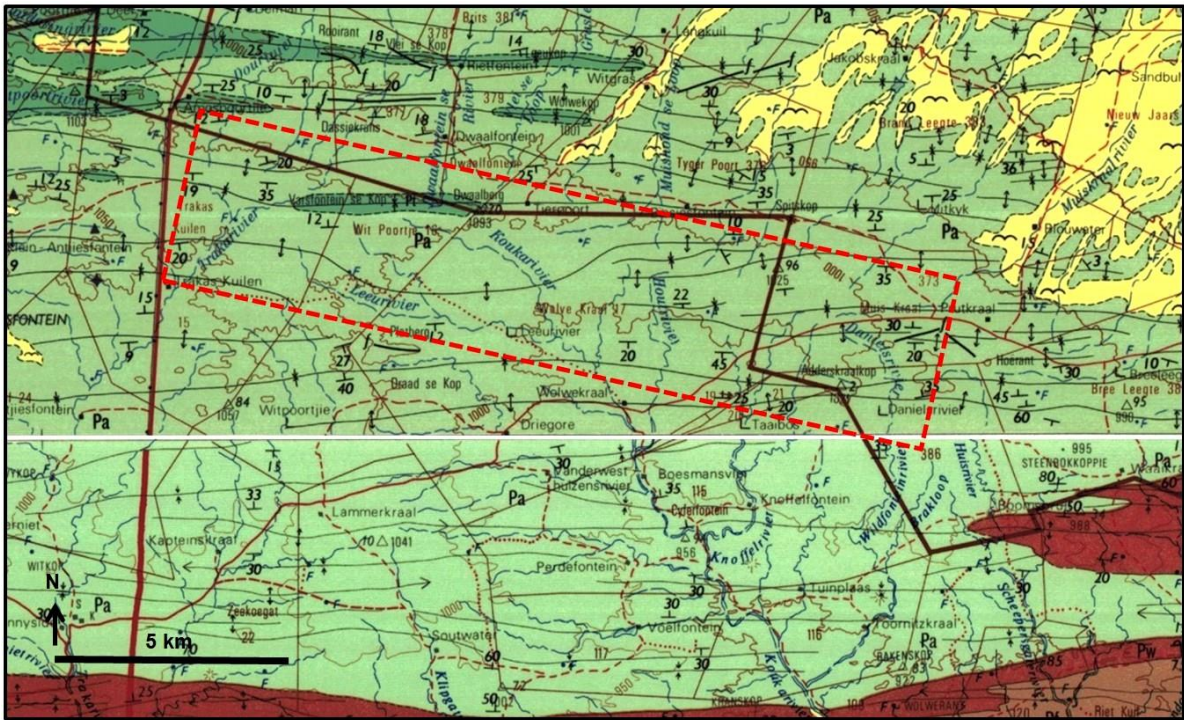


Figure B.8. The geology of the approximate area of the proposed powerline study area (indicated in red) and immediate surrounds (Source: Council for Geoscience, 1:250 000 Map (3222 – Beaufort West, and 3322 - Oudtshoorn), 1979)

B.2.4 Geohydrology

According to the 1: 1 200 000 scale groundwater resource potential map of the Central Karoo District Municipality, the proposed powerline study area is located in a region of the Central Karoo that has a fairly low average groundwater resource potential (i.e. between 4 001 and 6000 m³/km²/a) (Figure B.9).

Groundwater quality within the study area is considered to be generally good to somewhat brackish in certain parts of the proposed project site, with virtually no recharge occurring on the plains topography. In addition, the potential for groundwater vulnerability is considered overall moderate for the study area.

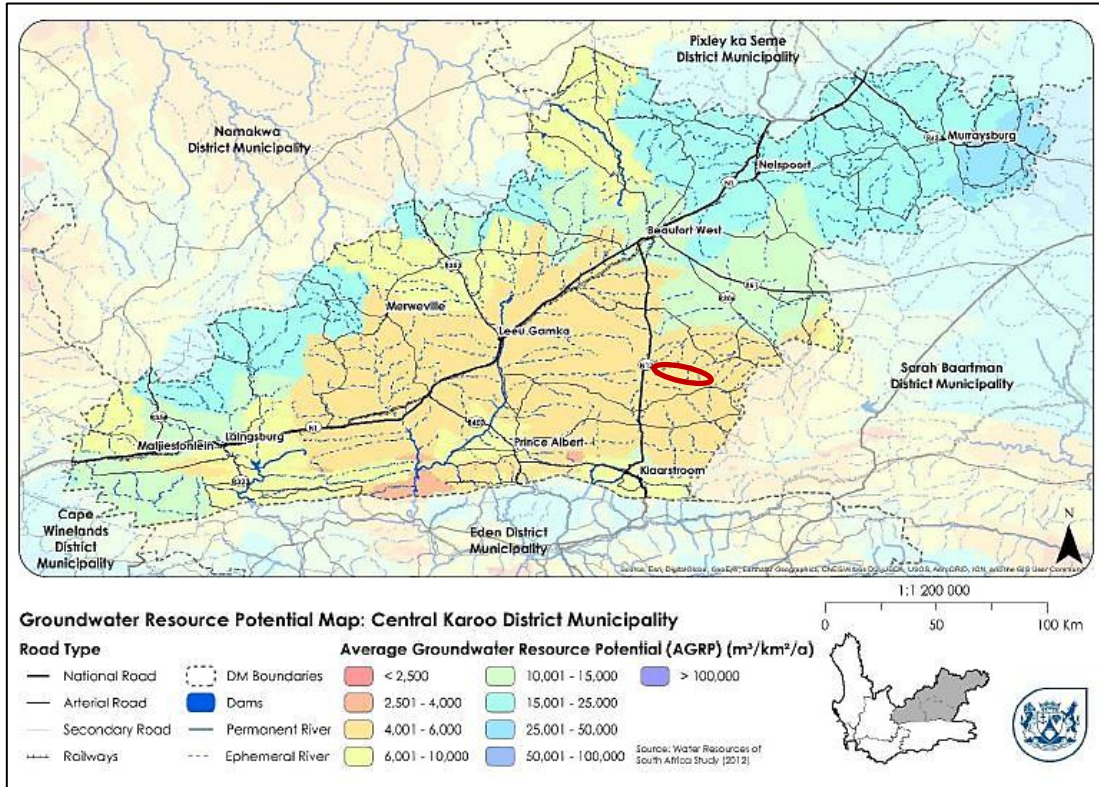


Figure B.9. Groundwater resource potential of the Central Karoo District Municipality, including the proposed powerline study area (indicated in red oval) (Source: DEA&DP, 2019)

B.2.5 Land types and Soils

The land type classification denotes areas that display a marked degree of uniformity with respect to terrain form, soil pattern and climate. A terrain unit within a land type is any part of the land surface with homogeneous form and slope.

The proposed powerline corridor falls within the Fc163b and Fc164b units (Figure B.10). The Fc land type typically consists of Glenrosa and/or Mispah soil forms where lime is generally present in the entire landscape. These soils are also usually very shallow covering hard or weathered rock, with limited pedological development (i.e. Soil Symbol EB) (Figure B.11).

A detailed description of the land- and soil types within the study area is provided in the Agriculture and Soils Compliance Statement (Appendix D.1) of this BA Report.



Figure B.10. The Land Type Classification of the Kwagga EGI Corridor (indicated in orange) (Land Type Survey, 1987) (Source: Van Rooyen, 2022)

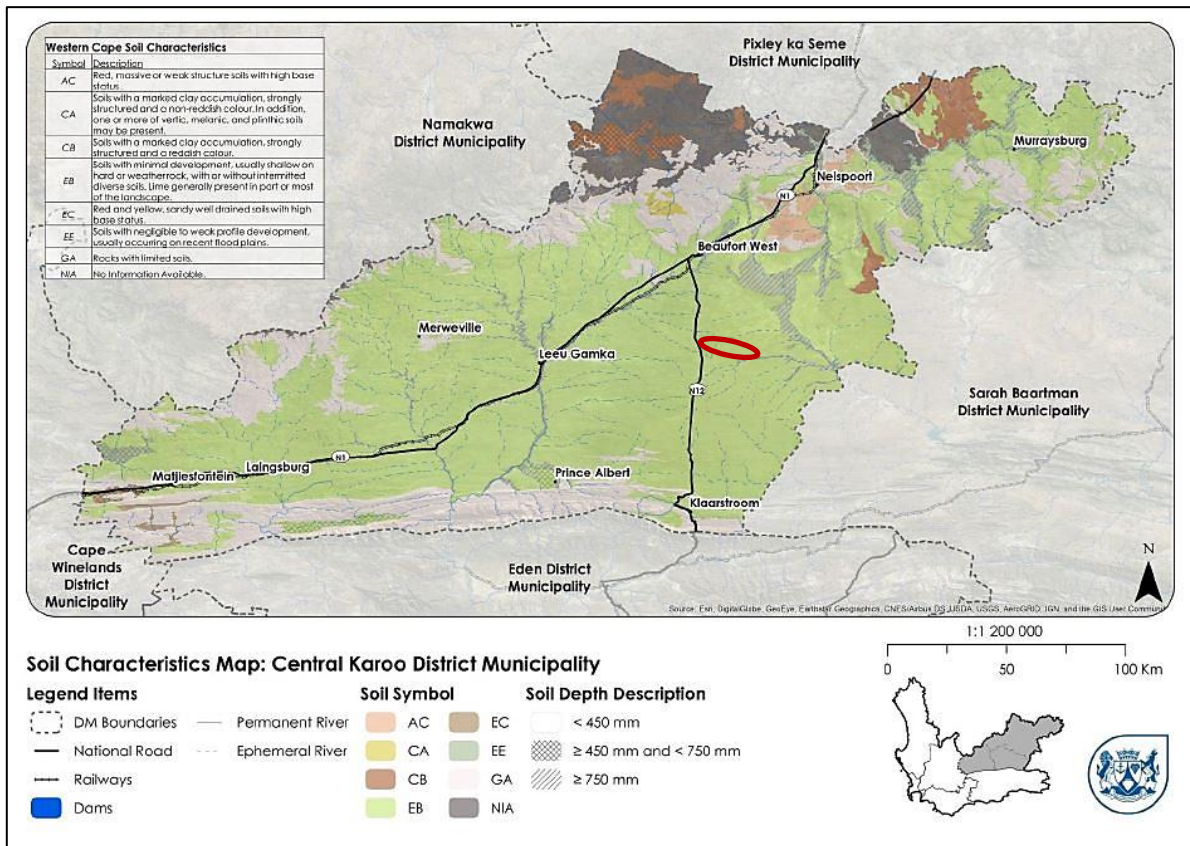


Figure B.11. Soil types of the Central Karoo District Municipality, including the proposed powerline study area (approximate area indicated by red oval) (Source: DEA&DP, 2019).

B.2.6 Land Capability and Agricultural Sensitivity

The information described below is based on inputs provided by the Agricultural Specialist, which are included in Appendix D.1 of this BA Report.

B.2.6.1 General Context

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability. The Department of Forestry, Fisheries and the Environment (DFFE) National Web-Based Screening Tool classifies agricultural sensitivity according to only two criteria – land capability and whether the land is cultivated or not. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the Screening Tool in terms of its land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable, grazing land, or at the lowest extreme, not even suitable for grazing. In 2017, the then Department of Agriculture, Forestry and Fisheries (DAFF) released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for production of cultivated crops. This land capability data is used by the Screening Tool.

According to Lanz (2022), the agricultural impacts of a powerline are insignificant in such an agricultural environment, regardless of the level of agricultural sensitivity of the land which it traverses. As none of the land traversed by the proposed powerline is classified as cropland, agricultural sensitivity is purely a function of land capability.

B.2.6.2 Screening Tool Descriptions and Site Verification

The National Web-Based Screening Tool (hereafter referred to “Screening Tool”) identifies the land capability of the proposed powerline corridor as varying between 4 (low agricultural sensitivity) to 7 (medium agricultural sensitivity). However, the land capability within the proposed powerline corridor is identified as predominantly 5 (low agricultural sensitivity).

A map of the proposed study area overlaid on the Screening Tool sensitivity is shown in Figure B.12 below.

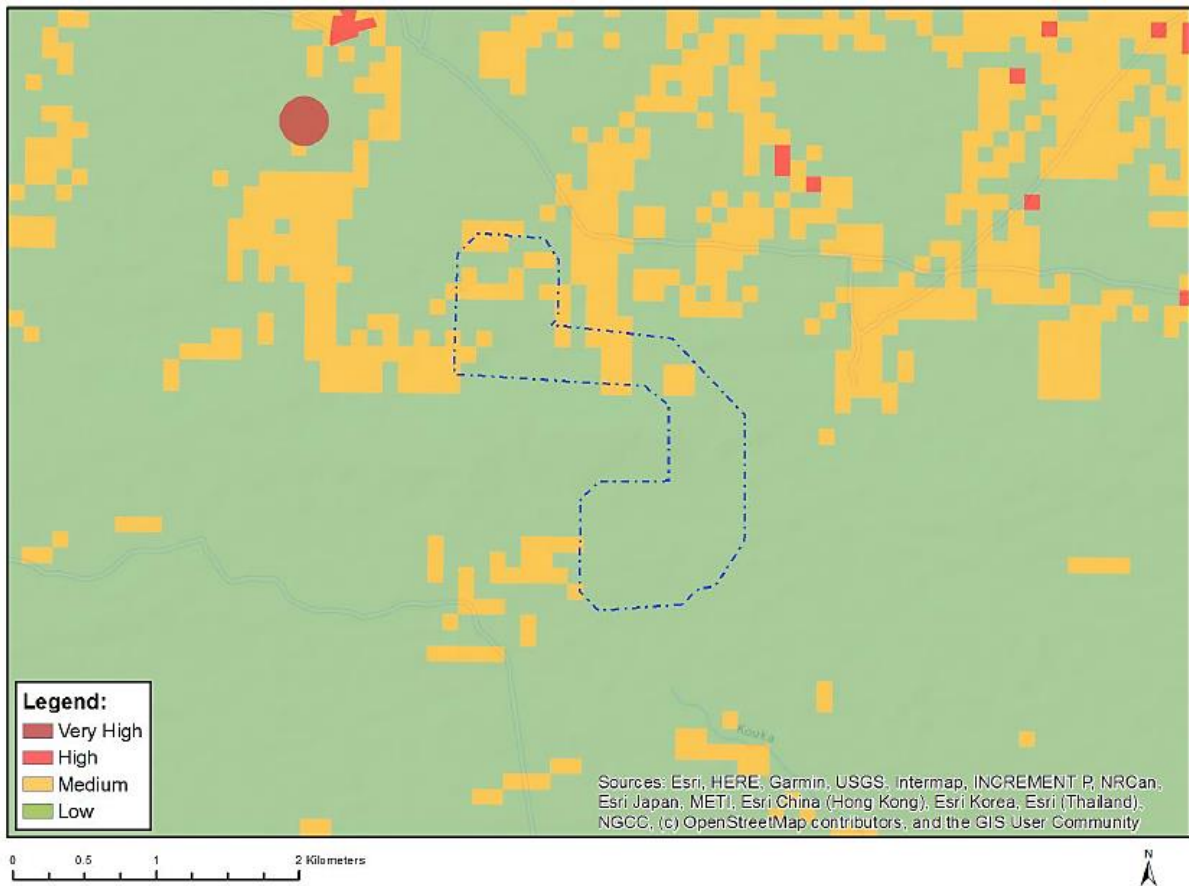


Figure B.12. The proposed powerline corridor (outlined in blue) overlaid on agricultural sensitivity as identified by the Screening Tool (low = green; medium = yellow)

The predominantly low agricultural sensitivity, as identified by the Screening Tool, was confirmed by the Site Sensitivity Verification undertaken as part of the Agricultural Compliance Statement. Climate data indicates that the area receives fairly low rainfall of approximately low rainfall of 144 to 168 mm per annum. Consequently, area is marginal for crop cultivation and therefor limited land capability. The relatively arid nature of the local climate is identified as the main factor limiting land capability.

Land type data indicates that soils are predominantly fairly deep, sandy soils with limited water holding capacity on underlying rock or hardpan carbonate. A smaller proportion of shallow soils and rock outcrops also occur, which also constrain agricultural capability. The land of the study area, therefore, corresponds to the definitions of the different Screening Tool sensitivity categories in terms of its land capability and its cultivation status.

Due to climate being the limiting factor that controls production potential, it is the only aspect of the agro-ecosystem description that is required for assessing the agricultural impact of this development. According to Lanz (2022) the proposed powerline has insignificant agricultural impact for two reasons:

- There is no loss of future agricultural production potential under transmission lines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission lines. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, including

a service track below the lines, is insignificantly small within an agricultural environment of large farms with low density grazing; and

- The affected land across the entire corridor has very limited agricultural production potential (as discussed above).

Overall, the proposed powerline corridor has low agricultural potential because of, predominantly, rainfall constraints. It is totally unsuitable for cultivation, and agricultural land use is limited to low-density grazing. The land is also predominantly of low agricultural sensitivity; therefore, the amount of agricultural land loss is well within the allowable development limits and the proposed development poses a low risk in terms of causing soil degradation. The proposed development will not have an unacceptable negative impact on the agricultural production capability of the site but rather offers some positive impact on agriculture as well as wider, societal benefits.

A detailed description of the agricultural capability and sensitivity within the study area is provided in the Agriculture and Soils Compliance Statement (Appendix D.1) of this BA Report.

B.2.7 Strategic Water Source Areas

Strategic Water Source Areas (SWSAs) are defined as “areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b)” (Le Maitre et al., 2018:1 in DFFE, 2019: Page 61).

Thirty-seven groundwater SWSAs have been identified in South Africa and are considered to be strategically important at a national level for water and economic security. The total area for groundwater SWSAs extends approximately 104 000 km² and covers approximately 9% of the land surface of South Africa (Le Maitre et al. 2018, in DEFF, 2019: Page 61).

There are no SWSAs traversing the affected farm portions associated with the proposed powerline project. The closest surface water SWSA is located more than 40 km to the south-west, while the nearest groundwater SWSA is situated about 45 km to the north. Refer to Figure B.13 below for a map showing surface water and groundwater SWSAs.

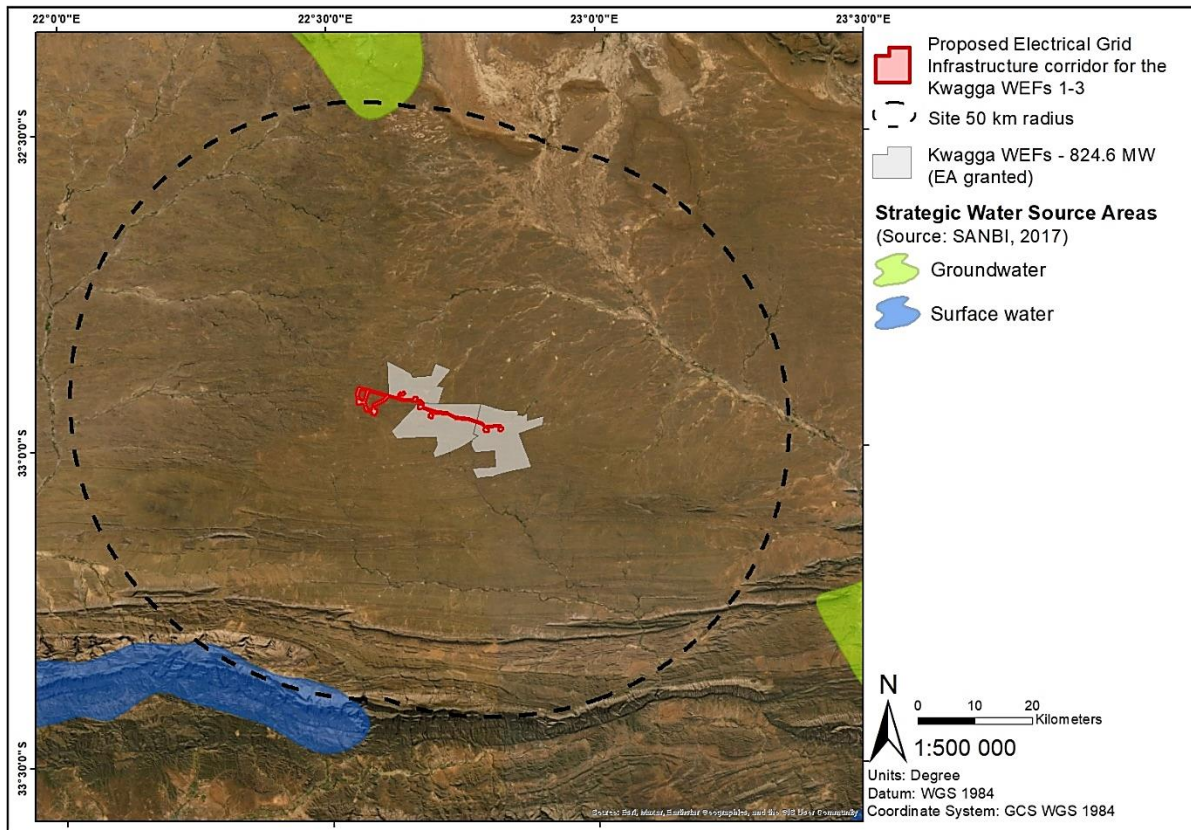


Figure B.13. SWSAs in relation to the locality of the proposed powerline corridor (i.e. all seven of the proposed powerlines in support of the Kwagga WEFs 1-3).

B.2.8 Aquatic Biodiversity

Various resources, such as, but not limited to, the SANBI BGIS and National Fresh Water Priority Areas (NFEPA), have been used to define the regional vegetation, water resources, fauna and anticipated ecological sensitivity of the study area. A literature review of existing reports, scientific studies, databases, reference works, guidelines and legislation relevant to the study area was conducted to establish the baseline ecological and vegetative condition of the site and associated environment. Details pertaining to the aquatic environment is provided in the Aquatic Biodiversity and Species Impact Assessment (which is included in Appendix D.5 of this BA Report).

B.2.8.1 General Context

The study area is located in the upper reaches of the upper reaches of the Leeu and Grasleegte Tributaries, crossing only minor feeder streams of these tributaries. Drainage in the eastern portion of the route tends to be a southerly direction, towards the Kouka/Traka River that flows southwards through the Swartberg Mountains, to join the Olifants River in its upper reaches. The Olifants River joins the Gamka River downstream of Calizdorp to form the Gouritz River that drains into the sea west of Mossel Bay. In the western portion, drainage is northwards, to the Amos/Sout River. This river is joined by the Kariega River to form the Groot River, with then flows in a south-easterly direction to join the Kouga River. These two rivers form the Gamtoos River flows for a short distance before draining into the sea northeast of Jeffreys Bay.

Within the proposed powerline corridor, the streams fall within the foothill zones of the Great Karoo Ecoregion. The watercourses in this region, due to the low rainfall of the area, are non-perennial (i.e. ephemeral) rivers that tend to only flow for relatively short periods immediately following rainfall events. They comprise primarily of gravel beds, and single to multiple channels. Therefore, no indigenous fishes occur within the rivers and the amphibian diversity within the study area is likely to be relatively low. No species of conservation concern are known to occur in the study area from an aquatic perspective. The larger river contains a distinct riparian vegetation of low trees and shrubs such as *Vachellia karroo*, *Searsia lancea*, *Searsia pallens*, *Gymnosporia sp.*, *Carissa haematocarpa*, *Melianthus comosus*, *Lycium spp.* and *Asparagus striatus*. The smaller watercourses along the proposed powerline have less distinct vegetation that tends to comprise a low density of *Vachellia karroo* with *Stipagrostis namaquensis* and other grasses.

The ecological habitat integrity of the rivers within the study area is still in a largely natural condition in their upper reaches with few modifications, becoming largely natural to moderately modified in their lower reaches on the site. Where localised impacts to the watercourses have taken place, the habitat integrity of the watercourse has been reduced in places however these impacts are direct habitat disturbances and do not impact the overall ecological integrity or ecological importance and sensitivity of the watercourses. The larger watercourses in the study area, have a high ecological importance and sensitivity, while the smaller tributaries/drainage features are of a moderate ecological importance and sensitivity. The larger watercourses tend to be more ecologically important but less sensitive to impacts, while the smaller tributaries are less ecologically important but more sensitive to flow, water quality and habitat modification. The recommended ecological condition of these features would be that they remain in a largely natural ecological condition.

Due to the fact that the watercourses in the study area are non-perennial and are dry for large parts of the year, no indigenous fishes occur within the rivers and the amphibian diversity within the study area is likely to be relatively low. No species of conservation concern are known to occur in the study area from an aquatic perspective.

B.2.8.2 Biodiversity Conservation Planning

Freshwater Ecosystem Priority Areas

Freshwater Ecosystem Priority Areas (FEPAs) are priority areas for conserving freshwater ecosystems and supporting sustainable use of water resources and upstream management areas. The catchment of the Grasleegte/Swartbakens River is mapped as a Freshwater Ecosystem Priority Area (FEPA) Sub-catchment that should be maintained in a natural or near-natural state or where necessary rehabilitated.

Critical Biodiversity Areas and Ecological Support Areas

Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) are indicated in terms of the Western Cape Biodiversity Spatial Plan (WCBSP) (2017). This preliminary data provided by the WCBSP is the product of a systematic biodiversity planning assessment which identifies portions of land that require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and aquatic realms (CapeNature, 2017). These spatial priorities are used to inform sustainable development in the Western Cape Province.

In addition to the above, CBAs and ESAs are separated further into CBA 1 and 2 as well as ESA 1 and 2, respectively. It is important to note that CBA 1 show areas in a natural condition and those that are potentially degraded or represent secondary vegetation are considered to be CBA 2. Similarly, a distinction is made between ESAs that are likely to be functional (i.e. in a natural, near-natural or moderately degraded condition – ESA 1), and ESAs that are likely severely degraded or have no natural cover remaining and therefore require restoration where feasible i.e. ESA 2. The ESAs are not considered essential from a conservation perspective for meeting biodiversity targets; however, they may offer some ecological services.

Other Natural Areas (ONAs) have not been identified as a priority but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Land use guidelines for Terrestrial ONAs are not required to meet biodiversity targets. ONAs represent the largest area in the region and form a matrix within which the CBAs and ESAs occur.

There are no aquatic CBAs mapped within the section of powerline. The smaller feeder streams to the Grasleegte and Leeu Rivers are mapped as aquatic ESAs that are not essential for meeting biodiversity targets, but that play an important role in delivering ecosystem services. The ecological functioning of these watercourses should not be compromised by the proposed project activities. The Leeu River Sub-catchment is mapped as an Upstream Catchment that is important to be maintained in its current ecological condition to not impact the downstream Olifants River that provides important habitat for indigenous fish species.

There are no natural wetlands identified within the study area except for a couple of artificial wetland areas within the larger area that are associated with manmade dams or livestock troughs which are mapped as artificial FEPA Wetlands.

B.2.8.3 Aquatic Ecosystems

The aquatic features within the study area are all mostly in a largely natural (B Category) ecological condition and are considered of moderate ecological importance and sensitivity. The aquatic features consist of the upper reaches of the Leeu and Grasleegte Rivers and their lesser, unnamed tributaries. The ecological habitat integrity of the rivers within the study area is still largely natural in the upper reaches with few modifications. Downstream, in the middle reaches the rivers become largely natural to moderately modified. The larger watercourses in the study area have a high ecological importance and sensitivity, while the smaller tributaries/drainage features are of a moderate ecological importance and sensitivity.

Considering the largely natural ecological condition of the aquatic ecosystems within the study area and their moderate to high ecological importance and ecological sensitivities, the recommended ecological condition (REC) of these features would be that they remain in a largely natural ecological condition and should not be allowed to degrade further.

