

Basic Assessment for the proposed construction of a 132 kV Overhead Powerline between the proposed Kwagga Wind Energy Facility 3 and the proposed Eskom 132 kV Switching Substation, near Beaufort West in the Western Cape Province

DRAFT BASIC ASSESSMENT REPORT

July 2022



Prepared for:
ABO Wind Renewable
Energies (Pty) Ltd

Prepared by:
CSIR Environmental
Management Services,
PO Box 320, Stellenbosch
7599, South Africa



BASIC ASSESSMENT PROCESS

for the

Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 3 and the proposed authorised Eskom 132 kV Switching Station (i.e., Kwagga EGI Section 4), 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 3 and the proposed authorised Eskom 132 kV Switching Station (i.e., Kwagga EGI Section 4), near Beaufort West in the Western Cape Province: DRAFT BASIC ASSESSMENT (BA) REPORT
Purpose of this report:	<p>The purpose of this Draft 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 is currently being 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 will be incorporated and addressed, as applicable and where relevant, into the Final BA Report. The Final BA Report will then be submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.</p>
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Mapping:	Dhiveshni Moodley (CSIR)
Date:	July 2022
Formatting and Desktop Publishing:	Magdel van der Merwe, DTP Solutions
To be cited as:	CSIR, 2022. Basic Assessment for the Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 3 and the proposed authorised Eskom 132 kV Switching Station (i.e., Kwagga EGI Section 4), near Beaufort West in the Western Cape Province: CSIR/SPLA/SECO/ER/2022/0023/B

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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). 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 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 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 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 Eskom 132 kV Switching 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);
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed Eskom 132 kV Switching 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);
- Proposed Construction of a 132 kV overhead transmission powerline between the proposed Eskom 132 kV Switching Station and the Kwagga WEF 3 (i.e., **Kwagga EGI Section 4**) – this powerline facilitates connection of Kwagga WEF 3;
- 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 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 are being 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 will be incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and appended to the Final BA Report. The Final BA Report will be 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 1 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 B and Point E, via Point C and Point D in Figure A. For purposes of this BA Process, this proposed powerline project is referred to as **Section 4 of the Kwagga EGI Corridor**.

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

DRAFT BASIC ASSESSMENT REPORT: Basic Assessment for the Proposed Construction of a 132 kV Overhead Transmission Powerline between the proposed authorised Kwagga Wind Energy Facility 3 and the proposed authorised Eskom 132 kV Switching Station (i.e., **Kwagga EGI Section 4**), near Beaufort West in the Western Cape Province

- Remainder of the Farm Dwaalfontein Wes No. 377 (Surveyor General 21 Digit Code: C0090000000037700000);
- Portion 1 of the Farm Dwaalfontein Wes No. 377 (Surveyor General 21 Digit Code: C0090000000037700001);
- 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);
- Remainder of the Farm Wolwe Kraal No. 17 (Surveyor General 21 Digit Code: C0610000000001700000);
- Portion 9 of the Farm Wolwe Kraal No.17 (Surveyor General 21 Digit Code: C0610000000001700009);
- Portion 7 of the Farm Muis Kraal No. 373 (Surveyor General 21 Digit Code: C0090000000037300007);
- Portion 1 of the Farm Witpoortje No. 16 (Surveyor General 21 Digit Code: C0610000000001600001); and
- Portion 1 of the Farm Trakas Kuilen No. 15 (Surveyor General 21 Digit Code: C0610000000001500001).