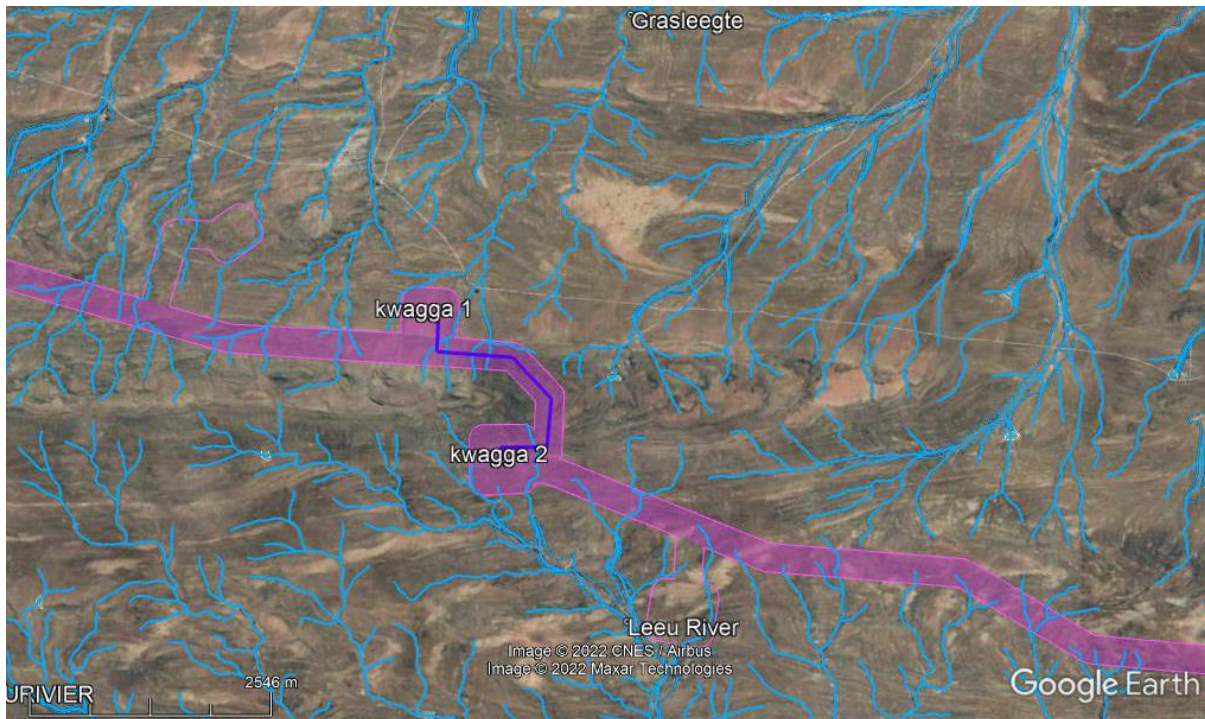


Figure B.14. Google Earth image with the mapped aquatic features and drainage lines (pale blue lines and polygons) in relation to the proposed development site (purple polygon with dark blue polyline representing the proposed powerline routing).

B.2.8.4 Aquatic Species

Vegetation cover within the wider study area consists of open to sparse low Kimberley Thornveld savannah. This widespread vegetation type is classified as being Least Threatened and does not comprise of any endemic species. Due to the sparse and largely ephemeral nature of the aquatic habitats in the area, there are no specific aquatic species that are solely dependent of aquatic habitat occurring in the wider study area. Larger trees such as *Vachellia karroo* (sweet thorn), *V. tortilis* (umbrella thorn), *V. erioloba* (camelthorn), *Searsia pyroides* (common current rhus), *S. lancea* (karee), *Tarchonanthus camphoratus* (camphor bush), *Ziziphus mucronata* (buffalo thorn), *Lycium hirsutum* (river honey thorn), *Diospyros lycioides* (bluebush) and *Grewia flava* (wild raison bush) also that would occur within the riparian zones of larger rivers in the area, are also common to the bushveld thicket in the area. Due to the fact that these trees are widespread, their conservation status is Least Concern. A Species of Conservation Concern (SCC) is *Vachellia erioloba*, which is classified as declining by the Red List and protected under the National Forests Act, Act 84 of 1998.

The watercourses in the study area are non-perennial and are dry for large parts of the year. As a result, no indigenous fishes occur within the rivers and the amphibian diversity within the study area is likely to be relatively low. No species of conservation concern are known to occur in the study area from an aquatic perspective. The species likely to be present are quite widespread and of low conservation concern. These include the Karoo Dainty Frog, *Cacosternum karooicum* (Data Deficient), the Cape Sand Frog, *Tomopterna delalandii*, Karoo Toad, *Vandijkophrynus gariepensis* and the Raucous Toad, *Amietophrynus rangeri*. The latter three amphibian species are listed as “Least concern”.

B.2.8.5 Screening Tool Descriptions and Site Verifications

Figure B.15 below presents the information from the Screening Tool for the Aquatic Biodiversity Combined Sensitivity as it relates to the proposed powerline corridor. The Screening Tool has indicated that the catchment of the Grasleegte/Swartbakens River Catchment is of very high sensitivity while the catchment of the Leeu River is of low Aquatic Biodiversity Combined Sensitivity, this is largely based on the National FEPA and aquatic CBA mapping for the aquatic ecosystems within the proposed powerline study area.

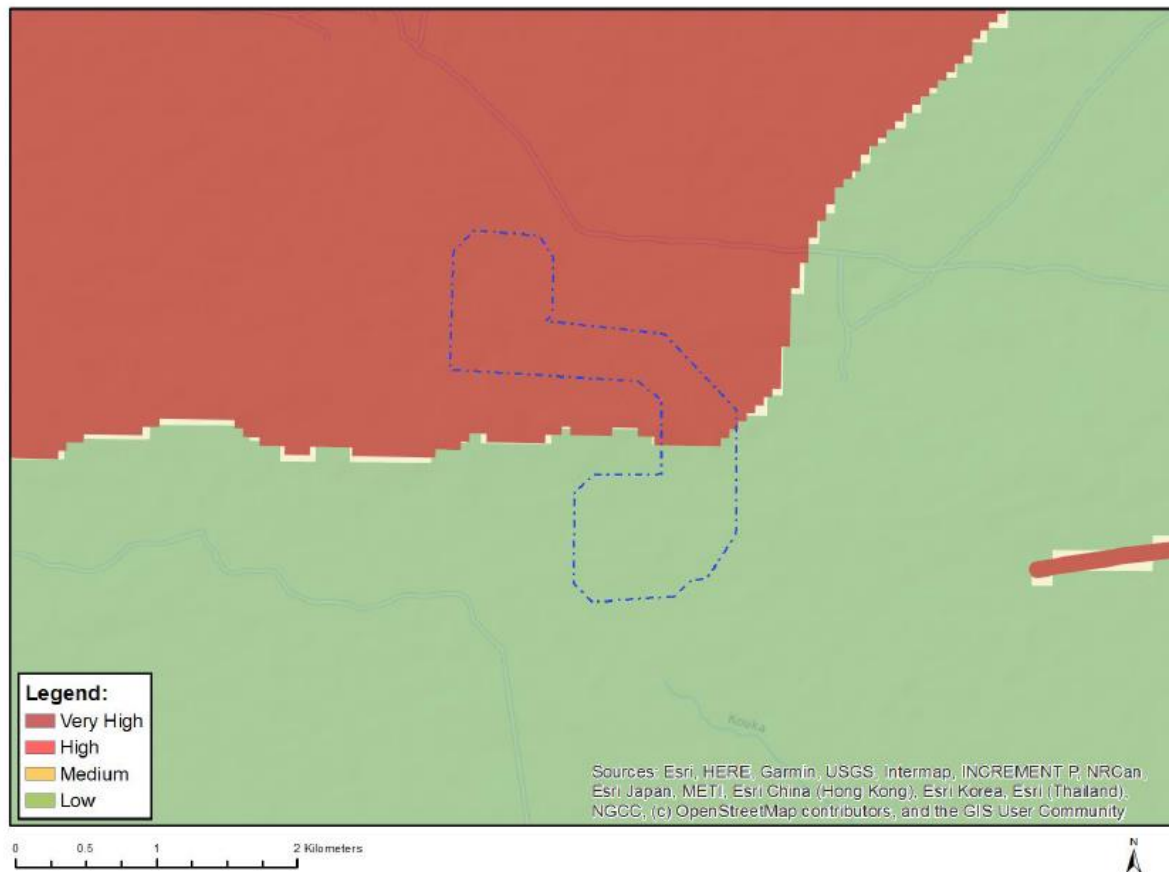


Figure B.15. Map depicting Aquatic Biodiversity Combined Sensitivity in and around the proposed powerline corridor (Source: DFFE Screening Tool, 2022).

The catchment of the Grasleegte/Swartbakens River Catchment is of very high sensitivity, while the catchment of the Leeu River is of low Aquatic Biodiversity Combined Sensitivity, this is largely based on the National FEPA and aquatic CBA mapping for the aquatic ecosystems within the proposed powerline study area. The mainstem of the Traka River is mapped as aquatic CBAs, with the wider river corridor being mapped as a terrestrial CBA. The smaller feeder streams of the Grasleegte and Leeu Rivers are mapped as aquatic Ecological Support Areas. The Leeu River Sub-catchment is mapped as an Upstream Catchment that is important to be maintained in its current ecological condition. The only wetlands mapped within the site are wetlands associated with dams that are mapped as artificial FEPA Wetlands.

This assessment determined the watercourses within the site to be of Moderate sensitivity while the smaller watercourses, as well as the recommended buffer areas (35 m for the small

watercourses), are considered as of Low Aquatic Biodiversity Combined Sensitivity. The proposed overhead powerline will only cross the small low, sensitivity streams.

With mitigation, the potential freshwater impacts of the proposed overhead powerline for the construction, operation and decommissioning phases are likely to be very low. One can also expect that the cumulative impact of the proposed project would not be significant provided mitigation measures are implemented.

B.2.9 Terrestrial Biodiversity

Various resources, such as, but not limited to, Google Earth satellite imagery, the SANBI BGIS, SANBI NewPOSA, International Union for Conservation of Nature (IUCN) Red List and the University of Cape Town (UCT) Animal Demography Unit, as well as national and provincial biodiversity spatial data and species lists, have been used to define the regional vegetation, watercourses, fauna and anticipated ecological sensitivity of the study area. Details pertaining to the terrestrial environment is provided in the Terrestrial Biodiversity and Species Impact Assessment (which is included in Appendix D.4 of this BA Report)

B.2.9.1 General Context

Refer to Section B.8.1 above for information on the general context of the site from an ecological perspective.

B.2.9.2 Biodiversity Conservation Planning

Protected Areas and National Protected Areas Expansion Strategy

According to the South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) databases, Quarter 3 (2020), the proposed study area does not form part of any formally protected areas, nor does it form part of the National Protected Area Expansion Strategy (NPAES) (2010).

The closest protected area is the Karoo National Park, which was proclaimed in 1979 and is located approximately 70 km away to the north of the proposed project site. Refer to Section B.2.10 below for more information on other conservation areas in the region of the proposed project site.

Freshwater Ecosystem Priority Areas (FEPA)

Freshwater Ecosystem Priority Areas (FEPA) are priority areas for conserving freshwater ecosystems and supporting sustainable use of water resources and upstream management areas. The areas classified as Freshwater Ecosystem Priority Areas (FEPA) intersect the powerline route in northern portion of the proposed powerline as well as towards the alternative substation location at the Kwagga WEF site. However, the area mapped as FEPA did not emerge as being highly sensitive in the current assessment and the sensitivity model that was applied, classified only the drainage lines in the FEPA as being of medium sensitivity. Refer to Appendix D. 5 for the detailed Aquatic Impact Assessment.

Critical Biodiversity Areas and Ecological Support Areas

Refer to Section B.2.8.1 above for information on the identification of CBAs and ESAs within the proposed project site and immediate surrounds.

Critically Endangered and Threatened Ecosystems

There are no Critically Endangered, Threatened and/or Vulnerable Ecosystems present within the proposed project site nor within the Beaufort West or Prince Albert Local Municipalities. Such areas are located more than 60 km to the south of the site within the adjacent Eden District Municipality.

B.2.9.3 Terrestrial Ecosystems

As indicated above, the proposed study area falls in the Nama Karoo Biome, more specifically in the Lower Karoo Bioregion between Beaufort West and Klaarstroom, and is located in the Gamka Karoo vegetation type, which occurs between the Great Escarpment (Nuweveld Mountains) in the north and Cape Fold Belt Mountains (Swartberg Mountains) in the south. As highlighted above, the Gamka Karoo vegetation type, which is dominated by spiny Karoo dwarf shrubs, is classified as "least threatened" with about 2.6% statutorily conserved in the Karoo National Park and some private nature reserves. Only a small part has undergone transformation.

Looking at the combined area encompassing the proposed powerline corridors, eight broad habitat types were distinguished within this combined study area, however only six of these habitat types were identified within the proposed powerline segment that is the subject of this BA report (Figure B.16). Overall, the vegetation on the proposed project site is structurally fairly homogeneous with dwarf shrubs (i.e. Karoo bushes) being dominant.

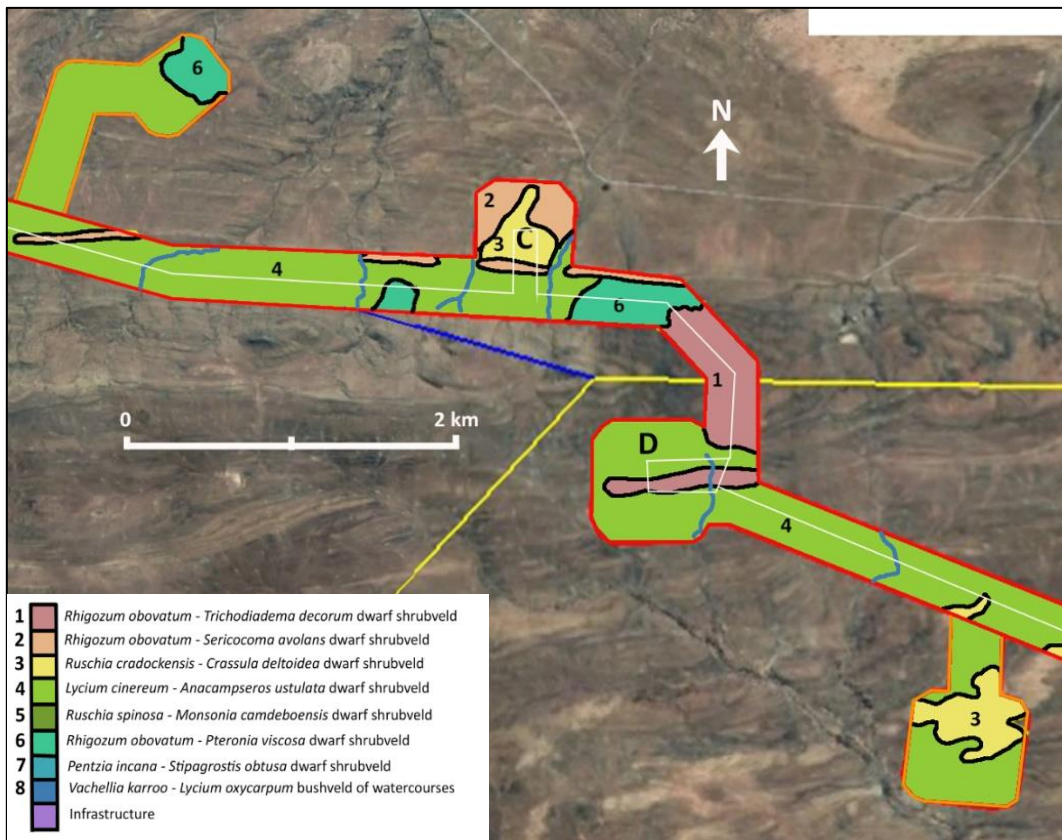


Figure B.16. Vegetation mapping of the proposed powerline corridor (Source: Van Rooyen, 2022).

B.2.9.4 Terrestrial Species

Botanical diversity is generally associated with niche habitats within the study area, in particular crests and scarps of hills, ridges, rocky outcrops quartz patches as well as the numerous ephemeral watercourses transecting the site. The dominant shrub and dwarf shrub species of the plains habitats *Lycium spp.*, *Rhigozum obovatum*, *Vachellia karroo*, *Searsia burchellii*, *Chrysocoma ciliata*, *Eriocephalus spp.*, *Felicia muricata* and *Pentzia incana*. The most prominent grass species include *Aristida adscensionis*, *Aristida congesta*, *Aristida diffusa*, *Fingerhuthia africana*, *Stipagrostis ciliata*, *Stipagrostis obtusa* and *Eragrostis spp.* The site does not fall within any Centre of Endemism, but some endemic plant species characteristic of the area includes *Chasmatophyllum stanleyi*, *Hereroa incurva*, *Hoodia dregei*, *Ruschia beaufortensis*, *Jamesbrittenia tenuifolia*, *Manulea karrooica* and *Piранthus comptus*.

Fauna of conservation concern that could potentially occur in the region include the Near-Threatened Littledale's whistling rat (*Parotomys littledalei*), the Endangered Karoo dwarf tortoise (*Chersobius boulengeri*) that is also an endemic species to the area, and the Critically Endangered Riverine Rabbit (*Bunolagus monticularis*). However, due to intensive grazing by livestock exacerbated by the ongoing drought, the vegetation on site and along many of the drainage lines is severely degraded and as a result, favourable habitat for the Riverine Rabbit does not appear to be present and is therefore unlikely to occur in the proposed powerline corridor.

The Terrestrial Biodiversity and Species Impact Assessment (Appendix D.4 of this BA Report) provides a detailed list of terrestrial botanical and faunal species common to the study area and surrounds, as well as the terrestrial botanical and faunal species recorded on site

B.2.9.5 Screening Tool Descriptions and Site Verification

Figures B.17 to B.19 below indicate the results of the Screening Tool in terms of terrestrial plant species, terrestrial animal species, and the terrestrial biodiversity combined sensitivity.

Based on the above, the Screening Tool notes that floral significance or sensitivity is deemed to be of medium significance (Figure B.17). suggesting that there may be some occurrence of important botanical communities, but this is not of a high probability. The Screening Tool highlighted three species were highlighted as being of concern (i.e. Species 383, *Peersia frithii* and Species 1039). Findings from the Site Sensitivity Verification confirmed that none of the mentioned species were encountered along proposed powerline segment that is the subject of this BA Report, although Sensitive species 1039 was recorded within the surrounding area, within the combined Kwagga Wind Energy Facilities (WEF) 1-3 site. However, several provincially protected/specially protected and CITES II listed species were recorded on site. These species are mostly associated with cliffs, scarps, quartz patches and rocky ridges (outcrops) and pylons should avoid these habitats. The findings from the Terrestrial Biodiversity Assessment recommends that the Plant Species Theme be downgrade to a Low sensitivity.

The Screening Tool shows that faunal populations are deemed to be of medium to high ecological significance or sensitivity (Figure B.18). According to Collins & Du Toit (2016) the riverine rabbit has been sighted in the broad region to the north and south, but not close to the proposed powerline corridor. Furthermore, the Animal Demography Unit's mammal database has no record of the riverine rabbit in the 3222D degree square. In addition, the Site Sensitivity Verification did not confirm ideal habitat for the riverine rabbit and due to intensive grazing by livestock, exacerbated by the recent drought, the vegetation on site and along many of the drainage lines was degraded. The specialist report for the neighbouring Trakas WEF site reported similar findings. Furthermore, camera trapping conducted on the neighbouring Trakas WEF site did not provide any evidence of the presence of the riverine rabbit.

A desktop investigation indicated that the proposed powerline corridor could indeed fall within the distribution range of the Karoo dwarf tortoise (Animal Demography Unit reptile map) although it was not recorded during the site visit. The closest records of the species are approximately 20 – 40 km from the proposed powerline corridor. A site visit (September 2021) by a specialist herpetologist on the farm Trakaskuilen yielded no evidence of live specimens or shell fragments of Karoo Dwarf Tortoise. This tortoise has a strong affinity with dolerite ridges and other types of rocky outcrops in the Nama Karoo biome. It utilises holes or cavities under rocks as shelter, which are considered the most important components of essential habitat that determines the likelihood of presence or absence in an area. The conclusion by the specialist was that the species was indeed absent from this particular area judging by the general lack of suitable habitat on Trakaskuilen. The findings from the Terrestrial Biodiversity Assessment recommends that the Animal Species Theme be degraded to a Low sensitivity.

In terms of the terrestrial biodiversity combined sensitivity layer on the Screening Tool, the majority of the study area is shown to have a low ecological significance with areas very high ecological significance or sensitivity (Figure B.19). This theme considers the presence of protected areas, National Protected Area Expansion Strategy (NPAES), CBA, ESA and National Freshwater Ecosystem Priority Area (NFPEPA). The study area is not located in a protected area and the vegetation type on site is listed as Least Concern.

A detailed desktop investigation indicated that the development would have no impact on existing protected areas nor affect the NPAES. There is only a very small section of the Kwagga powerline route (north of the onsite substation at Kwagga WEF 3 site) where a CBA marginally intersects the route and pylons should preferably not be located within the areas demarcated as CBA. Overall, the impact of the development within the identified CBAs and ESAs can be limited by good planning. Freshwater Ecosystem Priority Areas (FEPAs) intersect a section of the powerline route. However, the area mapped as FEPA did not emerge as being highly sensitive in the current botanical assessment and the sensitivity model that was applied, classified only the drainage lines in the FEPA as being of medium sensitivity. Considering the fact that none of the habitats had a high sensitivity, we would downgrade the Relative Terrestrial Biodiversity Theme to a Medium sensitivity.

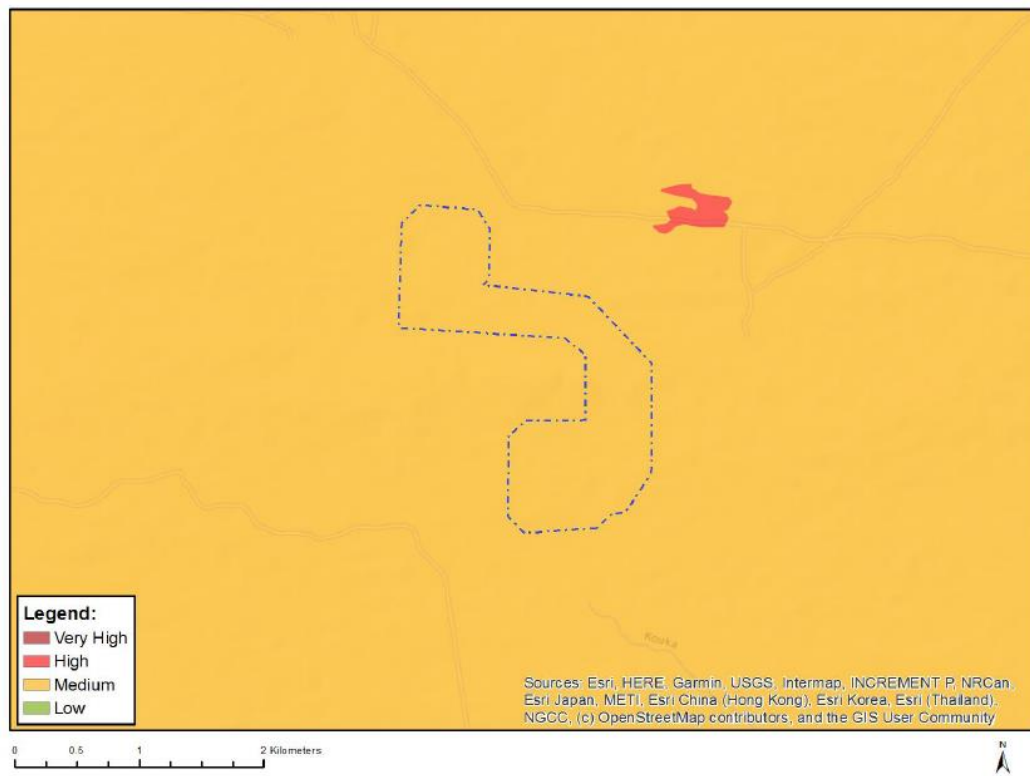


Figure B.17. Map indicating Terrestrial Plant Species sensitivity for the proposed powerline segment and surrounds (Source: DFFE Screening Tool, 2022).

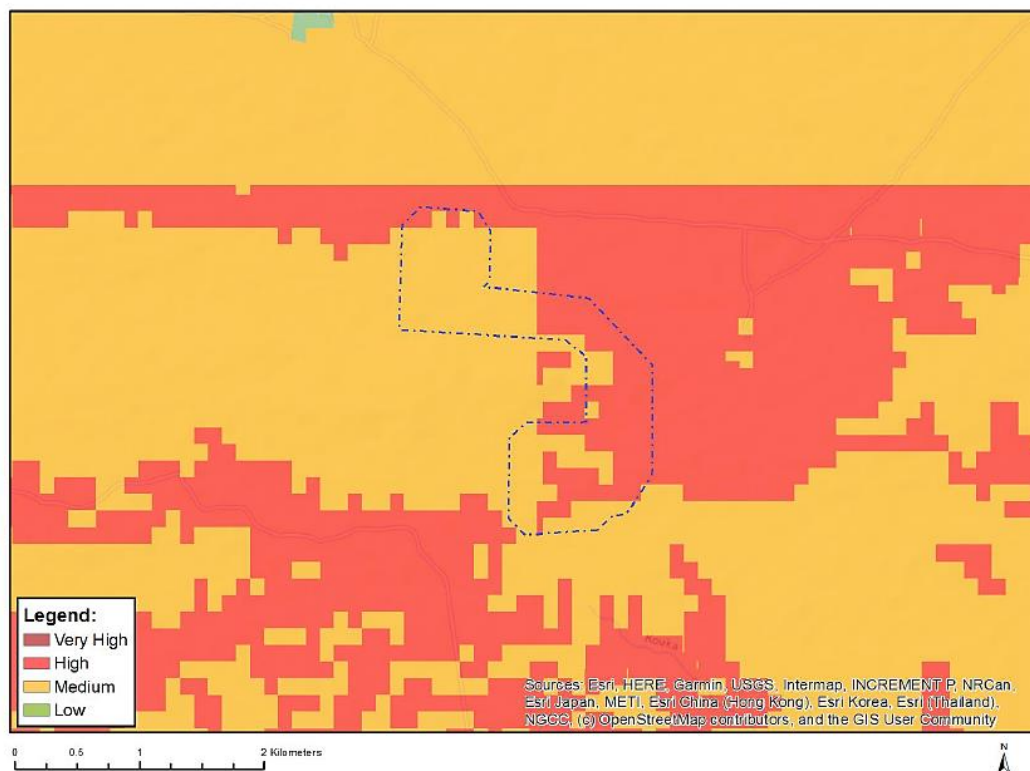


Figure B.18. indicating Terrestrial Animal Species sensitivity for the proposed powerline segment and surrounds (Source: DFFE Screening Tool, 2022)

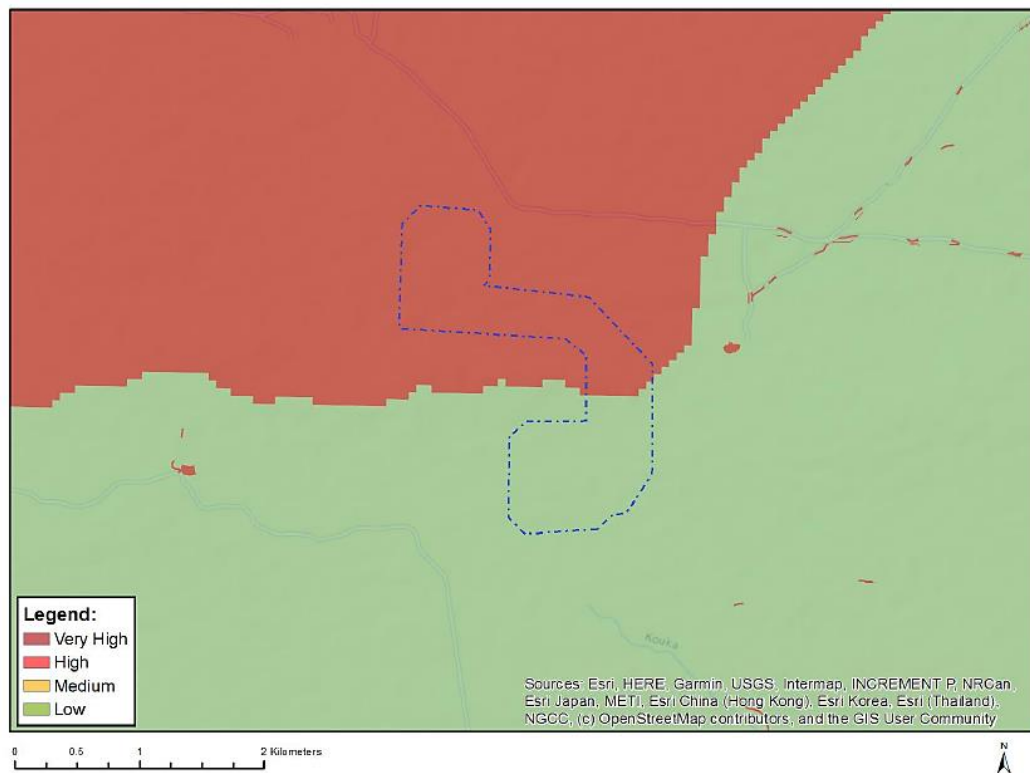


Figure B.19. Map indicating Terrestrial Biodiversity Combined Sensitivity for the proposed powerline segment and surrounds (Source: DFFE Screening Tool, 2022)

B.2.10 Avifauna

The Avifauna Assessment (Appendix D.6 of the BA Report) undertaken for the proposed project includes detailed feedback on avifauna species encountered during the site monitoring. The information provided in this section is extracted from the Avifauna Assessment (Appendix D.6 of the BA Report).

Whilst the distribution and abundance of the bird species in the broader area are mostly associated with natural vegetation, as this comprises virtually all the habitat, it is also necessary to examine the few external modifications to the environment that have relevance for birds.

The following avifaunal-relevant anthropogenic habitat modifications were recorded within the 2 km Project Area of Impact (PAOI) zone around the proposed powerline:

- **Water points:** The land use in the PAOI is mostly small stock farming. The entire area is divided into grazing camps, with associated boreholes and drinking troughs. In this arid environment, open water is a big draw card for birds which use the open water troughs to bath and drink.
- **Dams:** The PAOI contains a few ground dams located in drainage lines. When these dams fill up after good rains, they contain standing surface water for several months, which attracts birds to bath and drink.
- **Transmission lines:** The Droërvier - Proteus 400kV high voltage line bisects the extreme west of the PAOI, parallel to the N12 national road. A Martial Eagle nest is present on Tower 162. The nest is located approximately 12.5 km from the Beaufort West 132 kV – 400 kV Linking Station.

The proposed development site does not fall within any of the Important Bird Areas. The Swartberg Mountains Important Bird Area (IBA) SA106 is the closest IBA and is located approximately 37 km south of the project site at its closest point (Marnewick et al. 2015). The development is not expected to have any impact on the avifauna in this IBA due to the distance from the project site.

The results of an integrated pre-construction programme conducted over 12-months at the proposed Kwagga WEF 1, 2 and 3 sites from March 2019 – March 2020 were used to inform the Avifaunal Impact Assessment undertaken for the proposed powerline. The avifaunal information described is based on the findings of a 12-month pre-construction avifaunal monitoring programme, which was implemented by the Avifauna Specialist at the combined study area for the proposed Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3 projects during the course of 2019 and 2020. The monitoring programme was implemented prior to the promulgation of the prescribed protocol for assessment and minimum criteria for reporting on the impacts of WEFs on avifauna (GN 320 published on 20 March 2020), as well as the protocol on terrestrial plant and animal species (GN 1150 published on 30 October 2020). However, it is important to note that the aforementioned pre-construction monitoring programme was designed in accordance with the latest version (2015) of the “*Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development areas in southern Africa*” (Jenkins *et.al.*, 2011). Site inspections were also conducted on 05 October and 08 November 2021 at the proposed Trakas and Beaufort West Wind Farms and to record all avifaunal sensitivities as part of an avifaunal impact assessment study for the 132 kV grid connection.

The South African Bird Atlas Project 2 data indicates that a total of 160 bird species could potentially occur within the PAOI, which includes all the project sites in similar habitat. Of these, 38 species are classified as powerline sensitive species and 10 of these are South African Red List species. Of the powerline sensitive species, 20 are likely to occur regularly at the PAOI and immediate surrounding area, and another 18 could occur sporadically.

Table B.1. Priority Species recorded as incidental observations.

Species name	Scientific name	Regional status	Likelihood of regular occurrence in the PAOI
Black Harrier	<i>Circus maurus</i>	EN	L
Blue Crane	<i>Grus paradisea</i>	NT	M
Booted Eagle	<i>Hieraaetus pennatus</i>	-	M
Cape Crow	<i>Corvus capensis</i>	-	H
Egyptian Goose	<i>Alopochen aegyptiaca</i>	-	H
Greater Kestrel	<i>Falco rupicoloides</i>	-	H
Hadada Ibis	<i>Bostrychia hagedash</i>	-	M
Helmeted Guineafowl	<i>Numida meleagris</i>	-	M
Karoo Korhaan	<i>Eupodotis vigorsii</i>	NT	H
Kori Bustard	<i>Ardeotis kori</i>	NT	M
Lanner Falcon	<i>Falco biarmicus</i>	VU	M
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN	H
Martial Eagle	<i>Polemaetus bellicosus</i>	EN	M
Pale Chanting Goshawk	<i>Melierax canorus</i>	-	H
Pied Crow	<i>Corvus albus</i>	-	H
Red-knobbed Coot	<i>Fulica cristata</i>	-	M
Rock Kestrel	<i>Falco rupicolus</i>	-	M
South African Shelduck	<i>Tadorna cana</i>	-	H

Spotted Eagle-Owl	<i>Bubo africanus</i>	-	M
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	L
White-necked Raven	<i>Corvus albicollis</i>	-	M

Results from the pre-construction programme conducted over 12-months at the proposed combined Kwagga WEF study area indicates that the overall abundance of priority species within the combined Kwagga WEF study area was low, with an average of 0.43 birds/km recorded during transect counts. The low numbers are not surprising, given the general aridity of the habitat.

However, the Avifauna specialist concluded that the entire PAOI is high sensitivity based on the confirmed occurrence of several powerline sensitive SCC. The birds move randomly across the whole PAOI, therefore no specific areas can be delineated as being more sensitive than others.

B.2.10.1 Screening Tool Descriptions and Site Verification

In terms of the Screening Tool, the proposed site and immediate environment is classified as Medium to High sensitivity for avifauna from a powerline perspective and no known nests or roosts were identified (Figure B.20). The High classification is linked to the potential occurrence of species of conservation concern (SCC) Ludwig's Bustard (Globally and Regionally Endangered), Martial Eagle (Globally and Regionally Vulnerable), Black Harrier (Globally and Regionally Endangered), Southern Black Korhaan (Globally and Regionally Vulnerable) and Verreaux's Eagle (Regionally Vulnerable). The medium classification is linked to Ludwig's Bustard, Southern Black Korhaan and Verreaux's Eagle.

The PAOI, which contains all the development sites with the same homogeneous habitat, contains confirmed habitat for species of conservation concern (SCC), as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). The occurrence of SCC was confirmed during the surveys conducted in 2019-2020 and in 2021 in the PAOI and immediate adjacent area in similar habitat i.e. Ludwig's Bustard, Black Harrier, Blue Crane (Globally Vulnerable and Regionally Near-threatened), Karoo Korhaan (Regionally Near-threatened), Kori Bustard (Globally and Regionally Near-threatened), Lanner Falcon (Regionally Vulnerable), Martial Eagle and Verreaux's Eagle were recorded. This classification is assessed to be accurate as far as the impact of the proposed powerline and associated infrastructure is concerned, based on actual conditions recorded on the ground during the site visits in October 2021, and the 12-months of pre-construction monitoring in 2019 – 2020.

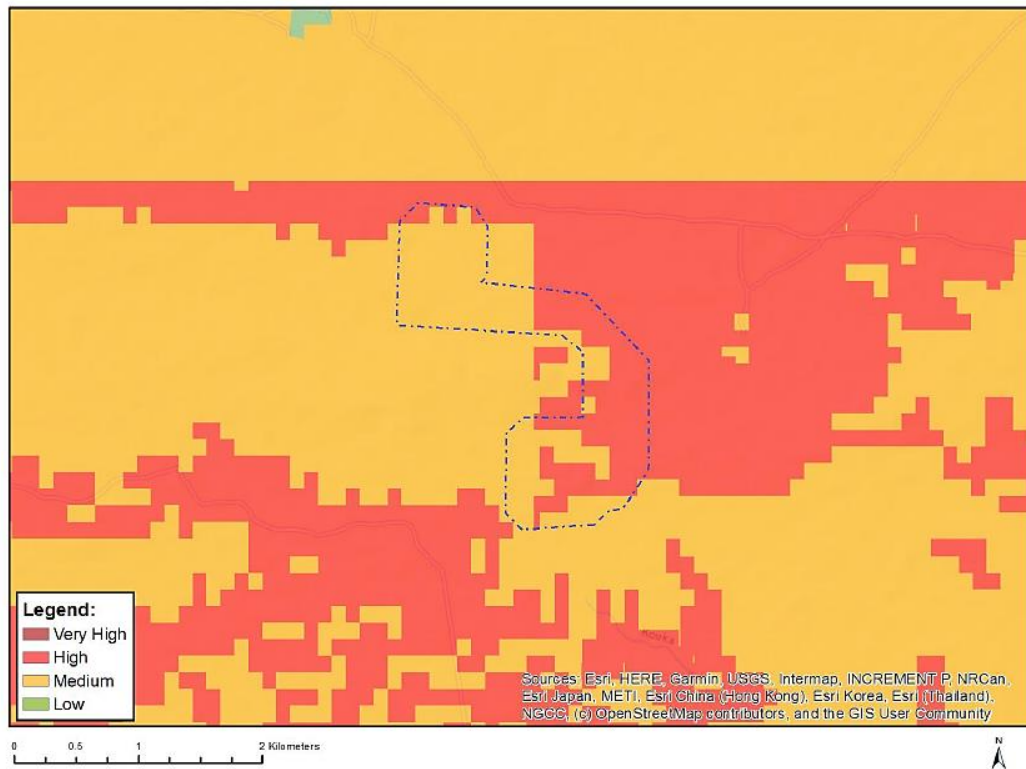


Figure B.20. The National Web-Based Environmental Screening Tool map of the proposed development area, indicating terrestrial animal sensitivities for the powerline theme (Source: DFFE Screening Tool, 2022).

B.2.11 Visual Aspects and Sensitive Receptors

The Visual Impact Assessment is included in Appendix D.2 of the BA Report and includes details on landscape and sensitive receptors. The information provided in this section is extracted from the Visual Impact Assessment (Appendix D.2 of the BA Report).

The visual assessment provides information on landscape, terrain and vegetation, as well as other aspects such as land use and sensitive receptors. As described in Section B.2.2 of this section, the landscape character of the proposed powerline site and surrounds is relatively flat to rolling with low ridges and covered with sparse, low-growing shrubland vegetation that is visually uniform. The vegetation is typical of the Karoo ambience and together with the undulating topography provides the sought after 'Karoo sense of place'.

The key visual sensitive receptors identified within the proposed project site and surrounds include built infrastructure i.e. homesteads of which the majority seems permanently uninhabited. Other visually sensitivity receptors include travellers on the main roads such as the N12, R306 and the R61, as well as conservation and tourism activities and hospitality establishments that rely on the aesthetic environment. Landscape sensitive receptors identified within the proposed project site include low-lying ridges, low-growing vegetation and several watercourses such as rivers and drainage lines, all of which are regarded as visually interesting and provides for that typical Karoo ambience. The visual periphery to the north and south of the project site is characterised by mountains and high ridges most of which are included in conservation areas.

B.2.11.1 Screening Tool Descriptions and Site Verification

The Screening Tool report did not include a map to show the proposed powerline corridor as it relates to potential Landscape or Visual Sensitivity. The Screening Tool however did indicate that the Plant Theme Sensitivity (Figure B.17) was medium sensitivity for the powerline corridor under assessment. However, the very nature of the vegetation in this area (Gamka Karoo and Prince Albert Succulent Karoo) is low growing and visually uniform which does not provide much visual screening. Although the vegetation is not overly sensitive to the powerline development it does not assist in reducing the visual expose of the overhead powerlines. The vegetation is typical of the Karoo ambience and it is this together with the undulating topography which provides the Karoo its unique 'sense of place'.

The study area's landscape is relatively flat to rolling with low ridges and covered with low growing and sparse vegetation. The current land-use is primarily small stock grazing. The peripheral visual boundaries to the north and south are truncated by the Swartberg Mountains in the south and the Nuweveld Mountains in the north. The area appears to be sparsely populated, which was borne out during the site visit. The study area is not regarded as having a high visual quality when compared to other areas in the region such as the Swartberg Mountains, Meiringspoort and the mountains around Beaufort West and the Karoo National Park but it does display the typical and iconic Karoo landscape.

B.2.12 Heritage: Archaeology and Cultural Landscape

A detailed description of the archaeological features and cultural landscape within the proposed powerline site is provided in the Heritage Impact Assessment, which integrates Archaeology, Palaeontology and Cultural Landscape (Appendix D.3 of this BA Report).

The Kwagga WEFs 1-3 project site was subjected to foot surveys from 3 to 13 November 2020. The Beaufort West WEF and Trakas WEF project sites were subjected to foot surveys from 21 to 23 February 2022. These surveys were during summer but, due to the arid nature of the area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Garmin Global Positioning System (GPS) receiver set to the WGS84 datum. The Heritage Specialist has extensive knowledge of the Karoo landscape and the types of heritage resources expected to be found in the project area.

The Heritage Impact Assessment for the proposed powerline route was based on the surveys of five adjoining and adjacent WEFs, which have been granted Environmental Authorisation by the DFFE, as mentioned above (i.e., the proposed Trakas WEF, the Beaufort West WEF, and the Kwagga WEFs 1-3).

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

Palaeontological resources are likely to be largely of low cultural significance and graded IIIC. A small chance exists, however, of material Grade IIIB or possibly even IIIA being found. The archaeological resources are deemed to have low to very low cultural significance at the local level

for their scientific value and can be graded NCW. It is possible, however, that resources of up to grade IIIC could be found within the corridor.

Graves are deemed to have high cultural significance at the local level for their social value. They would be allocated a grade of IIIA but none are known from the immediate vicinity of the proposed powerline corridor.

Although archaeologically resources were widespread but fairly sparsely distributed on the landscape, very few were located in or close to the proposed corridor. This is because the project layout was designed to avoid sensitive features. All sites currently on record within or close to the proposed powerline corridor are considered not conservation worthy (NCW) resources. Fossils also occur in the landscape but are very sparsely distributed. Impacts to graves were considered, but none are known in the vicinity of the proposed powerline corridor and the chances of any occurring in this fairly rocky landscape are minimal.

The cultural landscape is largely a natural landscape with aesthetic value and is rated as having medium cultural significance at the local level. It can be graded IIIB. However, with construction of above mentioned WEFs the landscape would lose some of its cultural value and likely be seen as a IIIC resource. In addition, the proposed powerline corridor and the proposed powerlines would not be constructed if the three Kwagga WEFs that they would support are not constructed. As such, no new impacts to the cultural landscape are expected.

No sites of cultural significance are yet known in the study area and there are thus none that require avoidance.

B.2.12.1 Screening Tool Descriptions and Site Verification

Figure B.21 indicates the archaeological and heritage sensitivity as captured on the Screening Tool. It can be derived from the Screening Tool that the sensitivity is low throughout the entire proposed powerline corridor. The site visit undertaken by the specialist confirms the findings of the Screening Tool and noted that only very small areas of higher sensitivity were found in the broader study area but none of these occurred within the proposed powerline corridor in which the powerline segment that is the subject of this BA Report would be constructed. A photographic record and description of the relevant heritage resources from within the corridor are contained within the Heritage Impact Assessment report (Appendix D.3 of this BA Report)

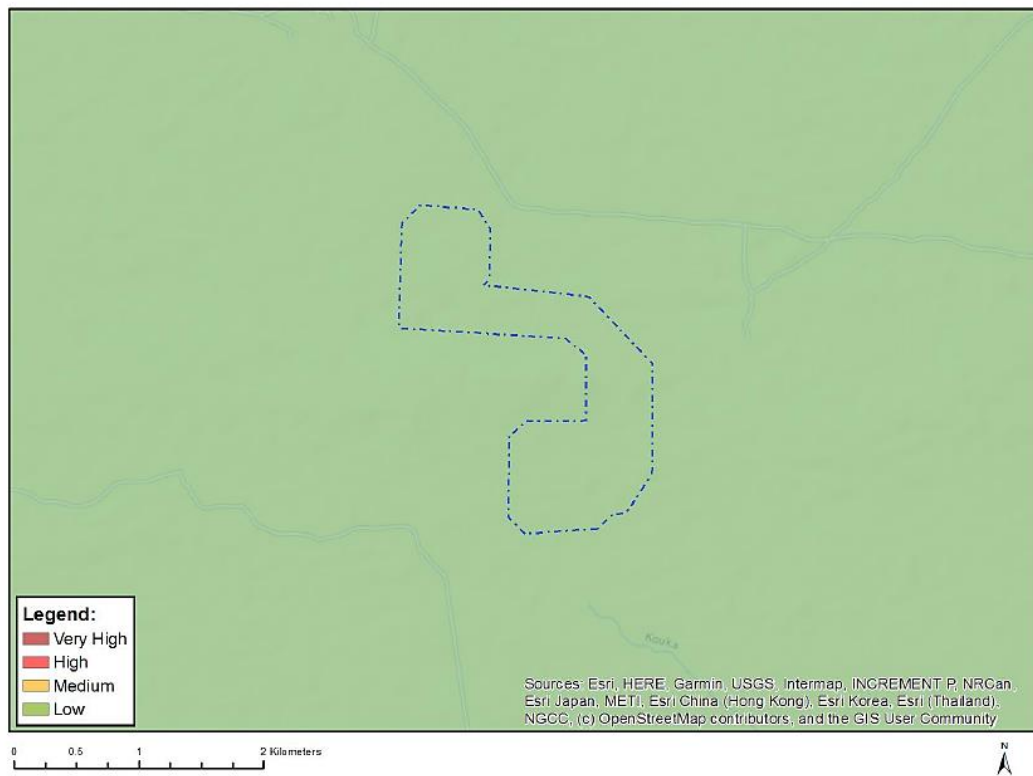


Figure B.21. Screening Tool map for Archaeology and Cultural Heritage Combined Sensitivity for the proposed development area (Source: DFFE Screening Tool, 2022).

B.2.13 Palaeontology

A detailed description of the palaeontological features within the proposed powerline corridor and recommended mitigation measures is provided in the Palaeontology Impact Assessment (Appendix D.3 of this BA Report), which forms part of the Heritage Impact Assessment (Appendix D.3 of this BA Report).

The proposed project site is underlain by Middle Permian continental sediments of the Lower Beaufort Group (Karoo Supergroup). These bedrocks are characterized by sparse, largely unpredictable fossil remains – notably those of various vertebrate subgroups – that may be of high scientific and conservation value.

Fossil sites recorded from the Beaufort West WEF, Trakas WEF, and the Kwagga WEFs 1-3 project areas are detailed in previous Palaeontological Impact Assessment reports by Almond (2021, 2022). Very few (c. 10) of these recorded sites lie within or very close to the proposed powerline corridor project area, most of which has not yet been palaeontologically surveyed on foot. The recorded fossil material mainly comprises postcranial skeletal remains of large, bodied tetrapods - pareiasaur reptiles / dinocephalian therapsids - *plus* a few skulls of small dicynodonts. Several of the recorded sites are of low scientific or conservation interest (e.g., fragmentary, weathered postcranial chunks of bone in surface float which are difficult or impossible to identify) while others have already been collected since they were recorded (cf Almond 2022). Important exceptions include two partial postcranial skeletons of large pareiasaur reptiles on Portion 1 of the Farm Trakas kuilen No.15.

Figure B.22 provides a satellite image of the proposed powerline corridor (white line/polygons), the Kwagga WEF 1 (Blue polygon), Kwagga WEF 2 (green polygon), Kwagga WEF 3 (purple polygon), Beaufort West WEF (yellow polygon) and the Trakas WEF (red polygon). The numbered small squares and circles map recorded fossil sites, abstracted from previous PIAs by Almond (2021a-c, 2022). Only 10 of these sites fall within or very close to the proposed powerline corridor.

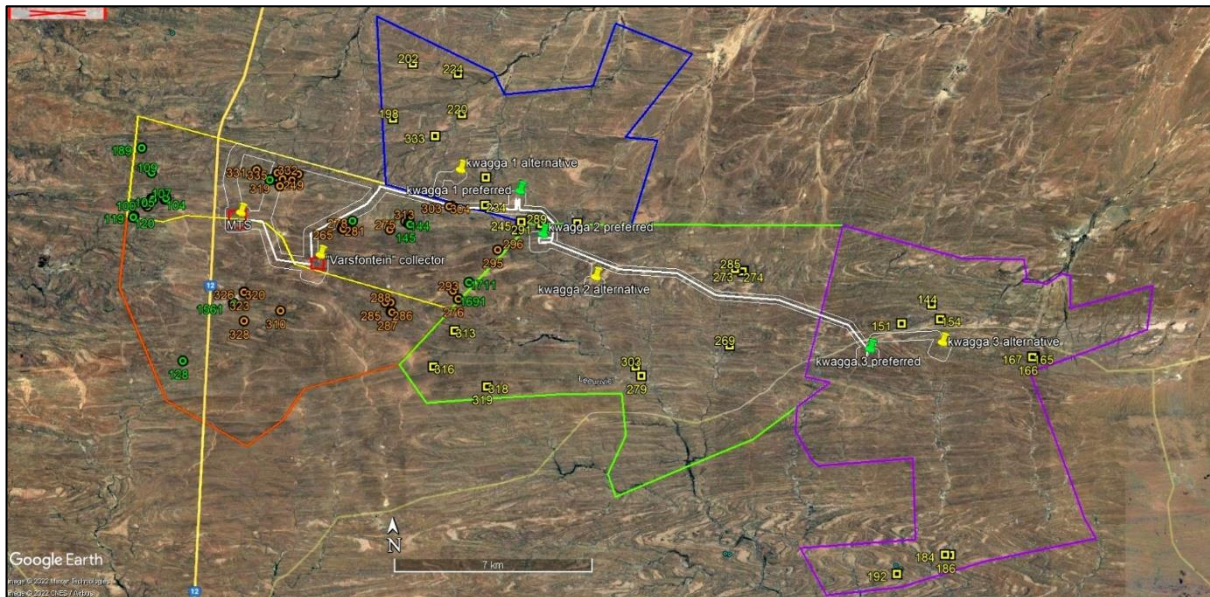


Figure B.22. Palaeontology Sensitivity Map for the proposed Kwagga EGI projects.

B.2.13.1 Screening Tool Descriptions and Site Verification

The Lower Beaufort Group outcrop area in the Main Karoo Basin as a whole is provisionally designated as Very High Sensitivity in palaeontological heritage terms on the basis of its rich fossil record of continental (fluvial / lacustrine / terrestrial) vertebrates of Middle to Late Permian age. A Very High Palaeosensitivity rating for almost the entire combined Kwagga WEFs 1-3, the Beaufort West WEF and the Trakas WEF project areas is indicated on the SAHRIS palaeosensitivity map (based on 1: 250 000 geological mapping), with the exception of small riverine areas with thick alluvial deposits (Almond 2021a-c, Almond 2022). Likewise a Very High Sensitivity is indicated for the entire proposed powerline corridor project area, based on the DFFE Screening Tool (Figure B.24). Paradoxically, the draft Phase 2 Heritage Scoping Report for the Aberdeen and Beaufort West REDZ 5 area located just to the north by Van der Walt (2019) asserts that “Small sections in the focus area are of medium palaeontological sensitivity” and assigns an overall Medium Sensitivity to this REDZ (This assessment is currently being challenged).

the north. The Henry Kruger Private Nature Reserve is situated just north of Leeu-Gamka straddling the R353 provincial road, and is located more than 50 km from the proposed project site, towards the west. The Gouritz Cluster Biosphere Reserve, the Gamkapoort Nature Reserve, the Swartberg Private Nature Reserve, the Gamkaskloof Provincial Nature Reserve and the Kleinberg Private Nature Reserve, as well as the Groot Swartberg-, Kammanassie- and the Swartberg-Oos Mountain Catchment Areas are all located more than 50 km away from the proposed project site.

The above activities will not be directly impacted by the proposed powerline development due to their respective distances (>50 km) from the proposed Kwagga EGI Corridor as potential visual intrusion by the pylon infrastructure could impact on sensitive receptors located on higher elevation areas only up to 20 km away from the development footprint.

B.4 Civil Aviation and Defence

As required by GN R320, a Civil Aviation Site Sensitivity Verification was undertaken for this proposed powerline project. The Screening Tool has indicated the proposed powerline corridor to be of 'low' sensitivity relating to Civil Aviation (Figure B.24).

This low sensitivity was verified and confirmed by the EAP during the BA process. Therefore, in line with GN R320, no further requirements are applicable i.e. a Civil Aviation Compliance Statement is not required.

The Civil Aviation Site Sensitivity Verification Report is included in Appendix D.7 of this BA Report.

As required by GN R320, a Defence Site Sensitivity Verification was undertaken for this proposed powerline corridor. The Screening Tool has indicated the proposed powerline corridor to be of 'low' sensitivity relating to Defence (Figure B.25).

This low sensitivity was verified and confirmed by the EAP during the BA process. Therefore, in line with GN R320, no further requirements are applicable i.e. a Defence Compliance Statement is not required.

The Defence Site Sensitivity Verification Report is included in Appendix D.8 of this BA Report.

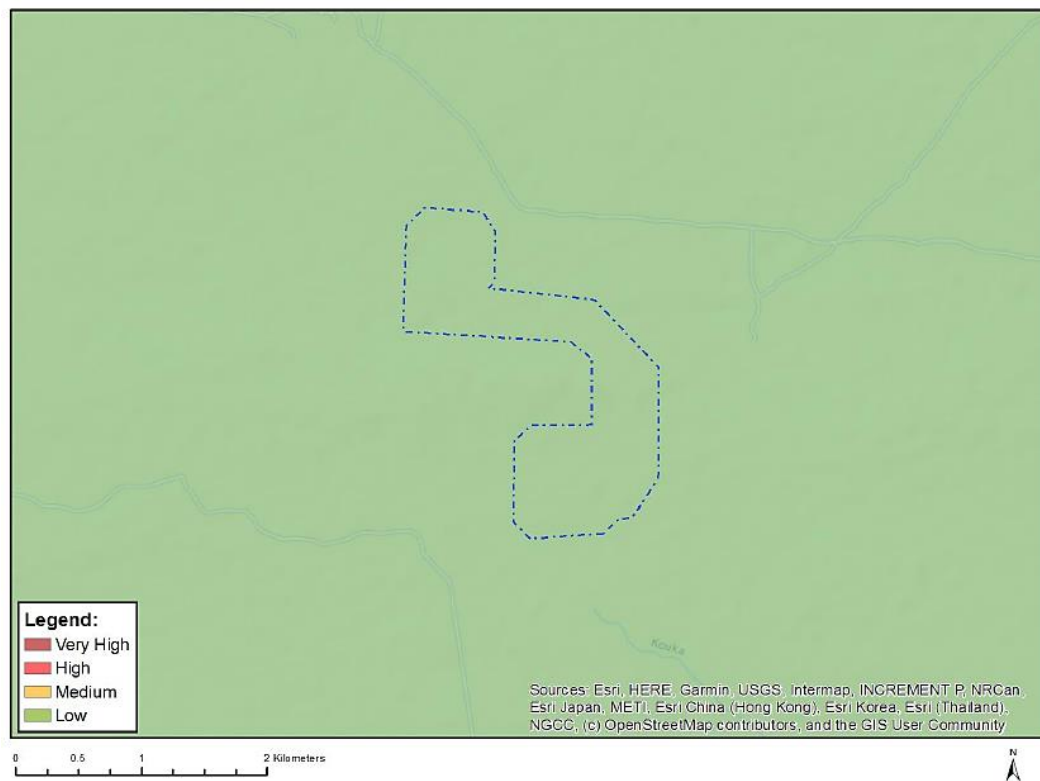


Figure B.24. Map showing Section 5 of the proposed Kwagga EGI Corridor as it relates to Civil Aviation sensitivity (Source: DFFE Screening Tool, 2022)

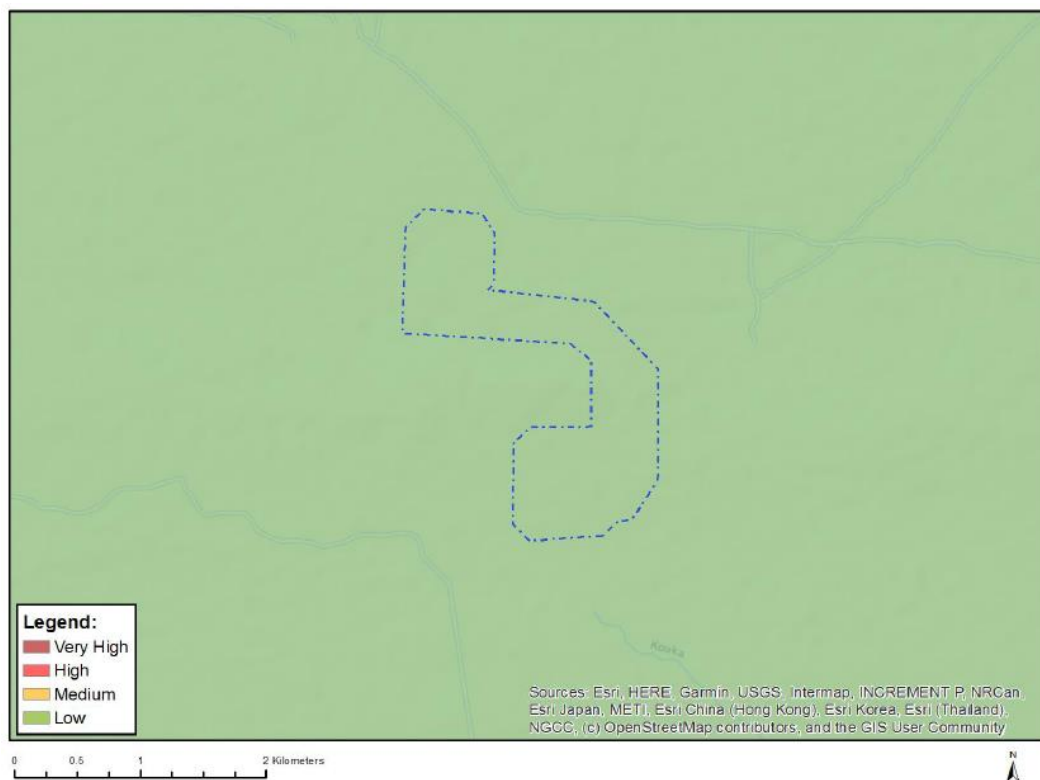


Figure B.25. Map showing Section 5 of the proposed Kwagga EGI Corridor as it relates to Defence sensitivity (Source: DFFE Screening Tool, 2022)

SECTION C. PUBLIC PARTICIPATION

C.1 Introduction to the Public Participation Process

This section provides an overview of the tasks undertaken during the Basic Assessment (BA), with a particular emphasis on providing a clear record of the Public Participation Process (PPP) that was followed. An integrated PPP has been undertaken for the BA Processes (i.e. Section 1 to 7 of the proposed overhead powerlines). The integrated PPP for the proposed projects will ensure that all public participation documents (such as newspaper advertisements, site notices, notification letters, emails etc.) served to notify Interested and Affected Parties (I&APs), Stakeholders and Organs of State of the joint availability of reports for the abovementioned projects and provided I&APs with an opportunity to comment on the reports. This approach was undertaken due to the close proximity of the sites (i.e. the proposed projects will take place within the same geographical area) and that proposed projects entail the same activity (i.e. distribution of electricity via power lines). However, it is important to note that, separate BA processes are being undertaken for each of the proposed powerlines (i.e., Section 1 to 7). As such, separate applications for BA will be submitted to the DFFE for the seven proposed powerline projects, respectively.