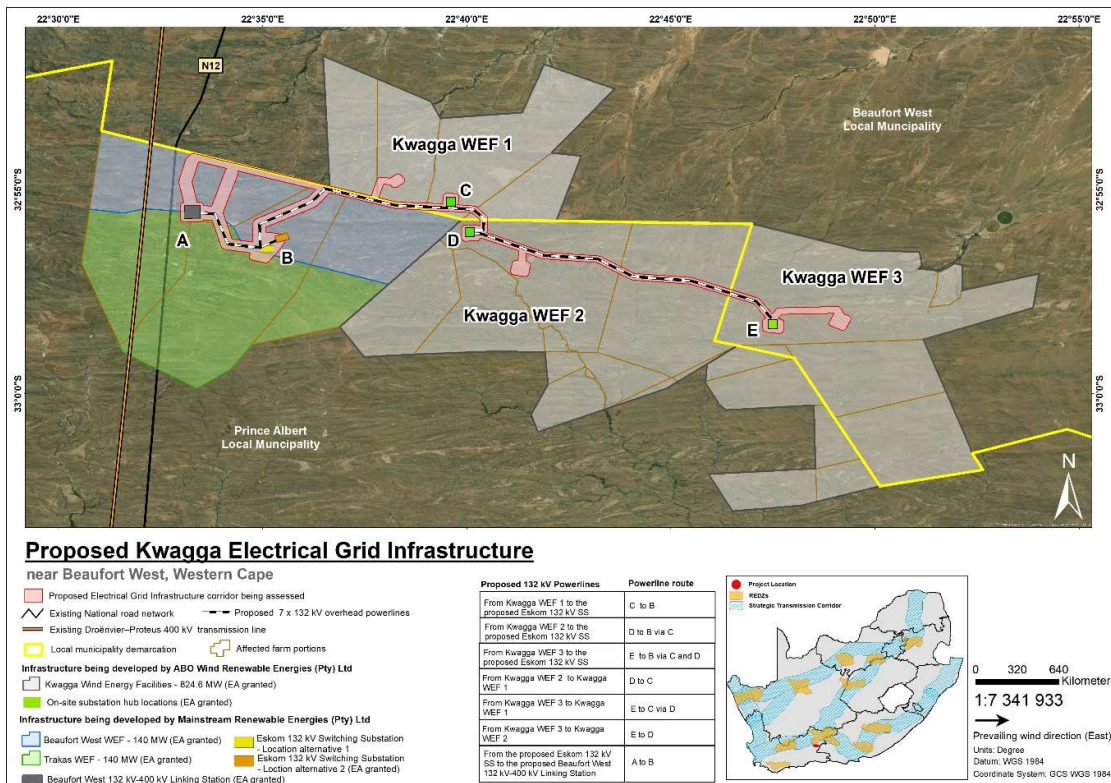


Figure A. Locality of the Kwagga EGI Corridor comprising the seven proposed 132 kV overhead transmission powerline projects (i.e., Kwagga EGI Section 1 – 7)

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	
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 Eskom 132 kV Switching Station and the proposed authorised Kwagga WEF 3 (i.e., **Kwagga EGI Section 4**) – this powerline facilitates connection of Kwagga WEF 3 (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.