The PPP for these BA Processes is driven by a stakeholder engagement process that includes inputs from authorities, I&APs, technical specialists and the project proponent. Guideline 4 on “Public Participation in support of the EIA Regulations” published by the former Department of Environmental Affairs and Tourism (DEAT) in May 2006, states that public participation is one of the most important aspects of the EA Process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the Competent Authority (CA) to make informed decisions and results in improved decision-making as the view of all parties are considered.

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently. The DEAT guideline states the following in terms of PPP:

- *“Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;*
 - *Provides I&APs with an opportunity to voice their support, concern and question regarding the project, application or decision;*
 - *Enables an applicant to incorporate the needs, preferences and values of affected parties into its application;*
 - *Provides opportunities for clearing up misunderstanding about technical issues, resolving disputes and reconciling conflicting interests;*
 - *Is an important aspect of securing transparency and accountability in decision-making; and*
 - *Contributes toward maintaining a health, vibrant democracy.”*

To the above, one can add the following universally recognised principles for public participation:

- Inclusive consultation that enables all sectors of society to participate in the consultation and assessment processes;
- Provision of accurate and easily accessible information in a language that is clear and sufficiently non-technical for I&APs to understand, and that is sufficient to enable meaningful participation;
- Active empowerment of grassroots people to understand concepts and information with a view to active and meaningful participation;
- Use of a variety of methods for information dissemination in order to improve accessibility, for example, by way of discussion documents, meetings, workshops, focus group discussions, and the printed and broadcast media;
- Affording I&APs sufficient time to study material, to exchange information, and to make contributions at various stages during the assessment process;
- Provision of opportunities for I&APs to provide their inputs via a range of methods, for example, via written submissions or direct contact with members of the BA team; and
- Public participation is a process and vehicle to provide sufficient and accessible information to I&APs in an objective manner to assist I&APs to identify issues of concern, to identify alternatives, to suggest opportunities to reduce potentially negative or enhance potentially positive impacts, and to verify that issues and/or inputs have been captured and addressed during the assessment process.

At the outset it is important to highlight two key aspects of public participation:

- There are practical and financial limitations to the involvement of all individuals within a PPP. Hence, public participation aims to generate issues that are representative of societal sectors, not each individual. Hence, the PPP will be designed to be inclusive of a broad range of sectors relevant to the proposed project.
- The PPP will aim to raise a diversity of perspectives and will not be designed to force consensus amongst I&APs. Indeed, diversity of opinion rather than consensus building is likely to enrich ultimate decision-making. Therefore, where possible, the PPP will aim to obtain an indication of trade-offs that all stakeholders (i.e. I&APs, technical specialists, the authorities and the development proponent) are willing to accept with regard to the ecological sustainability, social equity and economic growth associated with the project.

The Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations was also considered during this BA Process.

The key steps in the PPP for the BAs are described below. This approach is structured in line with the requirements of Chapter 6 (PPP) of the 2014 NEMA EIA Regulations (as amended, i.e. GN R326), as described below. Various mechanisms have been undertaken to provide notice to all potential and registered I&APs of the proposed projects, as described below.

The BA Processes commenced in May 2022, whereby the specialist studies were commissioned, a pre-application meeting with the National Department of Environment, Forestry and Fisheries (DFFE) was held and the Draft BA Reports were being compiled. The Draft BA Reports were released to I&APs, Stakeholders and Organs of State (including the National DFFE) for a 30-day comment period extending from 11 July 2022 to 11 August 2022 (excluding public holidays). All comments submitted during the 30-day review have been incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and were included with the Final BA Report. This Final BA Report has been submitted to the National Department of

Forestry, Fisheries and the Environment (DFFE) in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20.

C.2 Public Participation Plan

On 5 June 2020, the Minister of Forestry, Fisheries and the Environment issued Directions in terms of regulation 4 (10) of the Regulations issued by the Minister of Cooperative Governance and Traditional Affairs in terms of section 27(2) of the Disaster Management Act, 2002 (Act 57 of 2002). These Directions were published in Government Gazette 43412, GN 650 on 5 June 2020, regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences.

Regulation 5.1 of GN 650 states that Authorities responsible for the processing of applications contemplated in the EIA Regulations, will be receiving such applications from 5 June 2020 and will receive and process applications and issue decisions in the manner as set out in Annexure 2 of GN 650. Regulation 5.2 of GN 650 states that Annexure 3 includes additional requirements in respect of the provision, supporting or obtaining of services contemplated in Regulation 5.1.

Annexure 3 of GN 650 states that an EAP must:

- Prepare a written public participation plan, containing proposals on how the identification and consultation with all potential Interested and Affected Parties (I&APs) will be ensured in accordance with Regulation 41(2)(a) to (d) of the 2014 NEMA EIA Regulations (as amended) or proposed alternative reasonable methods as provided for in regulation 41(2)(e), for purposes of an application and submit such plan to the competent authority; and
- Request a meeting or pre-application discussion with the competent authority to determine the reasonable measures to be followed to identify potential I&APs and register IA&Ps for purposes of conducting public participation on the application requiring adherence to Chapter 6 of the 2014 NEMA EIA Regulations (as amended) as set out in the public participation plan and obtain agreement from the competent authority on the public participation plan.

GN R650 is applicable to Alert Level 3 and was repealed by GN R970. GN R970, published on 9 September 2020, contains directions regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences, and it applied for the period of the national state of disaster. However, it is understood that even though GN R650 is repealed, it may be used as a guideline to inform the public participation process.

On 22 March 2022, the withdrawal of various directions regarding measures to address, prevent and combat the spread of COVID-19 (including GN R650 and GN R970) was published in Government Gazette 46075, and provides the following schedule and extent of the repeals of the Government Notices and Gazette Numbers relevant under the COVID-19 lockdown regulations:

Table C.1. Extent of withdrawal of various directions regarding measures to address, prevent and combat the spread of COVID-19 (Source: Extracted from Government Gazette 46075, 2022)

Government Notice and Gazette Number	Title	Extent of repeal
Government Gazette Notice No.650 in Government Gazette No. 43412 of 5 June 2020	Directions regarding measure to address, prevent and combat the spread of COVID-19 relating to national environment management permits and licenses	Repeal of the whole
Government Gazette Notice No.970 in Government Gazette No. 43696 of 9 September 2020	Directions regarding measure to address, prevent and combat the spread of COVID-19 relating to national environment management permits and licenses	Repeal of the whole
Government Gazette Notice No.649 in Government Gazette No. 43411 of 5 June 2020	Directions for Alert Level 3 regarding measure to address prevent and combat the spread of Covid-19 relating to the forestry sector	Repeal of the whole

Although the Government Notices and Gazette Numbers mentioned in Table 5 were repealed, a Pre-Application meeting request was submitted to the Competent Authority, the National DFFE in order to discuss and confirm the approach regarding various aspects prior to the release of the Draft BA Report.

A Pre-Application Meeting took place with the National DFFE, on 18 May 2022 (Reference Number: 2022-05-0008). It was confirmed during the Pre-Application meeting that a Public Participation Plan is not required to be submitted and approved by the National DFFE. The National DFFE also confirmed that digital copies of the Application Forms for EA and the corresponding BA Reports must still be submitted to the National DFFE via the DFFE Novell Filr System.

Refer to Appendix F.3 for a copy of the Pre-Application Meeting Notes; as well as Appendix F.4 with a copy of correspondence from the DFFE with approval of the Pre-Application Meeting Notes.

C.3 Pre-Application Meeting and Consultation with the DFFE

As mentioned above, a Pre-Application Meeting took place with the Competent Authority, the National DFFE, on 18 May 2022 (Reference Number: 2022-05-0008), in order to discuss and agree on various aspects with the DFFE prior to release of the BA Reports. The following points were discussed with the DFFE:

- An overview of the description of the seven proposed Kwagga 132 kV Overhead Transmission Powerlines and its associated infrastructure.;
- Findings of the National Web-Based Screening Tool Reports;
- Discussion and confirmation on the specialist assessments and compliance statements to be undertaken;
- Discussion and confirmation on the approach towards the specialist reporting, including that of the Assessment Protocols (GN 320, dated 20 March 2020);
- Discussion on the approach towards the BA reporting, including a request for combination of the projects;
- Approach to the Public Participation Process, including confirmation of the repealed requirement for a Public Participation Plan as per Government Gazette 46075 published on 22 March 2022;
- Discussion and confirmation on the proposed project schedule and overall process for the BAs, including the applicable Listed Activities and Cumulative Impact Assessment approach; and

- Points for clarification.

Refer to Appendix F.1 of this BA Report for a copy of the Pre-Application Meeting Request Form submitted to the DFFE; Appendix F.2 for a copy of the presentation delivered at the Pre-Application Meeting; Appendix F.3 for a copy of the Pre-Application Meeting Notes; as well as Appendix F.4 with a copy of correspondence from the DFFE with approval of the Pre-Application Meeting Notes. The Pre-Application Meeting Notes were submitted to the DFFE via email on 27 May 2022 and approved by the DFFE on 30 May 2022. The integrated Public Participation process was therefore discussed with the DFFE during the Pre-Application Meeting in order to facilitate the decision-making on the plan itself.

C.4 Landowner Written Consent

Regulation 39 (1) of the 2014 NEMA EIA Regulations (as amended) states that “if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land”.

Regulation 39 (2) of the 2014 NEMA EIA Regulations (as amended) further states that “sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014”.

Although the proposed Kwagga powerlines constitute linear activities, written consent was obtained from the landowners on which the linear infrastructure is proposed to be located. The written consent has been included as an appendix to the amended Application for EA, which is being submitted to the DFFE, together with the Final BA Reports for decision making.

As discussed in Section A of this BA Report, it is understood that the proposed Eskom 132 kV Switching Substation and the proposed Beaufort West 132 kV-400 kV Linking Station (DFFE Ref: 14-12-16-3-3-2-925-1) will be constructed by South Africa Mainstream Renewable Power Developments (Pty) Ltd (“Mainstream”) in support of their Beaufort West and Trakas WEFs that are to be located on land directly adjacent to the proposed Kwagga WEFs 1-3. The Project Developer (i.e., ABO Wind Renewable Energies (Pty) Ltd) has signed a servitude agreement and relevant powers of attorney with the landowner of the relevant Beaufort West and Trakas WEFs affected land portions and obtained with Mainstream to facilitate the connection of the proposed Kwagga WEFs 1-3 via the proposed 132 kV overhead powerlines, via the aforementioned Eskom Switching Substation and the Beaufort West 132kV-400kV Linking Station, to the existing Droërivier–Proteus 400 kV overhead powerline that runs parallel to the N12 in a north-south direction.

C.5 Site Notice Boards

One specific mechanism of informing I&APs of the proposed projects includes the placement of site notice boards. Regulation 41 (2) (a) of the 2014 NEMA EIA Regulations (as amended) requires that a notice board providing information on the project and BA Process is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site.

Notice boards in the Afrikaans and English languages were placed at the entrance of the key affected farm portions on which the proposed project will be constructed, as well as at other strategic locations, and government and public facilities in Beaufort West and Prince Albert. The site notice boards were placed on 14 and 15 June 2022. Table C.2 provides a breakdown of the locations at which the site notice boards were placed.

Table C.2. Site Notice Board Placement for the Proposed Projects

#	Locality/ Description	Coordinates
1	Entrance at the Prince Albert Local Municipality offices, Prince Albert	S33° 13' 41.8" E22° 01' 52.0"
2	Entrance at the Central Karoo District Municipality offices, Beaufort West	S32° 20' 55.0" E22° 34' 57.6"
3	Entrance at the Beaufort West Local Municipality offices, Beaufort West	S32° 21' 00.7" E22° 35' 00.4"
4	Entrance at the Beaufort West Public Library, Beaufort West	S32° 21' 01.3" E22° 35' 00.4"
5	Entrance gate on the N12 main road at the Silver Karoo Guest House turnoff	S32°53'20.19" E22°33'11.11"
6	Entrance gate to Farm Dwaalfontein 1/377 on the western border of the proposed Kwagga WEF 1	S32°53'47.83" E22°36'32.70"
7	Entrance gate to Farm Tyger Poort 3/376 on the eastern border of the proposed Kwagga WEF 1	S32°55'16.68" E22°42'22.13"
8	Entrance gate to Farm Muis Kraal 7/373 from the Rietbron bound public access road	S32°57'48.1" E22°50'03.3"
9	Western fence to Farm Muis Kraal 7/373 from the Rietbron bound public access road	S32°58'00.0" E22°47'30.0"
10	Western fence to Farm Wolve Kraal 19/17 from the Rietbron bound public access road	S32°58'50.0" E22°45'20.5"

Site notice boards were placed in English and Afrikaans; and included the following, in compliance with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended):

- The details of the proposed projects that are subjected to public participation;
- Explanation that a BA procedure is applicable to the proposed projects;
- The nature and location of the proposed projects;
- Details on where further information on the BA projects can be obtained; and

- The manner in which and the person to whom representations in respect of the BA Projects can be made.

Refer to Appendix E.3 of this Final BA Report for copies and proof of placement of the site notice boards. The site notice boards proved to be successful as various requests for registration as I&APs were received during the pre-application stage when the site notices were placed.

C.6 Newspaper Advertisement

Regulation 41 (2) (c) of the 2014 NEMA EIA Regulations (as amended) requires the placement of a newspaper advertisement in one local newspaper or any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of the NEMA EIA Regulations.

In line with this, in order to notify and inform the public of the proposed projects, to invite I&APs to register on the project database, as well as to inform I&APs of the release of the BA Reports for comment, the BA processes were advertised in English, Afrikaans and isiXhosa in one local newspaper (i.e., Die Courier) at the commencement of the 30-days comment period for the Draft BA Reports. The content of the newspaper advertisement complies with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended). The newspaper advertisement also included the details of the project website, where information available on the proposed project can be downloaded from. Refer to Appendix E.4 of this Final BA Report for a copy of the content of the newspaper advertisement and proof of placement of the newspaper advertisement.

At this stage, there are no official Gazettes published specifically for the purpose of providing public notice of applications or other submissions made in terms of the 2014 NEMA EIA Regulations (as amended).

C.7 Determination of Appropriate Measures

Refer to the section below which provides a detailed outline of the measures taken to include all potential I&APs, stakeholders and Organs of State in the BA Process. If during the BA Processes, persons are identified as desiring but unable to participate due to illiteracy, disability or any other disadvantage, then the EAP will contact the I&AP to discuss the proposed projects and provide assistance, where needed.

In line with Regulation 41 (2) (b) of GN R326 and prior to the commencement of the BA Processes (and advertising the EA Processes in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the BA Processes. This was undertaken based on research. Appendix E.5 of this Final BA Report includes a copy of the I&AP Database, which indicates interaction with I&APs, key stakeholders and all I&APs that have been added to the project database.

In line with Regulation 41 (2) (b) of GN R326, the database includes the details of the following:

- Landowner of the affected farm portion;
- Occupiers of the affected farm portions;
- Landowners of the neighbouring adjacent farm portions;

- The municipal councillor of the ward in which the proposed projects will be undertaken (Ward 7 of the Beaufort West Local Municipality and Ward 2 of the Prince Albert Local Municipality);
- The municipality which has jurisdiction in the area (i.e. Beaufort West Local Municipality, Prince Albert Local Municipality, Central Karoo District Municipality);
- Relevant Organs of State that have jurisdiction in respect of any aspect of the activity; and
- Any other party as required by the competent authority.

The I&AP database contains, as a minimum the competent authority (DFFE); relevant state departments (e.g. Department of Agriculture, Rural Development and Land Reform (Western Cape), Department of Water and Sanitation (DWS), Department of Mineral Resources and Energy (DMRE) etc.); relevant organs of state (e.g. Beaufort West Local Municipality, Central Karoo District Municipality, Eskom SOC Ltd etc.); as well as potential and registered I&APs (e.g. landowners, neighbours etc.).

The above stakeholders, Organs of State and I&APs have accordingly received written notification of the commencement of the BA Processes and release of the Draft BA Reports for comment.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements, the identification and registration of I&APs is ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups are expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

As per Regulation 42 of the GN 326, in terms of the electronic database, I&AP details are captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the BA Process will remain on the project database throughout the process and will be kept informed of all opportunities to comment and will only be removed from the database by request.

C.8 Approach to the PPP

In terms of Regulation 41 (6) of GN R326 the section below outlines the PPP for this assessment in order to provide potential I&APs, Stakeholders and Organs of State access to information on the project and the opportunity to comment at the various stages of the assessment process.

C.8.1 BA Report Phase - Review of the Draft BA Report

The PP approach is structured in line with the requirements of Chapter 6 (PPP) of the 2014 NEMA EIA Regulations (as amended, i.e. GN R326), as described below. Various mechanisms will be undertaken to provide notice to all potential and registered I&APs of the proposed project, as described below.

The BA Processes commenced in May 2022, whereby the specialist assessments were commissioned and a pre-application meeting with the National DFFE was held on 18 May 2022. As noted above, the Draft BA Reports for the proposed projects were released to I&APs, Stakeholders and Organs of State (including the National DFFE) for a 30-days comment period extending from 11 July 2022 to 11 August 2022, excluding public holidays. The Applications for EA were submitted to the National DFFE at the same time as the Draft BA Reports.

The section below summarises the PPP undertaken for the review of the BA Reports.

Relevant stakeholders, Organs of State and I&APs were informed of the review period in the following manner:

- **Database Development and Maintenance:** In line with Regulation 41 (2) (b) of GN R326, an initial database of potential I&APs was developed for the BA process and will be updated throughout the process.
- **Site Notice Board:** As noted in Section C (5) above, notice boards were placed for the proposed projects. A copy of the notice boards is included in Appendix E.1 to E.3 of this Final BA Report.
- **Advertisements to Register Interest:** An advertisement announcing the commencement of the 30-day comment period for the Draft BA Reports was released in Afrikaans, English and isiXhosa in one local newspaper i.e. Die Courier on 8 July 2022. A copy of the content of and proof of placement of the advertisements is included in Appendix E.4 of this Final BA Report.
- **Submission of the Application Form and Draft BA Reports to the DFFE:** The Application Form for EA and Draft BA Reports were submitted to the DFFE via the DFFE Novell Filr System and proof of upload was emailed to the DFFE upon submission (i.e., 11 July 2022). Proof of submission of the Draft BA Reports to the DFFE and proof of upload to the DFFE Novell Filr System is included in Appendix E.9 of this Final BA Report.
- **Letter 1 to I&APs (Commencement of the BA Process):** Written notification of the availability of the BA Reports for public comment (i.e. Letter 1) was sent to all I&APs and Organs of State (including landowners and adjacent landowners) included on the project database (at the time of releasing the Draft BA Reports for comment) via email, where email addresses were available. This letter was sent at the commencement of the 30-days review period of the Draft BA Reports and includes information on the proposed projects and notification of the release and availability of the reports. Letter 1 was written in the English language. Proof of email, as

well as copies of the Letter 1 and emails sent is included in Appendix E.9 of this Final BA Report that was submitted to the DFFE for decision-making.

- **Text Messaging:** SMS texts were also sent on 11 July 2022 to all I&APs on the database (at the time of releasing the Draft BA Reports for comment), where cell phone numbers were available, to inform them of the proposed project and how to access the Draft BA Reports. Proof of text messaging is included in Appendix E.9 of this Final BA Report.
- **Executive Summaries of the BA Reports:** Executive Summaries of the Draft BA Reports were also emailed to I&APs on the database together with Letter 1 and uploaded to the project website and Google Drive.
- **Local Networks:** Where possible, communication was made with the Ward Councillors to request that they send notifications of the projects, availability of the reports and executive summaries via their local networks (such as WhatsApp groups, Neighbourhood Watch groups, other social media mechanisms etc.).
- **30-days Comment Period:** As noted above, potential and registered I&APs, including authorities and Organs of State, were notified via Letter 1, of the 30-day comment and registration period within which to submit comments on the BA Reports and/or to register on the I&AP database.
- **Availability of Information:** The Draft BA Reports were made available for a 30-day comment period and were distributed to ensure access to information on the project and to communicate the outcome of specialist studies. The Draft BA Reports were uploaded to the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>) for I&APs to access it. As a supplementary mechanism, the Draft BA Reports were also uploaded to an alternative web-platform (i.e. Google Drive). Proof of upload of the Draft BA Reports to the project website and Google Drive is included in Appendix E.9 of this Final BA Report. If an I&AP could not access the report via the project website, via the alternative web-platforms such as Dropbox or Google Drive, and if additional information was required (other than what was provided in the Executive Summaries), then the I&AP could have contacted the EAP, who then made available an electronic copy (where feasibly possible).
- **Comments Received:** A key component of the BA Process is documenting and responding to the comments received from I&APs and the authorities. Copies of all comments received during the review of the Draft BA Reports have been included in Appendix E.10 of the Final BA Reports, as well as in the Comments and Response Report.

C.8.2 Compilation of Final BA Reports for Submission to the DFFE

Following the 30-days commenting period of the Draft BA Reports and incorporation of the comments received into the reports, the Final BA Reports were submitted to the DFFE in line with Regulation 19 (1) (a) of the 2014 NEMA EIA Regulations (as amended). The reports were submitted electronically to the DFFE via the Novell Filer system, as recommended by the DFFE since June 2020. This approach was also confirmed by the DFFE during the Pre-Application meeting held on 18 May 2022. Refer to Appendix F.3 for a copy of the Pre-Application Meeting Notes and Appendix F.4 for a copy of correspondence from the DFFE with approval of the Pre-Application Meeting Notes.

In line with best practice, I&APs on the project database are being notified via Letter 2 via email (where email addresses are available) of the submission of the Final BA Reports to the DFFE for decision-making. To ensure ongoing access to information, copies of the Final BA Reports that

have been submitted for decision-making and the Comments and Response Reports (detailing comments received during the BA Process and responses thereto) is being placed on the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>). As a supplementary mechanism, the Final BA Reports are also being uploaded to other alternative web-platforms such as Google Drive.

The Final BA Reports that are being submitted for decision-making to the DFFE include proof of the PPP that was undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the Draft BA Reports for the 30-day review (as explained above).

The DFFE will have 107 days (from receipt of the Final BA Reports) to either grant or refuse EA (in line with Regulation 20 (1) of the 2014 NEMA EIA Regulations (as amended). In line with best practice, I&APs on the project database will be notified via Letter 3 (Release of Environmental Authorisation and Notification of Opportunity to Appeal) via email (where email addresses are available) of the outcome of the decision-making on the Final BA Reports.

C.8.3 Environmental Decision-Making and Appeal Period

Subsequent to the decision-making phase, if EAs are granted by the DFFE for the proposed projects, all registered I&APs, Organs of State and stakeholders on the project database will receive notification of the issuing of the EAs and the associated appeal period. The 2014 NEMA EIA Regulations (as amended) (i.e. Regulation 4 (1)) states that after the Competent Authority has reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the 2014 NEMA EIA Regulations (as amended) stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EAs and the appeal procedure, as well as the respective timelines.

The distribution of the EAs (should such authorisations be granted by the DFFE), as well as the notification of the appeal period, will include a letter (i.e. Letter 3 (Release of Environmental Authorisation and Notification of Opportunity to Appeal)) to be sent via email to all registered I&APs, Stakeholders and Organs of State on the database, where email addresses are available. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EAs. A copy of the EAs will be emailed with Letter 3. The EAs will also be uploaded to the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>). SMS texts will also be sent to all I&APs on the database, where cell phone numbers are available, to inform them of the EAs (should they be granted).

C.9 Consultation with Heritage Western Cape

In line with Heritage Western Cape (HWC) requirements, a Notification of Intent to Develop (NID) were submitted for the proposed projects to the HWC on 18 May 2022 by Dr Jayson Orton of ASHA Consulting (Pty) Ltd. HWC responded on 14 June 2022 confirming that the NID application was discussed by Heritage Officers Meeting held on 17 May 2022.

All seven of the proposed 132 kV overhead powerlines were assigned the Case Number of 20220518SB0519E. The response from HWC on the combined NID has determined the requirements for the assessment phase from a heritage perspective. Refer to Appendix E.6 of this

Final BA Report for proof of submission of the NID to HWC; as well as Appendix E.7 for the acknowledgement of receipt of the NID from HWC.

In line with the above and as per the requirements of the HWC, an integrated Heritage Impact Assessment (including Archaeology, Palaeontology and Cultural Landscape) was commissioned and undertaken, as described in Section B of this report. These relevant specialist assessments were released to I&APs for comment with the Draft BA Report and are included in Appendix D of this Final BA Report.

The integrated Heritage Impact Assessment (including Archaeology, Palaeontology and Cultural Landscape) was also submitted to the HWC for consideration and comment on 8 July 2022. Refer to Appendix E.8 of this Final BA Report for proof of submission of the Heritage Impact Assessment to HWC for decision-making, as well as their acknowledgement of receipt. HWC has provided written approval of the Heritage Impact Assessment on 31 August 2022, after the report was discussed at the Archaeology, Palaeontology and Meteorites Committee (APM) meeting held on 3 August 2022 as well as at the HWC Impact Assessment Committee (IACOM) meeting held on 17 August 2022. Refer to Appendix E.11 of this Final BA Report for a copy of the approval received from HWC.

SECTION D. IMPACT ASSESSMENT

This section includes a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the construction phase, operational phase, and decommissioning phase, in line with the requirements of the 2014 NEMA EIA Regulations (as amended).

D.1 Approach to the BA: Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

The impact assessment methodology has been aligned with the requirements for BA Reports as stipulated in Appendix 1 (3) (1) (j) of the 2014 NEMA EIA Regulations (as amended), which states the following:

“A BA 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 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 mitigated”.

As per the then Department of Environmental Affairs and Tourism (DEAT) Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

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

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all 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.
- **Cumulative impacts** are 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. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The cumulative impacts have been assessed by identifying other renewable energy projects and other applicable (and relevant) projects, such as construction and upgrade of electricity generation, and electrical transmission or distribution infrastructure in the local area (i.e. within 50 km of the proposed Kwagga powerline corridor). There are a number of renewable energy projects being investigated in the local area that are at different stages of planning, ranging from projects that were awarded Preferred Bidder status in terms of the REIPPPP, and projects where the EIAs or BAs have been conducted and EAs have been obtained. The neighbouring proposed authorised Beaufort West and Trakas Wind Farms have both received preferred bidder status.