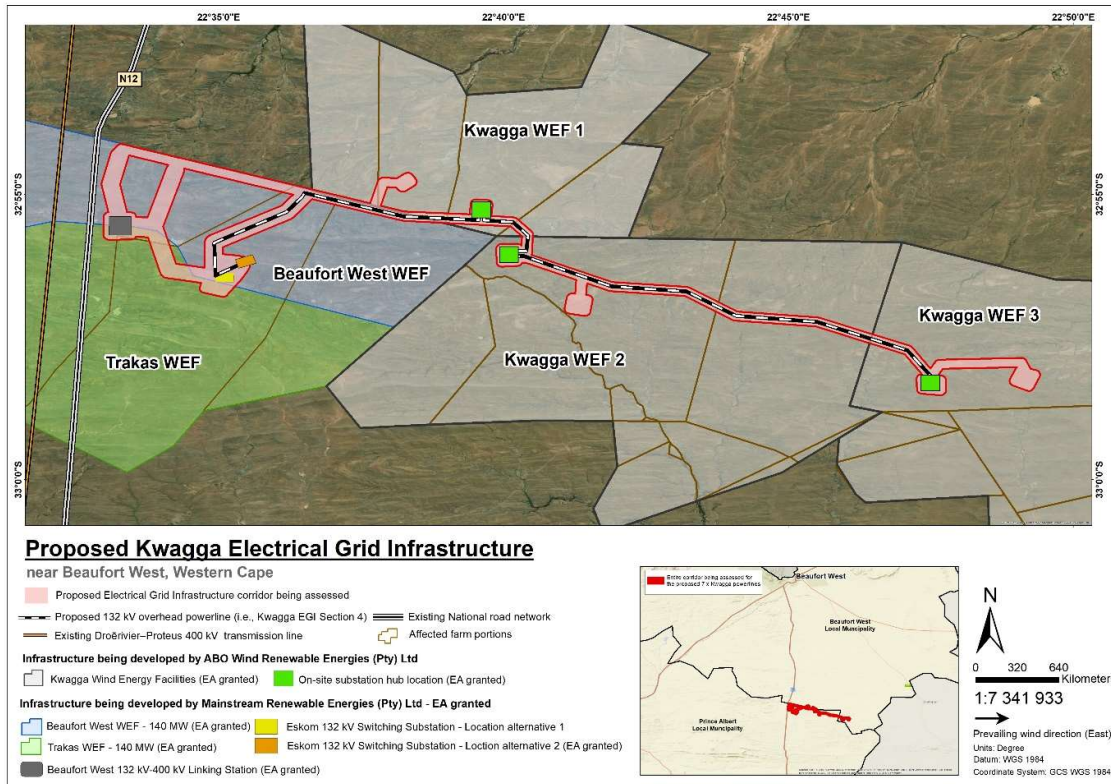


Figure B. Locality map showing the proposed 132 kV overhead powerline in relation to the Kwagga EGI Corridor (i.e., Kwagga EGI Section 4 that is the subject of this BA Report), which extends between the proposed authorised Kwagga WEF 3 and the proposed authorised Eskom 132 kV Switching Substation

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	25 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 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 Eskom 132 kV Switching Station (Footprint: approximately 20 ha); ○ Proposed authorised Kwagga WEF 1 On-site Substation (Footprint: approximately 5.21 ha); ○ Proposed authorised Kwagga WEF 2 On-site Substation (Footprint: approximately 18.5 ha); ○ Proposed authorised Kwagga WEF 2 On-site Substation (Footprint: approximately 17 ha).

Component	Description
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.
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 3 to the existing Droërivier–Proteus 400 kV overhead transmission powerline, via the proposed authorised Kwagga WEF 1-2, 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 4 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 Draft 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 Draft 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)
DIRECT IMPACTS - CONSTRUCTION PHASE		
<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)
DIRECT IMPACTS - OPERATIONAL PHASE		
<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)
DIRECT IMPACTS - DECOMMISSIONING PHASE		
<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)
CUMULATIVE IMPACTS - CONSTRUCTION PHASE		
<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)
CUMULATIVE IMPACTS - OPERATIONAL PHASE		
<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)

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
CUMULATIVE IMPACTS - DECOMMISSIONING PHASE		
<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)
DIRECT IMPACTS - CONSTRUCTION PHASE		
<ul style="list-style-type: none"> Impact 1: Potential damage or destruction of archaeological materials/sites 	Low risk (Level 4)	Very low risk (Level 5)
<ul style="list-style-type: none"> Impact 2: Potential damage or destruction of graves 	Low risk (Level 4)	Very low risk (Level 5)
<ul style="list-style-type: none"> Impact 3: Intrusion of powerlines and electrical equipment into the cultural landscape 	Very low risk (Level 5)	Very low risk (Level 5)
DIRECT IMPACTS - OPERATIONAL PHASE		
<ul style="list-style-type: none"> Impact 4: Intrusion of powerlines and electrical equipment into the cultural landscape 	Very low risk (Level 5)	Very low risk (Level 5)
DIRECT IMPACTS - DECOMMISSIONING PHASE		
<ul style="list-style-type: none"> Impact 5: Intrusion of powerlines and electrical equipment into the cultural landscape 	Very low risk (Level 5)	Very low risk (Level 5)
CUMULATIVE IMPACTS – CONSTRUCTION; OPERATIONAL AND DECOMMISSIONING PHASES		
<ul style="list-style-type: none"> Impact 6: Potential damage or destruction of archaeological materials/sites, buildings and graves 	Low risk (Level 4)	Very low risk (Level 5)
<ul style="list-style-type: none"> 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>		
<ul style="list-style-type: none"> 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>		
<ul style="list-style-type: none"> 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)
<ul style="list-style-type: none"> Impact 1: The clearing of natural vegetation 	Low risk (Level 4)	Low risk (Level 4)
<ul style="list-style-type: none"> Impact 2: The loss of threatened, protected & endemic plant and animal species 	Low risk (Level 4)	Low risk (Level 4)
<ul style="list-style-type: none"> Impact 3: Loss of faunal habitat 	Low risk (Level 4)	Very Low risk (Level 5)
<ul style="list-style-type: none"> Impact 4: Direct faunal mortalities 	Low risk (Level 4)	Very Low risk (Level 5)
<ul style="list-style-type: none"> Impact 5: Increased dust deposition 	Low risk	Very Low risk

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
	(Level 4)	(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)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
● 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)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
● 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)
<i>DIRECT IMPACTS - DECOMMISSIONING PHASE</i>		
● 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)
<i>CUMULATIVE IMPACTS - CONSTRUCTION PHASE</i>		
● 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)
<i>CUMULATIVE IMPACTS - OPERATIONAL 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 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 4 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>	<u>YES / NO</u>	<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.