The approach for this BA is that the assessment includes all renewable energy and EGI projects within 50 km that have received an EA at the time of starting this BA (i.e., by May 2022), as well as the three proposed authorised Kwagga WEF developments and the other six Kwagga EGI Sections (i.e., Kwagga EGI Section 1-4, 6 and 7). The information was collected from the National DFFE Renewable Energy EIA Application (REEA) database, 2022 Quarter 1; as well as from the Eskom's Generation Connection Capacity Assessment (GCCA) (2022). Table D.1, Table D.2 and Table D.3 provides more details; and Figure D.1 provides an illustration of the projects considered in the cumulative impact assessment.

A summary of the process flow followed in the cumulative impact assessment is provided below:

- A list of authorised Renewable Energy and its associated electric grid infrastructure projects within a 50 km radius were identified based on research, DFFE REEA and the Eskom GCCA.
- This resulted in five Renewable Energy Projects, all of which are wind energy projects. Two approved powerline projects and other planned and existing powerlines based on the Eskom GCCA were also identified.
- Considering all of the above, the cumulative impacts were then clearly defined, and where possible the size of the identified impact was quantified and indicated, i.e. hectares of cumulatively transformed land. With regards to the levels of transformation, the current state of the affected area was also taken into consideration. In most cases however the actual development footprint of the nearby Renewable Energy developments could not be easily quantified or accessed spatially. For example, the REEA database contains land parcels, and not the footprints. Hence the land parcels were considered, which took into account the worst case. This typically allowed the determination of the following aspects (or similar aspects) in the **relevant** specialist assessments:
 - The total affected land parcel area taken up by authorised renewable energy projects and their grid connections, where relevant, within the 50 km radius.
 - Combined land parcel area affected by renewable energy developments within the 50 km radius around the proposed powerline projects.
 - The total area within the 50 km radius around the proposed powerline projects.

- Therefore, the assessment of cumulative impacts was based on the specialist and EAP's knowledge of similar approved Renewable Energy and EGI projects in the 50 km radius. In some cases, the specialists involved in this BA process were also involved in some of the other Renewable Energy Projects within the 50 km radius, thus being well aware of the type of impacts and mitigation measures recommended. The specialists assessed such impacts based on their expertise and knowledge of similar projects and management actions. However, the following points are important to note in terms of the cumulative impact assessment:
 - As indicated above, all of the projects in the 50 km radius employ wind turbines, which present fundamentally different impacts and externalities that may affect the broader ecology of the region. Furthermore, the majority of the mitigation measures adopted for wind energy facilities do not necessarily apply to powerlines, such as those relating to noise from turbines and visual screening.
 - The assessment of cumulative impacts is not necessarily solely focused on an assessment of impacts linked to previously authorised similar developments and consideration of their mitigation measures, but also about the sensitivities of the land on which the projects take place. For example, from a heritage point of view, it is also about other heritage resources, the type of locations they could occur in, and any other developments that may have impacted on heritage resources.

Table D.1. Proposed renewable energy and EGI projects that have received EA within 50 km of the proposed projects (Source: DFFE REEA, 2022)

DFFE REFERENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
Renewable Energy Projects – Source: DFFE REEA, 2022								
12/12/20/1784/1	Scoping and EIA	Proposed Development of the 140 MW Beaufort West Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SIVEST Environmental Division	Western Cape	Onshore Wind	140	Approved
12/12/20/1784/2 12/12/20/1784/2/AM1	Scoping and EIA (and Amendments)	Proposed Development of the 140 MW Trakas Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SIVEST Environmental Division	Western Cape	Onshore Wind	140	Approved
12/12/20/1784/1/AM2	Amendments	Proposed Development of the 140 MW Beaufort West Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SLR Consulting	Western Cape	Onshore Wind	140	Approved
12/12/20/1784/2/AM2	Amendments	Proposed Development of the 140 MW Trakas Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SLR Consulting	Western Cape	Onshore Wind	140	Approved
12/12/20/1784/1/AM3	Amendments	Proposed Development of the 140 MW Beaufort West Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SLR Consulting	Western Cape	Onshore Wind	140	Approved
12/12/20/1784/2/AM3	Amendments	Proposed Development of the 140 MW Trakas Wind Farm in the Prince Albert Local Municipality, Western Cape Province	South Africa Mainstream Renewable Power Developments (Pty) Ltd	SLR Consulting	Western Cape	Onshore Wind	140	Approved
14/12/16/3/3/2/2070	Scoping and EIA	Proposed Development of the 279 MW Kwagga Wind Energy Facility 1 near Beaufort West, Western Cape	Kwagga Wind Energy Facility 1 (Pty) Ltd	CSIR	Western Cape	Onshore Wind	279	Approved
14/12/16/3/3/2/2071	Scoping and EIA	Proposed Development of the 341 MW Kwagga Wind Energy Facility 2 near Beaufort West, Western Cape	Kwagga Wind Energy Facility 2 (Pty) Ltd	CSIR	Western Cape	Onshore Wind	341	Approved
14/12/16/3/3/2/2072	Scoping and EIA	Proposed Development of the 204.6 MW Kwagga Wind Energy Facility 3 near Beaufort West, Western Cape	Kwagga Wind Energy Facility 3 (Pty) Ltd	CSIR	Western Cape	Onshore Wind	204.6	Approved

Table D.2. Proposed and existing EGI projects within 50 km of the proposed projects (Source: Eskom GCCA 2022)

STATUS / LAYER SOURCE	TDP ID	TDP SCHEME	GP PROJECT
EGI Projects (Existing and Planned) – Source: Eskom GCCA 2022			
Tx Planned Lines	TS026	Droërivier-Proteus 2 nd 400 kV line	GPP0324
Tx Existing Lines	EXISTING	Droërivier-Proteus 400 kV line	N/A

Table D.3. Proposed Kwagga EGI Projects

DFFE REFERENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	STATUS
14/12/16/3/3/1/2578	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station and the proposed authorised Eskom 132 kV Switching Station (i.e., Kwagga EGI Section 1) – the powerline facilitates connection of Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress
14/12/16/3/3/1/2579	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station ¹² and the proposed authorised Kwagga WEF 1 (i.e., Kwagga EGI Section 2) - the powerline facilitates connection of Kwagga WEF 1, as well as Kwagga WEF 2 and Kwagga WEF 3 (where Kwagga WEF 1 on-site substation is used as collector)	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress
14/12/16/3/3/1/2580	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station ¹² and the proposed authorised Kwagga WEF 2 (i.e., Kwagga EGI Section 3) - the powerline facilitates connection of Kwagga WEF 2, as	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress

¹² Following receipt of comments from Mainstream Renewable Power South Africa during the 30-day public comment period on the Draft Basic Assessment Reports for the proposed Kwagga EGI Section 2 DFFE Ref: 14/12/16/3/3/1/2579, Kwagga EGI Section 3 (DFFE Ref: 14/12/16/3/3/1/2580) and Kwagga EGI Section 4 (DFFE Ref: 14/12/16/3/3/1/2581), the Project Applicant was requested to re-align the proposed powerline route within the already assessed corridor i.e., to connect the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects directly to the authorised Beaufort West 132 kV-400 kV Linking Station (“MTS”) (DFFE Ref: 14-12-16-3-3-2-925-1). Following from liaison with DFFE on 4 October 2022 regarding these changes, written notification was submitted in terms of Regulation 19(1)(b) of the 2014 NEMA EIA Regulations (as amended) that these revised Draft BA Reports, inclusive of specialist reports and the EMPr will be subjected to another public participation process of 30 days after which the Final BA Reports will be submitted to DFFE for decision-making within 140 days of receipt of the application by the DFFE.

DFFE REFERENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	STATUS
		well as Kwagga WEF 3 (where Kwagga WEF 2 on-site substation is used as a collector)					
14/12/16/3/3/1/2581	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Beaufort West 132 kV-400 kV Linking Station ¹² and the proposed authorised Kwagga WEF 3 (i.e., Kwagga EGI Section 4) - the powerline facilitates connection of Kwagga WEF 3	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress
14/12/16/3/3/1/2582	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 2 (i.e., Kwagga EGI Section 5) - the powerline facilitates connection of Kwagga WEF 2	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress
14/12/16/3/3/1/2583	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Kwagga WEF 1 and the proposed authorised Kwagga WEF 3 (i.e., Kwagga EGI Section 6) - the powerline facilitates connection Kwagga WEF 3	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress
14/12/16/3/3/1/2584	BA	Proposed Construction of a 132 kV overhead transmission powerline between the proposed authorised Kwagga WEF 2 and the proposed authorised Kwagga WEF 3 (i.e., Kwagga EGI Section 7) - the powerline facilitates connection Kwagga WEF 3	ABO Wind renewable energies (Pty) Ltd	CSIR	Western Cape	EGI	BA in Progress

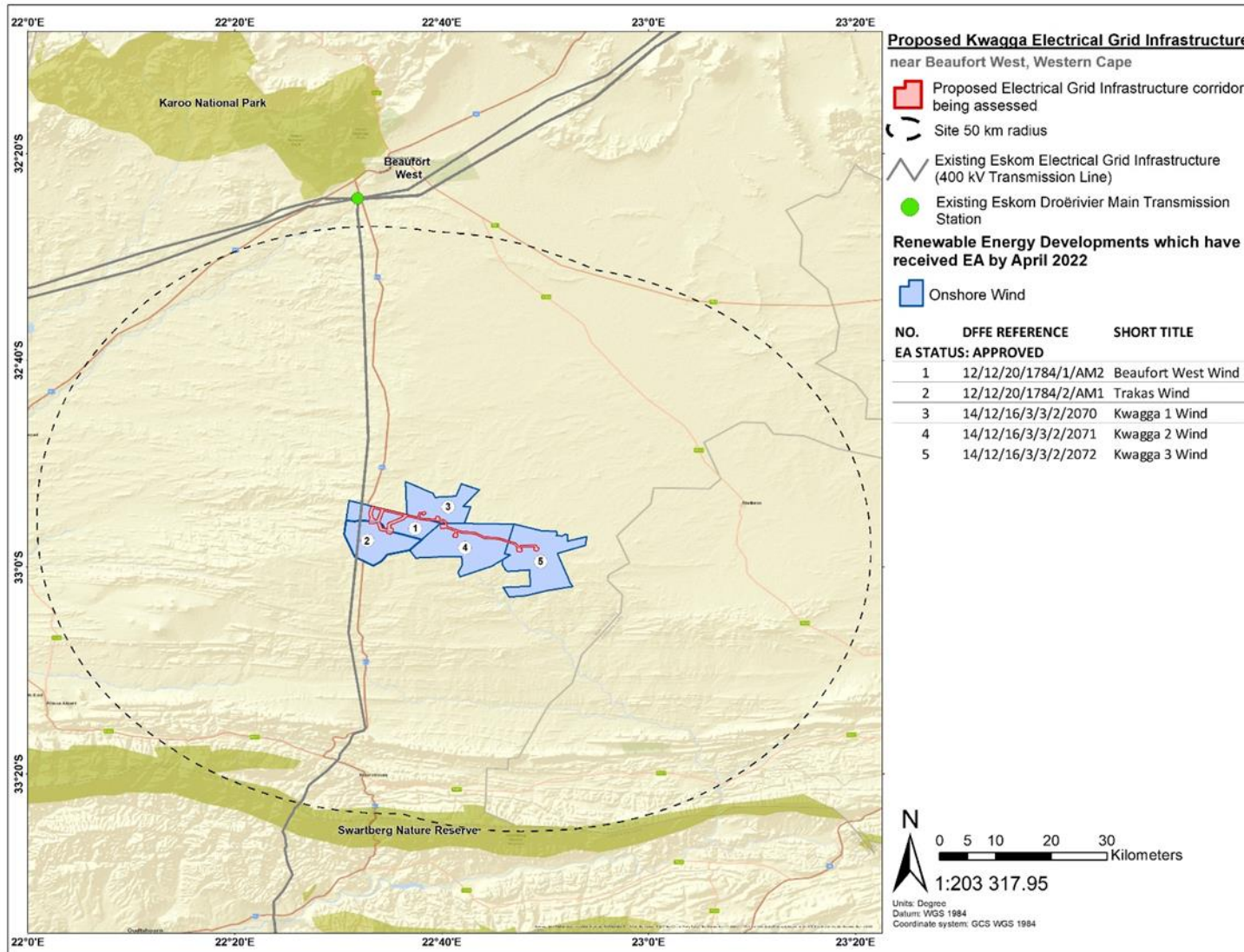


Figure D.1. Projects within the 50 km radius considered for the Cumulative Impact Assessment

In addition to the above, the impact assessment methodology includes the following aspects:

Nature of impact/risk - The type of effect that a proposed activity will have on the environment.

Status - Whether the impact/risk on the overall environment will be:

- Positive - environment overall will benefit from the impact/risk;
- Negative - environment overall will be adversely affected by the impact/risk; or
- Neutral - environment overall not be affected.

Spatial extent – The size of the area that will be affected by the impact/risk:

- Site specific;
- Local (<10 km from site);
- Regional (<100 km of site);
- National; or
- International (e.g. Greenhouse Gas emissions or migrant birds).

Duration – The timeframe during which the impact/risk will be experienced:

- Very short term (instantaneous);
- Short term (less than 1 year);
- Medium term (1 to 10 years);
- Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).

Consequence – The anticipated consequence of the risk/impact:

- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).

Reversibility of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):

- High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);
- Moderate reversibility of impacts;
- Low reversibility of impacts; or
- Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).

Irreplaceability of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

Using the criteria above, the impacts are further assessed in terms of the following:

Probability – The probability of the impact/risk occurring:

- Extremely unlikely (little to no chance of occurring);
- Very unlikely (<30% chance of occurring);
- Unlikely (30-50% chance of occurring)
- Likely (51 – 90% chance of occurring); or
- Very Likely (>90% chance of occurring regardless of prevention measures).

To determine the significance of the identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure D.2). This approach incorporates internationally recognised methods from the Intergovernmental Panel on Climate Change (IPCC) (2014) assessment of the effects of climate change and is based on an interpretation of existing information in relation to the proposed activity, to generate an integrated picture of the risks related to a specified activity in a given location, with and without mitigation. Risk is assessed for each significant stressor (e.g. physical disturbance), on each different type of receiving entity (e.g. the municipal capacity, a sensitive wetland), qualitatively (very low, low, moderate, high, and very high) against a predefined set of criteria (i.e. probability and consequence):

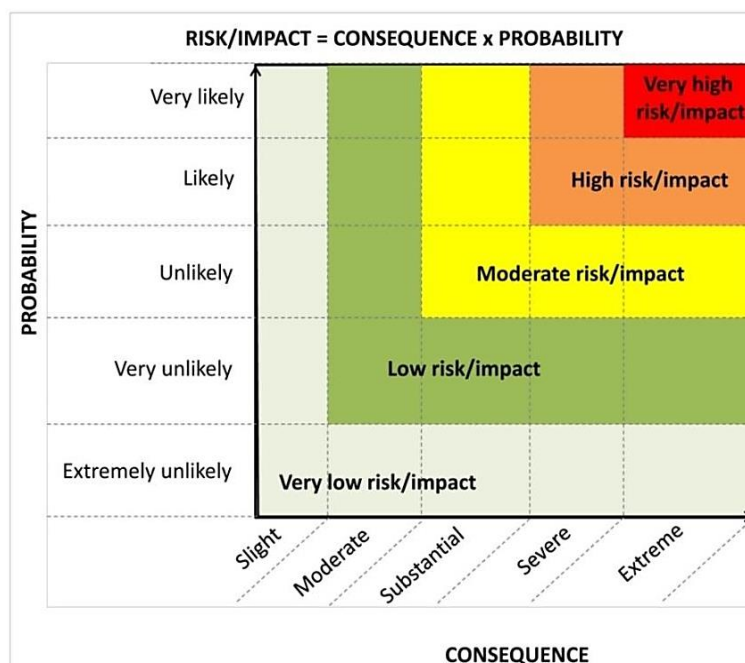


Figure D.2. Guide to assessing risk/impact significance as a result of consequence and probability

Significance – Will the impact cause a notable alteration of the environment?

- Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
- High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and
- Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).

With the implementation of mitigation measures, the residual impacts/risks will be ranked as follows in terms of significance (based on Figure D.2):

- Very low = 5;
- Low = 4;
- Moderate = 3;
- High = 2; and
- Very high = 1.

Confidence – The degree of confidence in predictions based on available information and specialist knowledge:

- Low;
- Medium; or
- High.

Impacts have been collated into the EMPr (Appendix G of the BA Report) and these include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements (as applicable). This includes a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this is stated.
- Positive impacts and augmentation measures have been identified to potentially enhance positive impacts where possible.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts are evaluated for the construction and operational phases of the development. The assessment of impacts for the decommissioning phase is brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;

- Impacts have been evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation has, where possible, taken into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment attempts to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

D.2 Assessment of Environmental Risks and Impacts

The issues and impacts presented in this Section have been identified via the environmental *status quo* of the receiving environment (environmental, visual and heritage features present on site - as discussed in Section B of this BA Report) and input from specialists that form part of the project team. The impact assessments of the specialist studies undertaken to inform this BA have been summarised in this section. It should be noted that unless otherwise stated, impacts identified, and their associated significance are deemed to be negative.

Refer to Appendix D of this report for the full specialist studies undertaken (including the Terms of Reference for each study). All proposed mitigation measures, as relevant, have been carried over into the EMPr, included in Appendix G of this report.

D.2.1 Agriculture

The Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statement is included in Appendix D.1 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Agriculture Compliance Statement. The information below is extracted from Lanz (2022) (Appendix D.1 of the BA Report).

D.2.1.1 Approach and Methodology

An Agricultural Compliance Statement was required and undertaken in terms of the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted on 20 March 2020 in GN R320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998). As per the requirement of the Protocol in GN R320, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the powerline corridor. Various information and desktop sources of information were used.

D.2.1.2 Relevant Project Aspects relating to Agricultural Impacts

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land and whether it is being occupied by a powerline, a road, a building or a substation makes no difference. What is of most relevance and addressed in this assessment, therefore, is simply the total footprint of the pylons that excludes agricultural land use or impacts agricultural land, which in this case is considered insignificant. As an agricultural impact is a temporary or permanent change to the future production potential of land, the significance of the agricultural

impact is directly proportional to the extent of the change in production potential. If a development will not change the future production potential of the land, then there is no agricultural impact.

D.2.1.3 Potential Impacts

The proposed electrical grid infrastructure has insignificant agricultural impact for two reasons:

- There is no loss of future agricultural production potential under transmission powerlines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission powerlines. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, including a service track below the lines, is insignificantly small within an agricultural environment of large farms with low density grazing.
- The affected land across the entire corridor has very limited agricultural production potential, anyway.

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to these proposed powerline projects, and other associated infrastructure:

- Minimal disturbance to agricultural land use activities - This impact is relevant mainly in the construction and decommissioning phases. No further disturbance of agricultural land use occurs in the operational phase.
- Soil degradation - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. There are a number of renewable energy developments that are leading to loss of agricultural grazing land in the area. However, because this overhead powerline itself leads to insignificant agricultural land loss, its cumulative impact must also logically be insignificant. It therefore does not make sense to conduct a more formal assessment of the development's cumulative impacts as per DFFE requirements for cumulative impacts. Much more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change in terms of loss of production potential are exceeded. In reality, the landscape in this environment could be covered with powerlines and agricultural production potential would not be affected.

Due to the considerations discussed above, the cumulative impact of loss of future agricultural production potential can confidently be assessed as not having an unacceptable negative impact on the area. In terms of cumulative impact, the proposed development is therefore acceptable and it is therefore recommended that it be approved.

D.2.1.4 Concluding Statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed powerline development will have an insignificant and therefore acceptable impact on the future agricultural production potential of the sites. This is because:

- There is no loss of future agricultural production potential under transmission lines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission lines. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, including a service track below the lines, is insignificantly small within an agricultural environment of large farms with low density grazing.
- The affected land across the entire corridor has very limited agricultural production potential, anyway.

Therefore, from an agricultural impact point of view, it is recommended that this proposed overhead powerline development be approved.

D.2.2 Visual Impact Assessment

The Visual Impact Assessment was undertaken by Menno Klapwijk to inform the outcome of this BA from a visual perspective. The complete Visual Impact Assessment is included in Appendix D.2 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Visual Impact Assessment. The information below is extracted from Klapwijk (2022) (Appendix D.2 of the BA Report).

D.2.2.1 Approach and Methodology

The methodology of the Visual Impact Assessment involved a number of standard procedures including those in the “Guideline for Involving Visual and Aesthetic Specialists” (Oberholzer,2005), including the following steps:

- A baseline survey of existing scenic resources and visual characteristics of the study area was made, including desktop work and field observations.
- The viewshed, the area within which the proposed project can be visible, was determined using digital 1:50 000 topographic maps with 20 m contour intervals analysed by the Geographic Information System (GIS), algorithms available in the ArcView Software Suite, and mapped to determine the zones of visual influence as well as those areas in a view shadow.
- Key landscape receptors and important visual receptors were mapped in relation to the proposed powerline developments.
- Distance radii from the proposed powerlines were mapped to determine its potential visibility from the identified viewpoints.

- Photomontages were constructed from selected viewpoints using panoramic photographs taken in the field. The montages give a realistic impression of the proposed powerlines from the identified viewpoints at a range of distances.
- The potential visibility, zone of visual influence and photomontages of the proposed powerlines provided a quantitative measure of visual impact intensity.
- Existing vegetation cover, land uses, topographic features and general intactness of the landscape, along with the overall “sense of place” provided a qualitative measure of visual impact intensity.
- Potential impacts identified in the visual specialist study have been assessed based on the criteria and methodology outlined in Section D.1 of this BA Report.
- A site inspection was carried out over two days on 11 and 12 May 2022 by the principal visual specialist.

Various base data was used in the assessment.

D.2.2.2 Relevant Project Aspects relating to Visual Impacts

Components of the proposed project that are relevant in terms of visual aspects are those typically associated with such developments, with a specific focus on overhead powerlines.

D.2.2.3 Potential Impacts

The potential visual impacts resulting from the proposed powerline projects on landscape features and receptors are listed below for each of the project phases, including cumulative impacts. The potential visual impacts would be identical for each of the seven proposed powerlines. The impacts identified are direct and cumulative impacts. No indirect impacts have been identified.

Construction Phase:

- Potential effect of dust and noise from construction machinery during the construction of pylons and stringing of electrical cabling, and the effect of this on residents and visitors to the area.
- Potential visual effect of access roads, stockpiles and construction camps in the exposed landscape.

Operational Phase:

- Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors.

Decommissioning Phase:

- Visual intrusion by 132 kV overhead transmission powerline and its associated electrical grid infrastructure on visual and landscape receptors.

Cumulative Impacts:

Visual impacts have been assessed in terms of the cumulative impact the powerline development will have on the visual environment. Visual assessment is a component of the human aesthetics and is considered part of a suite of social impacts such as noise and sense of place which together may result in a higher cumulative impact than if it were read in isolation. This study assesses only the visual impacts.

Cumulative visual impacts may arise where more than one wind farm development will be visible from the same viewpoint. Each development will have its associated powerlines and grid connection infrastructure. There are two more renewable energy generation facilities approved in the area, in addition to the three proposed authorised Kwagga WEFs 1-3 projects.

D.2.2.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the proposed Kwagga overhead transmission powerlines and associated infrastructure for the construction, operational and decommissioning phases.

Impact	Impact Criteria		Significance and Ranking (Pre-mitigation)	Potential mitigation measures	Significance and Ranking (Post-mitigation)	Confidence Level
DIRECT – CONSTRUCTION PHASE						
Visual intrusion by 132 kV overhead transmission Powerline and its Associated Electrical Grid Infrastructure on visual and landscape receptors	Status	Negative	Low (4)	<ul style="list-style-type: none"> Limit area of disturbance for access roads, and construction camp sites Locate construction camps and all related facilities such as stockpiles, lay-down areas, batching plants in areas already impacted such as existing farmyards or in unobtrusive locations away from the main visual receptors. Limit access tracks for construction and maintenance vehicles to existing roads where possible. Once established do not allow random access through the veld Suppress dust during construction. Blend edges of road and platforms with surrounding landscape Rehabilitate exposed disturbed areas Avoid vegetation stripping in straight lines but rather non-geometric shapes that blend with the landscape Limit need for security lighting Use non-reflective materials Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour 	Low (4)	High
	Spatial Extent	Local				
	Duration	Short Term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Replaceable				

<i>Impact</i>	<i>Impact Criteria</i>		<i>Significance and Ranking (Pre-mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-mitigation)</i>	<i>Confidence Level</i>
				<ul style="list-style-type: none"> Avoid bright colour/patterns and logos 		
DIRECT – OPERATIONAL PHASE						
Visual intrusion by 132 kV overhead transmission Powerline and its Associated Electrical Grid Infrastructure on visual and landscape receptors	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> Maintain rehabilitated disturbed areas 	Moderate (3)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Replaceable				
DIRECT – DECOMMISSIONING PHASE						
Visual intrusion by 132 kV overhead transmission Powerline and its Associated Electrical Grid Infrastructure on visual and landscape receptors	Status	Neutral	Low (4)	<ul style="list-style-type: none"> Remove all project components from site Rip all compacted hard surfaces such as platforms, works areas, access and service roads etc. and reshape to blend with the surrounding landscape Rehabilitate/revegetate all disturbed areas to visually the original state by shaping and planting 	Very low (5)	High
	Spatial Extent	Local				
	Duration	Medium term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Replaceable				

D.2.2.5 Concluding Statement

The impact assessment was undertaken for only the main components of the project i.e. the overhead transmission powerlines and associated infrastructure. The study excluded ancillary components such as borrow pits, quarries, lay-down areas and construction camps. This study evaluated the visual impact of the project with a view to assessing its severity based on the visual specialist's experience, expert opinion and accepted techniques.

The description of the visual impacts of the phases of construction and decommissioning are not considered as significant visual impacts since the period of activity is of relatively short duration and of a primary impact (localized, of short duration and easily mitigated at the end of the phase). The fact that disturbed areas, e.g. camps / lay-down areas will be rehabilitated also reduces the impacts of these phases.

It is the operational phase that presents the most significant long term visual impact. This is due primarily to the scale and form of the proposed development. The generally flat terrain is visually exposed with the result that structures can be seen for several kilometres; however, visibility reduces exponentially the further the viewer is from the proposed powerline infrastructure.

The powerline project will exert a negative influence on the visual environment, which is largely due to the following:

- high visibility of the pylons which can be 30 m high, within the study area, especially as it is adjacent to the N12 and that the site when viewed from the road is flat and open sloping down to the east;
- the high visibility of construction and operation activity within the low growing, uniform open Karoo veld of uniform visual pattern;
- the low visual absorption capacity of the area due to the low and uniform visual pattern of vegetation which does not allow for the project to be visually accommodated within the landscape as a result of the high visual contrast and absent screening; and
- the scale of the project in a rural setting.

Based on the field observations and subsequent impact assessment, and with the implementation of the mitigation measures, it is the visual specialist's opinion that the potential visual impact of the 132 kV overhead transmission powerline and its associated electrical grid infrastructure does not present a fatal flaw provided that the recommended mitigation measures are implemented, and therefore be authorised.

D.2.3 Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by Dr Jayson Orton to inform the outcome of this BA from an archaeology and cultural landscape perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete Heritage Impact Assessment is included in Appendix D.3 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Heritage Impact Assessment. The information below is extracted from Orton (2022) (Appendix D.3 of the BA Report).

D.2.3.1 Approach and Methodology

A Heritage Impact Assessment is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. The Heritage Impact Assessment aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the DFFE. The Heritage Impact Assessment outlines any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted. The methodology of the Heritage Impact Assessment involved a literature review, field survey, impact assessment and grading of the sites found on site.

D.2.3.2 Relevant Project Aspects relating to Heritage Impacts

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains, while the above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

D.2.3.3 Potential Impacts

The potential impacts identified during the Heritage Impact Assessment for the proposed powerline projects include:

Construction Phase

- Potential impacts to palaeontological resources
- Potential impacts to archaeological resources and graves
- Potential visual impacts to the cultural landscape

Operational Phase

- Potential visual impacts to the cultural landscape

Decommissioning Phase

- Potential visual impacts to the cultural landscape

Cumulative impacts

- Potential impacts to palaeontological resources
- Potential impacts to archaeological resources
- Potential impacts to the cultural landscape

No indirect impacts are anticipated for the Heritage Impact Assessment.

D.2.3.4 Impact Assessment

The assessments for palaeontology are provided in the following section. The table below includes an assessment of the potential **direct impacts** identified for the proposed Kwagga overhead transmission powerlines and associated infrastructure for the construction, operational and decommissioning phases. The table also includes an assessment of the potential **cumulative impacts** identified for the proposed Kwagga overhead transmission powerlines and associated infrastructure for the construction, operational and decommissioning phases. Note that because the various facilities in the landscape will be built, operated and decommissioned at different times, there is no distinction made between the project phases for cumulative impacts

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
Construction Phase						
Damage or destruction of archaeological materials	Status	Negative	Low (4)	- Preconstruction survey - Micrositing of infrastructure where possible to minimise impacts - Sampling of any sites that cannot be avoided - Report any chance finds	Very low (5)	High
	Spatial extent	Site specific				
	Duration	Permanent				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Non-reversible				
Irreplaceability	High					
Damage or destruction of graves	Status	Negative	Low (4)	- Preconstruction survey - Micrositing of infrastructure to avoid impacts	Very low (5)	High
	Spatial extent	Site specific				
	Duration	Permanent				
	Consequence	Extreme				
	Probability	Very unlikely				

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
	Reversibility	Non-reversible		- Report any chance finds - Protect graves <i>in situ</i> and appoint archaeologist to exhume		
	Irreplaceability	High				
Intrusion of powerlines and equipment into the landscape	Status	Negative	Very low (5)	- Minimise duration of construction period - Minimise cut-and-fill and landscape scarring in general - Ensure effective rehabilitation of areas not needed during operation	Very low (5)	High
	Spatial extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Operational Phase						
Intrusion of powerlines into the landscape	Status	Negative	Very low (5)	- Ensure that all maintenance vehicles stay within designated areas	Very low (5)	High
	Spatial extent	Local				
	Duration	Long term				
	Consequence	Slight				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Decommissioning Phase						
Intrusion of powerlines and equipment into the landscape	Status	Negative	Very low (5)	- Minimise duration of construction period - Minimise cut-and-fill and landscape scarring in general - Ensure effective rehabilitation of all areas	Very low (5)	High
	Spatial extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Cumulative impacts						
Impacts to archaeology, graves, buildings	Status	Negative	Low (4)	- Preconstruction survey - Micrositing of infrastructure where possible to minimise impacts - Sampling of any sites that cannot be avoided - Report any chance finds - Protect graves <i>in situ</i> and appoint archaeologist to exhume	Very low (5)	High
	Spatial extent	Regional				
	Duration	Permanent				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Non-reversible				
	Irreplaceability	High				
Intrusion of powerlines and equipment into the landscape	Status	Negative	Moderate (3)	- Minimise duration of construction period - Minimise cut-and-fill and landscape scarring in general - Ensure effective rehabilitation of areas not needed during operation	Moderate (3)	High
	Spatial extent	Regional				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

D.2.3.5 Concluding Statement

There are no significant concerns for this project and, based on current information, there are no areas within the assessed powerline corridor that require protection. Because no significant impacts to culturally significant heritage resources are anticipated and impacts of low significance can be easily managed or mitigated, it is the opinion of the heritage specialist that the proposed Section 2 powerline between the proposed authorised Kwagga WEF 1 and the proposed authorised Eskom 132 kV Switching Station should be authorised in full.

D.2.4 Palaeontology Impact Assessment

The Palaeontology Impact Assessment was undertaken by Dr John Almond to inform the outcome of this BA from a palaeontological perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Palaeontology. The complete Heritage Impact Assessment is included in Appendix D.3 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Palaeontology input to the Heritage Impact Assessment. The information below is extracted from Almond (2022) (Appendix D.3 of the BA Report).

D.2.4.1 Approach and Methodology

The approach to this palaeontological heritage study can be briefly summarized as follows. Fossil bearing rock units occurring within the broader study area (including all relevant land parcels) were determined from geological maps and relevant geological sheet explanations as well as satellite images. Known fossil heritage associated with each rock unit was inventoried from published and unpublished scientific literature, previous PIAs of the broader study region, and the author's field experience and palaeontological database (Almond & Pether, 2008). Based on this data as well as field examination of representative exposures of all major sedimentary rock units present across the entire powerline corridor, both within and in the vicinity of the project footprint, the impact significance, including cumulative impacts, of the proposed powerline development was assessed. Recommendations for any further studies or mitigation were also outlined for inclusion within the EMPr.

D.2.4.2 Relevant Project Aspects relating to Palaeontological Impacts

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains.

D.2.4.3 Potential Impacts

The potential impacts identified during the Palaeontology Impact Assessment are the same for all seven proposed powerline projects.

The key impacts on local palaeontological heritage resources considered are direct and relate to the potential disturbance, damage, destruction or sealing-in of scientifically-important and legally-protected fossils preserved at or beneath the surface of the ground due to construction phase excavations (e.g. pylon foundations), and ground clearance (e.g. access roads, temporary laydown area).

The impacts identified only apply to the construction phase of the proposed developments since further significant impacts on fossil heritage during the planning, operational and decommissioning phases of the powerlines are not anticipated.

It should be noted that, should the recommended mitigation measures for the construction phase of the powerline developments be fully and consistently implemented, the impact significance would remain very low but would entail both *positive* and negative impacts. Residual negative impacts from inevitable loss of some fossil heritage would be partially offset by an improved palaeontological database for the study region as a direct result of appropriate mitigation. This is a positive outcome because any new, well-recorded and suitably-curated fossil material from this palaeontologically little-known region would constitute a useful addition to our scientific understanding of South African fossil heritage.

Construction Phase

- Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance.

Cumulative impacts

- Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance.

No indirect impacts were identified for the Palaeontology Impact Assessment.

D.2.4.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the proposed Kwagga overhead transmission powerlines and associated infrastructure for the construction phase.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
CONSTRUCTION PHASE						
Disturbance, damage or destruction of fossils preserved at or beneath ground surface within EGI development footprint due to excavations and surface clearance	<i>Status</i>	Negative	Low risk / impact (4)	1. Pre-construction survey of potentially sensitive, unsurveyed sectors of selected EGI corridor (including substation sites) by qualified palaeontologist. 2. Pre-construction recording and judicious sampling of new and previously recorded scientifically valuable fossil remains within EGI corridor (including substation sites) by qualified palaeontologist. 3. Monitoring for fossil remains on an on-going basis by ECO / ESO during the construction phase. 4. Application of Chance Fossil Finds Procedure.	Very low impact (5)	Medium
	<i>Spatial Extent</i>	Site specific				
	<i>Duration</i>	Permanent				
	<i>Consequence</i>	Moderate				
	<i>Probability</i>	Very likely				
	<i>Reversibility</i>	Non-reversible				
<i>Irreplaceability</i>	Moderate					

The table below includes an assessment of the potential **cumulative impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the construction phase.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
CONSTRUCTION PHASE						
Disturbance, damage or destruction of fossils preserved at or beneath ground surface within the development footprint due to	<i>Status</i>	Negative	Moderate (3)	1. Pre-construction survey of potentially sensitive, unsurveyed sectors of authorised footprints by qualified palaeontologist.	Low impact (4)	Medium
	<i>Spatial Extent</i>	Regional				
	<i>Duration</i>	Permanent				
	<i>Consequence</i>	Substantial				
	<i>Probability</i>	Very likely				
	<i>Reversibility</i>	Non-reversible				
<i>Irreplaceability</i>	Moderate					

excavations and surface clearance				2. Pre-construction recording and judicious sampling of scientifically valuable fossil remains inside, or within 10 m radius of, authorised project footprint by qualified palaeontologist. 3. Monitoring for fossil remains on an on-going basis by ECO / ESO during the construction phase. 4. Application of Chance Fossil Finds Procedure		
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D.2.4.5 Concluding Statement

As a consequence of (1) the paucity of irreplaceable, unique or rare fossil remains within the development footprint, as well as (2) the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks within the proposed powerline corridor, the overall impact significance of the construction phase of the proposed powerlines regarding legally-protected palaeontological heritage resources is assessed as **very low** (negative status) with mitigation, and **low** (negative status) without mitigation. Confidence levels for this assessment are medium, given the generally low exposure levels of potentially-fossiliferous bedrocks.

Anticipated cumulative impacts in the context of several planned or authorized renewable energy projects in the region are assessed as **medium** (negative status) before mitigation, and **low** (negatives status) after mitigation, falling within acceptable limits. It is concluded that as far as fossil heritage resources are concerned, given their very similar geological and palaeontological context, and the fact that the great majority of known or new fossil sites can be mitigated in the pre-construction phase, these ratings apply equally to all seven the proposed powerline routes under consideration. This analysis only applies provided that all the proposed monitoring and mitigation recommendations made for all these various projects are consistently and fully implemented.

The following palaeontological mitigation and monitoring is recommended for the proposed powerline project under consideration here, and are included in the EMPr:

- Once the final powerline routing is determined and confirmed, a specialist palaeontological survey or “walk down” of the corridor should be undertaken by a qualified palaeontologist in the pre-construction phase, post-EA. The walk down would focus on potentially-sensitive, previously unsurveyed sectors of the powerline footprint, such as areas of extensive mudrock exposure along drainage lines, erosion gullies and bedrock ridges. Previously recorded as well as any new fossil sites of scientific or conservation value within the corridor should be mitigated through recording and collection / sampling of fossil material and associated geological data. The palaeontologist responsible will need to submit beforehand a Work Plan for approval by Heritage Western Cape. The ensuing mitigation report should make recommendations for any further palaeontological input (if

any) in the Pre-construction and Construction Phases. The fossil material collected must be curated in an approved repository (museum / university collection). Standards for palaeontological reporting and mitigation have been established by Heritage Western Cape (2016, 2021) and SAHRA (2013); and

- During the Construction Phase of the powerline project, a standard Chance Fossil Finds Protocol will apply, to be implemented by the Environmental Control Officer (ECO) / Environmental Site Officer (ESO) and, where necessary, a palaeontological specialist (see Appendix E of the EMPr, that is included in Appendix G of this BA Report). The ECO / ESO responsible for the development should be made aware of the possibility of important fossil remains (vertebrate bones, teeth, petrified wood, plant-rich horizons etc.) being found or unearthed during the construction phase of the development. Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the Environmental Site Officer on an on-going basis during the construction phase is therefore recommended. Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist (Contact details: Heritage Western Cape. 3rd Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959. Email: ceoheritage@westerncape.gov.za).

There are no identified fatal flaws and no objections on palaeontological heritage grounds to authorisation of the proposed powerline projects on condition that (i) the recommended mitigation measures and the Chance Fossil Finds Protocol as discussed above, are implemented in full during the Construction Phase.

D.2.5 Terrestrial Biodiversity and Species

The Terrestrial Biodiversity and Species Assessment was undertaken by Dr Noel van Rooyen and Prof Gretel van Rooyen to inform the outcome of this BA from a terrestrial biodiversity and species perspective. The complete Terrestrial Biodiversity and Species Assessment is included in Appendix D.4 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Terrestrial Biodiversity and Species Assessment. The information below is extracted from Van Rooyen & Van Rooyen (2022) (Appendix D.4 of the BA Report).

D.2.5.1 Approach and Methodology

The approach and methodology adopted in the Terrestrial Biodiversity and Species Assessment is described in this section.

The study commenced as a desktop study, followed by field-based surveys in November 2020 and June 2022. October to April is the main rainy season at Beaufort West when about 77% of the annual rainfall occurs. Field work for the powerline was conducted after the area had received good rains in the rainy season.

The focus of the site visit was:

- to undertake a site sensitivity verification in order to assess the current land use and environmental sensitivity as identified in the screening tool; and
- to conduct surveys (fauna and flora) of the proposed powerline and associated grid infrastructure project to identify sensitive habitats; to classify the vegetation along the

gridline route according to the vegetation map produced by Van Rooyen & Van Rooyen (2021) for the proposed authorised Kwagga WEFs 1-3; compile species lists and to search for Species of Conservation Concern (SCC). According to SANBI's (SANBI 2020) definition of SCC, these are species that have a high conservation importance in terms of preserving South Africa's high floristic and faunal diversity and include not only threatened species, but also those classified as Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare, Rare, Declining and Data Deficient - Insufficient Information (DDD)(www.redlist.SANBI.org).

Hard copy and digital information from spatial databases, such as BGIS of the South African Biodiversity Institute (bgis.sanbi.org) for maps of Critical Biodiversity Areas (CBAs), Protected Areas, Protected Area Expansion Strategy (PAES), Freshwater Ecosystem Priority Areas (FEPA); the geological survey maps (3222 Beaufort West); land type maps (3222 Beaufort West); topocadastral maps (1:50 000 maps); vegetation types of Mucina & Rutherford (2006) and SANBI (2006-2018); NewPosa database of SANBI; and databases of the Animal Demography Unit, University of Cape Town, were sourced to provide information on the environment and biodiversity of the study area.

Satellite images (Google Earth) were used to stratify the area into relatively homogeneous terrain/vegetation units. The vegetation survey consisted of visiting the mapped units and systematically recording plant species on site and estimating their cover. A total of 125 sites were surveyed in 2020 and a total of 44 additional sites were surveyed along the proposed Kwagga powerline route in 2022. Physical habitat features were also noted. During the site visit, digital photographs were taken and representative photographs of the different habitats are included in the report. The site was also surveyed for rare, threatened and/or endemic plant species during the site visit.

The animal site survey was limited to day-time visual assessments on site. Animal species presence on site was mainly attained by means of direct or indirect sighting methods (animals, spoor, burrows, scats, sounds), whilst traversing the site by vehicle or on foot. Red-listed species are generally uncommon and/or localised and the survey may have been insufficient to record their presence at or near the proposed development.

D.2.5.2 Relevant Project Aspects relating to Terrestrial Biodiversity and Species Impacts

The development of an overhead transmission powerline and associated infrastructure within the study area will by necessity, be undertaken on land that meets a number of criteria including, inter-alia, level or gradual falls, generally suitable founding conditions and avoidance of areas that may be inundated by flooding. As a consequence, the proposed powerline project will avoid all riverine and wetland environments. The proposed project will see no land use change from the prevailing land use. The implementation of the proposed development will result in insignificant change to the prevailing catchment associated with the river systems in the area, primarily on account of the construction phase, as well as the long-term operational stage.

The commencement of construction on site will entail low to insignificant alteration of the prevailing habitat, depending upon the final design and layout of the powerline routing. While the construction phase will see temporary disturbances and transformation to the environment, these impacts on the prevailing ecology are of short temporal extent, and likely to be of low to very low significance

in terms of impact as the construction project rolls out and a stability, albeit within a differing environment, arises on the site.

D.2.5.3 Potential Impacts

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. Direct impacts are those that are directly attributable to the implementation and operation of the project, while indirect impacts are consequential effects of the proposed project that may not be directly attributable to the development. Cumulative impacts are those externalities that arise from the proposed development and compound existing effects or influences on the ecology of the region. These potential impacts occur during the construction, operational and decommissioning phases, as relevant, and are listed below.

Construction Phase:

- Direct Impacts
 - Potential impact 1: The clearing of natural vegetation
 - Potential impact 2: The loss of threatened, protected and endemic plants/animals
 - Potential impact 3: Loss of faunal habitat
 - Potential impact 3: Direct faunal mortalities due to construction and increased traffic
 - Potential impact 4: Increased dust deposition
 - Potential impact 5: Increased human activity and associated increased noise levels.
- Indirect Impacts
 - Potential impact 1: Establishment of alien vegetation
 - Potential impact 2: Increased water run-off and erosion.

Operational Phase:

- Direct Impacts
 - Potential impact 1: Direct faunal mortalities
- Indirect Impacts
 - Potential impact 1: Establishment of alien vegetation
 - Potential impact 2: Increased erosion and water run-off

Decommissioning Phase:

- Direct Impacts
 - Potential impact 1: Direct faunal mortalities
 - Potential impact 2: Increased dust deposition.
- Indirect Impacts
 - Potential impact 1: Establishment of alien vegetation
 - Potential impact 2: Increased water run-off and erosion

Cumulative Impacts:

The cumulative assessment considers all seven proposed powerlines, and five other renewable energy projects including its associated electrical grid infrastructure that have received EA within

50 km of the assessed powerline corridor. The cumulative impact assessment also considers other proposed, approved and existing powerlines within the 50 km radius.

Given the above, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:

- Cumulative impact 1: Vegetation loss and habitat destruction
- Cumulative impact 2: Compromising integrity of CBA, ESA and NPAES
- Cumulative impact 3: Reduced ability to meet conservation obligations & targets
- Cumulative impact 4: Loss of landscape connectivity and disruption of broad-scale ecological processes.

D.2.5.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **construction phase**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
CONSTRUCTION PHASE: DIRECT IMPACTS						
The clearing of natural vegetation	Status	Negative	Low	<ul style="list-style-type: none"> • Micro siting of Substations to avoid sensitive habitat is proposed. • Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions. • Ensure that temporary use areas are located in areas of low sensitivity. • Footprints of the substation locations and pylons should be clearly demarcated. • Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided. • Any cliffs, ridges and rocky sheets should be avoided. • All vehicles are to remain on demarcated roads and no driving in the veld should be allowed. • No collection of fuelwood should be allowed on site. 	Low - 4	Medium
	Spatial Extent	Site specific				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Low				
Irreplaceability	Moderate					

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
				<ul style="list-style-type: none"> The ECO is to provide supervision on vegetation clearing activities and other activities which may cause damage to the environment, especially when construction commences and most vegetation clearing is taking place. River/stream crossings should follow the specific guidelines of the aquatic specialist. River/stream crossings should be specifically designed not to impede or disrupt the direction and flow of the water. Specific guidelines of the aquatic specialist should be followed. No plants may be translocated or otherwise uprooted or disturbed without express permission from the ECO. 		
The loss of threatened, protected & endemic plant and animal species	Status	Negative	Low	<ul style="list-style-type: none"> Construction crew, in particular the drivers, should undergo environmental training (induction) to make them aware of the importance of protected species. No monitoring of the riverine rabbit is necessary. 	Low - 4	Medium
	Spatial Extent	Site specific				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Low				
	Irreplaceability	Moderate				
Loss of faunal habitat	Status	Negative	Low	<ul style="list-style-type: none"> Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided. Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. Speed limits should be set on all roads and strictly adhered to. Development should avoid drainage lines and rocky outcrops. The outcrops may be favoured habitat for reptiles and other species since they offer protection from predators. Proper waste management procedures should be in place to avoid waste lying around and to remove all waste material from the sites. Observe buffer zones along drainage lines to make 	Very low - 5	Medium
	Spatial Extent	Site-specific				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Low				
	Irreplaceability	Moderate				

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
				provision for the possibility of the occurrence of the riverine rabbit (<i>Bunolagus monticularis</i>).		
Direct faunal mortalities	Status	Negative	Low	<ul style="list-style-type: none"> Construction crew, in particular the drivers, should undergo environmental training to increase their awareness of environmental concerns. The crew should also be made aware of not harming or collecting species such as snakes, tortoises and owls which are often persecuted. Proper waste management procedures should be in place to avoid litter, food or other foreign material from lying around and all waste material should be removed from the site. No night driving should be allowed on site. Speed limits should be set on all roads on site. Personnel should not be allowed to roam into the veld. Ensure that cabling and electrical infrastructure at the site is buried sufficiently deeply to avoid being excavated by fauna and that where such infrastructure emerges above-ground that it is sufficiently protected from gnawing animals. Any dangerous fauna (e.g. snakes, scorpions) that are encountered during construction should not be handled or molested by construction staff and the ECO or other suitably qualified persons should be contacted to remove the animals to safety. Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have an escape ramp to allow any fauna that fall in to escape. If there is any part of the site that needs to be lit at night for security reasons, then 	Very low - 5	Medium
	Spatial Extent	Site specific				
	Duration	Short-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Low				
	Irreplaceability	Moderate				

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
				appropriate lighting should be installed to minimise negative effects on nocturnal animals. <ul style="list-style-type: none"> • Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in the Western Cape. • Access to the site should be strictly regulated to reduce the opportunities for poaching. 		
Increased dust deposition	Status	Negative	Low	<ul style="list-style-type: none"> • Excessive dust can be reduced by spraying water onto the roads or other disturbed areas during construction activities. 	Very low - 5	High
	Spatial Extent	Site specific				
	Duration	Short-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
Irreplaceability	-					
Increased human activity and noise levels	Status	Negative	Moderate	<ul style="list-style-type: none"> • The SANS standards should be adhered to in terms of noise levels. • No construction should be done at night. • Appropriate lighting should be installed to minimise negative effects on nocturnal animals. 	Very low - 5	High
	Spatial Extent	Site specific				
	Duration	Short-term				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	High				
Irreplaceability	-					

The impact assessments for both projects are the same. The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **operational phase**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
OPERATIONAL PHASE: DIRECT IMPACTS						
Direct faunal mortalities	Status	Negative	Very low	<ul style="list-style-type: none"> • Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns. • Access to the site should be strictly controlled. • All excess wires, cables and waste material should be removed from the site. • All vehicles at the site should adhere to a low speed limit and slow-moving fauna such as tortoises on roads should be moved off the road. 	Very low - 5	Medium
	Spatial Extent	Site specific				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
Irreplaceability	Low					

				<ul style="list-style-type: none"> No activity should be allowed at the site between sunset and sunrise. 		
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The impact assessments for both projects are the same. The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **decommissioning phase**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
DECOMMISSIONING PHASE: DIRECT IMPACTS						
Increased dust deposition	Status	Negative	Low	<ul style="list-style-type: none"> Excessive dust can be reduced by spraying water onto the roads or other disturbed areas during construction activities. 	Very low - 5	High
	Spatial Extent	Site specific				
	Duration	Short-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
Irreplaceability	-					
Direct faunal mortalities	Status	Negative	Low	<ul style="list-style-type: none"> Decommissioning crew should undergo environmental training to increase their awareness of environmental concerns. Speed limits should be adhered to. Proper waste management procedures should be in place and no material should be left on site in order to prevent instances of ensnarement or ingestion of foreign material. 	Very low - 5	Medium
	Spatial Extent	Site specific				
	Duration	Short-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
Irreplaceability	Low					

The impact assessments for both projects are the same. The table below includes an assessment of the potential **indirect impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **construction phase**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
CONSTRUCTION PHASE: INDIRECT IMPACTS						
Establishment of alien vegetation	Status	Negative	Low	<ul style="list-style-type: none"> Implement a monitoring program for the early detection of alien invasive plant species. A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts. Herbicides for the control of alien species should be applied according to the instructions 	Very low - 5	Medium
	Spatial Extent	Local				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
Irreplaceability	Low					

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
				and by appropriately trained personnel. <ul style="list-style-type: none"> No alien species should be used in rehabilitation or landscaping. Use only plants and seed collected on-site for revegetation. Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife. Material brought onto site e.g. building sand should be regularly checked for the germination of alien species. 		
Increased erosion and water run-off	Status	Negative	Low	<ul style="list-style-type: none"> Clearing of vegetation, compaction and levelling should be restricted to the footprint of the proposed development. All roads should have water diversion structures with energy dissipation features to slow and disperse the water into the receiving area. A rehabilitation and revegetation plan should be developed as part of the EMP. Regularly monitor the site during construction for erosion problems. Silt traps should be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas. If applicable, topsoil should be removed and stored separately and reapplied as soon as possible in order to encourage and facilitate rapid regeneration of the natural vegetation on cleared areas. Where applicable, construct gabions and other stabilization features on steep slopes to prevent erosion. Reduced activity on site after large rainfall events when the soils are wet. No driving off hardened roads until soils have dried out and the risk of bogging down has decreased. A suitably qualified person should plan, design and supervise the proper 	Very low - 5	Medium
	Spatial Extent	Local				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Low				
	Irreplaceability	Moderate				

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
				construction of roads to minimise the impact on the environment.		

The impact assessments for both projects are the same. The table below includes an assessment of the potential **indirect impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **operational phase**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
OPERATIONAL PHASE: INDIRECT IMPACTS						
Establishment of alien vegetation	Status	Negative	Low	<ul style="list-style-type: none"> Implement a monitoring program for the early detection of alien invasive plant species and employ a control program to combat declared alien invasive plant species. No alien species should be used for landscaping and rehabilitation. Clearing of alien species should be done on a regular basis. 	Very low - 5	Medium
	Spatial Extent	Local				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Increased erosion and water run-off	Status	Negative	Low	<ul style="list-style-type: none"> Proper road maintenance procedures should be in place. Regular monitoring of the site during operation for erosion problems. Should new sections of the road be needed, a suitably qualified person should plan, design and supervise the proper construction of roads. Reduced activity at the site after large rainfall events when the soils are wet. 	Very low - 5	Medium
	Spatial Extent	Local				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				

The table below includes an assessment of the potential **cumulative impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **construction and operational phases**.

<i>Impact</i>	<i>Impact Criteria (after mitigation)</i>		<i>Significance and Ranking (Pre-Mitigation)</i>	<i>Potential mitigation measures</i>	<i>Significance and Ranking (Post-Mitigation)</i>	<i>Confidence Level</i>
Loss of vegetation, habitat and threatened species	Status	Negative	Moderate	All projects should adhere to the site-specific recommendations of the ecologists to ensure that impacts are mitigated where possible.	Low - 4	Medium
	Spatial Extent	Regional				
	Duration	Long-term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				

Impact	Impact Criteria (after mitigation)		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
	Irreplaceability	Low				
Compromising integrity of CBA, ESA and NPAES	Status	Negative	Moderate	Align roads and other infrastructure so that transformation within the CBAs and ESAs is minimised. River/stream crossings should follow the be specific guidelines of the aquatic specialist. Minimise the development footprint as far as possible. Stringent construction-phase monitoring of activities at the site to ensure that mitigation measures are adhered to and that the overall ecological impact of the development is maintained at a low level.	Low - 4	Medium
	Spatial Extent	Regional				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Reduced ability to meet conservation obligations & targets	Status	Negative	Moderate	Sensitive habitats should be avoided. Minimise the development footprint as far as possible.	Low - 4	Medium
	Spatial Extent	Regional				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Loss of landscape connectivity and disruption of broad-scale ecological processes	Status	Negative	Low	Sensitive areas should be avoided and least-impact locations are identified for river/stream crossings. Minimising the development footprint wherever possible. Revegetation of all cleared and bare areas created by the development with local species. Fences and other structures which impede faunal movement should be avoided where possible.	Low - 4	Medium
	Spatial Extent	Regional				
	Duration	Long-term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				

D.2.5.5 Concluding Statement

The overall impact significance (with the implementation of mitigation measures) associated with the proposed powerline project was rated as low to very low. In summary, the following:

- Since the development footprint is small, the loss of habitat or species will be limited.
- The extent of the project's clearing activities in the Gamka Karoo vegetation type is small in relation to the remaining extent of the vegetation type and ecosystem threat status will not be affected.
- None of the habitats identified were rated as highly sensitive, and the overall impact per habitat type will be small.
- The impact on overall species and ecosystem diversity of the adjacent land will not be affected and the impact will be small.
- The impact on populations of threatened or protected species will be negligible.

- Depending on the type of fencing to be erected at some of the infrastructure, the project may contribute minimally to obstruction of animal movement.

Given the low impact significance and low sensitivity rating for many of the habitats means the project could go ahead without major constraints, provided the mitigation measures and management actions proposed to conserve protected fauna and flora on the site are taken into consideration. The specialists thus recommend authorisation of the project provided all mitigation measures are implemented.

D.2.6 Aquatic Biodiversity

The Aquatic Biodiversity Impact Assessment was undertaken by Antonia Belcher to inform the outcome of this BA from an aquatic biodiversity perspective. The complete Aquatic Biodiversity Assessment is included in Appendix D.5 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Aquatic Biodiversity Assessment. The information below is extracted from Belcher (2022) (Appendix D.5 of the BA Report).

D.2.6.1 Approach and Methodology

The approach and methodology adopted in the Aquatic Biodiversity Impact Assessment is described in this section.

A biophysical reconnaissance and site evaluation of the assessed area was undertaken at the end of the rainy season for a full day in November 2020¹³ during which specific primary data was collected and evaluated to verify the aquatic features occurring in the study area. Therefore, no additional site visits were deemed necessary for purposes of the powerline corridor assessment. In addition, the identification of key hydrological features on site and the delineation, characterisation and integrity assessments of the aquatic habitats within the site was undertaken. The study also included a literature review of the region to confirm or corroborate findings. The literature review utilized various sources including the National Fresh Water Priority Areas (NFEPA), South African National Biodiversity Institute (SANBI) data and other relevant sources. In addition, mapping of the freshwater features was undertaken using a GPS Tracker and mapped in PlanetGIS and Google Earth Professional.

All data collected in the field and considered during desktop assessments of existing freshwater ecosystem information for the study area and surrounding catchments, as well as by a more detailed assessment of the freshwater features on the various farm portions that comprise the study area, was evaluated and interpreted in order to provide an understanding of the nature of the prevailing environment at a landscape and habitat level, together with specific evaluation of data relating to habitat form and structure. The evaluation also sought to identify any anomalies within the prevailing environment. Such variance may be considered to be indicative of differing

¹³ The Aquatic Specialist has also undertaken the detailed Aquatic Biodiversity Impact Assessments that were required as part of the Scoping and EIA Processes undertaken for the proposed authorised Kwagga WEF 1 (DFFE Ref: 14-12-16-3-3-2-2070), Kwagga WEF 2 (DFFE Ref: 14-12-16-3-3-2-2071) and Kwagga WEF 3 (DFFE Ref: 14-12-16-3-3-2-2072) projects, and therefore has an in depth knowledge and understanding of the receiving environment under assessment on which this desktop-based assessment of the powerline corridor was based.

habitat forms, which under consideration, may be of higher order ecological value in relation to the prevailing environment.

The following techniques and methodologies were utilised to undertake the assessments:

- The guideline document, “A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas” document, as published by DWAF (2005), was followed for the delineation of the aquatic habitats including riparian edge and ephemeral wetland environments;
- The present ecological condition of the watercourses and wetlands was determined using the national River Health Programme and Wet-Health methodologies;
- The ecological importance and ecological sensitivity (EI&ES) assessment of the wetlands and watercourses was conducted according to the guidelines as developed by DWAF (1999); and
- Recommendations made concerning the adoption of buffer zones within the site were based on watercourse and wetland functioning and site characteristics.
- The potential impacts to aquatic biodiversity and freshwater features by the proposed powerline development have been assessed based on the criteria and impact assessment methodology provided.

D.2.6.2 Relevant Project Aspects relating to Aquatic Biodiversity Impacts

The development of an overhead transmission powerline and associated infrastructure within the study area will by necessity, be undertaken on land that meets a number of criteria including, inter-alia, level or gradual falls, generally suitable founding conditions and avoidance of areas that may be inundated by flooding. As a consequence, the proposed powerline routing will avoid all riverine and wetland environments. The proposed project will not alter the nature of the immediate catchment associated with such riverine environments through both the construction and operational phases. Limited change could arise primarily from changes in the rate of flow of surface water and possible alteration of the edaphics or soils within the powerline corridor, as well as, to a minor extent, water chemistry and perhaps, more indirectly, the biotic components of the riverine system.

The commencement of construction on site will entail low to insignificant alteration of the prevailing aquatic habitat, depending upon the final design and layout of the powerline routing. While the construction phase will see temporary disturbances and transformation to the environment, these impacts on the prevailing ecology are of short temporal extent and likely to be of low significance in terms of impact.

D.2.6.3 Potential Impacts

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. Direct impacts are those that are directly attributable to the implementation and operation of the project, while indirect impacts are consequential effects of the proposed project that may not be directly attributable to the development. Cumulative impacts are those externalities that arise from the proposed development and compound existing effects or influences on the ecology of the region. These impacts occur during the construction, operational and decommissioning phases, as relevant, and are listed below.

Construction Phase:

- Direct Impacts:
 - Potential disturbance or modification of aquatic habitat;
 - Increased water use; and
 - Potential water quality impacts.
- Indirect Impacts:
 - Potential degradation of aquatic ecosystem integrity.

Operational Phase:

- Direct Impacts:
 - Potential aquatic habitat disturbance.
- Indirect Impacts:
 - Degradation of the ecological condition of aquatic ecosystems;
 - Soil erosion; and
 - Alien vegetation invasion in aquatic features.

Decommissioning Phase:

Such alterations and changes will be dependent upon the expectant post-decommissioning land use and operation cease of the powerline and associated infrastructure. However, abandonment of the powerline infrastructure would probably result in:

- Direct Impacts:
 - Potential disturbance or modification of aquatic habitat; and
 - Potential water quality impacts.

Cumulative Impacts:

The cumulative assessment considers all seven proposed powerlines, and five other renewable energy projects including its associated electrical grid infrastructure that have received EA within 50 km of the assessed powerline corridor. The cumulative impact assessment also considers other proposed, approved and existing powerlines within the 50 km radius.

Given the above, cumulative impacts arising from the implementation of this project are likely to result in the potential degradation of the ecological condition of aquatic ecosystems.

D.2.6.4 Impact Assessment

The impact assessments for both projects are the same. The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **construction phase**.

Impact	Impact Criteria	Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)	Confidence Level
CONSTRUCTION PHASE					
	Status	Negative	Very low (5)	Very low (5)	High

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)	Confidence Level
Disturbance of aquatic habitats within the watercourses with the associated impact to sensitive aquatic biota	Spatial Extent	Site-specific		Minimise any works within aquatic ecosystems and buffers; Rehabilitate disturbed aquatic habitats by revegetating with suitable local indigenous vegetation		
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				
Increased sedimentation and risks of contamination of surface water runoff during construction	Status	Negative	Very low (5)	Construction sites and laydown areas should be placed at least 30m away from the delineated aquatic features; Good housekeeping measures should be implemented at the construction sites that are set out in the EMPr and monitored by an appointed ECO for the project.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Likely to Unlikely				
	Reversibility	High reversibility				
Irreplaceability	Low irreplaceability					
Demand for water for construction could place stress on the existing available water resources	Status	Negative	Very low (5)	The water demand construction is very low and thus the associated construction water use is extremely unlikely to result in any impact. The water should be obtained from an existing water allocation to the property or should be provided from a viable water source for construction purposes.	Very low (5)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Extremely Unlikely				
	Reversibility	Moderate reversibility				
Irreplaceability	Moderate irreplaceability					

The impact assessments for both projects are the same. The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **operational phase**.

Impact	Impact Criteria	Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level	Impact
OPERATIONAL PHASE						
Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained	Status	Negative	Very low (5)	The moderate to high sensitivity aquatic habitats should be avoided in the layout design such that it is only the low sensitivity habitats that would be disturbed during construction. The disturbance of these habitats would only result in a slight (negligible) alteration to aquatic ecosystems and processes.	Very low	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Likely to Unlikely				
	Reversibility	High reversibility				
Irreplaceability	Low irreplaceability					
Disturbance of cover vegetation and soil and modified runoff characteristics that have the potential to result in erosion of hillslopes and watercourses and invasion of disturbed areas with alien vegetation	Status	Negative	Very low (5)	Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants. The project infrastructure and access roads must be designed to mitigate the stormwater runoff impacts leaving the developed areas. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate shaping of the road with berms or channels and swales adjacent to hardened surfaces where necessary.	Very low	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate reversibility				
Irreplaceability	High irreplaceability					

The impact assessments for both projects are the same. The table below includes an assessment of the potential **direct impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **decommissioning phase**.

Impact	Impact Criteria	Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level	Impact
DECOMMISSIONING PHASE						
Increased disturbance of aquatic habitat due to the increased activity on the site	Status	Negative	Very low (5)	Minimise works within aquatic ecosystems as far as possible. Rehabilitate disturbed areas.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				

Impact	Impact Criteria	Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level	Impact
Increased sedimentation and risks of contamination of surface water runoff	Status	Negative	Very low (5)	Laydown areas should be placed at least 30m away from the delineated aquatic features; Good housekeeping measures should be implemented for the decommissioning activities that are set out in the EMPr and monitored by an appointed ECO for the project.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				

The table below includes an assessment of the potential **cumulative impacts** identified for the Kwagga overhead transmission powerlines and associated infrastructure for the **construction and operational phases**.

Impact	Impact Criteria	Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level	Impact
CONSTRUCTION PHASE						
Increased disturbance of aquatic habitat due to the increased activity in the wider area	Status	Negative	Very low (5)	Minimise works within aquatic ecosystems as far as possible. Construct in the dry season. Rehabilitate disturbed areas. Rationalise infrastructure as far as possible by sharing of the infrastructure of using existing disturbed areas. Manage stormwater impacts.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				
OPERATION PHASE						
Degradation of ecological condition of aquatic ecosystems	Status	Negative	Very low (5)	Monitor and manage for impacts such as alien vegetation growth and erosion. Limit disturbance and rehabilitate disturbed areas. Ensure there is sufficient stormwater management to prevent erosion along roads. Ensure road crossings structures are properly designed to not result in blockage in the watercourses or erosion. Limit and monitor water use.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				
DECOMMISSIONING PHASE						
Increased disturbance of aquatic habitat due to the increased activity in the wider area	Status	Negative	Very low (5)	Decommission works near aquatic features should preferably be undertaken in the dry season. Minimise disturbance and rehabilitate.	Very low (5)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High reversibility				
	Irreplaceability	Low irreplaceability				

D.2.6.5 Concluding Statement

The potential aquatic ecosystem impacts of the proposed powerline are likely to be **Very Low** in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.

Based on the findings of this specialist assessment, there is no reason from a freshwater perspective, why the proposed activity (with the implementation of the above-mentioned mitigation measures) should not be authorized. The proposed powerline is located in high-lying areas where limited aquatic features occur. It is also possible to span the watercourses where the proposed powerline needs to cross them. The potential aquatic ecosystem impacts of the proposed powerline are thus likely to be very low in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.

D.2.7 Avifauna Impact Assessment

The Avifauna Impact Assessment was undertaken by Chris van Rooyen and Albert Froneman to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessment is included in Appendix D.6 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Avifauna Impact Assessment. The information below is extracted from van Rooyen and Froneman (2022) (Appendix D.6 of the BA Report).

D.2.7.1 Approach and Methodology

The Avifauna Impact Assessment (Appendix D.6 of the BA Report) includes a description of the affected environment from an avifaunal perspective, mapping of the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting / breeding, feedback of the sensitivity in terms of the Screening Tool, an assessment of the potential impacts of the proposed development on avifauna including cumulative impacts, and recommendations for sufficient mitigation measures. The study considered various desktop information sources and data to source information on the impacts of powerlines on avifauna. The results of an integrated pre-construction programme conducted over 12-months at the proposed authorised Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3 sites from March 2019 – March 2020 were used to inform the current study. Site inspections were also conducted on 5 October and 8 November 2021 at the adjacent proposed authorised Trakas and Beaufort West Wind Farms and to record all avifaunal sensitivities as part of an avifaunal impact assessment study for the 132 kV grid connection.

The proposed powerline project will consist of the components listed below. It is important to note at the outset that the exact specifications of the proposed project components will only be determined during the detailed engineering phase prior to construction (subsequent to the issuing of an EA, should such an authorisation be granted for the proposed project), but that the information provided below is seen as the worst-case scenario for the project.

- Overhead Transmission Powerlines
- Line capacity: Up to 132 kV
- Line/pylon height: Up to 30 m

- Pylon type: Monopole
- The registered servitude for each of the seven proposed 132 kV overhead transmission powerlines will be up to 50 m wide. The entire servitude will not be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant Eskom standards; and
- Associated electrical infrastructure (including but not limited to feeder bays, busbars, new transformer bays (up to 500 MVA) and possible extension/upgrade to the existing infrastructure at the proposed authorised Eskom 132 kV Switching Substation).

D.2.7.2 Relevant Project Aspects relating to Avifaunal Impacts

Negative impacts on avifauna by electricity infrastructure generally take two (2) main forms, namely electrocution and collisions with the high voltage cables. Displacement due to habitat destruction and disturbance associated with the construction of the electricity infrastructure and other associated infrastructure is another impact that could potentially impact on avifauna.

D.2.7.3 Potential Impacts

The potential impacts identified in the Avifauna Impact Assessment include collisions with the 132 kV grid connections during the operational phase. This is rated as a direct and cumulative impact. No indirect impacts were identified. The impacts include:

Construction Phase:

- Displacement due to disturbance associated with the construction of the 132 kV grid connection and associated infrastructure.
- Displacement due to habitat transformation associated with the construction of the 132 kV grid connection and associated infrastructure.

Operational Phase:

- Mortality of powerline sensitive avifauna through electrocution in the proposed authorised substations.
- Mortality of powerline sensitive species due to collisions with the 132 kV grid connection (high voltage cables).

Decommissioning Phase:

- Displacement due to disturbance associated with the decommissioning of the powerlines and associated infrastructure.

Cumulative Impacts:

- Construction Phase – Displacement due to disturbance associated with the construction of the 132 kV grid connection and associated infrastructure.
- Construction Phase – Displacement due to habitat transformation associated with the construction of the 132kV grid connection and infrastructure.
- Operational Phase – Electrocution of powerline sensitive species in the on-site substations.
- Operational Phase – Collisions with the 132 kV grid connections (high voltage cables).
- Decommissioning Phase – Displacement due to disturbance associated with the decommissioning of the 132 kV grid connections and on-site substations.

No indirect impacts were identified.

D.2.7.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the Kwagga powerlines and associated infrastructure for the construction phase.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
CONSTRUCTION PHASE						
Impact 1: Displacement due to disturbance associated with the construction of the 132 kV grid connection and associated substations	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> ▪ Activity should as far as possible be restricted to the footprint of the infrastructure. ▪ 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 as far as practical. ▪ Access to the rest of the property must be restricted. ▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned. 	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				
Impact 2: Displacement due to habitat transformation associated with the construction of the 132 kV grid connection and associated substations	Status	Negative	Low (4)	<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. 	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				

The table below includes an assessment of the potential **direct impacts** identified for the Kwagga powerlines and associated infrastructure for the operational phase.

Impact	Impact Criteria	Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
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OPERATIONAL PHASE						
Mortality of powerline sensitive avifauna through electrocution in the proposed substations.	Status	Negative	Low (4)	<ul style="list-style-type: none"> The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species is unlikely to frequent the substation and be electrocuted. 	Very Low (5)	Medium
	Spatial Extent	Site specific				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
Collision mortality of powerline sensitive species due to the 132 kV grid connections.	Status	Negative	High (2)	<ul style="list-style-type: none"> Bird Flight Diverters must be fitted to the entire grid connection according to the applicable Eskom Engineering Instruction (Eskom Unique Identifier 240 – 93563150: The utilisation of Bird Flight Diverters on Eskom Overhead Lines). 	Moderate (3)	Medium

The table below includes an assessment of the potential **direct impacts** identified for the Kwagga powerlines and associated infrastructure for the decommissioning phase.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
DECOMMISSIONING PHASE						
The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area.	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> Activity should as far as possible be restricted to the footprint of the infrastructure. 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 during the decommissioning phase and the construction of new 	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
				<p>roads should be kept to a minimum as far as practical.</p> <ul style="list-style-type: none"> The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned 		

The table below includes an assessment of the potential **cumulative impacts** identified for the Kwagga powerlines and associated infrastructure for the construction, operational and decommissioning phases.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post-Mitigation)	Confidence Level
CONSTRUCTION PHASE						
Displacement due to disturbance associated with the construction of the 132 kV grids and onsite substations	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> Activity should as far as possible be restricted to the footprint of the infrastructure. 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 as far as practical. Access to the rest of the property must be restricted. The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned. 	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
Irreplaceability	Low					
CONSTRUCTION PHASE						
Displacement due to disturbance associated with the construction	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> Vegetation clearance should be limited to what is absolutely necessary. 	Low (4)	High
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Likely				

of the 132 kV grids and onsite substations	Reversibility	High		<ul style="list-style-type: none"> The mitigation measures proposed by the vegetation specialist must be strictly enforced. 		
	Irreplaceability	Low				
OPERATIONAL PHASE						
Electrocution of powerline sensitive species in the on-site substations	Status	Negative	Low (4)	<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. 	Very Low (5)	Medium
OPERATIONAL PHASE						
Collision mortality of powerline sensitive species due to the 132 kV grid connections.	Status	Negative	High (2)	Bird Flight Diverters must be fitted to the entire grid connection according to the applicable Eskom Engineering Instruction (Eskom Unique Identifier 240 – 93563150: The utilisation of Bird Flight Diverters on Eskom Overhead Lines)..	Moderate (3)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
DECOMMISSIONING PHASE						
The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> Activity should as far as possible be restricted to the footprint of the infrastructure. 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 during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical. The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned 	Low (4)	
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				

D.2.7.5 Concluding Statement

The expected impacts of the proposed powerline construction were rated to be Low to Moderate negative pre-mitigation. However, with appropriate mitigation, the overall post-mitigation significance of all the identified impacts for should be reduced to **Low** for all phases of the project.

It is therefore recommended that the activity is authorised, on condition that the proposed mitigation measures as detailed in the Avifauna Impact Assessment and included in the Environmental Management Programme (EMPr) are strictly implemented.

D.2.8 Environmental Sensitivity Mapping

Based on the impact assessment undertaken and the relevant environmental sensitivities identified, the site layout and preliminary powerline route have been identified and shown in Figure D.8 and D.9, as well as Appendix C of this BA Report. Based on the specialist studies, the key environmental features that have been avoided in terms of the layout of the facilities are listed below.

▪ Agriculture

- The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts and disturbance.
- The protocol requires confirmation in the case of a linear activity, that the land can be returned to the current state within two years of completion of the construction phase. It is hereby confirmed that the land under the overhead powerline route can be returned to the current state within two years of construction.

▪ Visual

- The following viewshed areas have been determined, measured from the preliminary powerline routing (access roads are permissible in these areas):
 - Zone of very high visual impact: <1 km
 - Zone of high visual impact: 5 – 10 km
 - Zone of medium visual impact: 10 – 20 km
 - Zone of low visual impact: >20km
 - Refer to Figure D.3 for the visual sensitivity map.

▪ Heritage (Archaeology and Cultural Landscape)

- Palaeontological resources may occur quite widely and are sensitive to disturbance.
- Archaeological resources occur quite widely in the landscape and it is likely that others – especially Stone Age ones – occur in areas not yet surveyed. These sites are sensitive to disturbance.
- Buffers of at least 30 m should be maintained around known significant archaeological sites as far as possible. Also, direct damage to archaeological sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued.
- Disturbance or damage of graves must be avoided completely with a 30 m buffer.
- The cultural landscape is not a strongly developed one in terms of anthropogenic input and is largely a natural environment. However, because the project would only be developed if the proposed authorised Kwagga WEFs are developed, there are no particular indicators for this aspect of heritage. The same applies to buildings, since none occur anywhere close to the study area. Refer to Figure D.4 for the heritage sensitivity map.

- **Palaeontology**

- Provisional palaeosensitivity mapping of the proposed Kwagga EGI corridor study area by the DFFE Screening Tool suggests a Very High Palaeosensitivity for the entire corridor, based on the underlying bedrocks of the Lower Beaufort Group (Karoo Supergroup). However, extensive recent palaeontological field surveys indicate that, in practice, the site is of “Low” Palaeosensitivity overall, with rare, sporadic and largely unpredictable fossil sites present at surface. Refer to Figure D.5 for the palaeontology sensitivity map.

- **Terrestrial Biodiversity and Species**

- Overall, the vegetation on the proposed powerline corridor is structurally fairly homogeneous with dwarf shrubs (Karoo bushes) being dominant.
- Overall, the mountainous parts, quartz patches, shrubveld on deep sandy loam soils and drainage lines were of “medium” sensitivity in the area.
- There were a number of protected and CITES listed plant species found on the rocky ridges and the quartzitic rocky plains which should be taken into account when selecting the final site layout and powerline routing for the Kwagga EGI corridor.
- Buffers are applicable to the development along the watercourses. The buffer zones as delineated by the aquatic specialist should be observed when planning powerline infrastructure.
- Overall, the potential impact significance of the proposed powerline construction on the receiving terrestrial biodiversity and species is considered “low”.
- Refer to Figure D.6 for the ecology sensitivity map.

- **Aquatic Biodiversity**

- The proposed powerline corridor is located in the higher lying areas of the river catchments where only minor tributaries of the larger rivers would be potentially impacted by the proposed construction of the grid connections.
- Smaller streams and drainage features were assigned a buffer of at least 35 m from the centre of these streams.
- The larger rivers are buffered up to 100 m, measured from the top of the bank of the river channels.
- The larger watercourses in the study area, have a “high” ecological importance and sensitivity while the smaller tributaries/drainage features are of a “moderate” ecological importance and sensitivity.
- The larger watercourses tend to be more ecologically important but less sensitive to impacts while the smaller tributaries are less ecologically important but more sensitive to flow, water quality and habitat modification.
- The potential aquatic ecosystem impacts of the proposed powerline project are likely to be “very low” in terms of any potential impact on aquatic ecosystem integrity for all phases of the proposed development as the proposed works avoid the delineated aquatic features as well as the recommended buffer areas.
- Refer to Figure D.6 for the ecology sensitivity map.

- **Avifauna**

The following avifaunal-relevant anthropogenic habitat modifications were recorded within the project area of impact (PAOI):

- **Water points:** The land use in the PAOI is mostly small stock farming. The entire area is divided into grazing camps, with associated boreholes and drinking troughs. In this arid environment, open water is a big draw card for birds which use the open water troughs to bath and drink.
- **Dams:** The PAOI contains a few ground dams located in drainage lines. When these dams fill up after good rains, they contain standing surface water for several months, which attracts birds to bath and drink.
- **Transmission powerlines:** The Droërivier - Proteus 400 kV high voltage line bisects the extreme west of the PAOI, parallel to the N12 national road. A Martial Eagle nest is present on Tower 162. The nest is located approximately 12.5 km from the Beaufort West 132 kV – 400 kV Linking Station.
- Refer to Figure D.7 for the avifauna sensitivity map.

Key sensitivity features have been annotated in Figure D.9 (i.e. sensitivity and feature map). For detailed feature maps, refer to the Specialist Assessments (Appendix D of the BA Report).

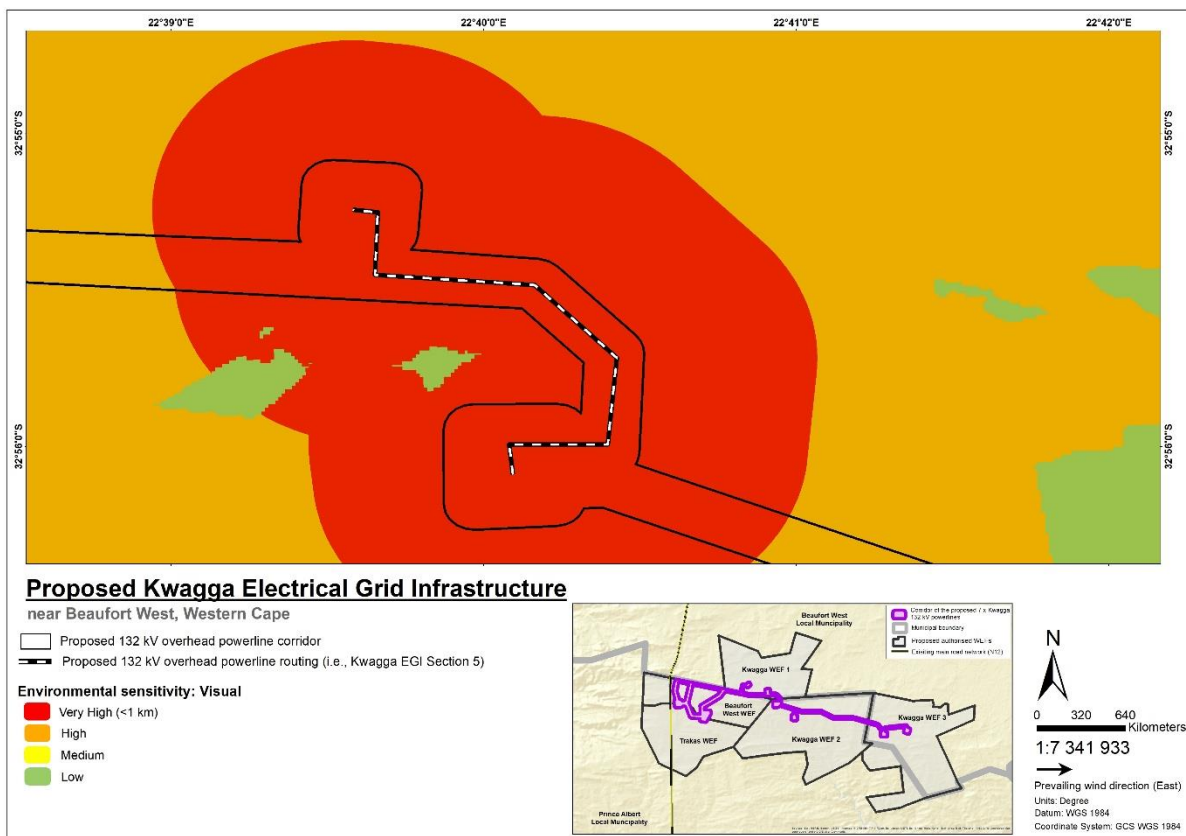
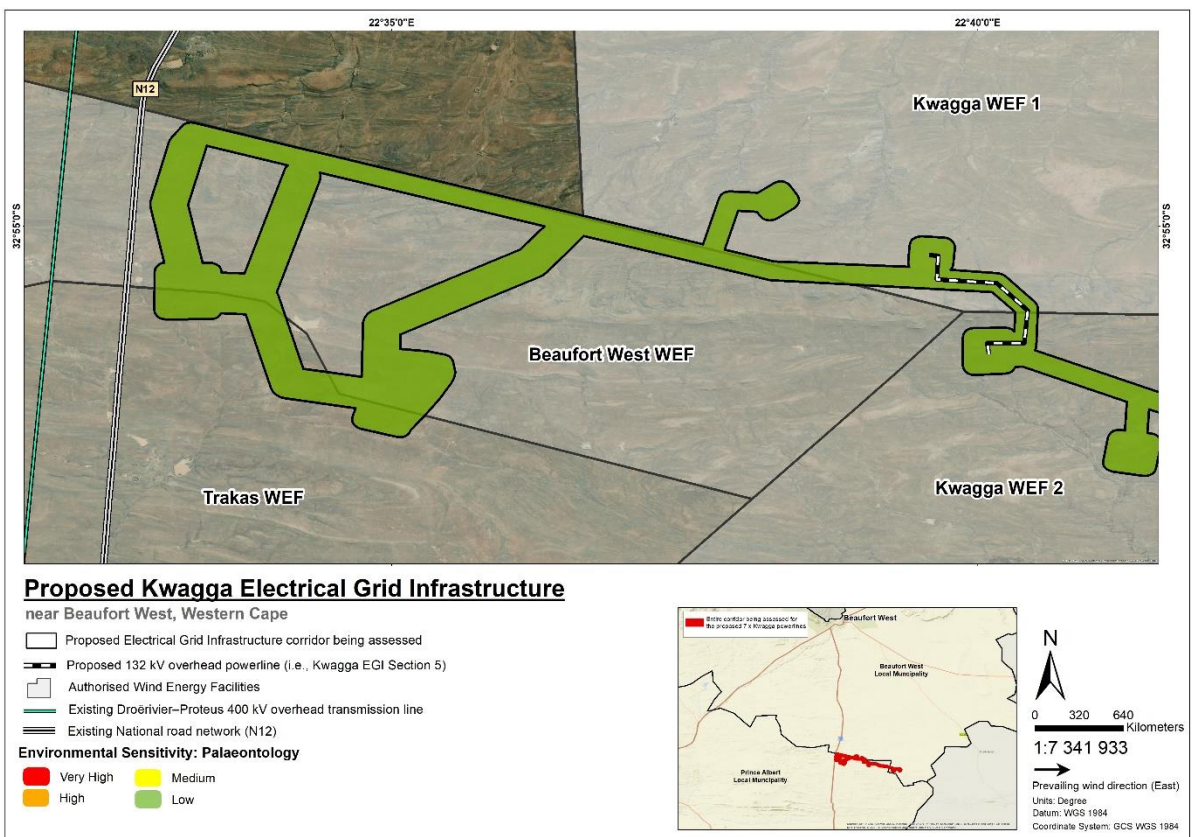
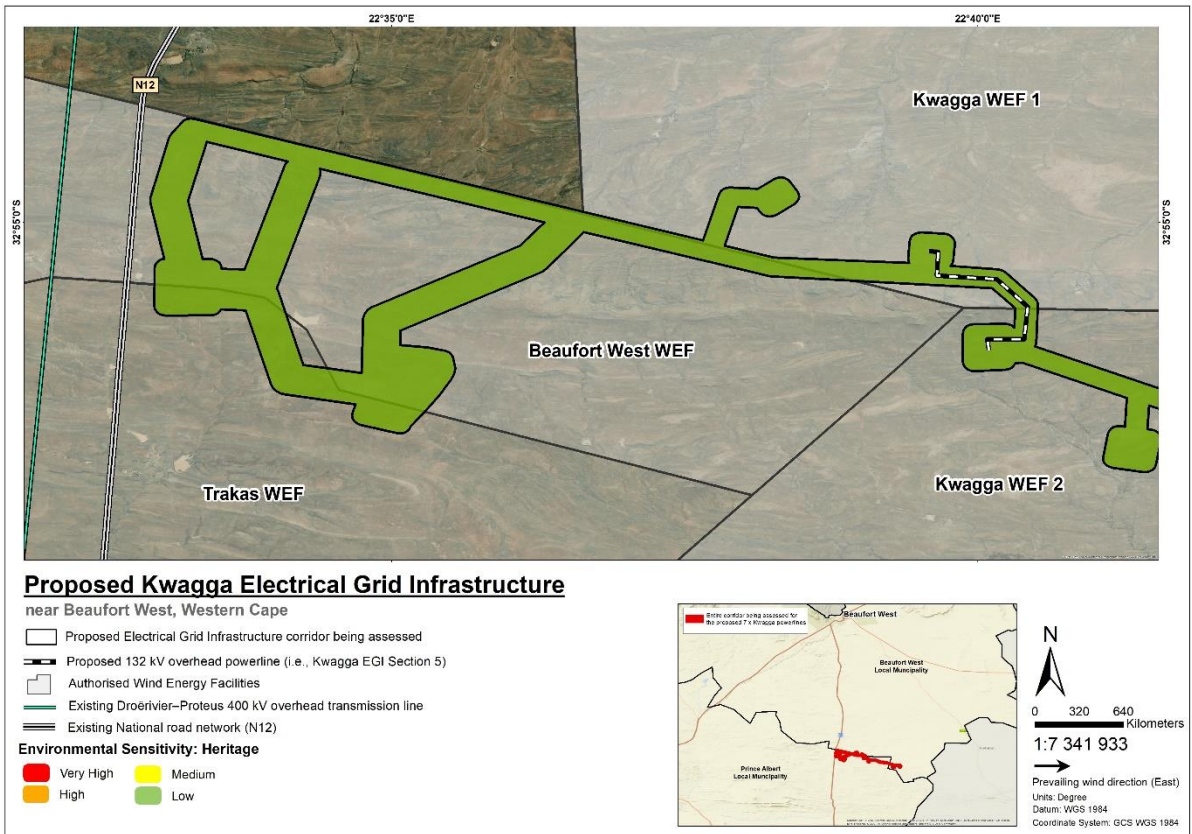


Figure D.3. Sensitivity Map for Visual Aspects



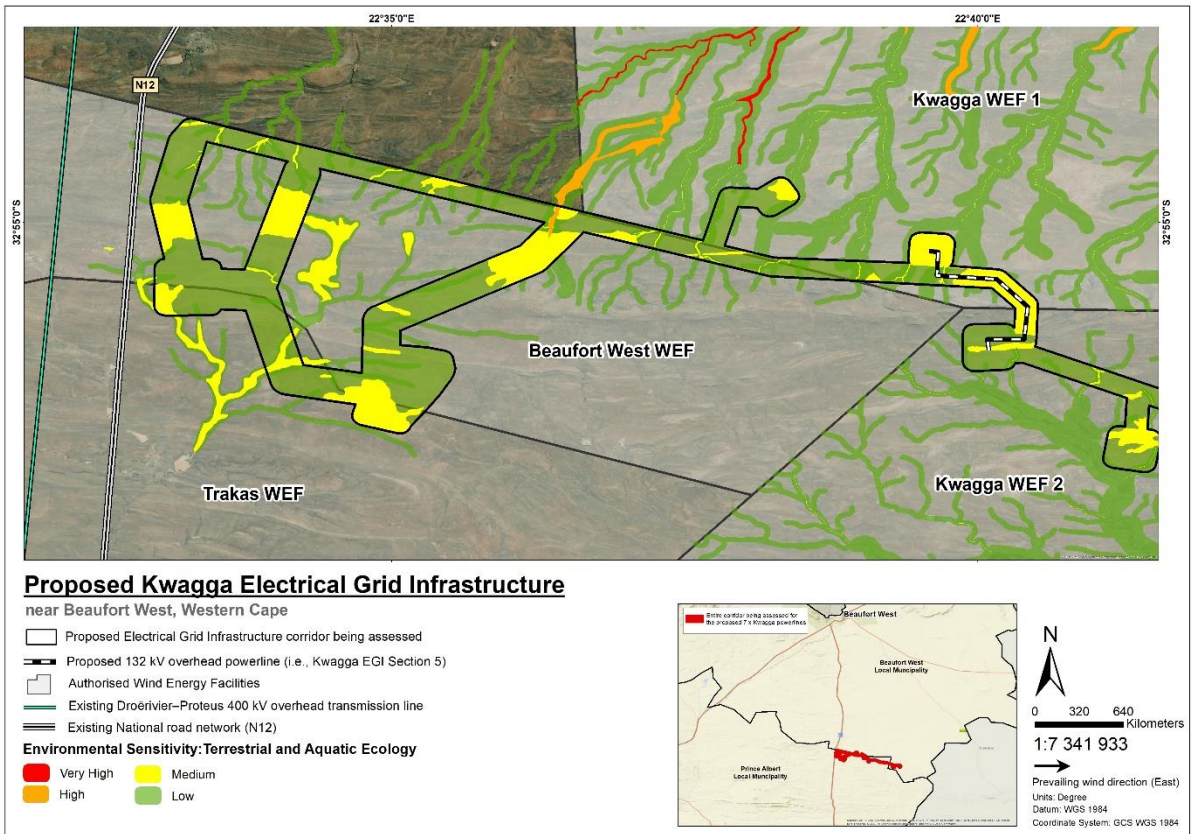


Figure D.6. Sensitivity Map for Terrestrial and Aquatic Ecology

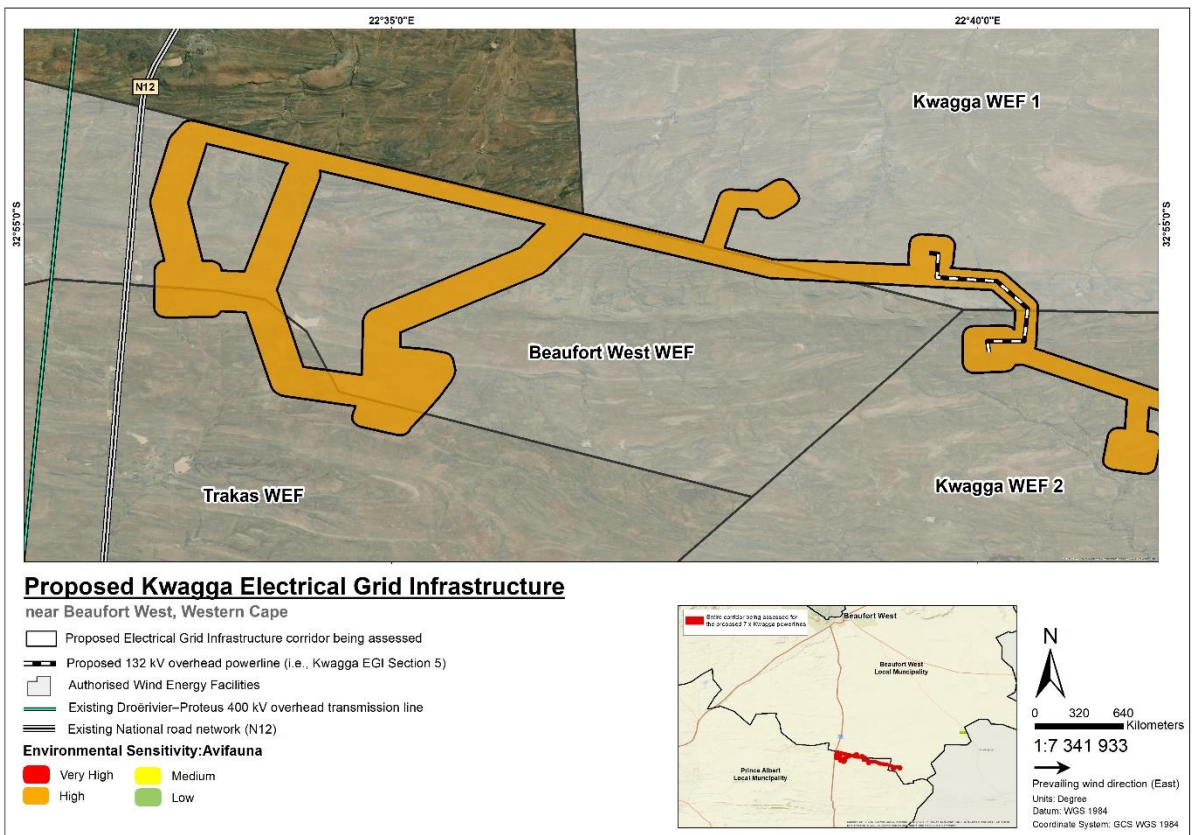


Figure D.7. Sensitivity Map for Avifauna

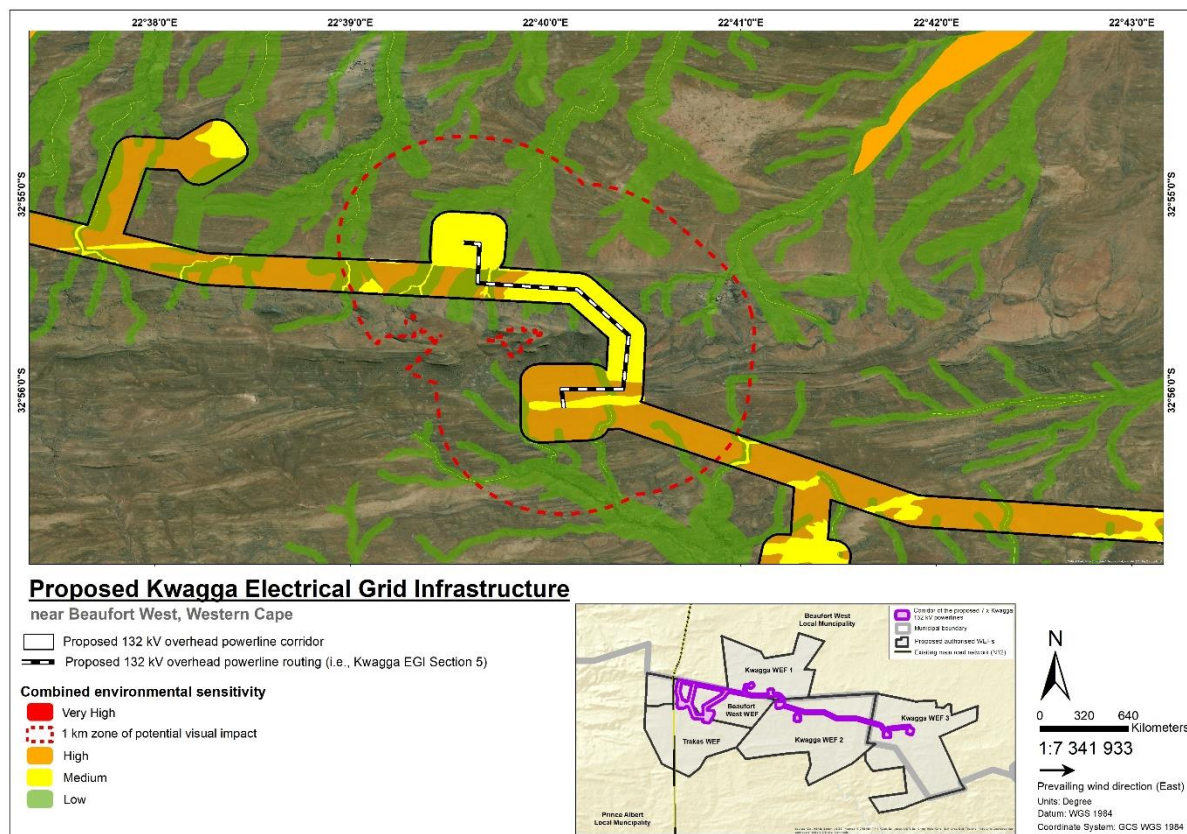


Figure D.8. Combined Sensitivity Map for the proposed project

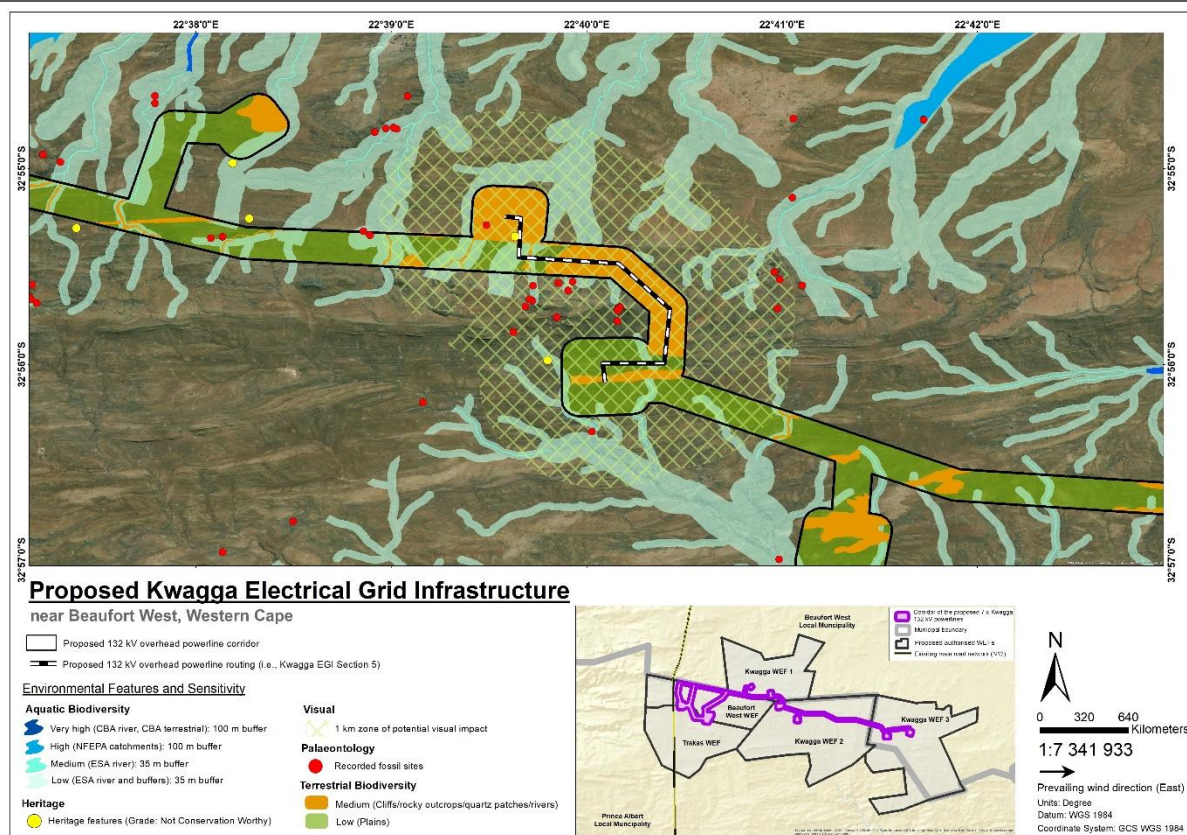


Figure D.9. Combined Sensitivity and Key Features Map for the proposed project

SECTION E. RECOMMENDATION OF PRACTITIONER & ENVIRONMENTAL IMPACT STATEMENT

This BA Report has investigated and assessed the significance of potential positive and negative direct, indirect and cumulative impacts associated with the proposed powerline projects that will support the proposed authorised Kwagga WEFs 1-3 and associated infrastructure. No negative impacts have been identified within this BA that, in the opinion of the EAP who has conducted this BA process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Section 24 of the Constitutional Act states that “*everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*”. Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMP in Appendix G of this BA Report).

It is understood that the information contained in this BA Report and appendices is sufficient to make a decision in respect of the activity applied for. It is recommended that the EA be valid for a period of 10 years.

Alternatives

As noted above, in Section A of this report, the preferred activity was determined to be the development of a 132 kV overhead transmission powerline to facilitate the connection of the proposed authorised Kwagga WEF 2 and Kwagga WEF 3 to the national electrical grid network. The EGI assessed in this BA is essential to the operation of the proposed authorised WEF project. In terms of the preferred location of the site, even though location alternatives were not assessed the layout was designed after provision of sensitivity data by the specialists to ensure that it would have the least possible overall impact. All the specialists assessed a large area within a corridor of up to 500 m in order to find the best location for the powerline and associated infrastructure. The specialists considered desktop data, field work, existing literature and the National Web-based Environmental Screening Tool to inform the identification of sensitivities. Based on this, a preliminary route option for the 132 kV overhead transmission powerline was determined. This routing will avoid the sensitive features including assigned buffer areas, as explained in Section B and Section D of this BA Report.

Need and Desirability of the Proposed Project

This BA considered the nature, scale and location of the proposed powerline development as well as the need for these powerlines. These seven proposed 132 kV overhead transmission powerline projects are situated in the same geographical area on adjoining farm properties and are necessary in order to facilitate the connection of the proposed authorised Kwagga WEF 1, proposed authorised Kwagga WEF 2 and the proposed authorised Kwagga WEF 3 to the national electrical grid network. The proposed powerline projects are not located within any of the Renewable Energy

Development Zones (REDZs) gazetted in Government Gazette 41445, GN R114 on 16 February 2018 (i.e. Phase 1 REDZ), and Gazette 44191, GN R144 on 26 February 2021 (i.e. Phase 2 REDZ). The proposed powerline projects are also not located within any of the Strategic Transmission Corridors gazetted in Government Gazette 41445, GN R113 on 16 February 2018; and in Government Gazette 44504, GN R383 on 29 April 2021.

However, proposed Kwagga EGI corridor in its entirety is located in close proximity (<5 km) to the Beaufort West REDZ and less than 10 km away (at its closest point) from the Central Strategic Transmission Corridor (as gazetted on 16 February 2018, GN R113). Furthermore, the proposed Kwagga EGI corridor is located approximately 4 km away (at its closest point) from the existing Droërivier-Proteus 400 kV Overhead Transmission Powerline that runs parallel to the N12 in a north-south direction. Therefore, the location of the proposed powerline project is very close to a geographical area that has been identified on a strategic planning level to have reduced negative environmental impacts but high commercial attractiveness (due to its proximity to, inter alia, the national grid) and socio-economic benefit to the country. The development of wind energy and its associated electrical grid infrastructure is therefore important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability.

The Karoo region is attractive for electricity transmission and distribution projects due to the significant solar and wind energy resources and as a result the increasing number of renewable energy projects that are being proposed for development. Various renewable energy projects have been approved in the Central Karoo District Municipality (CKDM), but most have yet to be developed. The draft CKDM Spatial Development Framework (SDF) (2019) identifies considerable opportunities for expanding renewable energy projects related to solar and wind power in the CKDM, encourages Independent Power Producers to locate in the region and to create downstream opportunities. Furthermore, renewable energy generation is deemed one of the economic sectors with most promise in the Central Karoo area in the provincial SDF and will add value to the Regional Gross Domestic Product (GDP), while having the potential to change the composition and character of towns in the district (CKDM IDP 2017-2022).

On a municipal planning level, the proposed project supports the objectives of the Beaufort West Local Municipality's IDP (2017-2022) and the Prince Albert Local Municipality's IDP (2017-2022) which identifies sustainable development and job creation as key priorities to improve its economic sector. Both the Beaufort West Local Municipality IDP and the Prince Albert Local Municipality IDP promote the creation of an enabling environment to attract investment and support local economy. The proposed powerline project is therefore aligned with the vision and goals of the District and Local Municipalities. It will also stimulate the creation of employment which is much needed in the municipal areas. It will therefore be supportive of the IDP's objective of creating more job opportunities.

Summary of Key Impact Assessment Findings

Based on the findings of the specialist assessments, the proposed powerline project is considered to have an overall **Low to Very Low** negative environmental impact (with the implementation of respective mitigation and enhancement measures). Table E.1 below provides a summary of the impact assessment for the proposed project post-mitigation for direct negative impacts. Table E.2 provides the same information for the cumulative impacts.

As indicated in Table E.1, it is clear that all of the direct negative impacts were rated with a **Low to Very Low** post-mitigation impact significance for the construction phase. In terms of the operational phase, the majority of the direct negative impacts were rated with a **Low to Very Low** post mitigation impact significance, with only the Visual impacts being rated as **Moderate**. All of the direct negative impacts were rated with a **Low to Very Low** post-mitigation impact significance for the decommissioning phase.

Based on Table E.2, the majority of the cumulative negative impacts were rated with a **Low to Very Low** post mitigation impact significance for the construction phase, with only the Heritage impacts (Archaeology and Cultural Landscape) and Palaeontology impacts being rated as **Moderate**. A similar trend is applicable to the operational phase, with Heritage impacts (Archaeology and Cultural Landscape) and Visual impacts being rated as **Moderate**. During the decommissioning phase, the majority of cumulative impacts were rated with a **Low to Very Low** post mitigation impact significance, with only the Heritage impacts (Archaeology and Cultural Landscape) being rated as **Moderate**.

Table E.1. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative Impacts for the Kwagga EGI Projects

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
DIRECT NEGATIVE IMPACTS			
Visual	Low	Moderate	Very Low
Heritage (Archaeology and Cultural Landscape)	Very Low	Very Low	Very Low
Palaeontology	Low	Insignificant	Insignificant
Terrestrial Biodiversity and Species	Low	Very Low	Very Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Low	Low

Table E.2. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative for the Kwagga EGI Projects

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Visual	Low	Moderate	Very Low
Heritage (Archaeology and Cultural Landscape)	Moderate	Moderate	Moderate
Palaeontology	Moderate	Insignificant	Insignificant
Terrestrial Biodiversity and Species	Low	Low	Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Low	Low

Note that all of the specialists have recommended that the proposed project receives EA if the recommended mitigation measures are implemented.

Overall Environmental Impact Statement

Taking into consideration the findings of this BA Process, as well as the location of the proposed powerline project (i.e., **132 kV Overhead Powerline Section 5 of the Kwagga EGI corridor**) in close proximity to the Beaufort West REDZ, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Gamka Karoo, and Beaufort West and Prince Albert regions.

Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed powerline project receive EA in terms of the 2014 EIA Regulations (as amended) promulgated under the NEMA.

Cumulative Environmental Impact Statement

The cumulative impacts have been assessed by all the specialists on the project team. The cumulative assessment included approved renewable energy projects within a 50 km radius of the powerline corridor, as well as existing and planned transmission lines, as well as the three proposed authorised Kwagga WEF 1-3 projects. No cumulative impacts have been identified that were considered to be fatal flaws. The specialists recommended that the powerline project receive EA in terms of the EIA Regulations promulgated under the NEMA, including consideration of cumulative impacts. It is also important to note that the proposed powerline corridor is located in close proximity to the gazetted Beaufort West REDZ, which supports the development of large-scale wind and solar energy developments. The proposed powerline corridor is also located in close proximity to the gazetted Central Strategic Transmission Corridor, as well as the existing Droërivier-Proteus 400 kV Overhead Transmission Powerline. The proposed powerline project is therefore in line with the national planning vision for wind and solar development, as well as electricity transmission and distribution expansion in South Africa.

Conditions to be included in the EA

In order to ensure the effective implementation of the mitigation and management actions, an EMPr has been compiled and is included in Appendix G of this BA Report. The mitigation measures necessary to ensure that the proposed projects are planned and carried out in an environmentally responsible manner are listed in this EMPr. The EMPr includes the mitigation measures noted in this report and the specialist studies. The EMPr is a dynamic document that should be updated as required and provides clear and implementable measures for the proposed project. The frequency of monitoring and auditing compliance with the conditions of the EA (should such an authorisation be granted) and EMPr, is recommended in the EMPr. The compliance monitoring ranges from weekly to bi-monthly to monthly. It is recommended that regular monitoring be undertaken, as specified in the EMPr. It is further recommended that the submission of compliance reports to the Competent Authority be undertaken quarterly.

Listed below are the **main** recommendations that should be considered for inclusion in the EAs (should such authorisations be granted by the DFFE). These main recommendations as well as additional recommendations are included in the EMPr and BA Report. These recommendations apply to this proposed powerline project (i.e., **Section 5 of the Kwagga EGI Corridor**) which is the subject of this BA Report, as well as the other six proposed powerline projects (i.e., Section 1-4 and 6-7 of the Kwagga EGI corridor).

For the Kwagga EGI corridor, seven separate Applications for EA and seven separate BA Reports have been prepared and will be submitted to the Competent Authority for decision-making. It is

therefore proposed that each of the seven proposed powerline projects (i.e., Section 1-7 of the Kwagga EGI Corridor) will each be issued a separately EA (should such EA be granted).

- **Agriculture Impacts**
 - The conclusion of the Agricultural Compliance Statement is that the proposed powerline project is acceptable and the recommendation for its approval is not subject to any conditions.
- **Visual Impacts:**
 - The conclusion of the Visual Impact Assessment is that the proposed powerline project is acceptable and the recommendation for its approval is not subject to any conditions, provided that the recommended mitigation measures are implemented as per the EMPr.
- **Heritage Impacts (Archaeology and Cultural Landscape):**
 - A palaeontologist must conduct a pre-construction palaeontological survey of the final authorised alignment well in advance of construction to determine whether any areas require avoidance or mitigation.
 - An archaeologist must conduct a pre-construction archaeological survey of the final authorised alignment well in advance of construction to determine whether any areas require avoidance or mitigation.
 - If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution (museum / university collection).
- **Palaeontological Impacts**
 - The ECO should be made aware of the possibility of important fossil remains (bones, teeth, petrified wood, plant-rich horizons, fossil termitaria etc.) being found or unearthed during the construction phase of the development.
 - Monitoring for fossil material of all surface clearance and deeper (>1 m) excavations by the ECO on an on-going basis during the construction phase is recommended.
 - Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist.
 - The palaeontologist must obtain a Fossil Collection Permit from Heritage Western Cape and all fossil material collected must be properly curated in an approved repository (museum / university collection).
- **Terrestrial Biodiversity and Species Impacts**
 - The conclusion of the Terrestrial Biodiversity and Species Impact Assessment is that the proposed powerline project is acceptable and the recommendation for its approval is not subject to any conditions, provided that the recommended mitigation measures and management actions are implemented as per the EMPr.
- **Aquatic Biodiversity Impact**

- Smaller feeder streams and drainage lines should have no-go buffer area of at least 35 m from the center of these streams to ensure these aquatic ecosystems are not impacted by the proposed activities.
- The existing road infrastructure should be utilised as far as possible to minimise the overall disturbance created by the proposed project. Where new access routes need to be constructed through the watercourses, the disturbance of the channels should be limited – a single jeep track that minimises disturbance of cover vegetation and hardening of surfaces should be used. Low water crossings through the watercourse should be utilised.
- Any indigenous vegetation clearing within or adjacent to the watercourses should occur in a phased manner to minimise erosion and/or run-off. An Environmental Control Officer or a specialist with knowledge and experience of the local flora should be appointed during the construction phase to be able to make clear recommendations with regards to the revegetation of disturbed areas.
- Proper site management must be undertaken during construction to address on-site prevention of pollution measures from any potential pollution sources during the construction activities such as hydrocarbon spills.
- Any disturbed areas should be rehabilitated and monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth. Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.
- Stormwater runoff from developed areas such as the access road should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate channels and swales when located within steep embankments. Should any erosion features develop, they should be stabilised as soon as possible.
- Any water supply, sanitation services as well as solid waste management services that should be required for the site should preferably be provided by an off-site service provider.
- During decommissioning, disturbance to the freshwater ecosystems should be limited as far as possible. Disturbed areas may need to be rehabilitated and revegetated. Mitigation and follow-up monitoring of residual impacts (alien vegetation growth and erosion) may be required.

▪ **Avifauna Impacts**

- Operational Phase (Direct and Cumulative):
 - If a powerline has to be routed across a high sensitivity zone, mitigation in the form of Bird Flight Diverters will be required.
 - The avifaunal specialist must conduct a walk-through of the entire powerline corridor prior to implementation to demarcate sections of the powerline that need to be marked with Eskom approved bird flight diverters.
 - Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented where possible by an appropriately qualified rehabilitation specialist, according to the recommendations of the Terrestrial Biodiversity and Species Impact Assessment.

▪ **General**

- Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.
- If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.

Paul Lochner

NAME OF EAP



SIGNATURE OF EAP

7 October 2022

DATE

References:

Refer to detailed reference lists included in each Specialist Assessment chapter in Appendix D of this Final BA Report. In addition to each of the Specialist Assessments chapters referred to in the text above, as well as various footnotes, below is a list of the key references used.

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